

Explaining the Cross Section of Stock Returns: A Comparative Study of the Pakistan and India

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Abstract

The study is conducted to provide significant evidence to assess the impacts of P/E ratio (price to earnings ratio), P/B ratio (price to book ratio) and D/E ratio (debt to equity ratio) on stock returns by amassing data of companies list on KSE in Pakistan and BSE in India over the period of 2010 to 2014. The annual compound returns are calculated on the bases of average of the past 12 monthly returns for each company. To effectively assess the relationship between variables used panel data approach and revealed that that price to book ratio and debt to equity ratio have positive and price to earnings ratio have negative impact on stock returns in Pakistan. In India, Price to earnings ratio and price to book ratio have positive while debt to equity ratio have negative impact on stock returns. The Markowitz Portfolio theory, Capital Assets Pricing model (CAPM) and Fama and French theories support to the findings of the study. The study have implications for investors, policy makers and shareholders to makes financing decision and suggested that independent variables have higher explanatory power which are statistically significant in explaining the cross-section of stock returns in both country.

Keywords: Stock returns, Market efficiency, Panel data.

1. INTRODUCTION

1.1 Background of the study

The Markowitz (1952,1959) found that the hypothesis of stock price behavior on Investors. The Markowitz investigated that investors used two measures of portfolio risks, return and Investment. After Markowitz' study Sharpe (1964) and Linter (1965) expand the work on stock return and introduced the most commonly use Asset pricing model and also called Capital asset pricing (CAPM). The CAPM like as Markowitz's model in structuring portfolio. They examined that there is a linear risk return association. Debt to equity ratio is measured of a company's financial leverage which can be calculated total liabilities of the company by dividing it Shareholders' Equity. The debt equity ratio shows the company debt and equity which is invested in business. Bhandari (1988) investigated that stock return are positively correlated to debt to equity ratios. The P/B or price to book ratio is a necessary measurement of the related value that the share of prices in market places. Fama and French (1992) resulted that the price to book ratio has the strongest relationship with expected returns in the U.S. Fama and French (1993) assumed that market to book equity ratio capture firms' sensitivities to a logical distress factor. Fama and French (1995) found that the high market to book ratios forecast unfavorable future earnings. This study indicated that there was some similarities between the cross-sectional individual of rising and developed equity market stock return. Bakaert (1997) found that emerging markets strategies has important behavior of of developed market return. The cross listing reduced their value of capitalization and improved the Investor confidence. They also provided the maximum guarantee to the other source of capital and better firm liquidity. Brockman and Chung (1999) determined the relationship between firm liquidity and cross listing companies of Hong Kong stock exchanges. The average return was negatively correlated due to Research and development during the period from (1985-1989), but in (1990-2000) research and development are significant correlated with average stock return in Post Bubble period. Xu and Zhang (2003) investigated that expected return and risk return positively relationship to research and development expenditures and discussion of stock return. The achievement of book to market ratio is reliable with two different models of stock prices. In an Incompetent markets book to market ratio serve to recognize stock return that are mispriced relevant to the original value Lakonishok (1994) investigated that short term mispricing is eliminated, under period stocks will consequently deliver high excess return while over priced stocks results will consequently deliver short excess. In a competent market, in which prices are considered as the current value of expected upcoming dividend, the book to market is considered the alternative for the unnoticed discount rate. The development of our model

performs well for the other assets, with 10 industry portfolio and 25 size and momentum portfolios. Lewellen (2010) investigated that Consuming Capital Assets Pricing Model (CCAPM) has determined the cross section pattern of size and industry and momentum portfolio is challenge for Fama and French three-factor model. The research and development intensity and return instability shown positive relationship. Chan (2001) examined the average return from all firms listed in US Markets and do not get firm with and without Research and development behavior difference. The results had shown a negative relationship between future return and return instability. The Ang (2006) determined the impact of firms' cash flow instability on stock return and also found the positive or negative relationship with earnings or cash flow instability and future stock return. Capital Assets pricing theory was not suitable techniques the stock return in Pakistan Capital market. Shamim, Abid and Shaikh (2014) examined the power of Capital Assets Pricing Model for Pakistan companies which are listed in Karachi stock exchange. When inflation occurs then defectively affected the economy and also affected the stock return due to reason that Pakistan is under developed country. Inflation rate increase then investors' behavior about stock return is negative. Saleem, Zafar and Rafique (2013) investigated the negative relationship between Inflation and stock return on investment. Most of the researcher investigated the relationship with stock return and other variables has positive and some of those have determined negative correlated which will create a problem for investors to makes investment decision. The main purpose of this study is aims to provide important facts and data to evaluate the impact of these independent variables Price to earnings ratio, Price to book ratio and debt to equity ratio on stock return. The basic purpose of this study is to determine the cross section of stock return impact on Investor behavior.

2. LITERATURE REVIEW

2.1 Theoretical Review

Theoretically, the relationship of stock return on debt to equity ratio, price to book ratio and price to earnings ratio to investigate through important prospect included Markowitz portfolio theory (1959), Capital Assets pricing model (1964) and Fama and French three factor model (1992).

2.1.1 Markowitz Portfolio Theory

Any discussion of the study of stock price, Markowitz (1952, 1959) started the working on investor behavior. The Markowitz model is a single period model, where investors main aim to maximize the portfolio's estimated return, focus to a satisfactory level of risk. The Markowitz investigated that investors used two measures of portfolio risks, return and Investment. The assumption of a single time period is about the Investor behavior toward risk and allows risk to be determined by the variance of the portfolio's returns.

2.1.2 Capital Asset Pricing Model (CAPM)

After Markowitz study, Sharpe (1964), Linter (1965) and Mossin (1966) expand the work on stock return and investor behavior and introduced a very commonly used theory Capital Assets Pricing Model (CAPM). The CAPM provide the facilities to the investors need to be awarded in two ways: risk and time value of money. The CAPM model determined the relationship between estimated return and risk which is used in pricing of uncertain securities. The formula of CAPM given below:

$$\text{Expected Return} = r_f + B (r_m - r_f) \quad (1)$$

Where:

- Fr = risk free rate
- B = beta
- Rm = return on the market

2.1.3 Fama and French Three Factor Model

The Fama and French three factor model is a technique to determine the risk and return of stocks. This model was introduced by Fama and French when mutually professors at the University of Chicago. This model consists of three factors like Beta, size and value. Beta means determine the instability or systematic risk of a security in similarity to the market. Beta also used in Capital Assets pricing model and this model determined the expected return and risk based on its beta, Size means the further risk in small company stocks. Small company stocks tend to perform different from large company stocks. In long period, small companies stocks generated greater return as compare to large company stocks. Values stocks are companies that tend to have minimum growth earning rate, higher return and lower prices vary to their book value. In long period, the value stocks generated maximum return as compare to the growth stocks

2.2 Empirical Review

Dennis and Chung (1999) examined the relationship between firm liquidity and cross listing companies of Hong Kong stock exchanges. They took data from (SEHK) cross listed and non-cross listed companies and used inter-day 981,183 observations on the basis of Bid-ask spreads. They found that Cross listing decreased the value of capitalization and increased the Investors' confidence, provided greatest assurance to the other source of capital and improving the firm liquidity. Xu and Zhang (2004) investigated that risk of return and expected return

positively correlated to research and development expenditures and discussed the cross-section of stock return. They took data from companies traded on Japanese stock exchanges during (1984-2000) and imposed Fama-French three factor model. They found that the average return was negatively relationship to Research and Development during (1985-1989), in (1990-2000) research and development shown positive and important result in the post bubble period. Teo and Woo (2004) examined the cross sectional style effects for reversals of stock returns. They found risk adjusted returns and major surplus in stock in style. They gathered data of common stock traded on AMEX, NASDAQ and NYSE during 1984 to 1999 and applied OLS Regression model. According to them, neither the stock reversal obsessed the momentum effects and style value, nor feedback trading nor do learning factors help in determining. Bulkley, Harris and Herrerias (2004) Investigated on book to market value of equity on the base of present value by using the model of panel data of individual stock to analyze the data. When 90% of using time series and cross section differences then model should be successful. They resulted that when fixed effects model used for estimated firms then the result was more efficient. They took data of Equity markets traded on AMEX and NYSE exchanges during the period of (1981-1999) on the basis of retained earnings, book-to-market and return for individual companies. Dimitrios, Prodromos and Anggelidis (2005) examined the impact of risk and average stock return by using the capability of the capital Asset pricing model in stock exchanges. They grabbed data from Greek Stock Exchanges during the period from (1993-2001) and also applied The Fama and French Model (1992). They resulted that, β measured risk in average stock return and a "size effect" in average stock return determined the negative relationship in Greek stock Exchange. Wong, TAN and LIU (2006) examined the cross sectional stock return depended on the A-share of the Shanghai Stock Exchange and also differentiate from other equity markets. They grabbed data (1993-2002) traded Chinese markets on the basis of the stock equity ratio, β , firm size and also applied full cross-sectional regression model. They resulted that, the large firms and growth stocks also effects in a downturn market and the cross sectional of stock return shows negatively correlated to a systematic risk. Wang and Iorio (2007) determined the positive relationship between β and return. They grabbed data from companies traded on Chinese stock exchange and Hong Kong stock exchanges on the basis of book-to-market, earning per shares, stock prices, market values, numbers of outstanding shares and cash dividend yield during the period from (1994-2002) and also applied Fama and MacBeth cross-sectional regression models. They found that the investors bear much systematic risk but earn a low rate of return in a share markets with other world markets. Muradoglu and Sivaprasad (2008) investigated that stock return variation and current assets pricing are affected due to leverage mimicking factors portfolio. The Fama-French-Carhart four factor models resulted that leverage imitating portfolio is better measure to explain the stock return variation in assets pricing models. The annual data of 155,342 observations regarding 792 listed companies, grabbed during 1980-2008. Beaulieu, Gagnon and Khalaf (2008) investigated the financial integration in stock markets during 1984 to 2003. The four factors cross sectional model resulted that, there was a strong integration in inter-listed and domestic stock portfolios while; the small investment strategy was not giving a reasonable profit. Huang (2009) Cash flow instability has affected the prices through the regular instability and individual instability. The end result of cash flow had negative impact in business meaning in both situations such as regular and individual volatility. He found that the prices of regular volatility and individual volatility were similar with overall volatility. He grabbed data from Equity markets traded on NYSE/NASDAQ/AMEX during (1973-2004) Grammig and Schrimpf (2009) determined the assets pricing models based on empirical valuation of newly projected which expand the standard preference characteristics of consumption level. They took data 1951:Q4-2005:Q1 could be calculated by using Delta Method. They found that, human capital as a benchmark model analyzed the size and Premia value. They applied Fama and French size book to market sorted portfolio estimated. Walid (2009) determined the impact of firm characteristics (Book to market and market capitalization) in cross sectional variations due to systematic risk factor in stock return. He took data from Japanese stock exchange based on Book to market diversification and Daily return on firm size during the period from (2002-2007) and also applied Fama-French three factor model. He found that firm size and book to market ratio has been correlated with average return Premium. Jung, Lee and Park (2009) evaluated that in which investors of different business had been exercised for the function of asset-pricing in emerging markets. When the short of transparency and larger uncertainty were included in those types of markets, then investors could not trust on each other and differ with other investors and their portfolios have not been the same. At the end result of portfolio was not efficient for market extension. They took data for all common stock traded on Korean stock Exchange during the period of (1992-2006). George and Hwang (2010) determined that the leverage and financial distress negatively correlated with stock return. The Cross sectional regression model resulted that, most of the firms avoid distress by adopting high costs but they still faced the systematic risk for adopting that costs on the basis of data grabbed during 1965-2003. They found higher leverage and distress in risk adjusted return and lower in raw returns which showed that, high leverage firms had less exposure of systematic risk than low leverage firms in distress situation. Bai and Green (2010) determined the positive impact of home country stock exchange and also exist in Domestic Exchange. They grabbed data from 13 emerging markets and 11 industries traded on UK Stock exchanges during the period (1984-2004). They

resulted that the country effects (Financial development, Macroeconomics Variable and the legal environment) and stock markets also main determinant of stock return and cover globalization. Gray and Johnson (2010) determined the impact between cross section of stock return and stock characteristics in International Markets. They took data from equity market traded in Australia during (1983-2007) and applied regression methodology and find out assets growth also effects the variables such as (EP, ROA) which is related with the cross section of stock return. But they resulted that there is no evidence to support the risk based system. Kang, Kim, Lee and Min (2011) determined the impact of Macroeconomic variables (Dividend yield, default spread, term spread and short-term interest rate) on cross section of stock return Using Fama and French three factor model and Consumption assets pricing model (CCAPM). They found that, Fama and French's three-factor model works better and also cover the total pricing errors as compare to the consumption capital Assets Pricing Model (CCAPM). Chira (2011) determined the positive impact on international companies that has been cross listed on U.S. Exchanges. He found that the rules and regulation, legal system, economic development and high corruption of the companies has been effected due to poorer governance indicators in short and long time period. He used data from common stock traded on NASDAQ/NYSE exchanges on the basis of abnormal return during (1996-2009) and also applied cross-sectional regression models. Du (2012) investigated that, the momentum factors and value have positive impact for both Investment practioners and financial economists. He took data from Federal Reserve Bank Chicago during the period (1951-2011) and also applied time series regression model. Moreover, the two-way portfolio classification system depend on the growth sized and inflation. Three-way system more effective as compare to the two-way portfolio classification system in momentum account. Ye and Turner (2014) used the monthly data during 1825-1870 of 1015 different stocks and determined the cross section of stock return, traded on London Stock Exchange. The Fama-MacBeth regression Methodology and portfolio techniques resulted that, the stock return is positively correlated with beta, illiquidity premium and past year performance of Stock Markets. Simlai (2014) investigated that traditional nonmarket (or individual) risk and unexpected component of market return could be measured on the basis of forecasting instability (EAV) Entity attribute value in stock return. He grabbed data from Common stock traded on NASDAQ/NYSE and AMEX on the basis of daily data of 6 size-and book-to-market portfolio during the period of 1963 and also applied Fama and Mcbeth Methodology. He resulted that the estimated value of EAV has been positively correlated with cross sectional distribution in stock return. The resolution of EAV creates difference between value and the growth stock. Singhania and Prakash (2014) determined the relationship between conditional and unconditional volatility of stock returns of SAARC countries markets. They grabbed data from all stock indices of SAARC countries during (2000-2011) and imposed GARCH model to determine the stock return in efficient market hypothesis (EMH). They resulted that the Indian markets to be negatively correlated with Pakistan and positively correlated to other markets. While unfavorable volatility of Pakistan considered positively to global markets.

2.3 Review in Context of Pakistan:

Saleem, Zafar and Rafique (2013) investigated the negative relationship between Inflation and stock return on investment. They grabbed data from KSE 100 index during the period from 1996 to 2011 on the quarterly basis in long run period and also applied Granger causality tests. They found that when inflation happen then badly affected the economy and also affected the stock return due to reason that Pakistan is under developed country. Haque and Sarwar (2013) examined the impact on book to markets has negative effects on return. They collected data from unequal Panel data of 394 Non-financial companies registered in Karachi stock exchange during the period from 1998-2001. The Capital Assets Pricing Model and three factor model is not successful in Pakistan Equity markets. They resulted that Pakistan are risk taker and profit from investment gain and also calculated the daily prices by standard deviation has a positive impact. Shamim, Abid and Shaikh (2014) inspected the strength of Capital Assets Pricing Model for Pakistan companies which are listed in Karachi stock exchange. They gathered data from 22 different sectors listed in Karachi stock exchange and also applied the simple regression model. They found that Capital Assets pricing theory was not suitable techniques the return in Pakistan Capital market. In Pakistan there are many researchers who conduct their many researches on cross section of return and check its relationship with investor behavior on return. Many researchers who check their results through price earnings ratio, and different conduct with price to book ratio impact on stock return. But I am the first who is going to research on stock return, price earnings ratio, and price to book ratio and debt to equity ratio of listed companies of Pakistan and Indian stock exchanges.

3. DATA AND RESEARCH METHODOLOGY

3.1 Data and Sources

In order to ensure the objects of firm's stock return and its significance on Debt to equity ratio, Price to book ratio and price to earnings ratio. I grabbed the data of Chemical sectors of Pakistan and India over the period of 2010 to 2014. We generated data of 29 chemicals companies from websites of each company out of 34 listed in

KSE. 5 Companies are eliminated due to lack of results in financial statements. I also collected the data of Indian chemical sector 29 out of 200 approximately registered in BSE. I shall be collected the secondary data of chemical companies from website of KSE and BSE annual reports and financial record

3.2 Explanation of Variables

3.2.1 Dependent Variable

The profit or loss of a share; security and debenture in a given period of time. The stock return includes income and the capital gains comparative on an Investment. The stock return can be calculated by using this formula as:

$$R_{i,t} = \left(\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \right) \times 100 \quad (2)$$

Where:

$R_{i,t}$ = Actual return or security return for share i at day t.

$P_{i,t}$ = Daily closing price of share i at day t.

$P_{i,t-1}$ = Daily closing price of share i at day t-1.

3.2.2 Independent Variable

Price Earnings Ratio (P/E)

Is to calculate of the market price related to annual net income or profit after tax earned by the company per share? P/E ratio creates the goodwill of the company on investors. If P/E ratio normally shows high demand in the market because the investors much interest to invest their funds. The P/E ratio can be calculated by using this formula as:

$$\text{Price Earnings Ratio} = \text{Market value per share} / \text{Earning per share}$$

Price to Book Ratio (P/B)

P/B Is used evaluate the market value per share to its book value per share. Those companies which have secreted assets such as intellectual assets which are great value but not mentioned in the book value. In general price to book ratio is better for the investors who invested in shares. The price to book ratio is measured as:

$$\text{P/B Ratio} = \text{Market value per share} / \text{Book value per share}$$

$$\text{Book value per share} = \text{Shareholders Equity} / \text{No. of Outstanding Shares.}$$

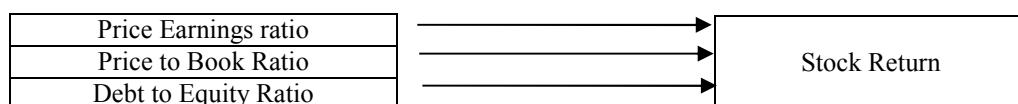
Debt to Equity Ratio (D/E)

Its Shows that what ratio of debt and equity of the company using to investment their funds. Debt to equity means company ability to pay its liabilities. If debt to equity ratio high then companies cannot be attract extra borrowing Capital. The debt to equity ratio can be measured by this formula as:

$$\text{Total Liabilities} / \text{Shareholder's Equity}$$

3.3 Theoretical Framework

There are many variables which disturbing the stock markets return comparable with Debt to equity ratio, Price earnings ratio and price to book ratio are mainly key variables amongst all variables. These variables also affect the Investor behavior and decided to invest in stock market for the purpose of earning stock return.



3.4 Research Model

In this study, the main objective is to measure the stock return and whether determine the force of these indicators differ by country wise. The model of our study discussed is set as follows. Sri means average stock return, P/Ei means price to earnings ratio, P/Bi considered price to book ratio, D/Ei mention debt to equity ratio, Σ_k Year ik is a number of dummy variables that is classify the conflict in stock return by year

$$SR_i = \beta_0 + \beta_1 P/E_i + \beta_2 P/B_i + \beta_3 D/E_i + \Sigma_k \text{Year}_{ik} + \epsilon_i$$

3.5 Tools, Test, Method Software

I used E views software to analysis the data from all chemical company which is selected in sample. I also use the regression techniques and GLS with random effects and ols pooled with standard error.

4. RESULTS & DISCUSSION

Table 1. Descriptive Statistics – Panel: Pakistan

Variables	Observation	Mean	Std. Dev.	Min.	Max.
Stock Return	145	0.11	0.52	-0.90	4.30
P/E	145	4.61	68.18	-575	435.27
P/B	145	3.97	6.73	-1.46	38.50
D/E	145	3.39	22.70	-3.30	273.44

Table 2. Descriptive statistics – Panel: India

Variables	Observation	Mean	Std. Dev.	Min.	Max.
Stock Return	145	0.28	0.62	-0.90	3.18
P/E	145	12.03	15.43	-28.53	95.88
P/B	145	11.91	12.68	0.039	59.91
D/E	145	1.84	3.38	0.000000	23.99

Table 3. Correlation Matrix

	PANEL- PAKISTAN				PANEL- INDIA			
	SR	P/E	P/B	D/E	SR	P/E	P/B	D/E
S.R	1				1			
P/E	-0.0129	1			0.0736	1		
P/B	0.0495	0.1706	1		0.1320	0.2871	1	
D/E	-0.0487	0.0702	0.2747	1	0.0919	-0.0006	0.3050	1

4.3 Regression Model:

Table.4, Panel Pakistan

Variables	OLS-POOLED	GLS-RANDOM Effects
P/E	-0.000158 [0.002029]	-0.000158 [0.002029]
P/B	0.005600 [0.006927]	0.05600 [0.006927]
D/E	-0.001556 [0.002029]	-0.001556 [0.002029]
R-square	0.007071	0.007071

Robust Standard errors are in brackets
 $p > 0.01$

The expected framework of both regressions characteristic both are given same result. The

OLS-Pooled and GLS- Random effects characteristics of R-square of 0.07071 meaning that independent variables discussed in this model determine 70% of the variations in stock return and those variables are influenced the stock return. This table shows that price to earnings ratio has a negative impact with stock return and price to book ratio and debt to equity has a positive impact with stock return in Pakistan. The R-square shows that insignificant result because it's greater than (0.05).

Table.5, Panel INDIA

Variables	OLS-POOLED	GLS-RANDOM Effects
P/E	0.001021 [0.003513]	0.001021 [0.003513]
P/B	0.008319 [0.004491]	0.008319 [0.004491]
D/E	-0.026521 [0.016128]	-0.026521 [0.016128]
R-square	0.037302	0.037302

Robust standard errors are in brackets
 $P < 0.01$

In table five, The expected framework of the regressions model characteristics R-square is 0.037702 means that independent variables in this model determined 37% of the variance in stock return which is lower than (0.05). So, this result is significant figure of the other factors that are influenced the variations in stock return. The Price to earnings and price to book ratio has a positive (at 1%) relationship with stock return. But debt to equity ratio has negative impact (at 1%) with stock return. Comparison with Pakistan and India panels, the explanatory strength of variables are greater than in Pakistan but it has no insignificant b variable.

5. Conclusion

Abstract Extend: purpose of currently statistically determinants the of different variable such as price to earnings ratio, price to book ratio and debt to equity ratio during the regression study and check their impact with stock return on KSE in Pakistan and BSE in India chemicals sectors. However, I could not important statistically results between dependent variable and Independent variable in Pakistan and India set of data.

Objectives: The main objectives of this study to check the investor behavior with stock return. The independent variables such as price to earnings ratio, price to book ratio and debt to equity ratio provides significant facts and data with stock return.

Methodology used in this study, Markowitz portfolio Theory, CAPM model and Fama and French three factors model to determine the stock return. While this study does not provide evidence for the underlying reasons. Rising markets are vary from developed countries markets in conditions of their environment and inherit features. So, comperihensible that the explanatory strength of independent variables is reasonably maximum and statistical importance in explaining the cross section of stock return in the India and it is not in Pakistan

5.2 Limitation of the study Due to shortage of time I have gathered of 29 companies of chemicals sectors in Pakistan and India. We are unable to work on whole sector of Chemical in KSE and BSE. This study cannot determine the investor behavior about stock return whether he invest or not invest in companies.

5.3 Policy Implication

In this study, we evaluate the stock return and check his impact on debt to equity ratio, price to earnings ratio and price to book ratio in chemicals sectors. The companies used these data to improve their strategies and decision making to increase his profitability given to the investors in future.

5.4: Future Directions:

The other researchers conduct research about stock return. So, my research is helpful for those who check the stock return impact on Debt to equity ratio, price earnings ratio and price to book ratio. Because, I am the first in Pakistan who used many variable to check their impact on Stock return.

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