

**“Cash to price ratio and stock return  
Empirical Study in Emerging Markets (Pakistan, India and China)”**

**By**

**Nudrat Fatima**

**MASTER OF SCIENCE IN MANAGEMENT SCIENCES**

**(Finance)**



**DEPARTMENT OF MANAGEMENT SCIENCES  
CAPITAL UNIVERSITY OF SCIENCES & TECHNOLOGY  
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By**

**Nudrat Fatima  
MMS151056**

**SUPERVISOR  
Mr. Ahmad Fraz**

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**DEPARTMENT OF MANAGEMENT SCIENCES  
CAPITAL UNIVERSITY OF SCIENCES & TECHNOLOGY  
ISLAMABAD**



**C.U.S.T.**

**CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY  
ISLAMABAD**

**CERTIFICATE OF APPROVAL**

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**MMS 151056**

**THESIS EXAMINING COMMITTEE**

<b>S No</b>	<b>Examiner</b>	<b>Name</b>	<b>Organization</b>
(a)	External Examiner	Dr. Iftikhar Hussain Adil	NUST, Islamabad
(b)	Internal Examiner	Dr. Arshad Hassan	CUST, Islamabad
(c)	Supervisor	Mr. Ahmad Fraz	CUST, Islamabad

---

Mr. Ahmad Fraz

**Thesis Supervisor**

November, 2016

---

Dr. Sajid Bashir

Head Department of Management and Social  
Sciences

Dated : November, 2016

---

Dr. Arshad Hassan

Dean

Faculty of Management and Social Science

Dated : November, 2016

## **CERTIFICATE**

This is to certify that Nudrat Fatima has incorporated all observation made by thesis supervisor. The title of the theses is “**Cash to price ratio and stock return Empirical Study in Emerging Market (Pakistan, India and China).**”

Forwarded for necessary action

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Mr. Ahmad fraz  
(Thesis supervisor)

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## ***DEDICATION***

*This thesis is dedicated to my beloved Father and respected teachers. They helped and supported me throughout my career and guide me to achieve my goals.*

## **STATEMENT BY CANDIDATE**

This thesis includes no material which has been already accepted for the award of any other degree or diploma in in any university and confirms that to the best of my knowledge the thesis includes no material previously published or written by another person, except where due reference is made in the text of the thesis.

**NUDRAT FATIMA**

**(MMS 151056)**

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## **ABBREVIATIONS**

S = Small portfolio

B= Big portfolio

S/L= Small low C/P portfolio

S/H= Small high C/P portfolio

B/L= Big low C/P portfolio

B/H= Big high C/P portfolio

MKT= Market premium

SMB= Size premium

HML= Value(C/P ratio) premium

CAPM= Capital asset pricing model

APT= Arbitrage pricing theory

## ABSTRACT

*This study examine the impact of size premium and value premium on average return in Pakistan, India and China equity market for the period of June 2000 to June 2015 by using Fama & French(1992,1993) Methodology. This study predict the significance and positive relationship between value premium(C/P Ratio) and stock return for all non-financial companies listed at Karachi stock exchange, Bombay stock exchange and Shanghai stock exchange on the basis of market Capitalization. The analysis regression result of study illustrate that size premium can predicts returns more for small firms than big firms while market premium found significantly positive with stock returns in Pakistan, India and China. Explanatory power of Fama and French three factor model is greater than CAPM for all three equity markets, so, this asset pricing model can facilitate investors in efficient portfolio diversification for getting enhanced returns.*

# Chapter 1

## 1. Introduction

Capital markets play a vital role in financial markets of any country. It is a fundamental factor to be considered while going for investment that how a market efficiently transform information to stock prices. In recent studies, numbers of asset pricing models are discussed in academics. Capital asset pricing model (CAPM) of Sharp (1964), Lintner (1965) and Black (1972) is still a debatable topic in modern finance literature. The CAPM makes a fundamental contribution for understanding the relationship of risk and return.

Covariance between expected return of market portfolio and stock return is related by CAPM. With time progression, many studies reported that single factor model cannot explain the return pattern. On the basis of previous results, Fama& French (1993, 2014) introduced three factor and five factor model. Cross sectional average returns have been explained better than CAPM by using value and size premium.

(C/P) ratio is an indicator of ability of company to generate cash that it uses to run its business. It is better valuation than P/E ratio. This ratio provides the better idea about the money available for the management for R&D, marketing activities, dividend and share repurchase etc. (C/P) ratio is better measurement of stock's value than P/E ratios. Investors prefer to use price to cash flow ratio because it adjusts for expenses i.e, depreciation and capital expenditures etc.

C/P ratio is one of the most important financial indicators in evaluating a stock return. Fama and French (1992) have found that future stock return is predicted by the value premium. With the help of C/P ratio companies managers can get sense that a company is performing. In general concept people are risk averse, whenever people who purchase the shares or securities make

portfolios to diversify the risk because by investing their funds risk must have to bear. So, investor in securities market prefers to position their investment portfolio that can give them more rates of returns. Investors prefer the C/P ratio to measure the company's financial performance. Whenever investor purchases the securities, he tries to minimize the risk with the help of making portfolios.

## **1.1 Theoretical Background**

### **1.1.1 Capital Assets Pricing Theory (CAPM)**

On the basis of linear relationship between systematic, securities are priced in stock market is examined by the studies. The origin of asset pricing theory is provided by CAPM presented by Sharp (1964) and Lintner (1965). The return on stock and risk relationship is expressed by CAPM. Only single factor market premium ( $R_m - R_f$ ) is effected by portfolio returns according to CAPM. CAPM is criticized by Roll (1977). A portfolio that contains all risky assets is unrevealed so CAPM cannot be testable.

### **1.1.2 Arbitrage Pricing Theory (APT)**

Roll (1977) presents the arbitrage pricing theory (APT) as an alternate model that identifies the problems in CAPM. The arbitrage pricing theory (APT) is alternative model for CAPM as APT is more generalized than CAPM. To determine the asset prices APT is used. CAPM depends on market portfolios whereas, APT does not depend on market portfolios, that explain expected returns are influenced by market risk. The APT assumes return on equity as well as efficiency of portfolio and it depends on number of factors. APT has three assumptions. First, more wealth is preferred than less wealth by investors. Secondly, generating returns process is linear function of

different factors. Thirdly, there is perfectly competitive capital market. Expected risk and return relationship is explained by APT by using different assumptions.

### **1.1.3 Fama and French Three factor Model**

Fama and French (1992) examined the three factor model. Three factor model is a multi-factor model of APT. They studied the combined role of P/E ratio, beta, B/M and size for cross sectional variations in expected returns of stocks of NYSE, AMEX, and NASDAQ. And found that size and B/M ratio and market beta explain cross sectional changes in expected stock returns. To explain the variation in returns, these two variables also absorb the effect of leverage and P/E.

Fama & French (1993) extended their study to bond market, in (1995) they studied B/M and size factor in earning in 1996 and provides multi-factor explanation for asset pricing anomalies. In (1998) they extended their study by testing different markets around the world and found that growth stock has lower returns than value stock. In (2006) F&F conducted a study on profitability, investment and average returns and confirmed the prediction of pricing theory that explains stock returns that are linked with B/M ratio.

In (2008) expected returns has been debated that people earns abnormal returns due to anomalies like assets growth and profitability, momentum and accruals. They divided these anomalies by dividing stocks into three size groups that is micro, small and big in cross section regression. In (2012) a research study has been conducted to test whether value premium and momentum effect exists in international returns or not. For this purpose they studies four regions, which are (North America, Europe, Japan, and Asia Pacific)

In (2014), Fama and French have released a working paper in which they added two more factors that is profitability and investment along with three factors model and claimed that cross sectional variations in expected returns can be better explained by their five factors model.

## **1.2 Overview of Markets**

Asia is considered as the growth center of the economy of the world. The main purpose of the emerging markets is to achieve economic development. Emerging markets are the best seekers of investment opportunities. Investors invest money across all over the world as it depends on various factors.

Pakistan stock exchange PSX is the one of the oldest stock exchange market in emerging markets. Kse-100 index is the market capitalization which is the most popular tracking index of Pakistan stock exchange. In 2015 KSE is listed as best stock markets in world. According to Bloomberg, Bench mark of Pakistan stock exchange is on no. 3<sup>rd</sup> as best performer in the world. PSX gives 26% for US dollar investor since 2009 by making Karachi a best performing stock exchange (Khaleej Times, 2015).

The Indian stock market is one of the oldest markets of the Asia. From few decades there has been fast change in Indian stock market. Due to use of technology and online based transaction Indian equity market has been modernized. Indian stock market is a stable market due to higher foreign investment. Emerging markets such as Indian stock exchange markets is fast becoming engine for growth in future.

From last couple of years China stock market has got excellent development. The standard and position of China market is developing increasingly in global securities market. China market is becoming largest emerging market. China stock exchange is the world's 5<sup>th</sup> largest stock market



at 3.5 trillion by market capitalization and is on no. 2<sup>nd</sup> in East Asia.

These emerging markets are leaders in the world and are growing at a high. In Industrial and agricultural sectors Pakistan and India are producing the same products. Pakistan, china and India has better investment opportunities due to high population. These markets are the significant place in Asia for investors because long term growth opportunities are very positive. These markets have the potential to become the world's largest economy.

### **1.3. Problem Statements**

Various studies have been conducted on value premium and size premium. But there is less evidence available on value premium by using the cash to price proxy. Moreover, certain studies have been conducted in developed countries in which C/P ratio is used as a proxy for value premium. Cash flow analysis is certainly some portion of financial analysis in which managers, administration, administrators, investors and stakeholders can use to decide the effectiveness of an organization's overall strategies. Evidence from emerging markets is limited. Therefore, there is a need of time to investigate these phenomena.

C/p ratio is another technique to P/E ratio. This ratio removes the effect of non-cash items and gives reasonable and strong results with no conscious or deliberate control. This offers investors some assistance with judging the actual position of an organization and then deciding how investors should position their portfolios.

## **Research questions**

This study has following research questions.

- What is the role of Cash to Price ratio in explaining equity returns in emerging markets?

### **1.4. Objectives of the study**

This study aim with the following objectives.

1. To check the impact of size on equity returns of emerging markets
2. To provide insight about the role of Cash to price ratio explaining the equity market return.
3. To compare the Cash to price ratio dynamics of Asian emerging markets..

### **1.5. Significance of the study**

The emerging markets (Pakistan, China and India) are good source of investment and portfolio diversification because of investors' interest. To get high returns on investment and highly growing markets with good quality of financial reporting these emerging markets are very important. This study is an effort to capture the current dynamics of equity market and fill the gap in existing literature by extending the work in cash flow yield domain. This study is an effort to explain the effect of C/P ratio on stock returns in three emerging markets i.e. Pakistan, Chian and India.

The importance of research on emerging markets has become crucial because of investor's interest that looks the market as an important source of investment and portfolio diversification. The C/p ratio is used to assess the price of a company's stock as compared to the amount of cash flow it generates. It turns the attention for how much cash an organization produces with respect

to its stock price rather than what it records in earnings relative to stock price. C/p ratio is another technique to P/E ratio. Investors want to use C/p ratio. C/p ratio removes the effect of non-cash items and gives reasonable and strong results with no conscious or deliberate control. This offers investors some assistance with judging the actual position of an organization.

The significance of study is to test the model taking proxies for future changes of expected returns, which can be useful for future practical execution by an extensive variety of interested investors making investment decision. The predictability of stock returns has a financial significance for investors while formulating investment policy and allotting resources to portfolios. Actually, the study gives a logical tool for that.

The study can contribute to better understanding of predicting power of C/P ratio, Firm size in explaining the stock return variation. It is fascinating to see and give empirical support of the research in Cross-comparison of results of three countries (Pakistan, China and India) that can motivate further innovative research in this field.

### **1.7 Plan of Study**

Following is the plan of the study:

Chapter I includes introduction of the study. Theoretical base with empirical findings are described in chapter II. Chapter III comprises of methodology used for the study. Analysis and results discussion of empirical results is described in chapter IV. In chapter V, conclusion, recommendation and future direction of the study is explained.

## Chapter 2

### 1. Literature Review

Portfolio theory is introduced by Harry Markowitz in 1950. Increasing returns for given level of risk and for given level of return taking lower risk is explained by modern theory. This work gave the edge to develop the Capital Asset Pricing theory such as Treynor (196,1962), Sharp (1964), Lintner Capital Asset Pricing in (1972). Because of their applicability and simplicity in various situations these asset pricing theories, APT & CAPM endure prevalent.

Mossin (1996) studies the development of investor's utility function by making investigation through equilibrium model of such portfolios that have risky assets and identify the presence of market line and predict risk in pricing mechanism. Pastor and Stambaugh (2000) examine the investor's preferences of portfolios that choose portfolios on some asset-pricing models.

Different hypothesis have been tested in New York Stock exchange from 1926 to 1966.

They made groups of portfolios and divide them. Mean is calculated on the basis of beta by removing some biases such as measurement and selection bias.

Black, Jensen and Scholes (1972) examine the stock returns and volatility relationship in US market. They use the cross sectional monthly data from 1931 to 1965 time period. Findings of the study reveal that there is a positive and significant relationship between returns and beta therefore CAPM is applicable in US market.

Fama and MacBeth (1973) investigate the pattern of stock returns in US market from 1926 to 1968 time period. The stock prices of companies listed at New York Stock market are taken. There is a significantly positive relationship between stock returns and volatility.

There arises a criticism by Roll on efficiency of CAPM as much significance testing on the application of CAPM has been made. Practical and theoretical CAPM are found different from each other. Roll argues the portfolios consisting of all risky assets cannot be observed there CAPM cannot be testable. Applicability of CAPM has been tested by different researcher all around the world. Fama and French (2004) evaluate the benefits and application of CAPM.

Similarly Black (1972) also tests the application of CAPM and results indicate that this CAPM is more useful and valuable than traditional CAPM. Size, P/E ratio and momentum are the factors that play role in explanatory power of returns volatility. Gibbons and Ferson (1989) examine that multivariate methodology has better measurement than traditional methodology by making analysis of the returns of portfolios by using monthly data.

Efficient market hypothesis is important component MPT in which market will be efficient when equal information is accessible to all shareholders since when any most recent data entered the business sector then price of share in stock exchange upward or descending movements. . So in EMH, market efficient has three types that explain the estimations of stock returns growth and stock prices by using past information.

Various past studies describe the stock return predictability by using different anomalies as independent variable. After 1970 various anomalies based on firm qualities reported with stock return such as B/M ratio, size, C/P and P/E ratio. To check normal returns these anomalies are used Ansari (2000).

Numerous analysts make the examination on these peculiarities in various time allotments. For the most part three systems use foresee the relationship between stock return and esteem premium. The majority of studies used ordinary least square (OLS) regression.

According to Dye and Pannypacker (1999) there are many method for portfolio selection but all have some issue. Basically portfolio management has three types that includes behavioral finance, traditional theory and modern theory.

In all of these three theories, MPT is most relating and wide techniques because basic purpose of choosing portfolio by purchasing different securities is trying to minimize their risk.

Whenever investor purchases the securities, he tries to minimize the risk with the help of making portfolios. A number of previous studies describe the stock return predictability by using various anomalies as independent variable. After 1970 different anomalies based on firm characteristics reported with stock return like firm size, book to market ratio, P/E ratio and C/P ratio. These anomalies are measured to predict the expected return in cross sectional pattern Ansari (2000).

Anomaly is introduced by Kuhn (1970). Market inefficiency has the evidence of anomalies.

According to Schwert (2001), “anomalies are empirical results that seem to be inconsistent with maintained theories of asset pricing”. Investors can get the opportunities to increase the return on investment by using anomalies.

Size effect explains Firms have high market capitalization earn low returns than those firms that has low market capitalization. SMB determines that small size firms have power to outperform the large size firms. The size effect in the cross-section of stock returns is one of the most established and best-known asset pricing anomalies. Since Banz (1981) reports that small firms earn higher returns than large firms, a large body of research has evolved on the size effect.

Basu (1977) shows the Price earning E/P ratio and risk adjusted returns are related with each other. The ratio of earnings to-price E/P is a wide proxy for unknown risk variables in expected returns, Ball (1978). The contradiction of the CAPM is directly affected by E/P ratio. The study

of Reinganum (1981) confirmed and extended the findings of Basu. Rosenberg, Reid and Lanstein (1985) give the confirmation against the CAPM by demonstrating that book-to-market ratio is significantly co-related with average returns. Furthermore a strong positive BTM effect is founded by Fama and French (1992) that suggests firms having higher BTM ratios have higher expected average returns. The study uses the D/E ratios as an additional variable to explain the expected stock return. The study of Bhandari (1988) examines that the expected returns on common stock and debt to equity ratio are positively related with each other when other variables i.e. beta and size are used as controlling variables. The coefficient of D/E ratio is 0.13% per month by excluding January effect and 0.09% by including January effect and he finds that D/E ratio is just proxy for risk.

The study of cash flow yield gained importance after the study of Beaver (1996). The cashflow is a segment of total obligation was the best powerful technique for predicting the failure rate of a given corporation (Diamond, 2006). Ensuing to the cashflow component of earning is a more positive predictor of future profit (Sloan, 1996). Aggregate cash flow is connected with total returns. Cash flow, is a positive cross-sectional indicator of profit (Desai, Rajgopal, and Venkatachalam, 2004; Pincus, Rajgopal, and Venkatachalam, 2007). Fama and French (1992) show that stocks with high P/E ratio procure higher returns. Chan, Hamao, and Lakonishok (1991) show that a high ratio of C/P ratio also predicts higher returns. The book to market ratio and cash flow positively affects expected returns (Chan, Hamao, and Lakonishok, 1991).

Banz (1980) examines the relation between stock return and market value of NYSE stocks. In previous study different methodology use for prediction of the relationship between these variable but Banz assets pricing model applied to find this relationship. This study use the monthly five years data from 1926-1975. Three indices are used in this study in which two are

stock indices and remaining one is value-weighted combination of the CRSP. The finding of this study that small firms have larger risk adjusted returns than the larger NYSE firms. In this study also find that there is little difference between small and large firms return.

Campbell (1987) examines the relation of interest rates and stock return. 20 year treasury bonds use the proxies for risk premium. This study uses the data from 1959-1978 and 1959-1983. Each time proxies use the 2-month bills, 20-year bonds. Regression analysis predicts the relation between these variable. The result for the sample period 1959-1978 is strong explanatory power for the excess return on 2-month bills over the month. And result for 1959-1983 samples is also positive strong. The explanatory power of 20-year bonds is less impressive as compare to 2-month bills. .

Benjamin Graham introduced the value effect in 1928. The value anomaly says that stocks having higher value produce higher returns over long run. To test value effect several ratios including P/E ratio, Book-to-market ratio, dividend to price ratio and cash-to-price (C/P) ratio are used. Due to less availability of data and as a new capital markets value effect is not much tested in emerging markets. Similarly size anomaly is also tested in US and developed international markets. Size anomaly says that small size stocks earn more than large size stocks. In comparison with value anomaly, size anomaly is unpredictable and can appear to be non-existent for extended period of time.

Some variables has power to predicting stock returns in the cross sectional data. These variables include C/P ratio, B/M ratio, size and P/E ratio. There are some examples of cross sectional studies that includes Basu(1977), Fama and French (1992) and Lakonishok, Shleifer and Vishny (1994). The shortage of accounting earnings increase different research studies to examine the stock returns and C/P ratio relationship Bernard and Stober (1989). Chan, Hamao and



Lakonishok (1991) investigate the difference in cross sectional returns for Japanese stock market by using size, P/E ratio, B/M ratio, C/P ratio.

High HML shows that investors earn high returns from value stock than growth stock. Value premium explains that the more risky a stock will be, the higher will be the returns. On contrary stocks with low risk will generate low returns ( Fama& French 1992, 1993, Zhang 2005).

There has been significant confirmation that the cross-section of average returns are identified with firm-level qualities, for example, size, earning/price, cash/price, dividend/price, book-to-market, leverage and momentum both in the United States and in developed and developing markets around the plan. Vuolteenaho (2002) demonstrates that individual stock returns are fundamentally determined with cash flow shocks. Daniati and Suhairi (2006) demonstrated that cash flow ratio, gross profit, and organization size significantly influence expected return for shares.

Basu (1977) study the common stock and P/E ratio relationship and found that stocks having high P/E ratio earn low than stocks with low P/E ratio. Stocks having higher P/E ratio are linked with high returns whereas small market capitalization is associated with high returns. Their study compares the returns of high and low P/E ratio and size effect. Stocks with high P/E ratio earn high returns and stocks with low P/E ratio earn low return. The stocks with high P/E ratio outperform better than low P/E ratio in each market value. The stocks are rank according to the P/E ratio in equally weighted stocks. These stocks were traded on NYSE. The high P/E ratio earns 16.30% compared to 9.34% low P/E ratio and 4.3% returns on treasury bills. However the low P/E ratio and high returns increases.

Rosenberg, Reid & Lanstein (1973) examine first time the performance of B/M ratio. The study

give the confirmation against the CAPM by demonstrating that book-to-market ratio is significantly co-related with average returns. They created hedge portfolio that were based on data availability. Size, P/E ratio, shares turnover and industry classifications are taken as control variables. The portfolio with high B/M ratio and low B/M ratio earned 0.36% on average return during 12 years.

Chan, Hmao and Lakonishok (1991) examine the relationship between average returns on stock and their size, B/M ratio and C/P ratio. They create four equally weighted portfolios. The firms having high P/E, B/M and C/P ratio earn high returns. Firms with high B/M ratio are also the firms with high C/P ratio whereas P/E ratio implies different measures of value are correlated. Fama& French (1998) study explains that stocks with high value earned higher average returns. They use B/M, E/P, C/P and D/P ratios to identify value versus growth. Portfolios are value weighted by company size. They also presented emerging data that shows value portfolio outperform the growth portfolio.

Fama& French (1992) use value premium to explain the portfolio returns with overall market returns. They create 100 portfolios by using the ranks of company's size market capitalization and the B/M ratio. Their study reveals that B/M effect exists by controlling size etc. They find that portfolios with high B/M ratio earn higher returns. Small stocks have strong effect and small stocks outperform large stocks.

Lakonishok, Shleifer and Vishny (1994) examine the performance of value effect based on several ratios of value effect by using several ratios of value, B/M ratio, C/P ratio, P/E ratio, G/S ratio. Their findings shows that stock with high C/P ratio earns high returns and stocks with low C/P ratio earn low returns. The C/P ratio earn 11% per year which is firm's with high C/P ratio earn high returns and firms with low C/P ratio earn low returns.

Kothari, Shanken and Sloan (1995) analyze the relation between book to market equity and return, this study examine the cross section of expected return for beta of risk. And the beta of risk is associated with economical and statistical return. This study use the data from 1927-1990. For analysis purpose made a portfolios monthly as well as annual base for applying the cross sectional regression and descriptive analysis. The result of this study is indicating the relationship between B/M and return is insignificant.

Kothari, Shanken, Sloan (1995) examine the relationship value premium and stock return, basically this study examine the cross section of expected return for beta of risk. And that beta of risk associated with economical and statistical return. This study use the data from 1927-1990. For analysis purpose they made portfolio on monthly and annual basis for applying regression and descriptive analysis. The result of this study is indicating the relationship between B/M and return is insignificant.

Daniel and Titman (1997) determines the behavior of size premium and value premium because these variables considered greatly correlated with stocks returns. Fama and French (1992, 1996) and Jegadeesh and Titman (1993) explained only these two characteristics, size and book-to-market variation in expected returns. In this study data form in quintile breakpoints based on book-to-market and market capitalization of NYSE and this quintile divided into five book-to-markets and other of size. This study consists of 45 portfolios basis of size, book to market and factor loading, co-variance and regression test is applied. The result of this study shows only single factor does not distress the stock. Second prediction of the study, characteristics of firms find out the return.

Rouwenhorst (1999) study and use the data from emerging markets which cover 20 countries from the period on 1982-1992. They ranked the stocks by country on beta, size, previous six

month returns, B/M ratio, P/E ratio and turnover by making three portfolios (top30%, middle 40% and bottom 30%). Their findings reveals that high B/M stocks outperform the low B/M stocks and average return of a diversified HML portfolio generates 72 bps excess returns per month based on equally weighted stocks. Their results reveal that averaged across all 20 markets higher returns of high turnover stocks is not different than the return on low turnover stocks. Size effect is uncertain as the size premium is significant in some countries and size effect is positive in twelve countries. Brazil, Zimbabwe, Argentina and Korea have the high excess return. There were four countries where size effect did not work that were Colombia, Pakistan, Portugal and Thailand. However, value effect is significant for both small size and large size stocks in emerging markets.

Liew and vassalou (1999) use the monthly data of ten countries obtained from DataStream International securities and take a prices of B/M ratio, size, and dividend ratio. The result of this study indicates that there is a positive link between higher returns of SMB and HML with economy.

Barry, Goldreyer, Lockwood and Rodriquez (2000) study a detail data set from 35 emerging markets that covers 15 years of data from 1985-2000. They attempt to make adjustments for differences in accounting treatment of book values i-e, several markets allow for making adjustment of asset values to fair value and other show assets on balance sheet at historical cost thus making the book values not comparable between countries. For this adjustment the authors use relative book-to-market value which compares the book value of a particular company to its own market average. For size same procedure is done to make analysis for both absolute and relative size. Their study concludes that value stock out-performed growth stocks more than 74%. In comparison of value and size effect, the difference in return was significant with a mean

difference of 5.82%.

Davis et al. (2000) also study the average stock returns from the period 1929 to 1997. They found value premium is significantly positive with t-value 3.38 and is 5% per month. Their findings reveal that value premium is higher than size premium and value premium is stronger than size premium.

Connor and Senghal (2001) study the comparison of Fama & French three factor model with CAPM to explore the explanatory power for stock returns in Indian stock market. The companies were sorted on size (SMB) and HML. They created 6 portfolios on the basis of size and book to market ratio. Intercept of all six portfolios for FF three factor models. Whereas, CAPM intercept of 3 portfolios found to be insignificant. They found on the basis of their study findings that Fama & French three factor model is better than CAPM in Indian stock market.

Lam (2002) investigate the behavior of stock return with B/M ratio, size, leverage and P/E ratio with the help of Fama and French (1992) methodology in Hong Kong stock market. They also found that B/M ratio and size has more predictive capability of return with beta as compare to other anomalies. The data has been collected from Pacific Basin Capital Markets for the period of 1980-1997. The result of this study indicates that return has not predictive ability to explain the beta. However other variables B/M ratio, P/E ratio, size capture the returns. They found that B/M ratio, size and P/E ratio have higher predictive power for average return as compare to other variables.

Beltrati Di Tria (2002) also study the Asset Pricing Model i.e., CAPM, FF three factor model, multifactor model by adding sector and multifactor by adding interest rate changes in short run. They found Fama & French model has better explanatory power for returns in Italian Market.

Drew and Veerarghaveen (2002) investigate the presence of value and size premium in emerging markets. In this study data from the period of 1991 to 1999 for Malaysian market. On the basis of B/M ratio and size portfolio they created six portfolios. They examined SMB and HML portfolios that generate 17.7% average returns with standard deviation of 5.3% and 6.1%.while market index was lower at 1.92% that indicates high risk for size and value factor.

Beltrati Di Tria (2002) also study the Asset Pricing Model i.e., CAPM ,FF three factor model, multifactor model by adding sector and multifactor by adding interest rate changes in short run. They found Fama& French model has better explanatory power for returns in Italian Market.

Drew, Naughtan and Veeraraghavan (2003) compare the performance of CAPM with multifactor model of Fama and French. In most of previous studies consider that capital asset pricing model is the only measure of risk but multifactor model could also be used in this purpose. In this study monthly data of stock returns, B/M ratio, Market capitalization and risk free rate has been collected from Taiwan Economic Journal for the period of 1993-2000. Regression applied on the given data. The result of this study finds that Chinese investors view small stocks turned to be high in January.

Drew and Veeraraghaven (2003) examine the descriptive power of FF three models for some markets such as Hong Kong, Malasiya, Korea and Philippines market. They found the presence of value premium and size premium in thesemarket.They also found the CAPM has low explanatory power than FF three factor model for variations in Stock returns. Gomes et al. (2003) study the relationship b/w size and book to market with variation in stock returns. Growth options are equal for all firms. Firms with high growth have low investment because they pay dividends. Value firms have high cash flow duration than growth firms and it has more positive stock returns.

Djajadikerta and Nartea (2005) investigate the behavior of size premium and value premium for return and also check the ability of Fama and French three factor model to make clearance of the variations of stock returns. After the analysis results suggest significant relation between size and stock return but weak relation with book-to-market. This study also reveals that CAPM is not better clarifications of expected returns in New Zealand stock market as compare to Fama and French three factor model.

Baker and Haugen (2008) investigate that beta of CAPM does not explain the variation in stock returns of US market and found high volatility stocks underperform the low volatility stock. In 2012 Baker and Haugen extended their study to 12 emerging markets including china and 21 emerging markets and examine same results in all countries. Rutledge, zhang and Karim (2008) examine the relationship between stock returns and firm size in Chinese Market. Their findings reveal that smaller firms are more reactive than large firms towards market. Large firms have low returns than small firms. Value effect was not examined.

The study of Hassan &Javed (2011) also examines the effect of size premium and value premium present in stock market of Pakistan. Value premium is significantly positive for all portfolios except low B/M stock. The results also demonstrate that B/M effect is present in Pakistani equity market. Stocks having high B/M outperform the stocks having low B/M. size premium is significant and positive for small portfolio returns and for big portfolios return it is insignificant.

Cakici, Fabozzi and Tan (2012) also study the value and size effect in emerging markets. The data of 18 emerging markets from period of 1990 to 2011 has been used. Their study reveals that value effect s significant for small size and large size stocks in emerging markets. Value effect is significant at 5% level and it is economically significant. In Eastern Europe value effect is strong

with monthly higher return of HML portfolio of 188 bps and in Asia 103bps and in Latin America at 66bps. The average value effect for all emerging average portfolio is 115 bps. In US and Global Developed Markets high return from the HML portfolio are 30bps and 40 bps respectively. Value effect for small cap stock is 1.56% compare to 1.58% for large cap stock. The high monthly returns are generated by small value portfolio 1.87% with std. Dev. 7.31% that are lower than large value portfolio.

Fama and French (2014) examine the behavior of stock prices relation size, value, profitability and investment. Twenty five portfolios are created on monthly base into five size groups and five B/M groups. Data use for this study take in all NYSE, Amex, and NASDAQ stocks collected from CRSP from the period of July 1963 to December 2012. The result of this GRS test rejects a five-factor model. GRS test explain between 69% and 93% of the cross-section variation in expected returns.

In 2014, Dimson, Marsh and Staunton also study value and size effect factors that impact returns in emerging markets. This study reveals that size effect exist in some countries, the scale is not large and is smaller than developing markets. On contrary, the value effect is very large and is present in three emerging markets (Czech Republic, Russia, Mexico). They found that value effect is larger in emerging market as compared to developed markets.

Above review indicates that risk and return is explained by using FF three factor models. FF three factor model indicates some factors that have effect on stock returns and also provide the sight to investors to decide how to select and position the portfolios that give high returns in long run. C/P ratio is not investigated in detail in Asian emerging markets( Pakistan, China and India.

Limited studies are available on C/P ratio as determinant assets pricing i.e.; (Lakonishok, shleifer



and Vishny (1994)). So there is need to <sup>investigate</sup> the stock return in these markets by using cash to price ratio. Overview of literature provides an empirical supports that using C/P ratio has effect on stock returns in various emerging markets. Therefore, it can be said that value premium has significantly positive effect on stock returns in emerging markets (Pakistan, China and India).

## Chapter 03

### Methodology and Data Description

#### 3.1 Data set and Sample

This study includes the monthly closing prices of 180 companies, sixty listed companies having large market capitalization of each stock market including Pakistan Stock Exchange (PSE) for Pakistan, Bombay Stock exchange (BSE) for India and Taiwan Economic Journal Database (TEJ) for China for the time period of 2000 to 2015. Market index return of each of the market is used as return of market portfolio and 6 months T-bill rates are used as proxy of risk free rate.

#### 3.2 Methodology:

As indicated by Capital Asset Pricing Model developed by Sharp just market premium is one factor that influences the returns however Arbitrage Pricing Theory says different variable impact the return, for C/P ratio, B/M ratio and size etc. After the APT, Fama and French (1992, 1993) introduced three models in which value premium and size premium with market premium has been used. FF three factor methodologies have been adopted to examine the effect of C/P ratio on stock returns.

Portfolios are constructed as:

##### 3.2.1 Portfolio Construction:

- At the starting level, the general portfolio is created and after that general portfolio sorted on the premise of the size.

- Market capitalization of 60 companies is established for size sorted portfolio. On the basis of business sector capitalization companies are masterminded at this point. S is the group of small 30 companies and B be the group of biggest 30 companies.
- Size sorted portfolio B are further sorted on the premise of high and low C/P ratio to make C/P sorted variable. 15 companies with high low C/P ratio have been named as B/H and 15 companies with low C/P ratio have been named as B/L.
- Similarly the example of 30small (S) low C/P ratio has additionally Classified to make C/P sorted values on the basis of high C/P and low C/P ratios. There are 15 companies having high C/P ratio categorized as S/H also 15 organizations having low C/P are categorized as S/L.
- Average return for all of company' portfolios has been calculated.
- From 2000 to 2015 the portfolios have been constructed by repeating the above expressed methods.

**3.2.2 Variable Construction:**

So as to construct the variable size, market capitalization is used as proxy of size.

$$\text{Market Capitalization} = \text{MPS} \times \text{No. of extraordinary shares} \dots\dots\dots \text{I}$$

Size premium is calculated by following expressions after computing the measure of companies.

$$\text{Size Premium} = \text{SMB} = 1/2 [(S/H - B/H) + (S/L - B/L)] \dots\dots\dots \text{II}$$

The variable Value premium(C/P Ratio) is developed in the following manner. It is calculated by using the formula

**CASHPERSHARE**= Cash/No. of Shares

**C/P Ratio** = Cash Per share /MPS

Value premium(C/P Ratio) is calculated by the following expression.

$$\text{HML} = 1/2 [(S/H - S/L) + (B/H - B/L)] \dots \dots \dots \text{II}$$

HML refer to the different between the high **C/P Ratio** and low **C/P Ratio** of the firms.

The following formula is used for the market premium.

$$\text{Market premium} = \text{MKT} = (\mathbf{R}_{mt} - \mathbf{R}_{ft})$$

Where

$$\mathbf{R}_{mt} = \mathbf{Ln} (\mathbf{I}_t / \mathbf{I}_{t-1})$$

**R<sub>mt</sub>** is the market return for “t” month and I<sub>t</sub> and I<sub>t-1</sub> represents the closing prices of index for “t” months and “t-1” respectively. R<sub>ft</sub> is the T-bill rate.

### 3.2.3 Specification of Model

This study is using multivariate regression, two pas regression model and Fama and French (1992, 1993) methodology.

The equation would be:

$$\mathbf{R}_{pt} - \mathbf{R}_{ft} = \alpha + \beta_1(\text{Market premium}) + \beta_2(\text{Size premium}) + \beta_3(\text{Value premium}) + e_t \dots \dots \dots (1)$$

$$\mathbf{R}_{pt} - \mathbf{R}_{ft} = \alpha + \beta_1 (\mathbf{R}_m - \mathbf{R}_f) + \beta_2 \text{ SMB}_t + \beta_3 \text{ HML}_t + e_t \dots \dots \dots (2)$$

This equation will cover the accompanying measurements:

- $R_{ft}$  = Risk free Rate
- $R_m - R_{FR}$  = Market premium
- SMB = Size premium = Small - Big
- HML = the value premium = High C/P ratio - Low C/P ratio
- $\alpha$  = The managements impact (Alpha)
- $e_t$  = error term

## CHAPTER 04

### RESULTS AND DISCUSSIONS

This section provides the results and discussion. Table 4.1(a) reports the results of descriptive statistics.

**Table 4.1 (a) Descriptive statistics Size- C/P ratio sorted portfolios. (Pakistan)**

Variable	P	S	B	S-H	S-L	B-H	B-L
Mean	0.004	0.006	0.008	0.003	0.002	0.007	0.007
Median	0.007	0.007	0.008	0.007	0.007	0.009	0.007
Standard Dev.	0.040	0.037	0.034	0.040	0.037	0.032	0.040
Kurtosis	0.443	0.600	0.006	0.315	0.311	-0.152	0.105
Skewness	-0.066	-0.097	0.195	-0.146	-0.258	0.032	0.074
Minimum	-0.097	-0.073	-0.056	-0.096	-0.077	-0.057	-0.073
Maximum	0.100	0.084	0.079	0.100	0.076	0.069	0.087

*Note: S and B denote small and big and S/L, S/H, B/L, B/H, small low cash to price, small high cash to price, big low cash to price and big high cash to price*

The above table shows the behavior of the data. Mean, median shows the central tendency of the data whereas standard deviation explains the dispersion of the data that how much data is deviated from its mean. Kurtosis, skewness, minimum and maximum values represent the scattering of the data. The results indicate that average returns earned by portfolios range from 0.002 to 0.007. The maximum average profit is reported by portfolio B/H and B/L and the minimum average profit is reported by portfolio S/L. During the sample period the maximum loss reported by portfolio P and S/H is (-0.097), (-0.096) respectively. The maximum profit also earned by portfolio P and portfolio S/H is (0.100), (0.100). The maximum standard deviation is reported by portfolio P, S/H and B/L that is 0.040.

Skewness explains the distribution of the data. Table 4.1 (a) indicates skewness is negative for S/L (-0.258) and S/H (-0.146) and S (-0.097) which shows distribution of data is negatively skewed while positive for B/L and B/H is (0.074) and (0.032) and B (0.195).

Kurtosis represents relative peakness or flatness of data distribution. Kurtosis is 3 for normal distribution. The data distribution is relatively peaked or leptokurtic if it exceeds 3 and the data distribution is platykurtic shows that kurtosis is less than 3. Above Table kurtosis result represents relatively platykurtic data distribution for portfolio.

**Table 4.1 (b) Descriptive statistics Size- Cash to Price sorted portfolios. (India)**

<b>Variables</b>	<b>P</b>	<b>S</b>	<b>B</b>	<b>S-H</b>	<b>S-L</b>	<b>B-H</b>	<b>B-L</b>
<b>Mean</b>	0.003	0.014	0.024	0.006	0.009	0.009	0.012
<b>Median</b>	0.004	0.008	0.015	0.008	0.014	0.002	0.010
<b>Standard Deviation</b>	0.041	0.034	0.042	0.041	0.042	0.056	0.055
<b>Kurtosis</b>	0.050	0.079	0.306	0.520	2.666	1.912	1.254
<b>Skewness</b>	0.349	-0.141	0.156	0.094	-0.726	0.145	-0.146
<b>Minimum</b>	-0.090	-0.071	-0.109	-0.096	-0.212	-0.177	-0.177
<b>Maximum</b>	0.090	0.085	0.109	0.120	0.181	0.237	0.170

*Note: S and B denote small and big and S/L, S/H, B/L, B/H, small low cash to price, small high cash to price, big low cash to price and big high Price.*

Statistical properties of portfolios reported in table 4.1(b) indicate that average returns earned by the portfolios ranges from 0.003 to 0.024. Maximum return reported by portfolio B/H and S/L is 0.237 and 0.181 and minimum return earned by portfolio S.

Maximum average loss is -0.212 reported by portfolio S/L. Standard deviation of the portfolios ranges from 0.034 to 0.056. maximum standard deviation is 0.056 reported by B/H.

In Table 4.1 (b) shows result for skewness is negative for S/L (-0.726) and B/L (-0.146) and S (-0.141) which show negatively skewed data distribution while positive for S/H and B/H is (0.094) and (0.145) and B (0.156). Kurtosis result represents relatively platykurtic data distribution for portfolio.

**Table 4.1 (c) Descriptive statistics Size- Cash to Price sorted portfolios. (China)**

<b>Variables</b>	<b>P</b>	<b>S</b>	<b>B</b>	<b>S-H</b>	<b>S-L</b>	<b>B-H</b>	<b>B-L</b>
<b>Mean</b>	0.005	0.022	0.004	0.011	0.007	0.009	0.011
<b>Median</b>	0.005	0.022	0.003	0.010	0.012	0.012	0.013
<b>Standard Dev.</b>	0.008	0.063	0.024	0.054	0.051	0.055	0.056
<b>Kurtosis</b>	1.010	2.230	5.656	0.650	2.558	1.091	1.040
<b>Skewness</b>	-0.924	0.039	0.771	0.008	-1.026	-0.195	-0.130
<b>Minimum</b>	-0.020	-0.176	-0.084	-0.149	-0.212	-0.177	-0.177
<b>Maximum</b>	0.018	0.255	0.109	0.170	0.137	0.170	0.170

*Note: S and B denote small and big and S/L, S/H, B/L, B/H, small low cash to price ratio small high cash to price, big low C/P and big high C/P.*

Results reported in table 4.1(c) depicts that portfolio P has the mean value 0.005 with standard deviation 0.008, maximum value is 0.018 and minimum value -0.020.

S portfolio has the mean value 0.022 with standard deviation 0.063, minimum value -0.176 and maximum value 0.255. Whereas portfolio B has mean value 0.004 with standard deviation 0.063, minimum value -0.084 and maximum value 0.109. S is high risk and high return portfolio as compared to B which is low risk and low return portfolios.

S/H is high return and high risk portfolio as compared with S/L which low risk and low return portfolio. The average return earned by portfolio S/H is 0.011 with standard deviation 0.054. Minimum average return reported is -0.149 and maximum return is 0.170. While average return reported by portfolio S/L is 0.007 with standard deviation of 0.051. the minimum return is -0.212 and maximum return is 0.137.

Table 4.1 (c) result shows skewness is negative for B/L (-0.130) and S/L (-1.026) and B/H (-0.191) which indicates negatively skewed data distribution while positive for S/H and S (0.008) and (0.039) and B (0.77). Kurtosis result represents relatively platykurtic data distribution for portfolio.



**Table 4.2(a) Fama and French three –factor model (Pakistan)**

	<b>P</b>	<b>P</b>	<b>S</b>	<b>S</b>	<b>B</b>	<b>B</b>	<b>S/L</b>	<b>S/L</b>	<b>S/H</b>	<b>S/H</b>	<b>B/L</b>	<b>B/L</b>	<b>B/H</b>	<b>B/H</b>
<b>α</b>	0.007	0.004	0.007	0.005	0.011	0.005	0.015	0.006	0.015	0.004	0.009	0.003	0.004	0.002
<b>T Value</b>	2.162	1.898	2.325	1.786	3.098	2.128	3.693	1.766	3.693	1.261	2.142	0.816	1.166	0.723
<b>P value</b>	0.032	0.059	0.021	0.076	0.002	0.035	0.000	0.079	0.000	0.209	0.034	0.415	0.245	0.471
<b>β1</b>	0.865	0.728	0.833	0.707	0.629	0.495	0.723	0.647	0.723	0.513	0.526	0.419	0.781	0.672
<b>T Value</b>	11.854	13.118	12.140	11.801	7.655	9.265	7.453	7.675	7.453	7.654	5.671	5.478	8.819	8.445
<b>P value</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>β2</b>		0.882		0.752		0.981		0.872		0.794		0.827		0.854
<b>T Value</b>		13.355		9.571		14.646		8.933		10.138		8.743		10.073
<b>P value</b>		0.000		0.000		0.000		0.000		0.000		0.000		0.000
<b>β3</b>		0.120		0.070		0.482		0.177		0.279		0.334		0.219
<b>T Value</b>		1.579		0.780		6.288		1.461		3.267		3.116		2.074
<b>P value</b>		0.116		0.000		0.000		0.146		0.001		0.002		0.040
<b>Adj.R<sup>2</sup></b>	0.438	0.720	0.450	0.637	0.243	0.711	0.234	0.472	0.234	0.541	0.148	0.442	0.300	0.560
<b>F-Stat</b>	140.508	154.050	147.374	105.539	58.606	148.059	55.552	54.429	55.552	71.409	32.162	48.343	77.771	76.947
<b>F Sig.</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4.2 (a) reports single factor model CAPM and Fama and French three factors model analysis by regressing different type of portfolios (stock returns). The explanatory power of CAPM and three factor model has been explored through simple regression analysis to capture the relationship among market, size and value premium in Pakistan.

CAPM results for the overall portfolio P indicates that there is significant and positive effect of market premium with t value 11.854 that shows CAPM fundamentally explain variation in stock return. The adjusted R<sup>2</sup> is 0.438 that means market premium explain 43.8% variation in portfolio P. This shows market premium and stock returns has direct relationship that can be predictable with CAPM.

Fama & French three factors model results indicate MKT and C/P ratio are significant and positive while size is insignificant that shows MKT and C/P ratio explains variation in stock returns. An adjusted R<sup>2</sup> increased from 0.438 to 0.720 that shows increase in explanatory power of model in predicting the stock returns due to market, size and value premium.

CAPM results for S (Small portfolio returns) reports that MKT is significantly positive with t value 12.140 that shows that market premium explain variations in return. The adjusted R<sup>2</sup> is 0.450 that means market premium explains 45.0% variation in portfolio stock returns.

FF3F model results indicate MKT and C/P are significantly positive however size is insignificant that shows MKT and C/P explains variations in stock returns. An adjusted  $R^2$  increased from 0.450 to 0.637 that shows increase in explanatory power of model in predicting the stock returns due to market, size and value premium.

CAPM results for B (big portfolio return) reports MKT is significantly positive with t value 7.655 that shows that market premium explains variations in return. The adjusted  $R^2$  is 0.243 that means market premium explains 24.3% variation in overall portfolio stock returns. This indicates that market premium and stock returns has direct relationship that can be predictable with CAPM.

FF3F model results indicate MKT and C/P are significantly positive however size is insignificant that shows MKT and C/P explains variations in stock returns. An adjusted  $R^2$  increased from 0.243 to 0.711 which shows increase in explanatory power of model.

Result of CAPM for S/L indicates MKT is significantly positive with t value of 7.453 that shows market premium fundamentally explain variation in returns. The adjusted  $R^2$  is 0.234 that shows market premium explains 23.4% variation in overall portfolio stock returns.

FF3F model results of S/L reports MKT and C/P are significant and positive however size is found insignificant that indicates MKT and C/P explains variations in stock returns. The adjusted  $R^2$  increased from 0.243 to 0.472 which shows increase in explanatory power of the model.

Result of CAPM for S/H reports MKT is significant and positive with t value of 7.453 that shows that market premium explain variation in return. An adjusted  $R^2$  is 0.234 that means market premium explain 23.4% variation in overall portfolio stock returns.

FF3F model results of reports MKT and C/P are significant and positive however size is insignificant that shows MKT and C/P explain variation in stock returns. Adjusted  $R^2$  increased

from 0.234 to 0.541 that shows increase in explanatory power of model in predicting stock returns due to market, size and value premium.

Result of CAPM for B/L reports MKT is found significant and positive with t value of 5.671 that shows market premium fundamentally explain variation in return. The adjusted  $R^2$  is 0.148 that means there is 14.8% change in overall portfolio stock returns.

FF3F model results of reports MKT and C/P are significant and positive while size is insignificant that shows that MKT and C/P explain variations in stock returns. An adjusted  $R^2$  increased from 0.148 to 0.442 that shows increase in explanatory power of model in predicting stock returns due to market, size and value premium.

Result of CAPM for B/H reports MKT is significant and positive with t value of 8.819 that shows that market premium fundamentally explain variation in return. An adjusted  $R^2$  is 0.300 that shows market premium explain 30.0% variation in overall portfolio stock returns.

FF3F model results of B/H indicates MKT and C/P are significant and positive however size is insignificant that shows MKT and C/P explain variation in stock returns. Adjusted  $R^2$  increases from 0.300 to 0.560 which shows increase in explanatory power of model.

These results indicate that single factor model CAPM is a valid model for all stocks. But Fama and French three factors model has more explanatory power than CAPM. The above table results show the contribution of SMB and HML in the presence of MKT in predicting the average returns of portfolios. P values at 95% confidence level are significant indicates that proposed model has significant impact on stock returns in Pakistan equity market.

**Table 4.2(b)Fama and French three –factor model (India)**

	<b>P</b>	<b>P</b>	<b>S</b>	<b>S</b>	<b>B</b>	<b>B</b>	<b>S/L</b>	<b>S/L</b>	<b>S/H</b>	<b>S/H</b>	<b>B/L</b>	<b>B/L</b>	<b>B/H</b>	<b>B/H</b>
<b><math>\alpha</math></b>	0.005	0.003	0.016	0.013	0.009	0.003	0.002	0.000	0.004	0.004	0.005	0.003	0.007	0.005
<b>T Value</b>	1.693	1.251	3.975	3.752	2.491	1.198	0.659	0.080	1.649	1.510	1.666	1.259	2.316	1.944
<b>P value</b>	0.092	0.212	0.000	0.000	0.014	0.233	0.511	0.936	0.101	0.133	0.097	0.210	0.022	0.054
<b><math>\beta_1</math></b>	0.732	0.638	0.822	0.647	0.765	0.634	0.669	0.549	0.947	0.919	0.827	0.699	0.909	0.755
<b>T Value</b>	10.635	9.975	8.837	7.515	9.216	11.060	7.410	6.851	15.930	15.828	10.454	11.059	12.066	12.291
<b>P value</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b><math>\beta_2</math></b>		0.560		0.660		0.949		0.884		0.347		0.911		0.828
<b>T-Value</b>		7.137		6.250		13.205		10.35		4.806		12.113		11.324
<b>P value</b>		0.000		0.000		0.000		0.000		0.000		0.000		0.000
<b><math>\beta_3</math></b>		0.179		0.502		0.469		0.247		-0.119		0.070		0.217
<b>T Value</b>		1.991		4.141		5.705		2.326		-1.494		0.815		2.577
<b>P value</b>		0.048		0.000		0.000		0.021		0.137		0.416		0.011
<b>Adj.R<sup>2</sup></b>	0.385	0.527	0.301	0.465	0.319	0.706	0.231	0.529	0.585	0.633	0.377	0.657	0.447	0.683
<b>F-Stat</b>	113.10	67.34	78.09	52.92	84.92	144.56	54.90	67.92	253.74	103.94	109.29	115.26	145.58	129.52
<b>F Sig.</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

P portfolio comprises of all stocks is regressed with MKT, it is found significant and positive with T- value 10.635,that shows MKT fundamentally explain variation in stock return. An adjusted R<sup>2</sup> is 0.385that means market premium explain 38.5% variation in overall portfolio stock returns. It shows that market premium has significant relationship with stock returns which is consistent with CAPM.

Fama and French three factors model results indicates MKT and C/P are significant and positive however size is insignificant that shows MKT and C/P explains variations in stock returns. The adjusted R<sup>2</sup> is increased from 0.385 to 0.527 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

When S (Small portfolio returns) is regressed with MKT it is found significantly positive with t value 8.837that shows market premium explain variations in return. The adjusted R<sup>2</sup> is 0.301 that means market premium explain 30.1% variation in portfolio stock returns. It shows that market premium has significant relationship with stock returns which is consistent with CAPM.

FF3F model results report that MKT and C/Pare significant and positive however size is insignificant that shows MKT and C/P explains variations in stock returns. The adjusted R<sup>2</sup>

increased from 0.301 to 0.465 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

When B (big portfolio return) with MKT is regressed it is found significantly positive with t value 9.216 that shows that market premium explains variations in return. An adjusted  $R^2$  is 0.319 which shows market premium explains 31.9% variation in overall portfolio stock returns. It shows that market premium has significant relationship with stock returns which is consistent with CAPM.

FF3F model results indicate that MKT and C/Pare significantly positive while size is insignificant that shows MKT and C/P explains variations in stock returns. The adjusted  $R^2$  increased from 0.319 to 0.706 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

When S/L is regressed with MKT, it is significantly positive with t value 7.410 that shows that market premium fundamentally explain variations in returns. The adjusted  $R^2$  is 0.231 which shows that market premium explain 23.1% variation in overall portfolio stock returns. It shows that market premium has significant relationship with stock returns which is consistent with CAPM.

When C/P and size have been added and are regressed with S/L in the presence of MKT, then MKT and C/Pare found significantly positive however size is found insignificant that represents MKT and C/P essentially explains variations in stock returns. An adjusted  $R^2$  increased from 0.231 to 0.529 that shows increase in explanatory power of model in predicting stock returns due to size and value premium which is consistent with FF3F model.

CAPM results of S/H report MKT is significant and positive with t value 15.930 that shows market premium explains variation in return. The adjusted  $R^2$  is 0.585 that means there is 58.5%

variation in overall portfolio stock returns due to market premium.

FF3F model results report that MKT and C/P are positive and significant but size is insignificant that indicates only MKT and C/P significantly explain variations in stock returns. The adjusted  $R^2$  increased from 0.585 to 0.633 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

CAPM results of B/L indicate that MKT is significant and positive with t value 12.066 that indicates that market premium significantly explain variation of return. An adjusted  $R^2$  is 0.447 that shows market premium explain 44.7% variation in overall portfolio stock returns.

FF3F model results of B/L report that MKT and C/P are significantly positive however size is insignificant that shows MKT and C/P explain variation in stock returns. The adjusted  $R^2$  increased from 0.447 to 0.683 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

CAPM results of B/H indicate that MKT is significantly positive with t value 10.454 that shows market premium fundamentally explain variation in return. The adjusted  $R^2$  is 0.377 that means market premium explain 37.7% variation in overall portfolio stock returns.

FF3F model results of B/H indicate that MKT and C/P are significantly positive while size is insignificant that shows MKT and C/P explain variation in stock returns. The adjusted  $R^2$  increased from 0.377 to 0.657 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

The results indicate that single factor model CAPM explain variation in stock returns and is a valid model for all stocks. But Fama and French three factors model has more explanatory power of model in predicting stock returns due to size and value premium than CAPM. The above table results show the contribution of SMB and HML in the presence of MKT in predicting the

average returns of portfolios. P values at 95% confidence level are significant indicates that proposed model has significant impact on stock returns in Indian stock market.

**Table 4.2(c) Fama and French three –factor model (China)**

	<b>P</b>	<b>P</b>	<b>S</b>	<b>S</b>	<b>B</b>	<b>B</b>	<b>S/L</b>	<b>S/L</b>	<b>S/H</b>		<b>B/L</b>	<b>B/L</b>	<b>B/H</b>	<b>B/H</b>
<b><math>\alpha</math></b>	0.008	0.006	0.010	0.008	0.008	0.003	0.009	0.007	0.011	0.008	0.005	0.005	0.009	0.006
<b>T Value</b>	3.090	2.779	3.322	3.079	2.044	0.821	3.021	2.824	3.583	3.285	1.446	1.676	2.914	2.458
<b>P value</b>	0.002	0.006	0.001	0.002	0.042	0.413	0.003	0.005	0.000	0.001	0.150	0.096	0.004	0.015
<b><math>\beta_1</math></b>	0.992	0.902	0.872	0.771	0.861	0.789	0.731	0.637	0.792	0.650	0.779	0.800	0.741	0.599
<b>T Value</b>	17.096	18.931	12.733	13.543	9.749	9.735	10.852	11.688	11.512	12.196	10.463	11.42	10.478	11.248
<b>P value</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b><math>\beta_2</math></b>		0.663		0.769		0.856		0.794		0.724		0.465		0.883
<b>T-Value</b>		10.485		10.183		7.338		10.963		10.668		5.007		12.486
<b>P value</b>		0.000		0.000		0.000		0.000		0.000		0.000		0.000
<b><math>\beta_3</math></b>		0.078		0.072		-		0.014		0.411		-		0.244
<b>T Value</b>		1.102		0.856		-		0.178		5.168		-		3.079
<b>P value</b>		0.272		0.393		0.973		0.859		0.000		0.000		0.002
<b>Adj.R<sup>2</sup></b>	0.619	0.764	0.474	0.666	0.344	0.494	0.395	0.636	0.424	0.680	0.377	0.495	0.378	0.676
<b>F-Stat</b>	292.27	194.40	162.12	120.04	95.04	59.21	117.77	105.43	132.51	128.04	109.47	59.47	109.79	125.69
<b>F Sig.</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4.2 (c) reports the CAPM and Fama and French three factors model analysis by regressing different type of portfolios (stock returns) of China stock market. CAPM results of P portfolio indicates that MKT is significant and positive with T- value17.096 that shows MKT fundamentally explain variation in stock return. An adjusted R<sup>2</sup> is 0.619 that means market premium explain 61.9% variation in overall portfolio stock returns. It shows that market premium has direct relationship with stock returns which is consistent with CAPM.

Fama and French results of P portfolio report that MKT and C/P are significantly positive while size is insignificant that shows MKT and C/P explain variations in stock returns. An adjusted R<sup>2</sup> increased from 0.619 to 0.764 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

CAPM results of S (Small portfolio returns) indicates that MKT is significantly positive with t value 12.733 that shows market premium explain variations in return. The adjusted R<sup>2</sup> is 0.474 that means market premium explain 47.4% variation in overall portfolio stock returns.

Fama and French results of S reports MKT and C/P are significantly positive while size is insignificant that shows MKT and C/P explain variations in stock returns. An adjusted  $R^2$  increased from 0.474 to 0.666 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

CAPM results of B (big portfolio return) indicate that MKT is significant and positive with t value 9.749 that shows that market premium explains variations in return. An adjusted  $R^2$  is 0.344 that means market premium explain 34.4% variation in overall portfolio stock.

FF3F results report that MKT and C/P are significantly positive while size is insignificant that shows MKT and C/P explain variations in stock returns. The adjusted  $R^2$  increased from 0.344 to 0.494 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

CAPM results of S/L indicate that MKT is significantly positive with t value 10.852 that shows that market premium fundamentally explain variation in return. The adjusted  $R^2$  is 0.395 that means market premium explain 39.5% variation in overall portfolio stock returns explained by market premium.

FF3F results report MKT and C/P are significantly positive while size is insignificant that shows MKT and C/P explain variations in stock returns. An adjusted  $R^2$  increased from 0.395 to 0.636 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

CAPM results of S/H report that MKT is significant and positive with t value 11.512 that shows market premium fundamentally explain variation in return. The adjusted  $R^2$  is 0.424 that means market premium explain 42.4% variation in overall portfolio stock returns.

FF3F results report MKT and C/P are positive and significant and size is insignificant that shows



MKT and C/P explain variations in stock returns. An adjusted  $R^2$  increased from 0.424 to 0.680 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

Results of B/L reports that MKT is significantly positive with t value 10.463 that shows that market premium fundamentally explain variation in return. An adjusted  $R^2$  is 0.377 that means market premium explain 37.7% variation in overall portfolio stock returns which are consistent with CAPM.

FF3F results report that MKT and C/P are positive and significant while size is insignificant that shows MKT and C/P explain variations in stock returns. An adjusted  $R^2$  increased from 0.377 to 0.495 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

B/H results report that MKT is found significantly positive with t value 10.478 that shows market premium fundamentally explain variation in return. An adjusted  $R^2$  is 0.378 that means market premium explain 37.8% variation in overall portfolio stock returns which are consistent with CAPM.

FF3F results report that when size and C/P are included then MKT and C/P are found positive and significant and size is insignificant that shows MKT and C/P explain variations in stock returns. The adjusted  $R^2$  increased from 0.378 to 0.676 that shows increase in explanatory power of model in predicting stock returns due to size and value premium.

The results indicate that single factor model CAPM explain variation in stock returns and is a valid model for all stocks. But Fama and French three factors model has more explanatory power of model in predicting stock returns due to size and value premium than CAPM. The above table results show the contribution of SMB and HML in the presence of MKT in predicting the

average returns of portfolios. P values at 95% confidence level are significant indicates that proposed model has significant impact on stock returns in Chinese stock market.

**Table 4.3(a) Descriptive statistics: Fama and French three factors. (Pakistan)**

<b>Variable</b>	<b>MKT</b>	<b>SMB</b>	<b>HML</b>
<b>Mean</b>	0.003	-0.005	0.001
<b>Median</b>	0.006	-0.002	0.001
<b>Standard Deviation</b>	0.080	0.027	0.048
<b>Kurtosis</b>	1.506	-0.457	1.396
<b>Skewness</b>	-0.425	-0.269	-0.395
<b>Minimum</b>	-0.283	-0.058	-0.177
<b>Maximum</b>	0.239	0.042	0.133

*Note:  $R_m - R_f$  and HML denote market premium and low C/P minus high C/P premium*

Statistical properties that include mean, median, std. deviation are shown in table 4.3(a). The mean value and standard deviation of value premium are 0.001 and 0.048. The mean value and standard deviation of size premium are -0.005 and 0.027 and market premium has mean value and standard deviation 0.003 and 0.080. The results indicate that average size premium is negative whereas average market premium and value premium are positive. Positive HML indicates that value stocks outperform the growth stocks. Negative SMB shows that average of small stocks is lower than big stocks.

HML, MKT and SMB have maximum values 0.133, 0.239 and 0.042 respectively. This shows the demand for maximum value, market and size premium to take risk. Whereas HML, MKT and SMB have minimum values -0.177, 0.283 and -0.058 respectively.

**Table 4.3(b) Descriptive statistics: Fama and French three factors. (India)**

Variables	MKT	SMB	HML
Mean	0.009	-0.003	0.003
Median	0.009	-0.001	0.003
Standard Dev.	0.070	0.056	0.046
Kurtosis	1.823	1.874	1.998
Skewness	-0.543	-0.193	-0.542
Minimum	-0.274	-0.219	-0.190
Maximum	0.249	0.190	0.151

*Note:  $R_m - R_f$  and HML denote market premium and low C/P minus high C/P premium*

Statistical properties in table 4.3 (b) reports that mean value and standard deviation of value premium are 0.003 and 0.046. The mean value and standard deviation of size premium are -0.003 and 0.056. The mean value and standard deviation of market premium are 0.009 and 0.070. This shows that average of value premium and market premium is positive which indicates that value stocks outperform the growth stocks. Whereas size is negative that shows that average of small stocks is lower than big stocks..

Maximum value for HML, MKT and size are 0.151, 0.249 and 0.190 showing that maximum Value, market and size premium demand by investor for taking risk. While minimum premium by investors for HML, MKT and size are -0.190, -0.274 and -0.219. The standard value of Kurtosis is 3. In this study variables are normally distributed because value of kurtosis is nearest to 3.

**Table 4.3(c) Descriptive statistics: Fama and French three factors. (China)**

Variables	MKT	SMB	HML
Mean	0.004	-0.003	0.017
Median	0.010	0.002	0.020
Standard Dev.	0.041	0.078	0.073
Kurtosis	1.160	1.419	1.371
Skewness	-0.693	-0.281	-0.263
Minimum	-0.136	-0.254	-0.228
Maximum	0.099	0.278	0.254

*Note:  $R_m - R_f$  and HML denote market premium and low C/P minus high C/P premium*

The statistical properties of created variables that include value premium, market premium and size premium are shown in table 4.3 (C). The mean value and standard deviation of value

premium are 0.017 and 0.073. The mean value and standard deviation of size premium are -0.003 and 0.078. The mean value and standard deviation of market premium are 0.004 and 0.041. This shows that average of value premium and market premium is positive whereas size is negative.

Maximum value for HML, MKT and size are 0.254, 0.099 and 0.278 showing that maximum Value, market and size premium demand by investor for taking risk. While minimum premium by investors for HML, MKT and size are -0.228, -0.136 and -0.254. The standard value of Kurtosis is 3. In this study variables are normally distributed because value of kurtosis is nearest to 3.

**Table 4.4 (a) Comparative statement of Adj. R<sup>2</sup> (Pakistan)**

Variable	CAPM	Three factor models.
P	0.438	0.720
S	0.450	0.637
B	0.243	0.711
S/H	0.234	0.472
S/L	0.234	0.541
B/H	0.148	0.442
B/L	0.300	0.560

*Note: CAPM denote capital asset pricing model.*

Adj. R<sup>2</sup> indicates that explanatory power of model in explaining the returns of constructed portfolios. Results in Table 4.4(a) shows that portfolio returns are found significantly positive and are explained by CAPM. Whereas FF3F model has high explanatory power than for all sorted portfolios which show that FF3F can explain returns of portfolios in Pakistan stock market. These results depicts that FF three factors better explain stock return then its explanatory power is higher than CAPM. Therefore it can be said that proposed model is better than CAPM.

**Table 4.4 (b) Comparative statement of Adj. R<sup>2</sup> (India)**

Variable	CAPM	Three factor models.
P	0.385	0.527
S	0.301	0.465
B	0.319	0.706
S/L	0.231	0.529
S/H	0.585	0.633
B/L	0.377	0.657
B/H	0.447	0.683

*Note: CAPM denote capital asset pricing model*

Adj. R<sup>2</sup> reveals that explanatory power of model in explaining the returns of constructed portfolios. Results in Table 4.4(b) shows that portfolio returns are explained by CAPM and are found significantly positive. Whereas FF3F model has high explanatory power than for all sorted portfolios which reveal that FF3F can explain returns of portfolios in India stock market.

It is clear that FF three factors better explain return on stock then its explanatory power is higher than CAPM. Therefore it can be said that proposed model is better than CAPM.

**Table 4.4 (c) Comparative statement of Adj. R<sup>2</sup> (China)**

Variable	CAPM	Three factor models.
P	0.619	0.764
S	0.474	0.666
B	0.344	0.494
S/L	0.395	0.636
S/H	0.424	0.680
B/L	0.375	0.495
B/H	0.378	0.676

*Note: CAPM denote capital asset pricing model*

Results of Adj. R<sup>2</sup> indicate that explanatory power of model in explaining the returns of constructed portfolios. Results in Table 4.4(b) shows that portfolio returns are explained by CAPM and are found significantly positive. Whereas FF3F model has high explanatory power than CAPM for all sorted portfolios which shows that FF3F can explain returns of portfolios in India stock market. Results indicate that FF three factors better explain return on stock then its explanatory power is higher than CAPM. Therefore it can be said that proposed model is better than CAPM.

**Table 4.5 (a) Two Pass Regression Results(Pakistan)**

<b>Variables</b>	<b>Intercept</b>	<b><math>\beta_1</math>MKT</b>	<b><math>\beta_2</math>SMB</b>	<b><math>\beta_3</math>HML</b>	<b>Adj R<sup>2</sup></b>	<b>F-Stat</b>	<b>F. Sig</b>
<b>A</b>	0.011	-0.007					
<b>T-Value</b>	1.794	-0.895			-0.034	0.802	0.412
<b>P value</b>	0.133	0.412					
<b>B</b>	-0.001	0.015	-0.009	0.021			
<b>T-Value</b>	-0.060	0.497	-0.249	0.644	-0.454	0.376	0.779
<b>P-value</b>	0.956	0.653	0.819	0.565			

From historical data future returns can be predicted through two pass regression analysis. Betas have been calculated on the basis of market, size and value premium. Calculated value and size premium do not have significant relationship with portfolio returns in case of Pakistan. It simply shows that betas explain today's return and do not predict the future returns. The value of adjusted R<sup>2</sup> is also very low that indicates independent variables are not able to explain significance variation in returns.

**Table 4.5 (b) Two Pass Regression Results (India)**

<b>Variables</b>	<b>Intercept</b>	<b><math>\beta_1</math>MKT</b>	<b><math>\beta_2</math>SMB</b>	<b><math>\beta_3</math>HML</b>	<b>Adj R<sup>2</sup></b>	<b>F-Stat</b>	<b>F. Sig</b>
<b>A</b>	0.005	0.008					
<b>T Value</b>	0.195	0.249			-0.185	0.062	0.813
<b>P value</b>	0.853	0.813					
<b>B</b>	-0.048	0.057	0.016	0.032			
<b>T Value</b>	-2.364	2.667	1.703	3.093	0.648	4.675	0.119
<b>P value</b>	0.099	0.076	0.187	0.054			

Results show that there is no significant relationship between beta and portfolios return. There is no significant relationship between size and value premium with portfolio returns. This shows that these do not predict the future returns. The value of Adj. R<sup>2</sup> is low which indicates that independent variables do not predict any significant changes in stock returns.

**Table 4.5 (c) Two Pass Regression Results (China)**

<b>Variables</b>	<b>Intercept</b>	<b><math>\beta_1</math>MKT</b>	<b><math>\beta_2</math>SMB</b>	<b><math>\beta_3</math>HML</b>	<b>AdjR<sup>2</sup></b>	<b>F-Stat</b>	<b>F. Sig</b>
<b>A</b>	0.020	-0.012					
<b>T Value</b>	0.808	-0.414			-0.160	0.171	0.696
<b>P value</b>	0.456	0.696					
<b>B</b>	0.017	-0.014	0.005	-0.005			
<b>T Value</b>	0.391	-0.375	0.150	-0.260	-0.868	0.071	0.972
<b>P value</b>	0.722	0.732	0.890	0.812			

Results show that there is no significant relationship between beta and portfolios return. There is no significant relationship between size and value premium with portfolio returns. It just explains the today's returns but do not predict future return. The value of Adj. R<sup>2</sup> is low which indicates that independent variables do not predict any significant changes in stock returns.

## CHAPTER 05

### CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusions

This study examine the impact of size and value premium across three emerging countries i.e. Pakistan, India and China to check effects of Fama and French three factor model (1993). Value premium is found positive for all created portfolios. Therefore it can be concluded that value effect is present in three emerging markets. High C/P ratio outperforms the low C/P ratio stocks.

In this study C/P ratio (value premium) integrated with size and market premium to check whether it can predict stock returns of small and large firms for high or low C/P ratio. The finding is similar to (Lakonishok, Shleifer and Vishny (1994) and Hassan & Javed (2011)) that found positive relationship of value premium and stock return and negative relationship of size premium and stock return.

The main focus of the study is to check the effect of C/P ratio on stock returns in three emerging markets that includes Pakistan, China and India by using the data of stock prices for the period of 2000 to 2015. This study includes non-financial sector of emerging countries that includes listed companies (Pakistan, India and China) and data is collected then portfolios are made. On the basis of market capitalization portfolios are sorted then on the basis of C/P ratio portfolios are further sorted for the period of 2000 to 2015.

By applying descriptive statistics and to check the effect of the C/P ratio on stock returns regression analysis has been used. This study also compares the results of CAPM with the help of table comparative statement. The findings of this study indicate that in Pakistan equity market,



India equity market and China equity market, C/P ratio based three factor models significantly explains portfolio returns.

In the case of Pakistan descriptive power ranges from 33% to 91% for different portfolios with FF three factor models. The explanatory power of FF three factors is higher explanatory power than CAPM that is 11 % to 65%. In case of Indian equity market based on three-factor reveal FF3F model explain portfolios return and it has 43% to 87% explanatory power which is higher than CAPM.

In Chinese equity market, C/P ratio based on three-factor shows fundamentally explain portfolio return and 44% to 82% is the explanatory power for different portfolios. So it is higher than explanatory power of CAPM. Fama & French based on three factors that include market, size and value premium and this model better clarify stock returns in three emerging markets.

## **5.2 Direction for Future Research**

For constructing advance improvements in the study the attractive steps could be:

- To check the effect of value premium on stock returns of all sector of Pakistan, India and China which includes financial and non-financial sector.
- Further variables of this domain and macroeconomic factors should be taken with stock returns.
- By using the attractive proxies such as WOV (weighted order value) that can explain returns variation in these countries.

### **5.3 Recommendations**

As this study predict the significance and positive relationship between value premium(C/P Ratio) and stock return in Asian emerging markets under study (Pakistan, China, India). This study can provide investors some assistance with judging the actual position of an organization and then deciding how investors should position their portfolios.

Therefore, investors should carefully consider in their investment, financing and valuation decision. Investors should invest in those firms that have high C/P ratio because firms with high cash to price ratio earn high returns. So this study is a valuable source of information for all investor who invest their funds.

## Chapter 6

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## APPENDIX

The details of companies taken from each sector of Pakistan, India and China are given below:

### **Pakistan:**

<b>Industries</b>	<b>Number of Companies</b>
Oil and Gas	12
Chemicals	11
Gas Water and Multiutilities	9
Food Producers	10
Industrial Engineering	5
Automobile and parts	4
Pharma and Bio Tech	5
Beverages	4



**India:**

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<b>Industries</b>	<b>Number of Companies</b>
Oil and Gas	13
Chemicals	10
Gas Water and Multiutilities	8
Food Producers	9
Industrial Engineering	8
Automobile and parts	5
Pharma and Bio Tech	5
Beverages	2

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**China:**

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<b>Industries</b>	<b>Number of Companies</b>
Oil and Gas	11
Chemicals	11
Gas Water and Multi-utilities	8
Food Producers	7
Industrial Engineering	7
Automobile and parts	6
Pharma and Bio Tech	5
Beverages	5

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