LIQUIDITY AUGMENTED CAPITAL ASSET PRICING MODEL

By

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NATIONALUNIVERSITY OF MODERN LANGUAGES

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THESIS AND DEFENSE APPROVAL FORM

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Candidate of Master of Science in Business Administration at the National University of Modern languages do hereby declare that the thesis Liquidity Augmented Capital Asset Pricing Model submitted by me in partial fulfillment of MS degree, is my original work, and has not been submitted or published earlier. I also solemnly declare that it shall not, in future, be submitted by me for obtaining any other degree from this or any other university or institution.

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LIQUIDITY AUGMENTED CAPITAL ASSET PRICING MODEL

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This thesis has been read by me and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and thus fulfills the qualitative requirements of this study. It is ready for submission to the Faculty of Advanced Integrated Studies and Research for internal and external evaluation.

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DEDICATION

I dedicate this research to my parents and especially to my husband who is a real source of motivation and inspiration to me, not because he is my husband rather because of his conduct, honesty, dedication towards his profession and way of living. No doubt due to special blessing of ALLAH and prayers of my parents today I am able to complete this study.

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I bow my head before Almighty Allah, The Kind and The Merciful, submitting with willingness and obedience before his majesty who created the universe and blessed me intellect, efficiency and capacity to complete this research study.

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SADAF IQBAL

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ABSTRACT

This study examines the effect of an overall market factor and liquidity risk factor on expected returns of an asset in emerging market of Pakistan. Traditional CAPM alone was unable to explain the variations in returns in Pakistan as proved from many past researches. The liquidity risk, which is the main problem of emerging markets, is added to CAPM to increase its explaining power. Monthly data for the period of 2008-2017 was taken for PSX 100-index. Turnover proxy was used for liquidity which has significant impact on excess stock returns. The results of this study suggests that LCAPM performs better than single factor model.

Keywords: Asset Pricing, Risk and Return, CAPM, Liquidity factor.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

For generations, the stock markets had removed the difficulty of investors to best invest their money. As the financial world is constantly in changing condition, the investors should be so knowledgeable and have sufficient information in order to make rational decision. The two important factors to be considered while investing in "Risk and Return". It is a general myth that to earn high returns, more risk has to be taken. Thus, for wise investment decision, investor should have skill of risk management to optimize the profits.

1.1.1 Risk & Return

It is a general view that investors are expecting higher returns for assuming high level of risk. The economist explained it through an assumption that investors are by nature "Risk Averse", means that investors are risk reluctant at cost of their returns. If their assumption is considered true then investors will expect higher rate of return whenever he assumes higher risk by investing in riskier asset.

The measure of risk is volatility. The portion of volatility which is present in specific asset due to its random noise is unsystematic risk. While the part of volatility which is not asset specific and it comes from the market is called unsystematic risk. Beta is the measure to calculate systematic risk i.e. it measures the volatility of an asset towards

the overall market. Thus, beta will calculate the relationship between expected return and systematic risk.

According to Bryant and Eleswarapu (1997), that in today's world, investors want high returns on their investment. The financial managers or investor does have certain expected asset return in their mind when they buy a stock or asset, it is quite possible that they might not receive the desired returns or at times they receive returns, more than their expectations. Because of this uncertainty, stocks are assumed to be risky securities. To lower this risk factor in the financial markets, investors are advised to diversify their portfolios that are different stocks with different ratio of risks are bought. Investors are interested in finding out a model to calculate their risk on investment and also the expected return. Researchers all over the world has tested the CAPM model and had different experiences.

1.2 Capital Asset Pricing Model

Capital asset pricing model (CAPM) was originally proposed by Sharpe (1964) and Linter (1965). They suggested that expected returns of an asset that is in excess to risk free rate depends upon its systematic risk, which is non-diversifiable.

CAPM is based on modern Portfolio theory proposed by Markowitz (1959). Markowitz was the first to talk about portfolio risk and return. According to this theory, the investor would minimize the risk of portfolio for given level of return or return can be maximized forgiven level of risk. The model was later on modified by Sharpe and Linter by extending its assumption and drawing the effect of adding risk free asset to risky portfolio. CAPM has gained a great fame due its practical implication e.g. by using this model investor can construct their portfolio and manage its performance. CAPM can be used to find the required rate of return for investor and cost of capital for the firm. In

CAPM model, unsystematic risk is eliminated by using assets portfolio whereas systematic risk is calculated by beta. Un-systematic risk could be controlled by diversification but the systematic risk is also related to the market which is called as Market risk, which can never be controlled by the diversification. CAPM model only calculates the market risk known as beta in this model.

1.2.1 Assumption of CAPM

The CAPM is based on following assumptions which are extension of Markowitz and Tobin (1958) assumptions.

1. Capital market is in equilibrium. If the market is in equilibrium it means that everyone is holding the best combination of asset in portfolio and it must be along efficient frontier at which return will be maximum for given level of risk.
2. Investor are price takers. There are so many small investors that their buying and selling does not affect the price of stock.
3. The security market is frictionless i.e. no order fee, transection fee or any other tax.
4. Investors have homogeneity of expectation. It means that the investors have same expectations for different investments in terms of mean, standard deviation and co-efficient correlation.
5. Investors are assumed to face only systematic risk which is non-diversifiable. If the investors hold diversifiable portfolio and beta is known then we can calculate the expected rate of return of an investor.

In case of risk free asset whose beta is zero, its expected return will be equal to risk free return on this asset.

Now if the return on asset moves up and down with movement in market, it has perfect correlation with the market and has beta equal to one. Now the return on this asset will be equal to that of market i.e.

$$E(R_A) = E(R_M)$$

Now consider the movement of returns is greater than that of market, then it has beta greater than one. The investors would expect greater return as their compensation for investing in this risky asset.

The CAPM equation can be get by generalizing the relationship between expected return its non-diversifiable risk i.e.

$$E(R_A) = R_f + \beta\left(E(R_M) - R_f\right) \text{ ---------- (1.1)}$$

Where R_f in equation (1.1) represents the return on risk free asset. E (R_M) – R_f is the market risk premium i.e. the excess return on market as compensation for investing in risky asset.

Thus, the CAPM elaborates that an asset has capability to yield risk free rate along with premium for beta which is non-diversifiable.

After Sharpe (1964), the researcher extended the model and make it more efficient by adding some more real world factors as the explanatory power of CAPM has been proven to be weak (Griffen, 2002; Black et al., 1972; Basu, 1997, 1983; Banz,1981; Bhandari, 1988). As the world is developing, it is believed that risk factors of investing on the assets or especially on the stocks are increasing and are no more one dimensional. The more pronounced was the Fama & French (1993), negated the use of single risk factor, beta, in calculating returns on the risky assets in financial market. They pointed out the

presence of two other anomalies i.e. the size factor and book-to-market. They used SMB (small minus big) to address the size risk and HML (high minus low) for value risk. SMB which stands for Small minus Big, is the measure of additional return investors have received by participating in stocks of companies with relatively small market capitalization. This additional return is referred as the "size premium". A positive SMB indicates that small cap stocks outperformed large cap stocks while a negative SMB indicates the large caps outperformed. HML, which is short for High minus Low, has constructed to measure the "value premium" provided to investors for investing in companies with high book-to-market values. A positive HML indicates that the value stocks outperform the growth stocks while a negative HML indicates that the growth stock outperform.

Minovic & Zivkovic (2010) showed that the inclusion of other factors enhanced the significance of single factor model in explaining the asset returns. Fama (2006) recommended the research to be conducted on other factors as well as their model do not have the capability of explaining all asset returns in different markets. Amihud and Mendelson (1986) were the first to introduce the concept of liquidity. In their study, they took the stock listed on NYSE for the period of 1960-1980. They found that as the bid and ask spread increases, the return for those portfolios decreases and vice versa. Hence, they concluded that investors should be compensated for the transaction fee.

Similarly, Datar, Naik & Radcliffe, (1998) has defined an alternative proxy to find the liquidity i.e. turnover rate. The results were confirming the theory that less liquid stocks generate more returns than high liquid stocks in order to compensate the bearer. Amihud (2002), had given a new measure of illiquidity as the previous one of bid and ask rate was hard-to-track. The new measure is simply the measure of price impact. His results also showed the positive relationship between illiquidity and stock returns, reaffirming the

compensation for illiquidity. Chan and Faff (2003), Archarya and Pedersen (2005) have also studied the different dimensions of liquidity with different proxies.

Liu (2006) researched the two factor model of CAPM by incorporating the liquidity factor versus Fama and French three factor model. He found that the explaining power of two factor model is more than Fama and French three factor model.

The standard CAPM model was static with only one factor, Market risk, is considered in the financial markets for evaluating stock returns. Fama-French recognized three common risk factors (market risk, firm size and book to market values) to evaluate the stock returns in the financial market. Liquidity augmented CAPM considers two factors that are the market risk and the liquidity risk in estimating stock returns. Hence after, thorough investigation, the literature (given in the following chapter) suggested that LCAPM model performs better than other two models.

1.3 Liquidity

Liquidity is how easily the stock can be traded in market with heavy volumes without decreasing its price and without incurring any transaction cost (Liu, 2006). It implies that before investing in an asset the investor would thoroughly analyze market for its resale. If they want to sell it in the future what cost they have bear and at what price they would be able to sell it. All these concerns are related to liquidity of an asset and also effects its price, thus important factor while pricing an asset.

Then, according to the above explanation, liquidity has four aspects; the speed with which an asset can be bought and sold, the quantity being bought and sold, the cost aspect and the price effect.

Generally, liquid financial market is described with features mentioned below:

- Tight bid -ask spread: Financial Market has low transaction costs
- Immediacy: The speed in which the asset trading occurs
- Depth: abundance of orders traded at around current price
- Breadth: Many large orders traded with minimum effect in the prices
- Resilience: orders are traded quickly and in order that doesn't imbalances the prices warranted

Different researches were done on different aspects of liquidity from time to time and their measures of liquidity was also different. For example, Amihud and Mendelson (1986) used the bid and ask price spread in order to determine the trading cost. Their study showed that a rational investor require a higher risk premium as compared to liquid stock.

Datar et al. (1998) worked on the quantity traded aspect of liquidity and captures the effect by using turnover rate. Amihud (2002) and Pastor and Stambaugh (2003) worked on prices to check its effect on trading quantity. Liu (2006) worked on all dimensions of the liquidity including speed. But a little literature is present on the speed aspect of the liquidity.

1.3.1 Causes of Illiquidity

Before investing in an assets, there are number of consideration which may serve as the source of illiquidity. For example the sources as identified by Amihud, Mendelson and Pedersen (2005) exogenous trading cost, demand pressure, inventory risk, asymmetric information and search friction. There may be other causes too which may be time varying but the investor should be compensated for holding the illiquid stock. The compensation for holding the illiquid stock should be in form of higher expected returns.

1.3.1.1 Expected State Of Economy

According to Pastor and Stambaugh (2003), the economic state can affect the stock liquidity that is if there is or expected recession in economy can cause a stock to be less liquid. The risk averse investor, if forecasted recession, will not only consider the less risky asset but also the more liquid asset. Chordia, Sarkar and Subrahmanyam (2005) was also of the same concept that liquidity of the stock market is related with the state monetary policy. Also the variation in liquidity due to change in monetary policy is also prevalent in stock and bond market.

1.3.1.2 Exogenous Trading Cost

The exogenous factor that can cause illiquidity are associated with trading cost such as brokerage fees, order processing fees and transaction cost. The buyer and the seller both are directly suffers from this type of cost. The trading cost is considered as cause of illiquidity as it creates market friction which in turn effect the prices at which investor will trade.

1.3.1.3 Demand Pressure

The term demand pressure refer to depth of the market for an asset. Demand pressure is also known as price impact. The phenomenon can be explained as the likelihood of selling large amount of securities without decreasing its price. For an instance if an investor wants to sell a considerable volume of his asset but there is no ready buyer to settle the transaction at current market price. So he must have to lower the price in order to liquidate the asset completely. The change in the price due to heavy trading is known as demand pressure or price impact. Thus large transactions will change the price when the asset is not perfectly liquid.

1.3.1.4 Inventory Risk

Another cause of illiquidity is inventory risk, a concept much closer to demand pressure, which can be described as if an agent wants to sell an asset quickly while in market no ready buyers are available. So as a result seller will sell this asset to market maker who busy it on his own anticipation. Now the risk of price change is shifted to market maker who should be compensated for holding this asset and is being exposed to the risk. But this compensation is a cost for seller.

1.3.1.5 Private Information

Another cause that may cost the trader is the private information to the other privileged party. The buyer of an asset will suspect that the seller must have some information about the company's poor performance and poor profit while the seller will be worried that the buyer must have some positive private information about the company. So the one party must bear loss as a result of trading with informed party. For example the order flow, if the trading desk have information that a hedge fund wants to trade their long position and that will result decrease in their prices. Now the trading desk will take advantage of this information by selling it on relatively high prices and later on buy it back at low price.

1.3.1.6 Search Friction

Another cost is the cost of searching a trading party who is willing to buy a particular security at a price and quantity. Once the willing party is found, the buyer must negotiate the price due to non-perfect competitive environment and as no other ready party is available who is willing to transect quickly. The search friction problem is mainly associated with market where there is lack of central market place such as Over the

Counter (OTC). The searching trader either have to bear the searching cost and give discounts when found a counter party or they can quickly sell it to the dealers and pay for the illiquidity cost.

All these illiquidity sources along with some other time varying sources effect the prices of the securities and the investors should be compensated for this liquidity risk specifically the risk averse investors who wants to be compensated for time varying liquidity. So the liquidity risk phenomenon is important while pricing an asset as it will affect the investor required rate of return which in turns affect the company's cost of capital which will affect the decision of distribution of economy's real assets.

1.4 CAPM & Liquidity Factor

The foremost assumption of the CAPM is that the capital market is frictionless which means that capital market is perfect. If this assumption holds true it means there is no trading cost. But according to Amihud, Mendelson and Pedersen (2005) trading cost is the source of liquidity. These trading cost also effect the bid and ask spread.

The other assumption of the CAPM model is that individuals involve in trading cannot influence the price of the security. But in price effect, the assumption is violated as all the stocks are not perfectly liquid and to trade the large amounts, prices must be lowered. Another assumption which is violated in terms of liquidity is the homogenous beliefs about the selection parameter of portfolio. The justification for violation is that the less liquid stocks will be held by investors who are more patient and can wait longer in order to get higher rate of return.

Precisely, as all stocks are not perfectly liquid so the assumptions of the CAPM is rejected. So one would get better results if they consider the liquidity when testing CAPM.

1.5 Measure to Calculate Illiquidity Cost

Keeping the importance of illiquidity cost in view, different researcher used different proxies to calculate it which covers only a specific dimension of liquidity.

1.5.1 Bid And Ask Spread

Bid and ask spread is the difference between the prices at which investor will be willing to buy a stock (selling price) and the purchasing price. The drivers of illiquidity also triggers bid and ask spread. This is because the investor wants compensation for trading cost, inventory risk and the risk for trading with informed traders.

Bid and ask spread method was first used by Amihud and Mendelson (1986) to examine the participation of liquidity in asset pricing. By using the bid ask they determined the trading cost dimension of liquidity.

1.5.2 Turnover Rate

Turnover rate simply measures the liquidity of an asset by computing how many times the owner of an asset changes. It is calculated by dividing the number of shares traded over a specific period by the shares outstanding in that respective period. Datar et al. (1998) used this proxy to study the impact of trading quantity dimension of liquidity.

1.5.3 Stock Return to Trade Volume

It is the ratio, used by Amihud (2002) and Pastor and Stambaugh (2003), in order to determine the price dimension of liquidity. It is the ratio of daily stocks returns to its dollar volume.

1.6 Problem Statement

Bekaert et al. (2007) indicates that the liquidity risk is significant for less developed markets where there are limited investors along with the limited availability of the stock. As exhaustive literature exists on the validity of the two factor model in international market but Pakistan's Stock market which has been classified as emerging market, has few researches on this topic . The presence of liquidity risk has been examined along with the market risk in order to get a clear view whether in Pakistan investors are compensated for liquidity risk or not. Fama & French anomalies were not added as the Liu (2006) has already proved that in emerging market, LCAPM has more explanatory power than FF plus liquidity.

Through CAPM required rate of returns will be determined by taking into account the liquidity risk. There are many proxies to find the liquidity risk. But this research is based on Chan and Faff (2005) model for determining liquidity in emerging market. They used the "turnover" as proxy for finding liquidity which was followed from Datar et al. (1998). Turnover rate simply measures the liquidity of an asset by computing how many times the owner of an asset changes. It is determined by dividing the shares traded over the number of shares outstanding. The researchers took Australian stock data for the period covering 1989 to 1998. They included only those which were survived as of 2005, raising the issue of survivorship bias. They took the same dependent variable as excess return on stock and independent variable as F&F three factors along with liquidity factor. The formation of portfolios of size and B/M factors were same as in F&F (1993). The portfolio for liquidity factor (IMV) is formed by subtracting the returns of most liquid stocks from illiquid stocks. The positive value of IMV indicates that the return on illiquid stock is more than return of liquid stock.

Now, after adding the liquidity to CAPM, the model is:

$$E(R_i) = R_f + \beta_{i,m} (E(R_m) - R_f) + \beta_{i,l} E(LIQ)$$

1.7 Research Objectives

Different researches has proven CAPM weak as compared to LCAPM. Hanif (2010) analyzed applicability of Capital Asset pricing model on the Tobacco sector registered on the Karachi stock exchange of Pakistan. After the empirical analysis of data gathered from tobacco sector, it was concluded that capital asset pricing model is not valid for tobacco sector and showed inconsistent results. At the same time Iqbal and Brook (2007) in his research paper recommended that an augmented version of Fama-French three factor model works better in both developed and developing financial markets whereas CAPM is mostly invalid in both type of financial markets. Same results were found by (Khan et al., 2012; Shamir, Abid, Shaikh, 2014).

This study was carried out to find that whether CAPM is most fits best for calculating asset return for investors in Pakistan 100 index or LCAPM. Thus, the objectives which defines this purpose are:

- To find the relationship between stock returns and market excess returns.
- To find the relationship between stock returns and liquidity factor (LCAPM)
- To increase the literature on asset pricing in Pakistan by applying liquidity augmented CAPM.

1.8 Research Questions

On the basis of purpose of the study mentioned, following questions are raised which has been answered.

- What is the relationship between liquidity and stock returns?
- Which factor affects the excess stocks' return more i.e. market excess return or liquidity factor?

1.9 Significance of the Study

Pakistan is found to be an emerging market and special interest and attention has been gained for its equity market due to several reasons. Great potential exists for its economic growth and prosperity if there is stability in political aspect as well as it makes an efficient utilization of resources. Therefore, interest is shown by investors to estimate risk and return due to existence of direct relationship between the two dimensions.

In past, extensive researches were carried out on different pricing models to investigate whether the investors are compensated for the risk that they have taken. But one of the new concept of liquidity risk, on which literature is available for different stock markets but in emerging market of Pakistan, rare study is available. This study investigated whether the liquidity factor has increased the explaining power of an asset's return in case of Pakistan stock market.

1.10 Scope of the Study

In this research the liquidity factor is added to CAPM in order to investigate its effect on stock's return. Turnover has been used as a proxy for finding liquidity factor.

Liquidity risk and pricing is present in all classes of asset e.g. the previous researches have proven the presence of liquidity risk and their pricing in the bond market as well. But this study has examined the liquidity risk only in stock market and their pricing.

As the stock market data is not easily available, it is another reason for not calculating different dimension and different proxies of the liquidity rather than a single one, i.e. the trading quantity dimension was investigated through turnover proxy.

1.11 Thesis Structure

The research study is composed of six sections.

- The first section explains the underlying theory of CAPM, its assumptions and the formula. It further sheds light on the phenomenon of liquidity, its causes and different proxies that could be used to calculate it.
- The second section has discussed the enormous past researches on single factor model and two factor model. These researches showed the significance of dependent variable and independent variable.
- Third part explains the methodology adopted and statistical tools used.
- Fourth section is based on discussion of results.
- Fifth section is comprises of conclusion and recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Meaning Background of CAPM

The asset pricing or investment models are based on the association in risk and return that exists in that financial stock market. The performance of financial market is also directly related to the financial and economic performance and development and growth of the country. In the financial market of any country is an indicator of the level of investment happening to activate different resources.

CAPM model is considered to be vital and powerful in measuring risk in relation to expected rate of return on the stocks or assets in any financial market. CAPM Model was created on the Markowitz model. Markowitz model is considered to be model of portfolio choice where an investor chooses a portfolio which generates a stochastic return. This model is often known as “Mean variance model”. In CAPM theory, it is believed that diversification of portfolio stocks reduces the risk in the financial market. The Aggregate risk consists of and systematic risk and specific risk in the financial stock market. In the specific hazard and risk can be reduced by adding more securities to the portfolio. As an outcomes and results, the primarily investors are only rewarded for the systematic risk of that stock market. But some scholars believe that it is very hard to hold the diversified portfolios as stock information and cost associated with these stocks is very limited and it

has been also observed that investors tend to invest in those stocks already known to them. So, it is suggested that idiosyncratic risk should be compensated for holding a diversified portfolio of stocks.

CAPM model describes the relation between financial risks and asset or securities return in the financial market. It estimates the rate of return that any financial manager or investor would receive after buying assets or stocks and also holding them for a time period mentioned is considered to be cash dividend plus any capital gain or minus capital loss during the holding period. CAPM model is none the less is a major force in the portfolio theory and asset pricing. But the empirical record of the model had some problems that showed its theoretical failing as the assumptions of model were overly simplified.

The CAPM model is extensively being used as an instrument which is utilized by Fund Managers to foresee and estimate portfolio's or asset return for the holding period and also the market return in any financial market. This gives the fund managers time to assess and evaluate whether they have outflanked the market or not. The dynamic Fund Manager will utilize their abilities and skills, will do some research and also take inform opinions and assessments to over perform the market. So as to evaluate whether the managers or investors are really outflanking the market a benchmark is required, so the CAPM can be utilized here to evaluate the manager’s position. The CAPM gives an estimation of the return of a given portfolio or assets, and when the real return is more prominent than the anticipated estimation of the CAPM it will show that value is being included; this is additionally valid for projects or different ventures around the world. The distinction between the real return and expected return is basically the abundance return which is gotten by the Fund Manager or venture and is alluded to as the alpha.

It is largely believed that the main advantage of using CAPM model is the objectivity with which it can estimate the cost of equity and its returns. However, researchers consider that the CAPM model should not be used alone but along with other supplemented techniques or models for the better realistic analysis of the financial market and also for better estimation of assets or stock returns.

CAPM model despite several shortcomings and limitations, is considered very useful analytical tool for the financial managers and investors the financial market. Although, CAPM is assumed to be simplified in its assumptions about the financial market. One of the assumptions of CAPM model is that financial markets are competent and sophisticated where all buyers and sellers are well-informed whereas in reality every financial market is not efficient and has some deficiencies. The other assumption of this model that the investors expect high returns for the risk they adopt.

It is believed that in today's world, investors want high returns on their investment. The financial managers or investor does have certain expected asset return in their mind when they buy a stock or asset, it is quite possible that they might not receive the desired returns or at times they receive returns, more than their expectations. Because of this uncertainty, stocks are assumed to be risky securities. To lower this risk factor in the financial markets, investors are advised to diversify their portfolios that are different stocks with different ratio of risks are bought. Investors are interested in finding out a model to calculate their risk on investment and also the expected return. Researchers all over the world has tested the CAPM model and had different experiences.

In financial economics, it is considered very important for economy of any country to have a well- regulated stock market. A well-regulated and managed stock market is considered to be crucial for the economic growth of any country and also play role in

improving productivity. The two most important functions of any stock market are the liquidity of the capital in the economy and it also provides a continuous market for the securities. The role of a pricing tool for a stock market is assumed to be important and helpful for investors to make certain investing decisions. These pricing tools of a stock market are crucial for guiding savings into profitable investments hence helping in well-organized allocation of capital in the economy.

Arbel and Strebel (1982) confined that the dynamic Fund Manager will utilize their abilities and skills, will do some research and also take inform opinions and assessments to over perform the market. So as to evaluate whether the managers or investors are really outflanking the market a benchmark is required, so the CAPM can be utilized here to evaluate the manager's position. The CAPM gives an estimation of the return of a given portfolio or assets, and when the real return is more prominent than the anticipated estimation of the CAPM it will show that value is being included; this is additionally valid for projects or different ventures around the world. The distinction between the real return and expected return is basically the abundance return which is gotten by the Fund Manager or venture and is alluded to as the alpha.

2.1.1 CAPM Model of Sharpe-Linter

Pastor and Stambaugh (2003) asserted that this model is extension of Markowitz model. In this model of asset pricing, the main focus is on the decisions made regarding the consumer wealth allocation, in order to get an equilibrium association in expected return and risk and on assets in that financial market. In this model, it is supposed that the investors are the risk opposed and portfolio or asset return dissemination is normal. It also assumes that efficient portfolio gives maximum result for the given mean variance, has lowest degree variance on an estimated output.

But in competitive financial markets, investors diversify risk which nullifies the customary function of the standard deviation is a tool to measure of risk factor.

2.1.2 Black Version of CAPM Model

In this version, Black and Scholes (1973) recommended to use zero beta as a proxy for risk averse assets in portfolios. In this case, zero betas perform a role the role just like as risk free rate in the model of Sharpe-Linter of CAPM. In Black's model of CAPM, the intercept term should be similar for all the assets in the financial market.

2.1.3 CAPM Conditional Version

The traditional CAPM model, considers that stock returns mainly depends on beta while believes that mean and variance of stock returns will be same for all market participants. Whereas the conditional version of CAPM assumes that stock return is time variant that differs from one period to another period. These time periods are conditional on the amount of information that is available at that time t.

So, there are different ways to evaluate the asset pricing or asset returns, these all models are not mutually exclusive. Here, our focus is on the effectiveness of the CAPM model in different financial markets round the world.

Bryant and Eleswarapu (1997) certificated that in today's world, investors want high returns on their investment. The financial managers or investor does have certain expected asset return in their mind when they buy a stock or asset, it is quite possible that they might not receive the desired returns or at times they receive returns, more than their expectations. Because of this uncertainty, stocks are assumed to be risky securities. To lower this risk factor in the financial markets, investors are advised to diversify their portfolios that are different stocks with different ratio of risks are bought. Investors are

interested in finding out a model to calculate their risk on investment and also the expected return. Researchers all over the world has tested the CAPM model and had different experiences.

2.2 Argument In Favor Of CAPM Model

Celik (2012) believes that central aim model of asset pricing is to evaluate the present value of the asset discounted for the risk and time slowness. Similarly, there are few troubles in the discounting procedure in determination of relevant factors that affect pay offs. These pay offs have a great impact on a firm/company future strategy. According to Celik (2012) theoretical perspective of CAPM model is flexible and tries to adopt additional variable in it.

It is believed that capital asset pricing model plays a comprehensive role in deciding about financial assets like shares, option and bonds. Here are two kinds of risk which are unsystematic risk and systematic. The Systematic risk is inherent and also called natural risk from the market while non-systematic risk belongs to the specific industry or company. In CAPM model, unsystematic risk is eliminated by using assets portfolio whereas systematic risk is calculated by beta. Un-systematic risk could be controlled by diversification but the systematic risk is also related to the market which is called as Market risk, which can never be controlled by the diversification. CAPM model only calculates the market risk known as beta in this model.

2.3 CAPM Model Applied on Different Financial Markets

Lau, Quay and Ramsey (1974) used this CAPM model in the stock market of Tokyo where the outcomes and results reinforced in applicability of that CAPM model. While Blume (1993) explained there is a linear association in risk calculated by beta and

the anticipated output on an investment. Hence his findings were compliant with the CAPM model assumptions.

Bjorn and Hordahi (1998) applied CAMP model on the Swedish stock market that showed limited applicability of the model. While Jones (1998) stated that the fluctuations in share price can be found out by measuring beta while also establishing the movement in portfolio i.e. from share portfolio to market portfolio. Elsas, Shaer and Theissen (2003) while studying the German stock market from time period of 1960-1995 showed that here is a significant positive association between returns and beta.

Gomez and Zapatro (2003) tested CAPM model on U.S securities and found the result in favor of the CAPM model. Similar, researches have also been carried out on Pakistan stock markets. A research was conducted by Javed and Ahmed (2008) on Karachi Stock Exchange (KSE) result supported the association in return and risk which was established in that traditional model of CAPM.

Rehman, Gul, Razzaq, Saif, Rehman, and Javed (2013) found that the estimates of CAPM the output and return in Pakistan Stock market is better and much accurate as compared to other models. In this research, risk premium was considered to be the only factor affecting the returns in stock. But at the same time, they advised that French three factor CAPM and Fama model cannot be used universally as different markets have different characteristics. In financial markets, there can be two risk factors that affect return on stocks as contrary to Pakistan stock market where we have considered only one beta factor.

In their research Levy and Roll (2010) agreed that the CAPM model can be used perfectly in all the conventional market proxies of the world. According to research conducted by Dai, Hu, and Lan (2014) CAPM model is applicable in the China stock

market. They came to this conclusion by the empirical analysis of data collected from Shanghai Stock Exchange. Nel (2011) conducted research in South Africa on the gap between academia and investment practitioners on the usage and effectiveness of model of Capital asset pricing model. It is believed the worldwide there are two asset pricing models which is utilized to calculate cost of equity. First, asset pricing model that is applied practically is Capital Asset Pricing Model (CAPM) and other is Arbitrage pricing theory (APT) model. This study was conducted with an aim to prepare students for the market. In South Africa universities, CAPM is considered to be a vital tool in calculating and estimating cost of equity. After detailed investigation it was found out that currently most used model in calculating cost of equity is CAPM and next most used model is APT. Although there are few gaps between academia and investment practitioner especially on the use of appropriate Rf but still CAPM is used mostly by investors.

Rossi (2016) in his research compared the studies on that Capital Asset Pricing model to find out the validity and efficiency since its inception. He found out that this model basically establishes an association in return risk in financial market. Even after four decades of its inception, it's still believed to be widely used by investors and researchers. CAPM describes a risk of the assets in comparison to co-variance of these returns in the extensive financial market.

2.4 Few Concerns Regarding The CAPM Model

Graham and Uliana (2001) was of the opinion that the CAPM model has turned into the model of decision for estimating the cost of equity for financial manager and investors for couple of decades. Regardless of there being various reactions about the model it is as yet the most broadly utilized model for estimating the cost of equity and asset returns, particularly for the bigger organizations or firms around the world. In any case, questions

have begun to be raised in regards to the incorporation between the global financial markets, are these markets completely coordinated or not. If all the financial markets around the world have been completely integrated and coordinated than there is a potential case to utilize a global CAPM model for figuring and estimating the expense of capital, instead of a local CAPM model.

It is considered that in the developed world, the local financial market is coordinated and integrated with the global financial markets, where the expected return for organizations or firm is almost the same within that financial market as in any other financial market. Though emerging financial market is supposed to be less coordinated on a worldwide scale and requires nearby factors to be mulled over.

Researchers are of the view that the local CAPM is characterized by the total asset possessions of the all financial specialists in a country whether emerging or developed. This model predicts and expect that the total assets or stocks of a state are held by the financial specialists or investors who live in that state. For instance, the beta for any country equities is recorded on the its main Stock Exchange would be determined with respect to the value weighted market return on the main Stock Exchange of that state. Moreover, the suspicion that the benefits are just held by people who dwell in that state, imply that there is no global diversification of, and state' capital markets would absolutely globally divided.

Yurtsever and Zahor (2007) carried out a straightforward experimental trial of the CAPM performed on the UK informational index. They discovered a fundamental connection between the expected return for an asset or stock and its risks non-direct for the individual assets or stocks, yet no proof for the portfolios were found. Furthermore, they opposed that the condition for higher risk is related with higher expected return and risk

avoidance is pertinent for stocks or assets but not for the portfolios. In this manner, they could discover little proof for the CAPM model to be utilized.

Korajczy and Viallet (1989) thought that at this point when the world is thought to be completely coordinated, the hazard of investment extends in various nations ought to have a similar cost of capital when the transactions are performed in some common currency. There has been a great deal of proof to recommend that global integration has occurred mostly in the last thirty years, with proof proposing that the expected return of the assets is principally decided on the global portfolio. There has been a change throughout the years which moved from a US ruled world market to a progressively integrated global market. More markets have turned out to be available and are available to outside financial specialists.

Lee (1993) examined and documented that, the beta for any country equities is recorded on the its main Stock Exchange would be determined with respect to the value weighted market return on the main Stock Exchange of that state. Moreover, the suspicion that the benefits are just held by people who dwell in that state, imply that there is no global diversification of, and state' capital markets would absolutely globally divided.

O'Brien and Dolde (2000) analyzed a currency global asset pricing model where a currency index factor and global market index factors are included to make this model a more useful tool for professional financial managers and investors where the markets were comprehensively internationally coordinated. The researcher in this model had considered that the systematic exposure rate changes, and contended this CAPM model gives more insight than the single factor CAPM.

Eleswarapu and Reinganum (1993) examined and considered that in the developed world, the local financial market is coordinated and integrated with the global financial

markets, where the expected return for organizations or firm is almost the same within that financial market as in any other financial market. Though emerging financial market is supposed to be less coordinated on a worldwide scale and requires nearby factors to be mulled over.

Mishra and O'Brien (2001) inspected distinctive cost of capital estimations concentrating on nearby and worldwide CAPMs. They came up with a view that the cost of equity in US dollars of the single-factor GCAPM varied, overall, from those of the neighborhood US-CAPM by 48 premise focuses for the example of US stocks utilized. The researchers found out that the developed markets had greater distinction than the developing markets. In any case, the report infers that the diverse models don't have a considerable effect in cost of equity calculations. But the decision of choosing any model makes a noteworthy monetary contrast in the cost of equity for various firms.

Koedijk, Kool, Schotman, and Van Dijk (2002) examined and tried to find out the features of both the local and global capital asset pricing models (CAPM). It also inspected the degree to which the local and global CAPM models used distinctive methods to estimate the cost of capital. They recognized that a multifaceted global CAPM model and single factor local CAPM differ on many frontiers. They discovered from their examination that the local CAPM model, once in a while lead to a different evaluation for the cost of capital when compared to the calculations of cost capital from the multifaceted worldwide CAPM.

O'Brien and Dolde (2000) examined six strategies to decide the cost of capital for developing markets. But they concluded in their research paper that there is no broad agreement among the investors or financial managers on how to assess the hazard or risks for the developing markets. Nonetheless, it makes two ends; if investors and financial

mangers diversify their portfolios globally, they should utilize the global CAPM model; however, in the event that financial investors and financial managers don't enhance universally, they should utilize the local CAPM model.

Different researchers consider that in last few decades the markets have turned out to be progressively incorporated and also integrated so that the financial specialist have the potential not exclusively invest into stocks on a local level, yet in addition can possibly contribute on the global market portfolio. Different studies show that this situation could mean that the local CAPM model is utilized to ascertain the cost of capital for investment examination could be wrong. This cost of capital could be incorrect because a key assumption behind this value or calculation will be that local investors or financial managers just purchase their very own home market stocks, and that remote financial specialists are not ready to purchase their stock.

The global CAPM model could likewise be contended not to be significant for nations where there are very less foreign investments or ownerships and where local investors don't contribute to the global financial market. The global CAPM model considers the way that coordination and integration does exists and hindrances for remote financial specialists have been limited or reduced which gives investors and financial mangers the potential opportunities for there to be foreign ownership. The recent economic crisis showed that has affected all financial markets not only locally but global financial markets as well which gives more power to propose that state or countries are not autonomous and independent entities, particularly in this developed world.

2.5 Arguments against CAPM Model

Many researchers have been critical of CAPM model because it depends only on one beta factor for decision making. It’s a known fact all around the world that “Higher the

risks, higher will be the returns". But the problem in financial markets is that how one measures the risks associated with an investment in financial assets.

The main issues of the Capital Asset Pricing Model (CAPM) can be summarized as follow:

- The assumptions of Capital Asset Pricing Model don't comply with the truth of the world. The real conditions in this world include exchange costs, information costs, and duties. Any genuine financial market cannot be completely efficient and effective market. Above all, financial specialists and investors desires are not homogeneous. Buying and selling rates are not equivalent. The genuine circumstance is that the credit loan fee is more than the deposit rate.
- CAPM applies just to capital stocks or assets while human capital can't be exchanged.
- The evaluated β coefficient can only show the fluctuation of the past, however speculators or investors are worried about the future prices or returns of the stocks or assets. In CAPM model, a hypothesis connects expected return rate with risk free interest rate, beta coefficient and market premium.
- In the real world, it must be realized that the stock market does not completely depicts the scenario of the whole market situation as risk free assets or stocks may not exist at all in that financial market.

Banz (1981) identified the problems related to the CAPM model. The main problem he identified was that where the stocks are divided on the grounds of market capitalization than the small stocks average returns on were increase in contradiction of the assumptions of the CAPM model. Kothari, Shanken and Sloan (1995) in his research revealed that historical betas which are calculated from the annual returns gives better and stronger results between asset returns and beta, in comparison to the historical betas estimated from

monthly returns. Fama and French (1995) which also showed that the small stocks return gives larger return than on highest stock portfolios.

Fama and French (1995) also negated the use of single risk factor, beta, in calculating returns on the risky assets in financial market. They considered the size factor and the book to market factors was important in estimating risk return relationship in financial markets**.** Koutmos and Knif (2002) came up with another model known as GARCH model that calculated time varying betas. As we all know, investors main aim is to maximize it return on investments made in the financial market. Although, Capital Asset Pricing Model is still considered significant in establishing the relation between risk and return but other models such as GARCH and APT are believed to be more efficient in calculating multi risks on investments and their returns.

2.6 CAPM Model Applied ON Different Financial Markets

Basu (1997) found out that CAPM calculation on investment in common stock based on E/P ratio shows different results for the future returns. When the E/P ratio is high, CAPM shows higher future returns while on lower E/P ratio it shows lower returns. CAPM model when used by Keogh (1994) in South Africa, stock market showed some fluctuations in beta hence showing limited applicability of CAPM model. Stattman (1980) and later Rosenberg, Reid and Lanstein (1985) came up with a research on the US stock market which revealed that the average cross-sectional returns had positive relation with the book to market value. They found out that stock with the higher book and to market ratio yielded higher returns which beta is unable to show.

Salman (2002) studied the Istanbul Stock market to know whether CAPM is valid in this market. It was analyzed that in Istanbul stock market, risk and expected return are correlated and hence CAPM is valid for this financial market. Whereas when Grigoris and

Stravos (2006) applied CAPM model in Greek stock markets, it also does not support that idea of higher risks give higher returns.

Lustig (2001) certificated that in this regard, a research was conducted to compare the results of CAPM and French and Fama model**.** Hence common stocks and shares of 230 to 480 which registered and listed companies were selected from Malaysian stock exchange. As new pricing models have evolved, CAPM is considered to be inflexible model that assumes market risk is the only risk to measure and estimate asset and stock prices.

Quo and Perron (2007) tested the CAPM model on New York stock exchange and found out that CAPM only recognizes single risk factor while investors don't get appropriate results to make investment decisions. Eatzaz and Attiya (2008) tested CAPM on Karachi stock exchange and found that CAPM is one dimensional model. It only recognizes one risk factor while making an investment in financial markets. Whereas Raei and Mohammadi (2008), concluded after empirical analysis of data collected from 70 different companies registered on KSE that CAPM only calculates the cost of capital and not the expected return on investments. Hanif (2010) analyzed applicability of Capital Asset pricing model on the Tobacco sector registered on the Karachi stock exchange of Pakistan. After the empirical analysis of data gathered from tobacco sector, it was concluded that capital asset pricing model is not valid for tobacco sector and showed inconsistent results. At the same time Iqbal and Brooks (2007) in his research paper recommended that an augmented version of Fama-French three factor model works better in both developed and developing financial markets whereas CAPM is mostly invalid in both type of financial markets.

Khan, Gul, Khan, Nawaz, and Sanaullah (2012) used the CAPM model to calculate beta (risk) of few companies versus its expected return in an efficient financial market. After analyzing the data of ten companies of KSE 100 index, they found that the model CAPM has limited applicability in Pakistan stock market i.e. KSE 100 index. The Capital Asset Pricing model when tested on Indian equity market showed diverse results. Bajpai and Sharma (2012) tested the validity of CAPM on their equity market and concluded that new model of CAPM is more appropriate and better than traditional Capital Asset Pricing model. It considers that eliminating intercept term in the second stage of CAPM model gives better performance than traditional CAPM model on Indian stock market.

Shamim, Abid, and Shaikh (2014) found that CAPM is valid only with few securities over a period of few years. Hence after collecting data from 22 different sectors registered in Karachi Stock Exchange, it was analyzed that CAPM model was not valid to calculate the expected return in Pakistan stock market. Additionally, Gilbert, Hrdlicka, Kalodimos and Seigel (2014) observed that beta does alter across return rates that can't be rationalized by trading frictions.

Wu, Imran, Feng, Zhang, and Abbas (2017) found that the CAPM is not correct on that stocks of Stock Exchange of Pakistan. Although that testing of CAPM model, shows that the results of regression analysis of around 306 non-financial firms were near to the real returns of stocks in the Pakistan stock market. So, in this case researchers believe that CAPM is not a valid model to be used in Pakistan Stock Exchange whereas investors use other tools of asset pricing and stock evaluation before investing in Pakistan Stock exchange.

Džaja and Aljinović (2013) carried out research for testing Capital Asset Pricing model about the Stock markets of (09) countries of South-East Europe and Central to

estimate the stock returns. This research was also done on different stock market indices of nine selected countries to check whether index can be substituted for the market portfolio as assumed in CAPM model. Countries that were included in this research were Hungary, Croatia, Poland, Turkey, Romania, Bulgaria, Serbia, Bosnia Herzegovina and Czech Republic. Stocks were selected on those criteria of liquidity in each stock market. So, ten most liquid stocks were chosen to weigh each stock against each particular stock market index. It was concluded that CAPM was not valid to estimate return on the stocks of Central and South Eastern European countries. It was discovered in this study that higher yields do not mean that the risk is also high and it was also established that stock indices do not lie on efficient frontiers as assumed in the CAPM model.

As the world is developing, it is believed that risk factors of investing on the assets or especially on the stocks are increasing and are no more one dimensional. In this regard, a research was conducted to compare the results of CAPM and French and Fama model**.** Hence common stocks and shares of 230 to 480 which registered and listed companies were selected from Malaysian stock exchange by Rahim and Nor (2006). As new pricing models have evolved, CAPM is considered to be inflexible model that assumes market risk is the only risk to measure and estimate asset and stock prices. In comparison**,** French model and Fama (1992) assumes that there are three factors that determine the price of an asset and stocks in any financial market. The three factors that determine asset or stock price were the following:

- Market risk
- Size risk
- Risk related to distress

After comparing the results of around 230 to 480 stocks, it was discovered that Fama and French model is more capable and accurate in measuring returns. It was also revealed that the market risk (Rm-Rf) alone is not accurate in estimating the asset or stock returns. Hence liquidity levels of the firm also play very important role in estimating returns. In certain cases, it is believed that firms at times compensate investors by issuing additional premiums due to illiquidity of firm and distress factor.

Most of the researchers were of the opinion that other factor which also contribute the return on asset returns in that financial markets whereas CAPM recognizes only one factor in calculating returns.

Rossi (2016) found that traditional CAPM was not sufficient for explaining risk and return trade off. This deficiency in traditional CAPM is due to number of reasons which were the following:

- Market inadequate information
- investors tend to be invest in individual shares and stock rather than portfolios
- investors hold portfolios for short time periods

The assumption of CAPM that says incline should be equal to the returns of that market while intercept should be zero is rejected by the most of researchers as findings contradict this assumption.

Shum and Tang (2005) also studied three developing markets using the Fama-French model. Those developing markets were of Hong Kong, Singapore and Taiwan. They observed that fama-french can describe the deviations in average returns. Another study showed that CAPM model is being tested on the African Stock market known as BRVM. The Western African Economic and monetary Union (WAEMU) was formed to launch a common currency (CFA currency) in this western market. This study was conducted to examine the association in the market risk and the expected returns of the

financial market. This union (WAEMU) developed a regional financial market, banking sector and micro finance institutions for western region known as DFS (Decentralized Financial Structure). The financial market established by this Western African union is called Bourse Regional des Values Mobilieres (BRVM). It was found out that here is a linear relation among the beta (risk) and expected return on the stock. It was also revealed that the non-systematic risk has no or minimum influence on the anticipated returns in these studied time slot. Actually the assumption of this CAPM that high risks yields high expected return and lower risks yield low returns is rejected.

Novak (2010) realized that the modern finance market is very complicated and complex. In such complex finance market measuring risk has become a huge challenge. In order to understand these complex financial stock markets, he conducted a research on the Swedish stock market known as Stockholm stock exchange. In this research, the risk factors that were studied were market risk, market value of equity risk which is also known as firm size risk, ratio of market value of equity to the book value and short-term historical asset or stock returns that is also called momentum risk factor. After the thorough investigation of the data of Swedish stock exchange he concluded that the selected risk factors did not exhibited any significant impact on the stock returns of the Swedish stock exchange.

Novak (2010) also mentioned that other factors like the structure of a country economy, the type of corporate governance policy that is implemented, also have an influence on the significance of these risk factors that are evaluated. It is established that the CAPM or Fama-French three factor model cannot be universally utilized for determining expected stock returns and cost of equity around the world.

Wang, Ojiako and Wang (2013) conducted a research on the China's stock exchange which is a rising capital market. In this research, Capital Asset Pricing Model is used to know whether this model is valid in this emerging financial market or not. In this research, Wang chooses 90 stocks from the Hushen 300 Index as a sample under observation. The sample period of this research was from January 2010 to December 2010. So, the CAPM model is tested on the data sample collected from the financial market by applying time series test and cross-sectional analysis. After conducting the CAPM test, it was that CAPM isn't totally appropriate in China's exchange market while test also showed that effect of systematic risk is weak. In view of the researcher, CAPM model was not valid in Chinese financial market as its new and emerging market and has not fully matured. By and large, the CAPM isn't legitimate in China's exchange market.

Mehrara, Falahati and Zahiri (2014) believed that the most critical issues in the financial market is familiarity with the Risk dimension of the Companies, particularly "unavoidable risk" that could influence stock returns, and can assume a noteworthy job in decision making process. In this research paper, the investigators analyzed the connection between stock returns and systematic risk that is considered unavoidable risk, by using the capital asset pricing model (CAPM) in Tehran Stock Exchange. The researchers choose the sample that includes panel data for 50 top organizations of Tehran Stock Exchange over a multi-year time frame from 1387 to 1392. The outcome of this research showed that there is a significant connection between systematic risk and stock returns. However, in this study the non-linear function outperforms the linear function showing that the connection between systematic risk and asset or stock prices which also implies that the assumption of linearity between precise hazard and stock returns is dismissed in the Tehran Stock Exchange. So, we can state that the Capital asset pricing model (CAPM) according to the sample tested is dismissed and not valid in the Tehran stock exchange.

Jais and Gunathilaka (2016) found the implications of risk factors such as size, value, illiquidity and the force of movement effects on the returns of stock in the Malaysian stock market. The researchers wanted to determine the pricing impact of illiquidity and momentum factor along with the established factors that are market risk, book and size to market ratio. The findings of that paper showed that illiquidity has a larger effect on the stock returns in comparison to that size and value factors in the Malaysian market. CAPM was considered to be invalid for this advanced emerging financial market whereas adjusted Fama-French three factor model (APT) was reflected to be valid for the stock exchange of Malaysian known as Kuala Lumpur.

Stephen (2018) applied CAPM model on the Chinese financial market as the CAPM plays a vital job in setting up the investment portfolio for the managers and especially for investors. As China's financial market keeps on building up, the CAPM model will largely be applied in the coming years. Along these lines, it is essential to test the appropriateness and viability of CAPM in a developing financial market like China. Following 20 years of progress, the Chinese stock exchange has made incredible transformation. Chinese financial market had played a vital role in the country’s financial development and stability in both social and financial sectors. In 2017, China had an aggregate of 3452 recorded organizations, 13.11% expansion contrasted with a similar time of a year ago, 131 securities organizations, 62 subsidize organizations and 163 fates companies1, with the second biggest securities exchange capitalization on the planet and the primary volume in the item fates showcase on the planet. At present, China's securities exchange is experiencing a troublesome recuperation stage after the brief flourishing in 2015. The normal individuals are exceptionally worried about whether the Chinese securities exchange can duplicate success. The most concerned issue for financial specialists and investors is whether the market cost has been successfully evaluated and

whether the adjustment in the stock cost is normal. Researchers that were concerned about results regarding the relevance of CAPM applied in China's exchange found out that numerous researchers have done some investigation in ongoing ten years and inferred that the Chinese securities exchange before 1999 isn't appropriate for the CAPM model. So, the Chinese financial market, because of its brief period of evolution in the world has the following problems:

- Earlier, there were no proper Laws and regulations for the conduct of the financial market. Now the laws and controls are in a process of getting implemented properly in the financial market.
- The securities organizations and other financial specialists should show more self - discipline as there are varied types of unlawful business activities, and there are many market rumors.
- The information disclosure of recorded organizations isn't institutionalized that encourages speculation in the financial market regarding any specific company stock or asset prices.
- Hence Chinese financial market is deficient in having expert and professional investors.

Stephan (2018) also has selected the stock information from February 2007 to February 2018 to test the CAPM model on the financial market share of China by time series and cross-sectional examination, attempting to examine the properties of the Chinese financial exchange. The general perception of the financial specialists isn't positive regarding the validity of CAMP model in the Chinese financial market. The time series analysis showed that there is a negative relation between asset portfolio return and systematic risk. This result is against the assumptions of the CAPM model which assumes

that asset portfolio returns and systematic risk has a positive relation in any financial market. Hence according to this result CAPM model is not valid in Chinese financial market. While in cross- sectional analysis of the data, it showed that interpretational level of each variable to asset portfolio returns is very less. Hence in this analysis also the result also reinforced that CAPM model is not suitable for the Chinese financial market as no linear or even secondary power relation was established between expected asset returns and systematic risks in any financial market.

Holmstrom and Tirole (2001) confined that the researchers choose the sample that includes panel data for 50 top organizations of Tehran Stock Exchange over a multi-year time frame from 1387 to 1392. The outcome of this research showed that there is a significant connection between systematic risk and stock returns. However, in this study the non-linear function outperforms the linear function showing that the connection between systematic risk and asset or stock prices which also implies that the assumption of linearity between precise hazard and stock returns is dismissed in the Tehran Stock Exchange.

After reviewing the literature on Capital Asset Pricing model, it could be deduced that in early years that CAPM was a valid tool to estimate return on investments while the modern literature shows that CAPM is not suitable in calculating returns as there are more than one risk factor in investing in any financial market. Capital asset pricing model is considered to be one of the most important and a single risk factor model that is not accurate in estimating rate of return on any investments.

2.7 Liquidity

Liquidity is said to be a concept that is the capability to trade higher amount of stocks or assets quickly at a mentioned cost besides any shifting of that cost. Thus, liquidity

has numerous dimensions. Liquidity is considered to be a one of the most important factors in estimating return on the stocks or assets in any financial market. Although researchers now believe that liquidity has received very less attention compared to the other recognized factors.

Understanding of the financial market play very important role in making right investment decisions as each financial market of the world behaves differently. As an investor one should know that how the financial market is organized also influences the stock or asset price formation process. As a result of this process, liquidity comes in the financial market. Whereas there is a different opinion by a set of researchers that liquidity of the market influences the stock prices at the macro level.

The illiquidity in the financial market has been extensively examined over the past decade, especially regarding its role in asset pricing in the financial market. In 1986, Constantinides outlines that the asset liquidity premium as "the decrease in the unconditional mean return on this asset that the investor requires to be indifferent between having access to the risky asset without the transaction costs rather than with them". Different measures have been presented that estimates the everyday asset returns and trading volumes to the asset illiquidity in the stock market. But it is believed that further research is required to further determine whether this illiquidity measures really estimates the cost of transactions inferred upon the investors or financial managers.

Hicks' (1967) viewed that the researchers over the decades have argued about the liquidity, whether it does have a direct impact on the asset prices in the financial markets. Many of them now consider liquidity factor as an essential factor in estimating asset price in any financial market.

Liquidity can be difficult to explain however; the characteristics of a liquid asset can more or less be recognized. Amihud and Mendelson (1986) consider that an asset can be identified as liquid if it has a low cost of direct execution. They also believed, that asset can also be considered liquid which traded largely but without affecting its price. They were also of the opinion that direct transaction cost of any asset or stock traded can be of small amount but can have a larger indirect impact on the asset price in the financial market. Most researchers assume that liquidity of any asset or stock is directly related to the direct cost of buying or selling any asset or stock in the financial market. While Amihud and Mendelson (1986) were of the view that liquidity of any asset or stock can also be measured through other ways. Liquidity can also be calculated by measuring the difference between the prices of the asset when it traded, as opposed to the price of the same asset in the absence of a trade.

Generally, liquid financial market is described with features mentioned below:

- Tight bid -ask spread: Financial Market has low transaction costs
- Immediacy: The speed in which the asset trading occurs
- Depth: abundance of orders traded at around current price
- Breadth: Many large orders traded with minimum effect in the prices
- Resilience: orders are traded quickly and in order that doesn't imbalances the prices warranted.

It is believed that in any financial market, its liquidity is measured on these features while they are not mutually exclusive. These features can be present in various degrees in any financial market. In liquid financial markets to avoid imbalances in prices, long-term deviations are not given. Researchers over the decades have argued about the liquidity, whether it does have a direct impact on the asset prices in the financial markets. Many of

them, now consider liquidity factor as an essential factor in estimating asset price in any financial market. Amihud, Mendelson and Pedersen (2006) have discussed the impact and effects of information asymmetries on the transaction cost for buying an asset or stock in financial markets round the world.

It is assumed that when an investor decides to invest in an asset, it instantly in minds also decides regarding the future potential of reselling of the asset. This thought of reselling the asset in future relates to the liquidity of the asset, hence this issue also relates to the future cash flows with regards of the asset. So, involuntarily investor's decision depends on the future cash flows of the asset which on other hand is affected by the liquidity. Hence liquidity is one of the very important factors that investor consider before buying any asset or stock in the financial market. Damoradm (2005) described the dilemma of the investors, "When you buy a stock, bond, real asset or a business, you sometimes face buyer's remorse, where you want to reverse your decision and sell what you just bought. The cost of illiquidity is the cost of this remorse"

Damoradm (2005) thought that there are different types of stocks or assets in the financial markets. He categorized the assets or stocks according to their liquidity in the financial market. Some stocks are highly liquid while some stocks are considered to be illiquid, depending on the development of the financial market.

- Heavily traded stocks in widely held companies in developed financial markets
- Stocks traded in small firms in developed financial markets
- Stocks traded in firms with small float in the emerging financial market
- Less traded stocks or that stocks traded in the emerging financial markets

He discovered that the most liquid stocks are held by companies in the developed financial market. While the most illiquid stocks are held by the companies with small float. But many researchers have argued against his research.

The CAPM model assumes that information available in the market is free of cost and is also available equally to all the buyers in the market. Whereas other scholars explain that mangers or investors in the financial market who acquire information are benefitted with greater expected asset returns. Stiglitz (1982) argues that it is impossible for the financial market to be efficient in all aspects. In most the financial markets, there are certain market makers who affects the price and are a cause for price frictions in the financial markets. Lawrence (1985) in his research described that these market makers while quoting the stock or asset prices, does look into the information asymmetries which ends in a bid-ask spread.

It is a known fact that assets which are not in demand in the financial market are considered illiquid. Hence prices of such assets are lowered to attract or force investors to buy these illiquid assets. Amihud and Mendelson (1986) are the one of the first researchers who established a relation between expected return and liquidity. They discovered that the expected market returns of assets or stocks is a concave function of asset illiquidity and they also learned that illiquid assets are a part of those portfolios which have expected longer holding periods. The direct relation between expected returns and illiquid assets tell us that even a small increase in transaction cost have an impact on the price of the asset or stock in the financial market. It has been observed that the expected holding period also has an impact on the relationship of expected return and asset illiquidity. Hence, longer holding periods of an asset means that the investor will get less compensation for any increase in

asset illiquidity. This shows that longer holding periods of an investor, decreases the importance of asset illiquidity cost.

As mentioned earlier, liquidity has been measured differently by the researchers. Hence, there are many tools and methods to estimate liquidity in the financial market. It is believed that there are different dimensions of liquidity. One of the methods, to estimate liquidity is the "Bid-ask spread" method. This method is used when the asset is traded on an exchange in the market. Bid-ask spread estimates the direct cost of transaction of an asset in the financial market. This is known as a good proxy to estimate asset illiquidity. Whereas Brennan and Subrahmanyam (1996) while estimating liquidity take in to consideration, both fix and variable cost of transaction of an asset in the financial market. They believed that liquidity of asset is best estimated by a variable component of the trading costs. Turnover rate of stocks or assets can be another method to measure liquidity in the financial market. This is also known as volume-base measure to calculate liquidity. Datar and Radcliffe (1998) applied this method to calculate asset liquidity. It is assumed to be good proxy to measure asset liquidity as liquidity is directly related to high trading frequency in the financial market.

Scholars are of the opinion that the understanding of the financial market also play very important role in making right investment decisions as each financial markets of the world behaves differently. As an investor one should know that how the financial market is organized also influences the stock or asset price formation process. As a result of this process, liquidity comes in the financial market. Whereas there is a different opinion by a set of researchers that liquidity of the market influences the stock prices at the macro level.

Acharya and Pedersen (2005) came up with an economy model where time variation in cost of liquidity is recognized. They proposed a model that estimates gross

returns considering there are three liquidity betas. First beta in the proposed model, is the cover ability among assets or stocks illiquidity and market illiquidity. Second beta is the investor's exposure to the market wide illiquidity while the last beta is the liquidity factor in the market.

2.8 Perspectives of Different Researchers

The scholars in their research papers, have defined liquidity is the easiness in which the transaction is made that too without adding any extra cost. It means that investors pay explicitly for the stock bid and there is no implicit cost in this transaction. Here it is believed that liquid stock is traded more easily and is cheap while illiquid costs are considered to be more expensive and difficult to be traded in the financial market. Hence liquid stocks are deemed to be more attractive while illiquid stocks are assumed to be less appealing for the investors. So, researchers concluded because of the above factors that to make illiquid stock more attractive to the investors it is believed that premium should be given on illiquid stocks.

But still liquidity factor in the market is not fully accepted by the researchers as an independent factor because they believe that the impact of liquidity factor is not measurable in different time periods but only that specific period in which sample data is collected. The other apprehension is that liquidity factor is widely affected by the microcaps in any financial market.

Some researchers assumed that here is a natural association in the size of stocks and liquidity of the stock in the market. Because of these reasons, in the Fama-French three factor model (1992) size of the stock is considered to be one of the factors. However, the size of the stock has been recognized as an independent factor by many researchers in any financial market while the liquidity factor still awaits such acknowledgment and

acceptance by the scholars. Although illiquid stocks or assets can only be considered as a catalyst in providing stock premium but not as a recognized independent factor. While, Huberman and Halka (2001) conducted a study to examine the impact of systematic liquidity. Liquidity in any stock exchange means that the speed and ease at which any investor can buy stocks and trade. Liquidity has two quantities that are spread and depth. Spread is considered to be the difference between the offer (bid) and the ask price while depth means that the number of units which are being offered at the ask price adding the number of units at bid price as well. It was discovered that proxies of liquidity vary over time and it was determined that temporal variation in liquidity proxies is directly related with the expected returns and has an inverse relation with the volatility of the stock market.

Chordia et al. (2005) determined that the size of the stock has been recognized as an independent factor by many researchers in any financial market while the liquidity factor still awaits such acknowledgment and acceptance by the scholars. Although illiquid stocks or assets can only be considered as a catalyst in providing stock premium but not as a recognized independent factor.

2.9 Emerging Stock Markets

It is believed that there is enormous gap between theory and transacting in the real financial market. This gap between theory and real market transaction is called as an implementation shortfall by many researchers round the world. While they believe that this gap can be narrowed down by constructing a smart investment portfolio by the investors. To construct a smart portfolio, investors should estimate liquidity to further enhance the portfolio turnover. It is also assumed that the emerging stock markets are not fully integrated and cohesive with the developed stock markets of the world. Hence researchers

believed that this detachment with the developed stock markets results in high risk and volatility in the emerging market.

It is being assumed that the Emerging markets give a considerable test to the asset pricing model used nowadays (Lischewski & Voronkova, 2012). These emerging markets don't observe and conform to the standards set by the capital asset pricing model because lack of integration between the markets completely. Imperatively, to comprehend both the cross-segment of expected returns and in addition the development of expected returns through time in these markets, it is important to portray the procedure of market incorporation and integration. Markets that have embraced considerable advancement in their financial segments to consider the free flow of portfolio investments will in general be progressively delicate to the components that may describe a world asset pricing model.

Emerging financial markets are those markets where investors and financial managers will experience the following things:

- Rapid growth and development in the market
- Lower per capita income
- Less mature financial markets

Examples of such emerging financial markets can be China, Russia and India. Investors in the emerging financial market can found valuable and significant opportunities. Since emerging financial markets can grow quicker and faster than any developed financial market that can be source of stronger and higher earnings growth for the investors and financial managers. Emerging markets also provide diversification to the investor in the sense that these emerging financial markets act and perform differently than the normal developed financial markets. The risk that investors should consider while investing in the emerging financial market. Investors should keep in mind the risk factors

while making an investment in the emerging financial markets. Two of those main risks are the followings:

- Economic risk is that there could be changes in government policies like in raw material, inflation or in monetary policies.
- Currency risk is that when the country's currency get devalue in comparison to dollar rate or is volatile in the market.

Hence developing or emerging markets regularly appear to offer give new venture openings, their increasing economic development rates offering higher expected returns – also the advantages of diversification. In any case, there are various dangers that potential financial managers or investors ought to know about before investing their capital in one of the emerging markets. So, investors must keep in mind that their all investments in stocks and bonds will regularly deliver returns in the local currency. Along these lines, money fluctuations can affect the aggregate return on the investment of the investor in any financial market.

Eisfeldt and Rampini (2006) documented that the investors believe that this gap can be narrowed down by constructing a smart investment portfolio by the investors. To construct a smart portfolio, investors should estimate liquidity to further enhance the portfolio turnover. It is also assumed that the emerging stock markets are not fully integrated and cohesive with the developed stock markets of the world.

Emerging or Developing markets are commonly less liquid than those found in more developed economies. Financial specialists who attempt to move stocks in an illiquid financial market confront significant risks that their requests won't be filled at the present cost, and the transaction cost will just rise to unexpected levels. It is also believed that an

ineffectively developed banking system will keep firms away from accessing in to the financing that is required to develop their organizations. Achieved capital will more often than not be issued at a high required rate of return, expanding the organization's weighted normal expense of capital (WACC). The real worry with having a high WACC is that less tasks will deliver a sufficiently high come back to yield a positive net present esteem. In this manner, money related frameworks found in created countries don't enable organizations to embrace a higher assortment of benefit producing ventures. Whereas a strong corporate administration structure inside any association is related with positive stock returns. Developing markets here and there have weaker corporate administration frameworks, whereby the executives, or even the legislature, have a more prominent voice in the firm than investors.

Moreover, when nations have limitations on corporate takeovers, the board does not have a similar dimension of motivation to perform so as to keep up employer stability. While corporate administration in the developing markets has a lengthy, difficult experience to go before being considered completely successful by North American measures, numerous nations are demonstrating enhancements here so as to access less expensive universal financing. A poor arrangement of governing rules and weaker bookkeeping review methods increment the shot of corporate liquidation. Obviously, liquidation is regular in each economy, however such dangers are most basic outside of the created world. Inside developing markets, firms can all the more openly cook the books to give an all-inclusive picture of productivity. When the organization is uncovered, it encounters a sudden drop in esteem. Since developing or emerging markets are seen as being progressively dangerous, they need to issue securities that compensation higher loan costs.

Political hazard refers to vulnerability in regards to unfriendly government activities and choices. Developed countries will in general pursue a free market control of low government mediation, while developing or emerging business sector organizations are regularly privatized upon interest. Some extra factors that add to political hazard are: possibility of war, impose further taxes and duties, loss of any kind of subsidy from the government, change of market approach, powerlessness to control inflation rate by the government and laws with respect to asset extraction. Major political unsteadiness can likewise result in common war and a shutdown of industry, as specialists either deny or are never again ready to carry out their employments.

Even than it is believed that putting resources into developing markets can deliver considerable comes back to one's portfolio. In any case, financial specialists must know that every exceptional yield must be made a decision inside the hazard and-reward system. The test for financial specialists is to discover approaches to capitalize on a developing business sector's development while keeping away from introduction to its unpredictability and different disadvantages.

In a research, Fama-French three factor model (1992) was tested in the emerging African stock markets. Here, firm size and illiquidity factor were considered as risk factors in estimating expected stock returns in financial market. The Countries including in this research on the emerging markets were South Africa, Kenya, Egypt and Morocco. In this study, London stock market was included to compare those emerging markets with a well-established and developed stock market. The Johannesburg Stock market was very large and regulated market. Kenya stock market was split into two segments, one is the main listings and other was Alternate Investment market. While Egyptian and Moroccan stock market were much smaller compared to other two stock markets.

Similarly in IMF research study**,** a study was conducted on the Chile stock market that is considered to be an illiquid stock market. Although Chile has a large stock market considering the market capitalization to GDP as compared to other OECD countries of this region. Chile financial markets has gone through vital structural changes in 1990s. IN this study, Fama-French three factor model (1992) was used to evaluate the Stock returns in this financial market. It was discovered that less liquid stocks gives much higher stock returns than the investors' expectations. It was found that reason of low market liquidity appears because of poor investor protection regulations. Hence, poor protection regulations are one of the reasons of low liquidity in the market. It was believed that as it is a developing stock market so global cyclical conditions and global risk appetite has greater influence as compared to the developed stock markets. In IMF research paper that Chile market illiquidity can be improved by improving structural issues of the financial market.

Belkhir, Saad and Samet (2018) investigated the relation among the stock extreme illiquidity and indirect companies cost of capital. This study was conducted on the companies of around 45 countries. It was established that the companies which have more possibility of extreme illiquidity, also experiences from high cost of capital. It was discovered that this association in greatest illiquidity of stocks and capital cost, becomes powerful when the markets are below and down and in nature of highly volatile. While this relation becomes weaker in a financial market where regulation is implemented for investor protection and the market structure are developed. Researchers have established that firm size has more impact on the valuation of the expected stock returns as compared to the illiquidity factor. The emerging stock market of Kenya showed higher cost of equity as compared to the developed stock markets those points out flaws in the Kenyan market. It shows that investors had difficulty in accessing the equity finance while the development policy of well-known developed stock exchanges also seems faulty and flawed.

2.10 Research In Favor of Liquidity as an Independent Factor

Amihud and Mendelson (1986) reported the association in the liquidity of stocks and stock returns in cross section portfolio. Amihud and Mendelson (1986) believed that liquidity emerges as a natural factor in any asset pricing model. They assumed while estimating stocks through capital asset pricing model (CAPM) that stock or asset returns increases with market beta. But in practice, stocks or assets with lower market beta gives higher return than predicted by the Capital Asset Pricing model.

Easley et al. (2004) examined and determined that the researchers observed that variations in the overall market liquidity is related to the expected stock returns in the cross-section analysis. They observed that stock which are sensitive to the overall market liquidity gives greater expected stock returns. The liquidity measures that were taken into consideration in this study were connected with the strength of volume associated return reversal.

Amihud (2002) in another research paper also studied the illiquidity of financial market on the stock returns by using cross-section and time series effect. In this paper between relationship between stock illiquidity and stock returns is measured over time. In the cross-sectional model, illiquidity has a positive relationship with stock returns in this study while stock capitalization has a negative impact. The study shows that expected illiquidity over the time has a positive impact on the stock returns while unexpected illiquidity over time has a negative impact on the expected stock returns. There is negative impact of unexpected illiquidity because higher realized illiquidity increases the expected illiquidity that raises the expected stock returns in this illiquid financial market.

Datar, Naik and Radcliffe (1998) used turnover rate of stocks is used as a proxy for liquidity measure. Hence the relation between liquidity and expected stock returns is being

assessed in an alternate test of the Amihud and Mendelson model (1986). The results of this investigations showed that liquidity has substantial role in explaining the changes in the expected stock returns in a cross-sectional analysis. Therefore, this study supports the findings of Amihud (2002) that the liquidity premium has an important role in the whole cross section of stock returns. Buchner (2016) measured the effects of illiquidity with regards to portfolio weight and stock returns dynamics. It was unearthed after a thorough analysis that investors should be prepared for variations in the portfolios weights and should not expect to have an optimum diversified portfolio. It was also revealed that illiquid stock in an investor's portfolio increases the portfolio risk. In this paper it was determined that when the portfolio risk increases due to illiquidity, it has an inverse relation with both, the liquid and illiquid assets or stock returns.

Datar, Naik and Radcliffe (1998) analyzed and found out that the share turnover is powerfully correlated to the stock return and stock performance. While Acharya and Pedersen (2005) in their research believed that elements of the illiquidity factor are also closely related to the stock returns in the financial market.

Pastor and Stambaugh (2003) examined overall market liquidity to find out its impact as the state variable in assessing the asset or stock pricing in the stock markets. The researchers observed that variations in the overall market liquidity is related to the expected stock returns in the cross-section analysis. They observed that stock which are sensitive to the overall market liquidity gives greater expected stock returns. The liquidity measures that were taken into consideration in this study were connected with the strength of volume associated return reversal. According to our study, small stocks are not liquid and also have higher sensitivity towards overall market liquidity. Further study will be required to determine liquidity as a variable of asset pricing.

Wermers (2000) in his research found out that the difference between gross cost of investing in stocks and net cost of investing in the stock is around on an average 70 percent. This difference is assumed to be due to inefficient implementation by the investors. It was suggested, liquidity can be used to regulate the size of stocks in which investment is made to minimize the after -investment costs.

Whereas and Pastor and Stambaugh (2000) found out in his research that market-wide liquidity is vital for asset or stock pricing in the Financial market. The dimension of liquidity that he explores is volume related return reversals. This liquidity dimension selected is categorized by commonality stocks. He revealed that asset pricing or expected returns are associated cross-sectionally to the sensitivities in the overall financial market. The standard asset pricing models suggests, low stocks that gives lower stock returns to the investors due to the unfavorable shifts in the overall financial market, must get some additional compensation to the investors for compensating them for buying or holding these stocks or assets. On the other hand, it is believed that stocks which are more sensitive also have higher expected stock returns. So, it is believed that macro economy and investment market are closely related to each other.

Although liquidity is considered to be one of the important factors in influencing investors decision options in the stock market. In theory, it is believed that when investors buy illiquid stocks, they expect higher returns as a compensation for risk coverage. Many researchers including Amihud (2002) and Datar et al. (1998) concluded that there is a negative relation among individual stocks and gross stock returns. It is assumed that individual stock liquidity consists of two elements. One element is to specifically represent individual determinants while other element is systematic integrating of stock related

features. Pastor and Stambaugh (2003) found that in US stock markets, liquidity is priced variable and showed that liquidity risk premium plays a significant role in the stock market.

Miralles-Quirós, Miralles-Quirand Oliveira (2017) were interested in finding out the role of illiquidity in evaluating stock returns in the Portuguese stock market. Portuguese stock market is considered to be a unique with regards to its transformation from an emerging financial market to a developed financial market in the world. So, here researchers also evaluated the impact of changes in the stock market classification on the role of liquidity in measuring the asset or stock return.

Brennan and Subrahmanyam (1996) used various pricing models to evaluate the cost of illiquidity in stock returns. In the paper, the relation between monthly stock returns and the measures of illiquidity were examined. When Fama-French model was applied in this financial market, it was revealed that stock returns and measures of liquidity have a noteworthy and important relation. It was suggested that investors that acquires the information regarding any stocks or securities privately generates an illiquidity costs for those uninformed investors in the financial market.

While in another study, Liquidity adjusted CAPM model (Acharya and Pedersen) was applied on the Portuguese stock market. The findings were that the individual illiquidity influences the stock returns in the Portuguese stock exchange. It also revealed that illiquidity factor had a greater impact on the stock returns in the period, when the market was categorized as an emerging stock market rather than a developed stock market. So, Acharya and Pedersen (2003) after examining the liquidity risk in an equilibrium model which is the liquidity adjusted pricing model, they proposed two alternate specifications of liquidity adjusted CAPM mode to separately measure and compare the impacts of liquidity in estimating asset pricing in stock market. This model helps investors understand that in

how many and different ways liquidity risk can have impact on the stock returns in any financial market. The researchers believe that these findings will help investors to make right investment decisions and will also guide market regulators to improve Portuguese stock market regulations to encourage more competitiveness in this market.

However various studies show that the individual liquidity is related or linked with the systematic liquidity in the stock exchange. Whereas different studies also agree on a point that liquidity factor has a greater impact on the illiquid assets and markets as compared on the liquid assets and markets. Some scholars mentioned that commonality in liquidity in any financial market shows that risk in such market is non-diversifiable. Pastor and Stambaugh (2003) also agreed that stock returns are directly related to the financial market liquidity.

The scholar, Li (2014) test the liquidity factor in the second largest equity market of Japan. He found that liquidity adjusted CAPM gives better result than Traditional CAPM model. Papavassiliou (2013) discovered that in the Greek financial market liquidity risk factor does have an impact on the stock returns. While studying another emerging market, Rahim and Noor (2006) revealed that market risk alone cannot be used in Malaysian market to assess stock returns. They believed that investors are also interested in knowing the distress and liquidity of the firm in the market. Hence investors consider distress and liquidity as very important factors in estimating returns.

Serbian financial market was one of the developing markets hence at that time was in a transition phase. Therefore, the market was considered to be illiquid as there were few stocks with capitalization, few shares outstanding and irregularities in trading. Minovic and Zivkovic (2012) analyzed the impact of the liquidity and size premium on the equity market of the Serbia by using different asset pricing models. Their main aim was to study

and assess the impact of different factors on the estimate or expected stock return in the Serbian market. After using different models to examine the impact of different factors, it was established that liquidity and firm size plays an important role in equity price formation. The different models that they used were CAPM, Fama-French and Liquidity augmented CAPM (LCAPM).

Gallmeyer et al. (2004) confined that in the cross-sectional model, illiquidity has a positive relationship with stock returns in this study while stock capitalization has a negative impact. The study shows that expected illiquidity over the time has a positive impact on the stock returns while unexpected illiquidity over time has a negative impact on the expected stock returns.

Shum and Tang (2005) various risk factors were assessed on the different Asian stock markets (Hong Kong Singapore and Taiwan). The results showed that Fama-french is valid for these stock markets. While researchers Drew (2003) found that the firm size factor and value affects were relevant in Hong Kong, Malaysia and Philippines financial markets. Liu (2006) has recognized liquidity is an important factor in calculating asset or stock returns.

Soskic and Zivkovic (2007) revealed that transition economies are not equipped with well-structured financial markets that restrict the pace of economic development. Thus, transition market suffers due to the lack of state regulations, control and transparency in trading and information sharing that increases the asymmetrical risk. Whereas in developed financial markets, asymmetrical risk is less that can also contribute to decline in transactional costs and lower illiquidity risk that attracts foreign investments.

O'Hara (2003) asserted that it was uncovered that transaction cost is a proxy for liquidity factor which can predict expected stock returns for a year or more. It was found

out that in time series fluctuations in the overall liquidity is a vital factor in determining expected stock returns in any stock exchange. They further documented that it also revealed that illiquidity factor had a greater impact on the stock returns in the period, when the market was categorized as an emerging stock market rather than a developed stock market.

Illiquidity can be defined as cost of instant execution where an investor is ready to transact at an agreed price. Bakaert et al. (2007) mentioned that liquidity risk is significant for the emerging markets which are considered to be less structured and sophisticated financial markets. Other scholars like Claessens et al (1999) and Rouwen-horst (1998) also considered that the role of liquidity factor important in estimating returns in emerging financial markets. Amihud (2002) believed that illiquidity chiefly has an impact on small firm stocks hence he concluded that small firms face bigger liquidity risks. So, the small firm should offer more illiquidity risk premium in the emerging financial market.

Hearn and Piesse (2009) investigated firm size and illiquidity factors by using Fama-French model in the African financial markets. These African financial markets included markets of South Africa, Kenya, Egypt and Morocco. In the African markets, it was found that both firm size and illiquidity factors has an impact. Hearn (2010) investigated the above two factors mentioned in the financial markets of India, Pakistan, Bangladesh and Sri Lanka but by using CAPM. Again, it was established that firm size and illiquidity factor effects are felt in all financial markets except on Sri Lankan financial market.

Chan and Faff (2003) employed the same shared turnover rate to calculate the liquidity for all listed companies of Australia as of 2005 for the period of 1989 to 1998. They investigate the anomaly by adding it to Fama and French three factor model. All the

investigated betas were significant effecting the returns. The liquidity beta is also significant i.e. illiquidity effects the returns positively.

In another study Zhang (2010) mentioned that although investors are fascinated by the high stock return potential in the emerging or developing markets but on the other hand, investors are also apprehensive due to the liquidity risk in the financial market. As emerging markets are less regulated therefore investors are worried misguided or misinformed by the management and else they can be outdone by the well-informed investors. Hence, it was considered that liquidity is important factor in estimating asset price in the financial market. Other researchers, Zivkovic and Minovic (2010) investigated the illiquidity and volatility of the Serbian financial market, found that the small size of the market and illiquidity halts the way of investments by the diverse investors all-round the world. In such illiquid financial markets, investors are expected to be given higher stock returns as a benefit for investing in small firms with illiquid stocks and high book to market ratios. Hence investors require different compensation for exposing themselves to different risks in the market. Minovic and Zivkovi (2012) also analyzed the significance of time-varying liquidity risk on the Serbian financial market by using LCAPM. It was discovered that these both factors have an impact on the price formation in the Serbian market.

Dinh (2017) investigated the correlation among the stock returns, market risk and the liquidity in high frequency trading stock market. The relation between risk and return has already been established in the traditional CAPM theory. In this study, Dinh (2017) focuses on aggregate volatility risk in the cross-section of stock returns and also the role of idiosyncratic risk at the intraday level. He used panel analysis for single stocks to measure the relation between these mentioned factors. The results showed that in a high trading stock market, idiosyncratic risk plays a more prominent role than the systematic risk in

estimating the stock price. Whereas he established that there is no noticeable relation between systematic risk and stock returns and he concluded that idiosyncratic risk has greater impact as compared to the systematic risk on estimating the stock returns. This study supports the findings of previous scholar (Ang et al. 2006) which emphasis the inverse relationship between idiosyncratic risk and stock returns exists. It was also found that liquidity factors have an impact on idiosyncratic risk which meant that while estimating this risk liquidity factors should also be considered. That shows that liquidity and stock returns have a positive relation with each other while it was also mentioned that beta and stock returns have a flat relation.

Daniel and Titman (1997) confined that the illiquidity of financial market on the stock returns by using cross-section and time series effect. In this paper between relationship between stock illiquidity and stock returns is measured over time. In the cross-sectional model, illiquidity has a positive relationship with stock returns in this study while stock capitalization has a negative impact. The study shows that expected illiquidity over the time has a positive impact on the stock returns while unexpected illiquidity over time has a negative impact on the expected stock returns. There is negative impact of unexpected illiquidity because higher realized illiquidity increases the expected illiquidity that raises the expected stock returns in this illiquid financial market.

Jones (2002) selected one of the New York stock exchanges and assembled an annual time series bid-ask spread from 1900-2000 for the evaluation of average commission on the stocks. It was uncovered that transaction cost is a proxy for liquidity factor which can predict expected stock returns for a year or more. It was found out that in time series fluctuations in the overall liquidity is a vital factor in determining expected stock returns in any stock exchange. Li, Mooradian and Zhang (1994) believed` that the

variations and level of variations in the whole market liquidity influences asset pricing in the Stock market. In the time series analysis, effective commission rate was used as a measure of liquidity to determine the relation between asset returns and overall market liquidity. It was determined that negative relation exists between asset or stock returns and liquidity while a positive relation exists between Asset or stock return and variation of liquidity.

Lang and Maffett (2011) took global sample of firms to study the transparency and liquidity uncertainty in the crisis period of the financial market. The firms were selected on the basis of analyst following, forecasting precision and the accounting standard. It was learned that companies which are more transparent encounter lower liquidity volatility, less extreme illiquidity incidents and weak relation exists between overall market liquidity and market or stock returns in a crisis period of any financial market.

The scholar, Stereńczak (2017) in the paper, "Usefulness of selected liquidity measures on the Warsaw stock exchange" evaluates the usage of the different measures of liquidity on the Polish stock exchange. It was found out that most apt measure of liquidity is the Amihud illiquidity ratio on the Polish stock market.

Jagannathan and Wang (1991) asserted that although investors are fascinated by the high stock return potential in the emerging or developing markets but on the other hand, investors are also apprehensive due to the liquidity risk in the financial market. As emerging markets are less regulated therefore investors are worried misguided or misinformed by the management and else they can be outdone by the well-informed investors. Hence, it was considered that liquidity is important factor in estimating asset price in the financial market.

2.11 Research against the Liquidity as an Independent Factor

The standard CAPM model was static with only one factor, Market risk to consider in the financial markets for evaluating asset or stock returns. Fama-French recognized three common risk factors (market risk, firm size and book to market values) to evaluate the stock returns in the financial market. Liquidity augmented CAPM considers two factors that are market risk and liquidity risk in estimating stock returns. Hence after, thorough investigation the result suggested that LCAPM model performs better than other two models in the Serbian market. They believed LCAPM model showed better results due to the fact that it recognizes liquidity factor as a risk. In the emerging or developing markets, liquidity factor plays very significant role.

Lischewski and Voronkova (2012) disclosed that in the Polish stock market that firm size, market risk and book to market value contribute in evaluating stock returns. Polish stock market is believed to be one of the largest and developed market in the Central and Eastern Europe. Polish financial market is believed to be biggest in terms of number of securities listed on the exchange and also due to vast market capitalization. They were of the opinion that single factor is not sufficient in estimating stock returns in any market. The risk factors that were selected for this paper are

- market risk,
- firm size risk,
- book to market value,
- liquidity risk.

Both researchers were of the opinion that liquidity indeed has an impact on the emerging stock markets as in such markets securities and investors are limited and volume

of trade is low in comparison to the developed financial market. After testing the data on the CAPM model and Fama-french three factor model, it was established that market risk, size factor and book to market value are vital in explaining and estimating the stock returns in the Polish stock exchange whereas liquidity risk was insignificant in regulating the stock returns. Hence liquidity factor did not qualify to be considered a priced factor especially in Polish financial market but other three risk factors have evident explanatory power in this market.

Consequently, they found out that liquidity factor is less significant in the polish stock market. Whereas Drienko, Smith and Reibnitz (2017) also examined the outcomes of Amihud research that argues liquidity has a strong relation with asset or stock returns. They concluded that Amihud has selected only in-sample data while measuring data of two decades liquidity factor does not have much impact on the stock return. Hou, and Zhang (2017) also rejected the research on the liquidity as an independent factor in estimating stock return.

Buchner (2016) focused on the Public market equivalent to estimate risk-adjustment of the private equity investments. In this study, CAPM model and multi factor extended models are used to measure public market equivalent. It was found out that capital investments perform better than the traded stocks. It was discovered that venture capital returns and small growth stock returns are similar in nature. There was no significant relation was seen between the venture capital returns and liquidity factor of the financial market.

Habib and Mounira (2012) research evaluated the impact of liquidity risk factors on the average stock returns of the emerging Tunisian stock market. Hence, this study is conducted to find out the potential role of illiquidity risk factor in stock valuation in

Tunisian market. Tunisia stock market is considered to be small and a developing stock market thus it incorporates some level of risk and illiquidity. Both CAPM and Fama-French model were used. Their analysis showed that liquidity factors are not priced in both approaches that were portfolio sorting approach and cross-section regression approach. Thus, liquidity is assumed to be controversial state variable that hardly gets rewarded.

2.12 Relationship between Asset Pricing and the Illiquidity Premium

Brennan and Subramanyam (1966) investigated the underlying effect of asset pricing on the financial performance. The study evidenced that all factors asset pricing i.e. asset pricing efficiency have direct relationship with firm performance. He used annual data to investigate the relationship. The study found that asset pricing along with other dimensions of asset pricing has positive effect on the financial performance of firms. The study also advised intense focus on the asset pricing practices of the firm to deliver better results.

Chordia (1998) confined the determining key effect of asset pricing on the financial proxies of the firm. The study used correlation and simple OLS to predict the results. The study found that as the level of firm‘s asset pricing increases it tends to increase the financial performance. The study further elaborated that each element of illiquidity premium is vital.

Datar, Naik and Radcliffe (1998) analyzed banking sector firms for investigating the relationship between asset pricing and illiquidity premium and financial performance. The study used fixed effect random effect model. The study used annual data to predict the results. He found that as the firm‘s asset pricing efficiency level increases than its financial performance enhances. He suggested that firms should maximize its asset pricing and illiquidity premium efficiency level and focus on all facets of asset pricing.

Chui and Wei (1999) documented that asset pricing efficiency and illiquidity premium is very vital for the firm‘s success. He argued that as the firm‘s level of asset pricing efficiency increases then its financial performance tends to increase. He found that all facets of asset pricing efficiency have positive impact on the illiquidity premium and the financial performance. He advised on the basis of the findings that firms should continuously work on the practices of asset pricing efficiency to faster better results.

Rouwenhorst (1999) asserted that asset pricing is a key for the enhanced performance of the firms. He analyzed manufacturing sector firms and confirmed the significant positive effect of asset pricing on the illiquidity premium and financial performance of firm. He suggested that firm must work out strategies to enhance the asset pricing practices of the firms. He further elaborated that the efficiency and transparency of asset pricing is very much important as compared to the other dimensions of premium of illiquidity.

Subrahmanyam and Anshuman (2001) analyzed pharmaceutical firms for knowing the relationship between the asset pricing and firm illiquidity premium and financial performance. He found that asset pricing efficiency is very vital for uplifting the financial performance of a firm. They further documented that asset pricing efficiency can contribute to the firm‘s growth and financial performance. He found a strong positive relationship between the efficiency of asset pricing and illiquidity and financial performance of the firm. He suggested that a firm should have well equipped asset pricing abilities to do well in the market, as the market is very dynamics.

Lo and Mackinlay (1990) also investigated the relationship between the different dimensions of asset pricing efficiency and found that all these have positive correlation with illiquidity premium and financial performance proxies of these firms.

Fama and MacBeth (1973) certificated that as firm shows strength in its asset pricing efficiency it start out performing other firms in the market and said that asset pricing and illiquidity efficiency is very vital for the firm existence and to be in the competition. He argued that asset pricing has positive significant impact on the financial performance of a firm.

Anderson, Clarkson and Moran (1997) asserted that asset pricing ability is very vital for the growth of the firm. He argued that human skills and capabilities can be used for the growth and uplifting of the financial performance of a firm. The study evidenced that firm should invest in the human capital to encourage tremendous growth.

Halliwell, Heany and Sawieki (1999) explained that importance of asset pricing capability and documented that asset pricing of a firm can ensure smooth functioning and uplifting of the firm financial performance. He suggests that firm should invest in human capital and hire capable people as much it can.

Chan, Hamao and Lakonishok (1991) argued that managerial and entrepreneurial experience of the employees is very vital for the continuous success of the firm. They argued that introducing training and capacity build up program will encourage growth and improved performance of the firm.

Jegadeesh (1992) investigated that the efficiency of asset pricing like managerial tenure, differentiation, specialization and other organizational characteristics can affect the organization performance. They further explained that the efficiency and transparency of asset pricing is very vital for the tremendous achievements and growth of the firm. They argued that organizational innovation can affect the financial performance of the firm. They suggested that as many as a firm can increase the asset pricing efficiency are vital. He further noted that efficiency of asset pricing can improve the financial performance. The

study evidenced that investing in hiring the skillful individuals for maintaining the better asset pricing directly affecting the financial performance.

Davis (1994) asserted that the Accounting Information System (AIS) excellent quality results cover utilizing data, execution of the business in non-financial and financial. They documented that prior research demonstrated that the efficiency of asset pricing have positive significant relationship with illiquidity premium. Moreover, numerous research studies found the association among Accounting Information System (AIS) and financial reports and performance of firm. In addition, Kothari, Shanken and Sloan (1995) conducted research study on the topic and found that the quality of information regarding asset pricing confluences on the financial performance of the company.

2.13 Theoretical Framework

From above literature, the importance of liquidity is proved along with fact that in emerging market CAPM alone cannot explain the returns. Hence, it can be concluded from the theory that excess market return depends upon two factors which are market premium and liquidity risk.

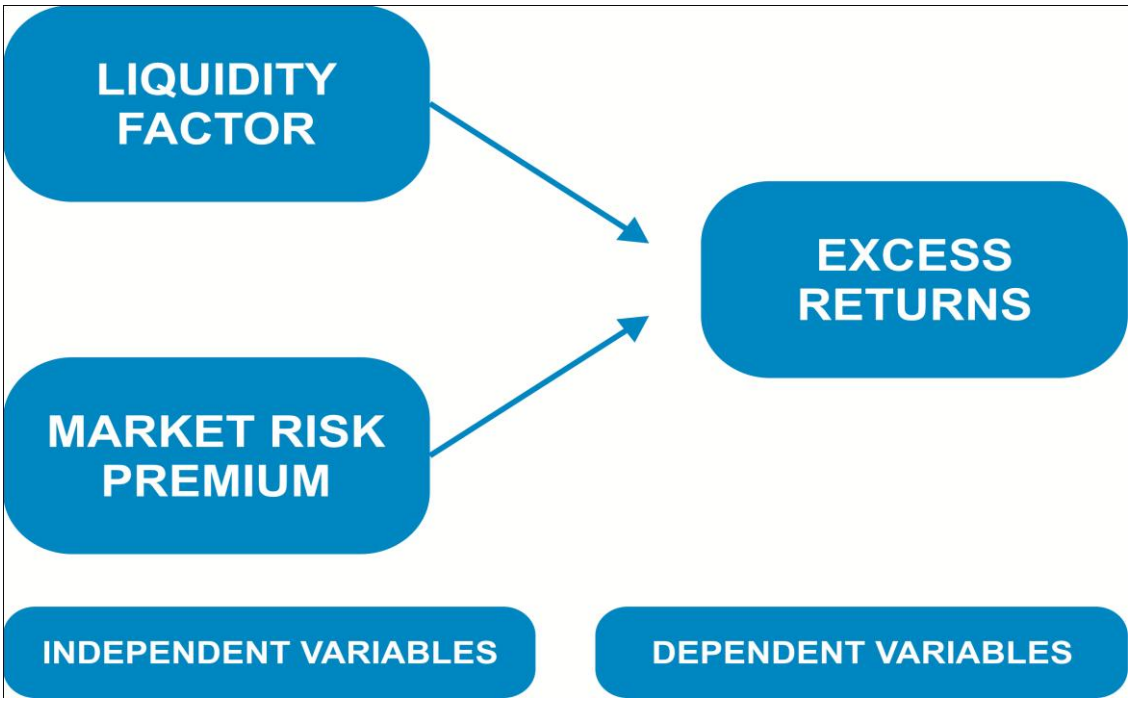
In this study, the dependent variable “excess market returns” depends upon two independent variable i.e. market risk premium and liquidity factor.

Market risk premium is measured as the difference between return on market portfolio and risk free rate. It represents excess return that investor could earn if he invests in market portfolio instead of investing in a risk free asset.

There is positive relationship between the returns and liquidity risk. According to previous studies conducted on the significance of liquidity factor, it is concluded illiquidity should be priced while asset pricing and investors should be compensated for liquidity risk.

The schematic diagram of Figure 1 illustrates the dependent and independent variables.

Figure 2. 1-Schematic Diagram of Independent and Dependent Variables



2.14 Hypothesis

The Arbitrage pricing theory (APT) by Ross (1967) and multiple equilibrium approaches (Merton 1973, Breeden 1979 and Cox et al., 1985) proved the form of asset pricing model as

$$E(R_i) = \lambda_0 + \beta_1\lambda_1 + \beta_2\lambda_2 + \cdots \beta_k\lambda_k$$ ---------- (2.1)

Equation 3.1 in this study of testing two factor model takes the following form

$$E(Ri)\text{-}Rf = \alpha_i + \beta_1 (E(R_m)\text{-}R_f) + \beta_2 E(LIQ)$$ ---------- (2.2)

Where $E(R_m)$ is the expected return on market portfolio and $E(LIQ)$ is the expected value of liquidity factor. β_1 and β_2 are the slopes of time series regression which takes the form

$$Ri\text{-}Rf = \alpha_i + \beta_1 (R_m - R_f) + \beta_2 (LIQ) + \varepsilon_i \quad \text{(2.3)}$$

As equation (2.3) introduced the regression model of this study, now hypothesis will be developed to estimate the betas (β_1 and β_2). The β_1 will measure the sensitivity of excess returns of a portfolio towards excess market return and β_2 will measure the sensitivity of excess return of portfolio towards liquidity factor. If the riskiness of portfolio increases i.e. betas increases then the excess returns will also be expected to increase.

Thus, the alternate hypothesis of β_1 will estimate that the risk factor will be significantly higher than zero i.e.

H1: The market excess returns (RM-RF) has significant impact on security's excess return (RI-RF)

B2 represents the effect of liquidity factor on stock's returns. According to the theory the relationship between the illiquidity factor and returns are expected to be negative. The alternate hypothesis of β_2 will be

H1: The effect of illiquidity have significant impact on stock returns.

This study investigated the applicability of existing single and two factor model of developed stock markets in emerging stock market of Pakistan.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will discuss in detail the methodology that has been adopted to test the validity of two factor model. The goal of this study was to determine the effect of market factor and liquidity factor on the dependent variable which was security's excess return.

This chapter outlines the philosophy and approach of research, research's nature, the sample of research and how to collect data for each factor and the proxy that has been used for liquidity factor. The data analysis tools and techniques were also discussed.

3.2 Research Philosophy And Approach

3.2.1 Philosophy

The philosophy must be known by the researcher upon which to base the strategy regarding the adoption of a specific strategy as discussed by Johnson and Clark (2006). The reason behind this is that the methods are determined by utilizing an effective research philosophy. Most importantly, the researcher is also helped by this concept regarding provision of justification of the selected methodology.

The philosophy that has been adopted in this study is positivism which makes deductions that is, the hypothesis is built on some already established theory. Then this hypothesis is tested to check the likelihood of validation or rejection of this theory (Saunders et al., 2009). Though, according to Blaxter, Hughes, & Tight, (2006) the positivism mostly relates with the quantitative approach.

This research was mainly aimed to determine the validity of "liquidity augmented pricing model" in emerging security market of Pakistan. The data for the two independent and one dependent variable, which has been defined on basis of literature, was secondary data. After collection data, model has been tested.

3.2.2 Approach

There are two research approaches, that is, inductive and deductive approach. In inductive approach, the first step is to build hypothesis on basis of collected data and make inferences on that basis. Induction approach is used for theory building (Saunder et al., 2009). In contrary, the deductive method is used for theory testing, that is on basis of already developed theories, hypothesis is build and that hypothesis is then tested either to approve or disapprove (Saunders et al., 2009; Maylor and Blackmon, 2005).

The research approach that suits our research objective is deductive approach. Single factor and two factor models were tested in emerging market of Pakistan to check its applicability. It describes the phenomenon with respect to Pakistani security market and also the findings.

3.3 Research Type and Nature

There are three methods of research: qualitative, quantitative and mixed method. As the research is positivist, the quantitative data serves the purpose of study best and it also

suits the nature of research. According to Creswell (2002), the quantitative data is the one that is based on the collection of numeric data on which statistical tools are applied which serves the researcher purpose of analysis. This study uses the quantitative data (Saunders et al., 2009) which helps in explaining the relationship between dependent and independent variables (Lorraine et al., 2006).

This study is descriptive which describes the phenomenon in scenario of Pakistan security's market also discussed the findings. It also describes the correlation between explanatory variables, which were market excess returns and liquidity factor, and dependent variable which was security's return.

3.4 Research Design

Research designs is the strategy which shows how a research study has been conducted. It identifies the plan which is made for the collection and analysis of data (Sekran, 2003). According to John A.H (2007), research design is the blue print to achieve our research objectives and answering questions of the research. It is like a story book which identifies all the steps that has been taken for the completion of research like the data collection tool, the statistical technique that has been employed.

The research design of the study is comprised of following steps.

Table 3. 1 Showing research design

1	Purpose of Research	To test the hypothesis
2	Philosophy of research	Positivism
3	Type of Research	Quantitative & Descriptive
4	Population	Pakistan's Stock Exchange
5	Sample	PSX 100 index
6	Data type	Secondary
7	Statistical tool	Stata
8	Data Analysis	Descriptive, Correlation and
9	Findings and Conclusion	Results after testing hypothesis

The literature review in the previous chapter has provided the base for developing theoretical framework, describing the independent variables and relationship between dependent and independent variable. On the basis of that theoretical framework, hypothesis has been developed. To test the hypothesis, secondary data was collected. After collection of the data, statistical tool was applied to analyze the data to reach to a conclusion.

3.5 Population

According to Huysamen, (1994), population is all units of observation of the study. For example if a researcher is carrying out research on the performance of Government Girls schools of Peshawar, KP., then all Government girls schools in Peshawar will be population of this study.

The population of the liquidity augmented capital asset pricing model is all the companies of PSX 100 index. In Pakistan Stock Exchange the total number of listed

companies which constitutes our population is 572. These 572 companies are the sum of companies from 35 sectors.

3.6 Sampling

Gray (2004) clarified population as the total possible number of observation of a study. The sample is the subset of population which represents it. The reason of taking sample is that population is so large that cannot be studied due to lack of resources (Gray, 2004; Saunders et al., 2007).

It is difficult to study all the listed companies of PSX because huge numerical calculations are involved. Therefore, this study takes PSX 100 index as its sample. These 100 companies are best representative of all listed companies because 85% of the trading are done in these companies.

3.6.1 Sample Size and Period

According to Morgan Stanley Capital Investment annual review, PSX has been counted as an emerging market in June, 2017 which attracts multimillion dollars in portfolio investment. Pakistan stock exchange is the most liquid exchange and has won the "Best Performing Stock Market of the World" award in year 2002. The top 100 companies symbolizes the whole market performance. Almost 85% of the trading has been done in these 100 companies. As these 100 companies justifies the major portion of capitalization and trading volume, so it would be better option to take these 100 companies as sample for research.

100 companies which are the representative of all sectors have been selected as sample. But only those companies have been included in sample which were continuously listed over the whole sample period.

The time period which was considered for the research is 10 years, that is, from Jan 2008 to Dec 2017. The data for the sample is collected for the above mentioned 10 years and will be analyzed to get to the conclusion.

Figure 3. 1: Population and Sample of the study

3.7 Data Collection

There are two types of data; primary data and secondary data. Primary data is the data that the author collected by himself during his study (Walbert, 2015). On the other hand, secondary data is the already published data, for example, book, newspaper, some website etc. (Johnruss 2012). This study has been explained by using both the data.

The secondary data has been collected from different websites. PSX database, business recorder, website of State Bank of Pakistan were used to collect data for different

variables. Daily closing value and turnover of each stock of PSX 100 index were obtained from business recorder website i.e. www.brecorder.com. Also, the data for index points was obtained from the same website.

3.8 Selection Criteria of Sample

This study tested and compare the Single factor model and two factor model on sample for the period of 2008 to 2018 as mentioned earlier. Following is the list of criteria that was employed to select companies.

1. PSX 100 index was taken as sample which represents all sectors.
2. The company can be the selected as a sample only if it is a public limited company.
3. Only those companies are considered as sample which are present in the recomposed list of PSX 100index on reference date of 2nd October, 2017.
4. The company should be registered for the whole sample period of 2008-2017 continuously. Any company which is not registered till 1st Jan, 2008 cannot be part of sample. Also, those companies which are winded up during the sample period were also not included in the sample.
5. Data of different variables should be available of the company to be part of sample.

The population of this research is 572 companies from which 100 representative companies is selected. After defining the selection criteria, only 87 companies are those which fulfils the selection criteria. These 87 companies survived during the period of 2008-2017. Also, the data of these 87 companies is available for the sample period.

3.8.1 Survivorship Bias

Following the selection criteria of stocks of Chan & Faff (2005), only those companies have taken as sample which survives for the sample period. It means that only

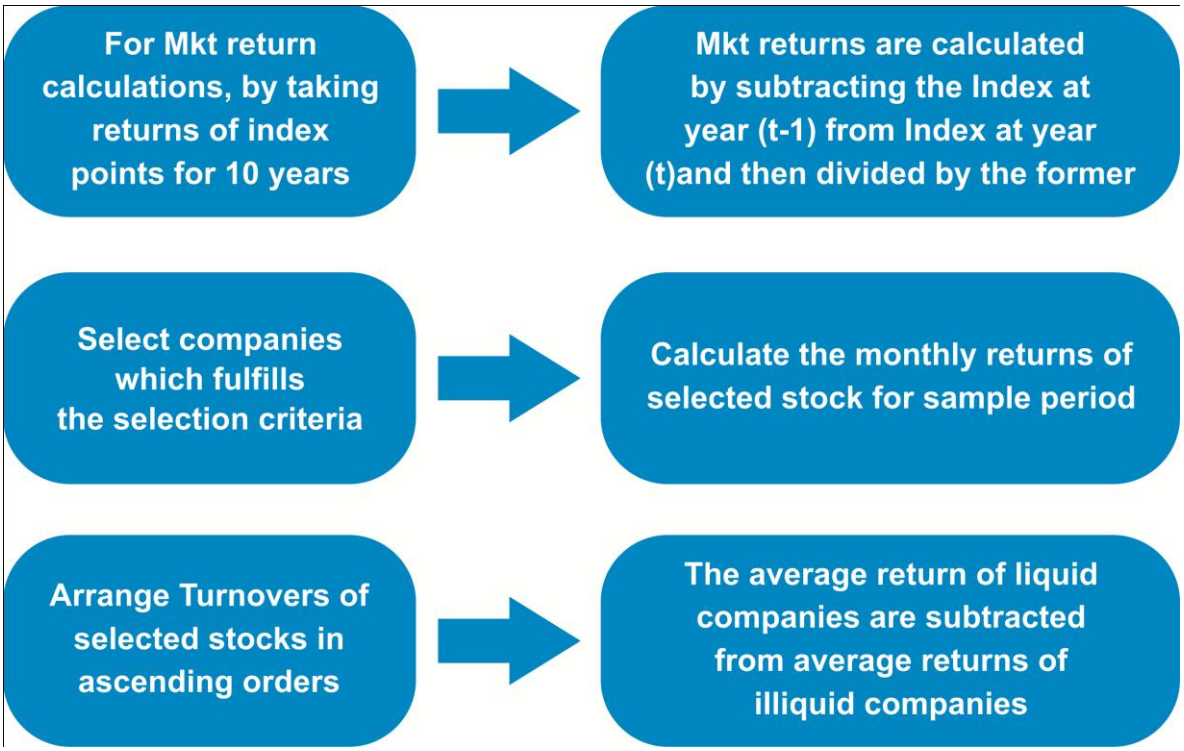
those companies were including in sample which were active till the reference point. But the small, illiquid stocks, which cannot survive till date, are excluded from sample. The illiquid stock which survived till reference point, means that now they are performing well and yielding high returns. So excluding its down side, the effect of illiquidity in stock will be exaggerated.

3.9 Methodology

The steps that has been followed to collect the data for all variables for testing hypothesis are as follows.

a. Monthly index points of PSX 100 index for the period 2008-2017 was collected to find the market access return.
b. For risk free rate, 6-months T-bills was taken for the period 2008-2017 and was converted to monthly yield.
c. Daily share prices of 87 companies were collected in order to calculate the security's return. The daily data was converted to monthly by taking average of the month first day and last day.
d. Monthly Average turnover of these 87 companies were collected.
e. The portfolio IMV (illiquid minus very liquid) was formed on the basis of turnover.
f. All risk betas were calculated through regression and correlation test is conducted.

Figure 3. 2: Methodology of the study



3.9.1 Independent Variable

While doing research for the applicability of two factors model, this study comprises of two independent variables which were market excess returns and liquidity factor.

Market Excess Returns:

The **"Market Excess"** returns are calculated by (R_M - R_F).

Market Returns

The market return (R_M) is calculated by taking monthly index points of PSX from 2008-2018. Then the returns of index points are calculated by following formula:

$$Markrt\ Return = (Index_t - Index_{t-1})/Index_{t-1}$$

Risk Free Proxy

The six months treasury bills rate (T-bills) is taken as proxy of risk free rate (R_F). As it is issued by the Government so there is no risk. That is why, it has been taken as risk free. The rates for the T-bills were obtained from website of State Bank of Pakistan.

Liquidity Factor

Liu (2006) explained liquidity as the ability of an asset that how easily it can be traded in market with heavy volumes without decreasing its price and without incurring any transaction cost. There are four fragments of liquidity namely speed, cost, quantity and price impact. Different researcher used different proxies to calculate the different aspect. For example, Amihud and Mendelson (1986) used the bid and ask price spread in order to determine the trading cost. Datar et al. (1998) worked on the quantity traded aspect of liquidity and captures the effect by using turnover rate. Amihud (2002) and Pastor and Stambaugh (2003) worked on prices to check its effect on trading quantity. Liu (2006) worked on all dimensions of the liquidity including speed and has defined his own proxy to cover all aspects of liquidity.

The unavailability of data limits the research to only trading quantity dimension of liquidity by using the proxy of turnover. For this purpose, monthly turnover of each company was taken for ten years which was further averaged to get the average monthly turnover of each company. The average of turnovers was taken in order to avoid the seasonality effect (Chan and Faff, 2003; Liu, 2006), that is, in January the liquidity premium is 2% high than in other months of the year. After getting averaged turnovers, the median of the turnover was calculated in order to sort the companies in ascending order and rank them as high liquid and low liquid. The company with low turnover will be

considered as less liquid while those with high turnovers are more liquid. Then the portfolio IMV was formed as in Chan and Faff (2003). The average returns of stocks with high liquidity is subtracted from average returns of stocks with low liquidity. IMV is the measure of additional return investors have received by participating in stocks of companies with relatively low liquidity. This additional return is referred as the "liquidity premium".

3.9.2 Dependent Variable

The dependent variable of the study is excess return on stock. The **Excess Return on Stocks** (R_I) are calculated by subtracting R_F from R_I.

Stock Returns

The monthly returns of securities are calculated by taking the individual stock prices of all the companies for the period of 2008-2017. The monthly return of stocks (R_I) is calculated by the following formula:

$$\text{Stock Return} = (\text{Price}_t - \text{Price}_{t-1})/\text{Price}_{t-1}$$

The **Excess Return on Stocks** (R_I) are calculated by subtracting R_F from R_I. Single factor model consists of one dependent factor R_I- R_F and one independent variable R_M - R_F. After calculating both the factors, Regression is run to check the significance of overall model and effect of IDV on DV.

3.10 Analysis Tools

The data for dependent variable and independent variables were collected from the mentioned source. Stata is statistical package for data analysis. Descriptive statistics,

correlation and regression were applied to test the hypothesis. Multi-collinearity was also analyzed to check the presence of multi collinearity problem.

3.10.1 Descriptive Statistics

Descriptive statistics describes the data. They represent statistical properties of data. It gives the summary of all data in terms of total number of observation of all variable. The minimum and maximum value of all variable. It also tells us the mean (average of all observation) of dependent and independent variable. The standard deviation tells about the deviation of observations from its mean. The higher the standard deviation, the more will be the variance in data. The skewness of data represents its spread that whether our data is symmetric or not. Kurtosis shows the peak of the curve.

3.10.2 Correlation Analysis

Pearson Correlation is the statistical tool used to analyze the co-movement of variables. It shows the fluctuation in two variables. Its value is determined by co-efficient of determination which is denoted by rho "R". The value of "R" lies between -1-+1 including 0. 0 shows that there is no correlation between two variables. +1 is perfect positive correlation, that is, both variable move in same direction (direct relationship). -1 is perfect negative correlation, that is, both variables move in opposite direction (inverse relationship).

In this study, the correlation between dependent variable (security's excess return) has analyzed with two independent variables (market excess returns and liquidity factor) separately.

3.10.3 Regression

Regression is statistical technique used to show the changes caused by one variable (independent) in another variable (dependent). Its equation is

$$Y = \beta_O + \beta X + \mu \quad \text{---------- (3.1)}$$

Where Y is the dependent variable which depend upon the independent variable X with strength of β. μ is the error term.

For testing the significance of single factor model (CAPM), linear regression will be used to check the impact of market excess returns on security's return. The equation 3.1 will become

$$Security\ Excess\ Return = \beta_O + \beta(Market\ Excess\ Returns) + \mu \text{ ------ (3.2)}$$

Equation (3.1) explains the changes in dependent variable that has been caused by one explanatory variable. This is linear regression where in multiple regression the changes in dependent variable is caused by two independent variable. The equation of multiple regression will be:

$$Y = \beta_o + \beta_1 X + \beta_2 X_1 + \beta_3 X_2 - - - - - - \mu \text{ ---------- (3.3)}$$

In two factor model, the security's return is dependent on two independent variables which are market excess returns and liquidity factor. The equation for two factor model will then become

$$Security\ Excess\ Return = \beta_o + \beta_1(Market\ Excess\ Return) + \beta_2(LIQ) + \mu$$

---------- (3.4)

3.10.3.1 Panel Regression

Panel regression is used to find the effect of independent variable on dependent variable across time. The variables are analyzed from both perspective, that is, cross section and time series. That is reason it is also known as longitudinal or cross sectional-time series data.

In this study, the monthly returns of 87 companies were assessed across 10 years of time period, that is, from 2008-2017. So the data has been analyzed cross-sectional as well time series.

3.10.4 Multi-Collinearity

Multi-collinearity problem exists where there is strong correlation exists between independent variables. The criteria for deciding about the presence or absence of problem lies on tolerance value and VIF (Value Inflatory fluctuations). If the value of tolerance is greater than 0.2 and value of VIF is less than 10, then there will be no correlation between independent variables and vice versa.

In this study, where the independent variables are market excess returns and liquidity factor, the problem has been analyzed between them.

3.11 Variables and Their Proxies

This study consists of one dependent variable (excess security return) and two independent variable namely market excess return and liquidity factor. Following is the summary of variables and their proxies.

Table 3. 2 Variables and their Proxies

NAME OF VARIABLE	PROXY	CALCULATION
DEPENDENT VARIABLE		
Excess Security's Return	R_I-R_F	R_i is calculated by monthly return on security R_F is calculated monthly yield on 6 months T-Bills
INDEPENDENT VARIABLES		
Market Excess Return	R_M - R_F	R_M is calculated by taking the monthly returns of 100 index points.
Liquidity	Security's Turnover (Chan and Faff, 2002)	Trading volume/No. of shares outstanding

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This section includes the analysis of all tests that were run to fulfil the objective of this study. The purpose of analysis is to identify the asset pricing model that fits best in the emerging market of Pakistan and it will help the investors while pricing their assets. It is assumed that when an investor decides to invest in an asset, it instantly in minds also decides regarding the future potential of reselling of the asset. This thought of reselling the asset in future relates to the liquidity of the asset, hence this issue also relates to the future cash flows with regards of the asset. So, involuntarily investor's decision depends on the future cash flows of the asset which on other hand is affected by the liquidity. Hence liquidity is one of the very important factors that investor consider before buying any asset or stock in the financial market. This study recognizes the importance of liquidity concepts which effects security's return. The literature have proved the significant impact of two factor model than single factor model.

The "LCAPM" has been used to analyze the security's excess return. For analysis purpose, descriptive and inferential statistics were used. Descriptive statistics, as its name sound, describe the data in term of measure of variance or dispersion of data. Inferential

statistics will be used in order to draw conclusion from the data that whether our model is significant or not.

4.2 Descriptive Statistics

Table 4. 1 Descriptive Statistics

Variables	Mean	Std Dev	Minimum	Maximum
Ri-Rf	-.0957304	.3316469	-1.12059	76.4741
Rm-Rf	-.0960323	.0689589	-.7552815	.085322
Liquidity	2.11e+07	5.44e+07	0	1.06e+09

The table 4.1 shows the findings of summary statistics for the variables which argued that the mean value stock premium is negative -0.957304 which means that the average variance of share prices in the study observations have been found negative, with minimum -1.12059 and maximum 7.4741. Mean of market premium is -.0960323 which also have been found negative with minimum -.7552815 and maximum .085322. Average value of liquidity is 2.11 which argued that the turnover of the market is positive and increasing trend has been seen in the study observations.

4.3 Inferential Statistics

The CAPM model has been analyzed for the addition of liquidity factor. The results will be analyzed to check for the impact of independent variable (RM-RF & turnover) on dependent variable (stock's excess return).

4.3.1 Diagnostic Tests

a. Chow Test

The diagnostic test was used to check the model of data analysis which needs to be taken in the present study. The chow test is the diagnostic test which has been used in the study to check the recommended model among fixed effect and pooled OLS model.

H0: Pooled OLS

H1: Fixed effect model

Chow test for structural break at observation 1:0016

F(3, 954) = 0.196444 with p-value 0.8988

The above are the findings of chow test which concludes that the null hypotheses has been accepted and argued that the pooled OLS model has been recommended for the present study analysis.

b. Breusch-Pagan test statistic:

The diagnostic test was used to check the model of data analysis which needs to be taken in the present study. The bruesch pagan test is the diagnostic test which has been used in the study to check the recommended model among random effect and pooled OLS model.

H0: Pooled OLS

H1: Random effect model

Table 4. 2 Breusch-Pagan Test

Test	Chi square	P-value
Breusch-Pagan Lagrange Multiplier	0.402608	0.525746

According to Girma (2006), if the p-value is less than 0.05 then random effect model would serve the better option for explanation. If the p-value is greater than 0.05 then Pooled OLS is good model to use. Table 4.2 shows that the p-value is 0.5 which is greater than 0.05, so null hypothesis has been accepted that pooled OLS is adequate model as compared to random effects for present study analysis.

4.3.2 Pooled OLS

Table 4. 3 Regression Results CAPM

Model 1: OLS

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	-0.0709703	0.00779926	-9.0996	<0.00001	***
Rm-Rf	0.247957	0.0673997	3.6789	0.00025	***

Dependent variable: Ri-Rf

R-squared	0.139301	Adjusted R-squared	0.129002
F(1, 958)	13.53432	P-value(F)	0.000247

*** p<0.01, ** p<0.05, * p<0.1

The above table 4.3 shows the findings taken from the regression model which has been used in the study to evaluate the market premium on the stock premium of the firm. The model which has been selected comprises of two factors i.e. stock premium which has been drawn from the variance in the share prices of the sample firms and market premium has been estimated by the changes occur in the market indexes. The study has taken market premium as independent variable while the stock premium was the dependent variable. The value of R-square argued that the market premium is having 13.9 effects on the share premium. The statistics show that the independent variable explained 13 percent variance in the dependent variable. The study has used F-value for the estimation of model statistical significance. The F-value in the table 4.3 is 13.53 which is more than the standard value i.e. 4 and concluded that the selected model is statistically significant.

The market premium is having positive relationship with the stock premium which argued that when the market premium has been increasing then the share prices will be higher and will lead to higher share premium. The beta value of market premium is 0.247957 which shows that the share premium will be increased by 24 percent when the market premium has been increased which shows the positive relationship of market index with the firm's share price. The t-value and p-value has been used to accept or reject hypotheses. The t-value of market premium in the table is 3.6750 which is more than the standard value i.e. 2. Also, the p-value is 0.00001 which is less than 0.05 and argued that there is a significant effect of market premium on the stock premium.

Table 4. 4 Regression Results LCAPM

Model 2: OLS

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	-0.0701071	0.00784491	-8.9366	<0.00001	***
Rm-Rf	0.245192	0.0674529	3.6350	0.00029	***
LIQ	-0.064168	0.011015	-5.8255	<0.00001	***

Dependent variable: Ri-Rf

R-squared	0.095001	Adjusted R-squared	0.072942
F(2, 957)	7.287213	P-value(F)	0.000723

*** p<0.01, ** p<0.05, * p<0.1

The above table 4.4 shows the findings taken from the regression model which has been used in the study to evaluate the effect of market premium and liquidity premium on the stock premium of the firm. The model which has been selected comprises of two factors i.e. stock premium which has been drawn from the variance in the share prices of the sample firms and market premium has been estimated by the changes occur in the market indexes. The study has taken market premium and liquidity premium as independent variable while the stock premium was the dependent variable. The table 4.4 showed that the market premium and liquidity risk is having 9.5 percent effect on the share premium. The value of R-square shows that the independent variable explained 9.5 percent variance in the dependent variable. The F-value is used for the estimation of model statistical significance. The f-value in the table 4.3 is 7.28 which is more than the standard value i.e. 4 and concluded that the selected model is statistically significant.

The market premium is having positive relationship with the stock premium which argued that when the market premium has been increasing then the share prices will be

higher and will lead to higher share premium. The beta value of market premium is 0.245192 which shows that the share premium will be increased by 24 percent when the market premium has been increased which shows the positive relationship of market index with the firm's share price.

The t-value and p-value has been used for the acceptance or rejection of hypothesis. The t-value of market premium in the table is 3.6350 which is more than the standard value i.e. 2. Also, the p-value is 0.0007 which is less than 0.05 and argued that there is a significant effect of market premium on the stock premium.

The proxy for liquidity is turnover. The turnover of 87 sample companies for the period of 2008-1017 was taken as independent variable to check its effect on excess stock return. As per literature, if the turnover of company is low then it would be facing problem of liquidity for which the investors should be compensated.

Table 4.4 implies that illiquidity is having negative relationship with the stock premium which argued that when the market turnover has been increasing then the excess return on stock decreases. The beta value of liquidity is -0.064168 which shows that the excess return on stock will be decrease by 6 percent when the market illiquidity has been increased by 1% which shows the negative relationship of turnover with the stock's excess return. The t-value has been used in this table to accept or reject hypotheses. The t-value of market liquidity in the table is -5.8255 which more than the standard value i.e. 2. Also, the p-value is 0.0001 and argued that there is a significant effect of liquidity on the stock premium.

Table 4. 5 Matrix of correlations

Variables	Ri-Rf	Rm-Rf	Liquidity
Ri-Rf	1		
Rm-Rf	0.17101**	1	
Liquidity	-0.15316**	0.21536**	1

The above table 4.4 is the findings of correlation test which has been used in the study to check the correlation among the dependent and independent variables. The findings shows that the correlation between stock premium and market premium is 0.17 which positively and significantly related with each other. Hence, if the market premium increases, the stock premium will also be increased.

The correlation between stock premium and liquidity has been found -0.15, negatively and significantly correlated with each other. Hence, if the illiquidity increases, the stock premium will be decreases.

4.3.4 Collinearity between IDVS

Table 4. 6 Multicollinearity

Variable	VIF
R_m-R_f	1.10
Liquidity	1.00

The table 4.5 shows the findings of test of multi collinearity which has been used to check the inflation among the sample data. The acceptable range for the VIF (variance inflation factor) for the variables is 10. The value of the variables must be in range to include in the study. The value suggested that the values are in range and acceptable. Hence, there is no multi collinearity problem between independent variables.

4.4 Relationship of Stock Excess Return and IMV

After getting averaged turnovers, the median of the turnover was calculated in order to sort the companies in ascending order and rank them as high liquid and low liquid. The company with low turnover will be considered as less liquid while those with high turnovers are more liquid. Then the portfolio IMV was formed as in Chan and Faff (2003). The average returns of stocks with high liquidity is subtracted from average returns of stocks with low liquidity. IMV is the measure of additional return investors have received by participating in stocks of companies with relatively low liquidity. This additional return is referred as the "liquidity premium".

Table 4. 7 Regression Results

Model		Standarized B	T value	Sig	Collinearity Statistics	
					Tolerance	VIF
(Constant)	0.472		7.339	0.000		
RmRf	0.988	0.039	3.902	0.000	0.987	1.013
IMV	-0.072	-0.070	-7.072	0.000	0.987	1.013

Dependent Variable Ri - Rf

R-squared	0.995	Adjusted R-squared	0.885
F-Test	12172.484	Prob > F	0.000

*** p<0.01, ** p<0.05, * p<0.1

The value of R-square shows that the changes caused by independent variable in dependent variable. Table 4.6 shows that value of R-square is 0.995. It argued that 99.5% changes in security's excess returns are caused by IMV and market excess returns. The significance of the overall model will be determined by F-value. As per table 4.6, the value of F-test is 12172.484 and p value is 0.0000. Both the values fulfill the criteria to be proved significant. It means that the two factor model that is "LCAPM" is overall significant model.

The t-value of market premium is 3.902 which is greater than 2. Hence, the t-test also verified the positive significance impact of RM-RF on RI-RF. The value of beta coefficient is 0.039. It shows the positive relationship between market excess returns and security excess returns. If the value of RM-RF increases by 1%, it will bring 3.9% change in RI-RF.

The t-value of IMV is -7.072 from which it can be concluded there is negative significant relationship between IMV and Stock's excess returns. It means that there is negative significant relationship between IMV and stock excess returns. The value of β_2 in equation (3.4) is -0.072. It also shows the negative relationship between IMV and security's excess return. If the difference between returns of illiquid and very liquid firms increases by 1%, it will decrease the security's excess return by 7.2%.

4.5 Discussion

In the recent era the financial and economic situation of countries, companies and individuals is rapidly changing due to globalization. Those firms and individuals who do not want to save their excess amount of money in the saving accounts, prefer to invest in money market and capital market securities. The most attractive source for profit maximization for millions of investors all around the world is to trade the stocks of the companies at stock markets. The main purpose of investors is to trade at stock exchange is to maximize their wealth which could only be possible if they found those stocks that have the capability of providing high return. The profit of investors depends on the price fluctuation of stocks at stock exchange. But how investors should find those securities that provide higher return on investments? For that purpose the investors must have sufficient knowledge that should be base for the decision making about the selection of the stocks among the pool of alternatives (Basu, 1997).

Return is the most important force that motivates the investors for investment. It is the reward for the investment. If an investor has ownership in a company then he/she will be ready to face the gain/loss due to the price fluctuation of that stock. The Capital Asset Pricing Model (CAPM) have been the most widely used techniques within the international committing area regarding calculating the return of a risky resource. This study considers PSX 100 index as its sample for inquiring the validity of CAPM in Pakistani scenario and also the liquidity augmented CAPM. These 100 companies are best representative of all listed companies because 85% of the trading are done in these companies. But only those companies will be included in sample which were continuously listed over the whole sample period. The time period which was considered for the research is 10 years, that is, from Jan 2008 to Dec 2017. The data for dependent variable and independent variables

were collected from the mentioned source. Stata is statistical package for data analysis. Descriptive statistics, correlation and regression were applied to test the hypothesis. Multi-collinearity was also analyzed to check the presence of multi collinearity problem. The findings of the study argued that the diagnostic tests i.e. chow and breusch pagan tests have recommended the use of pooled OLS model. The pooled OLS model argued that the market premium and liquidity are having significant effect on the stock premium.

The findings of the study were found consistent with the study of Basu (1997) who conducted study of CAPM model to check its estimating capacity for the stock premium and market premium. The findings of the study argued that the stock premium and market premium is having positive relationship with each other. The main purpose of investors is to trade at stock exchange is to maximize their wealth which could only be possible if they found those stocks that have the capability of providing high return. The profit of investors depends on the price fluctuation of stocks at stock exchange (Hanif, 2009). Another study conducted on the same objective in Pakistani market by Zubairi and Farooq (2011) who argued that the Capital Asset Pricing Model (CAPM) have been the most widely used techniques within the international committing area regarding calculating the mandatory return of a risky resource. A report conducted through Zubairi & Farooq (2011) analyzed no matter if Capital Asset Pricing Model (CAPM) is usually a logical type regarding couples your price/return of the fertilizer plus the Oil & Gas sector organizations stated for the Karachi Stock Exchange (KSE).

The second part of the model was the relationship between the stock premium and liquidity which was estimated by stock turnover turnover. The findings confirm the negative relationship of liquidity with the stock premium. The findings are consistent with the studies of Datar, Naik & Radcliffe (1998) and Chordia, Subrahmanyam & Anshuman

(2000), who argued that the stock turnover has negative significant effect on stock excess return.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The objective of the study was to define a best fit asset pricing model in emerging market of Pakistan which will be helpful for investors while calculating their required rate of return. Traditionally, CAPM was considered the best in calculating stock' return. This model has only one factor (market excess return) which could affect the excess stock's return. But with new researcher, it has been proved that this model is based on some ideal assumption. Hence, some real world factors were added to make the model more reliable for investors.

In this study, Chan and Faff (2003) methodology has adopted to study LCAPM. Size and value risk factor are not included as Liu (2006) has proved that LCAPM performed better than Fama and French three factor model in emerging markets. As Pakistan has been categorized as emerging market, this study considers only LCAPM. The data for the two independent and one dependent variable, which has been defined on basis of literature, was secondary data. The data of 87 companies for the period of 2008-2017 was taken. The effect of two independent variables (market excess return and liquidity) of LCAPM were analyzed on dependent variable (stock's excess return). Pooled OLS model was selected as model of analysis after running diagnostic tests.

The results of Pooled OLS of single factor model showed that market excess returns have positive significant effect on the stock excess return. The overall single factor model validity was proved. In past many researches were done for validity of single factor model in Pakistan but all proved that single factor model was not able to explain the variations in stock's return.

Liquidity factor has significant impact on stock excess return in emerging market of Pakistan. This is because the assumptions of traditional CAPM was not realistic. So to make the model more reliable, real world factor was added. Liquidity factor which is the main problem in emerging markets (Bekaert et al., 2007) was added. The importance of liquidity factor emphasizes that if it is not considered while calculating asset returns in Pakistan, the figures would be misrepresented. The importance of liquidity factor can observed from the study of Chai et al., (2011); and Amihud et al. (2005).

The results of two factor models was also significant. Market excess returns have positive significant effect on stock premium while the liquidity factor has also significant effect but negative which is consistent with the literature. Hence, it proves that if the liquidity risk increases, the stock premium would be decreases and vice versa. Hence LCAPM can actually explains the required rate of returns on stocks. In a state of low market returns while high illiquidity, the investor's return is significantly decreased.

5.2 Recommendations

To check the effectiveness of Liquidity augmented CAPM on Pakistan Stock Exchange in future, some recommendations are given below:

1. This research has taken the sample time period of 10 years. In future the sample period can be taken for more than 10 years.

2. This research used the 6-month T-Bills rate as risk free rate. The T-Bills for any other maturity can be used.
3. This research considered the turnover proxy for liquidity. It is recommended for the future that the effectiveness of the two factor model can be investigated through some other proxy.
4. The study was conducted on PSX 100 index firms and in future the study can be conducted in comparison of two or more sectors.
5. The present study used CAPM model and in coming future the researchers can also use other models as well e.g. fama and French model.

5.3 Limitations

- The study was conducted in Pakistan Stock Exchange and limited to PSX 100 index; the findings are not applicable to any specific sector of the stock exchange.
- The study has used CAPM to validate the estimation of CAPM and liquidity. The findings are limited to CAPM estimation only.

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