Operational Efficiency based Investment strategies and Equity Returns: Evidence from Emerging Economy

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ABSTRACT

The objective of this paper is to examine the impact of market premium, asset growth premium, net operating assets premium and volatility premium on stock market returns. This study uses secondary data of monthly closing stock prices of hundred non-financial companies, listed on Pakistan Stock Exchange (PSX). The sample period of the study consists of 20 years from Jun-1998 to Jun-2018 with 2000 firm year observations since these are the only companies through which maximum portfolios can be formed that is consistent with respect to data availability. The research methods used are quantitative research along with deductive approach. The data is collected from the official website of PSX. This study employs time series and cross sectional analysis to examine the impact of investment strategies based on operational efficiency on Pakistani equity market. The results of the study show that market premium and volatility premium have positive and significant impact on stock returns. Which state that market premium and volatility premium explain equity returns whereas, asset growth premium and net operating asset premium have mixed pattern. This opportunity is same for local and international investors to earn abnormal returns by investing into Pakistani stock market by adopting these strategies.

Keywords: *Pakistan Stock Exchange, Time Series and Cross-Sectional Analysis, Market Premium, Asset Growth premium, Volatility premium, Net Operating Assets premium, Operational efficiency.*

INTRODUCTION

(Markowitz,1952) proposed a modern portfolio theory, which states that individual investment has two types of risk. One is systematic risk, which is market risk and that cannot be diversified, the second is unsystematic risk and can be removed through diversification. This theory has led the foundation for portfolios construction in order to diversify the firm specific risk. The issue which plagues the investors most when computing the stock's return is; even by incorporating all the shares in a fine diversified portfolio in stock market, they can't eliminate systematic risk. Building on his work, (Sharpe,1964) and (Linter ,1965) and (Mossin,1966) simultaneously developed Capital Asset Pricing Model, considered as an important model in the field of finance. CAPM stated that abnormal return is the outcome of market premium only (a single factor). Market risk is the only risk factor that can explain the cross-sectional variation in the equity returns. Later on, (Ross,1976, 1977) criticizes CAPM's shortcoming and proposed an Arbitrage Pricing Theory (APT), which states that there are nth factors which affect the stock prices. Those factors could either effect positively or negatively. By keeping in view investors claim high returns against those multi-facet risks. Risk can either be a threat or an opportunity for a firm to when it is trying to get ahead of its competition. When experts talk about risk and management they emphasize on the danger posed by risk and the level of stress that investors get to minimize that risk (i.e. risk hedging). In recent years, a lot of questions have been raised regarding whether the investors decision making is really rational and are the stock markets really efficient or not? New fields of finance are trying to answer these questions. One of those fields is behavioral finance which tries to give details about bubbles of stock market, anomalies of markets and biases effecting the decision making of investors. Out of all these, one particular phenomenon which is found in the stock markets and is being very intrigued by the researchers is anomalies effects.

In order to address the efficiency of market Eugene (Fama,1970) proposed efficient market hypothesis (EMH). (Fama,1970) presents three increasingly stringent degrees of information processing efficiency, based on how much of the available public and private information market prices are expected to reflect. In market characterized by weak-form efficiency, asset prices incorporate all historical information, it is also known as returns predictability. While a seemingly innocuous proposition, this form of efficiency implies that trading strategies based on analysis of historical pricing trends or relationships cannot consistently yield excess returns to investors. Since prices are “memoryless”, they are unforecastable and will only change in response to the arrival of new information. This in turn implies that asset prices follow a random walk, meaning that there is (on average) no correlation between subsequent price changes and the asset price fluctuations randomly and unpredictability. In markets characterized by semi-strong form efficiency, asset prices incorporate all publicly-available information. It also known as event studies (or tests for rapid price adjustment); one implication of this form of efficiency is that the level of asset prices should reflect all potential historical, current, and forecastable (future) information that can be obtained from public sources. A second implication of this form of efficiency is that asset prices should change fully and instantaneously in response to the arrival of relevant new information. In markets characterized by strong-form efficiency, asset prices reflect all information-public and private. This is also known as tests for private information.

The term operational efficiency refers to how a firm is internally efficient meaning that how a firm is utilizing its resources to compensate it finance providers. Operationally efficient transactions are those in which investors seeks to earn highest gross/operating margin profit. Operational efficiency helps to improve overall efficiency of investment portfolios. Greater the operational efficiency in the investment markets means capital can be allocated without excessive frictional costs that reduce the risk/reward profile of an investment portfolio. (Ginger & Zhang,2011) investigate that whether risk or mispricing is the main reason behind market anomalies. By keeping in view, this study focuses on asset growth anomalies, volatility premium; net operating assets based anomalies, market risk premium and stock returns, of Non-Financial sector listed on Pakistan Stock Exchange.

Asset Growth

Asset Growth effect was first examined by (Cooper et al,2008), by arguing that firms having lowest asset growth will have the greater returns on stock, which indicates that asset growth and stock returns have negative relationship. Later on, these findings were also supported by (Fama & French,2008), (Lipson et al ,2009) and (Chen et al ,2008) in US equity market and other number of international markets including Asia Pacific. (Fama & French ,2008) proposed a study called “Dissecting Anomalies”, which examine asset growth on the basis of different factors like size, value, momentum and stocks. Study suggests that the anomaly of asset growth exist in small capital and stock companies. According to study of (Cooper et al ,2008) the asset growth has an effect on additional explanatory variables including book to market ratio and size of the firms.

When an economy is in stress, the spread is economically high and become statistically significant. (Grobys,2016) investigate the asset growth effect in economic conditions. The results revealed that there is no such asset growth when economy is quiet which is consistent with the findings of (Titman et al,2004) and (Cooper et al,2008). Mispricing occurs when an investor incorporates insufficient amount of information while deciding on investments. Whereas, based on q-theory investors are highly recommended to invest in those companies which have q greater than 1, if q is smaller than 1, companies are recommended to sell its assets. It would be better-off rather than attempting to put them to use. Likewise, asset growth reduces when investors choose to invest higher in stocks where expected returns are lower and vice versa. (Watanabe et al,2012) argue that the cross sectional relationship between asset growth anomaly and stock returns is more likely due to an ideal investment effect than due to overinvestment or mispricing.

Net Operating Asset

The difference between operating assets of a firm and operating liabilities of a firm is called net operating asset. (Sloan,1996) argues that multi-period counterpart like NOA is also likely to convey mispricing and defines NOA as measures the extent to which past accruals have persistently not translated into realised cashflows. Later on, consistent with these arguments, (Hirshleifer et al,2004) document a strong negative relationship between NOA and future returns to US stocks, using both portfolio sorts and cross-sectional regressions. (Choy,2003) documented that level of NOA predicts the firm's capacity to meet the analyst's future expectations. Thus, the industry component of NOA can serve as an investor's optimism provocation index at the industry level. (Gray et al,2017) examined the significant negative relationship between net operating assets and future expected stock returns and argue that this effect is also economically significant.

Volatility

Volatility refers to fluctuations in stock prices in a specific time span. If stock prices fluctuate rapidly, it is the case for high volatility. On contrary, if fluctuations in stock prices are slower, it is the case for low volatility. It is conventional observation that the volatility of the aggregate stock market is not constant, but changes over time. The researchers have built increasingly statistical models to capture this time variation in volatility. (Black,1972) provides a theoretical contribution in which he argues that idiosyncratic volatility is irrelevant for asset pricing an extension in capital asset pricing model (CAPM) of (Sharpe,1964) and (Linter,1965). The rolling standard deviation used by (Officer,1973) has given way to parametric ARCH or stochastic volatility models. (French, et al,1987) states that abnormal returns are linked with market situation as the risk increases return increases. Partial surveys of the enormous literature on these models are given by (Bollerslev, Chou, and Kroner,1992), (Hentschel,1995),(Ghysels, Harvey, and Renault,1996), and (Campbell, Lo, and MacKinlay,1997, chapter 12).

The remainder of this paper is structured as follows: Section 2 presents the literature review relating to board diversity and hypothesis development, Section 3 presents the dataset and methodology, Section 4 focuses on the empirical findings and discussion and the last section presents the conclusion and future directions.

LITERATURE REVIEW

Utilizing (Fama,1970) proposed a theory called Efficient Market Hypothesis (EMH), which stated that share prices of stock revealed all the information so generation of consistent Beta is impossible. EMH stated that the stock in the market is trading at its fair value and it is impossible for investors to purchase an undervalued stock and to sell overvalued stocks. So that an investor can only earn possibly higher returns by investing in risker stock.

EMH has several assumptions. First, all relevant information to the securities is available in the market. Second, it assumes that stocks in financial markets are fairly priced and never be undervalued or overvalued. Moreover, an investor cannot consistently beat the market by using different the investment policies. The EMH is made up by three progressively forms. First, weak form contains least information of the market as future predication cannot be done on the basis of historical prices and other market statistics. Second, semi strong form says that stock prices are fully reflect all publically available and investor can predict about the future prices. Third, strong form of the market shows that prices fully reflect all information whether publically available. Investor uses insider sources to gather all the information about market to predict the future expected returns however most studies observed that markets are not sufficient in this sense.

Generally, CAPM and Fama three factor model is being considered as more appropriate models to explain the risk and returns associated with the investment. There are number of studies were conducted to explain the association between return and the factors which affect returns, commonly called anomalies. As literature evidence, the associations between risk and its affecting factors have different applications around the world.

Asset Growth & Stock Return

The relationship between asset growth and stock returns was first investigated by (Cooper et al ,2008), by arguing that firms with lowest asset growth outperforms higher asset growth firms and shows the negative relationship between both variables. Later on, (Zhang et al,2011) observed the weaker but significant negative relationship between asset growth and returns in Asian equity markets during 1981-2007. This negative relationship is in weaker form, where firm's rely more on debt financing for asset growth. During recent decade, Asian markets generally observed the fast economic growth because of rapid growing in firm's assets and an active capital markets. The Asian markets are highly dominated by banking system so it significantly weakens the negative relationship between asset growth and stock returns.

(Bettman et al,2011) investigated the effect of asset growth anomaly on stock returns specifically in Australian market. Their findings show that there is not asset growth effect in Australian equity markets. Later on, (Fu,2011) argued that firms having low amount of assets can subsequently earn higher stock returns than the firms expanding their assets. (Watanabe et al,2012) argue that lower asset growth firms outperforms the firms with higher asset growth and this cross sectional relationship is more significant in developed market, where stock are fairly priced. It is also observed that cross sectional relationship between asset growth and stock return is more significant in developed markets as compared to the emerging markets.

(Lam and Wei,2011) explained the two basic reasons behind this anomaly, which are investor's behavior and investor's rationality. Investor's behavior explains that investors are not much faster to incorporate the firm's investment information with stock prices, which resulting mispricing. Whereas, investor's rationality is being explained by q-theory, investor do more investment when expected returns are low and invests less when expected returns are higher, resulting the cross sectional relationship asset growth and returns. Moreover, (Li et al,2012) discussed the other reasons behind this cross sectional and argue that this relationship can be associated with mispricing or systematic risks. (Ye and Li,2013) examined the significant and robust impact of asset growth anomaly in Chinese stock market.

(Lia and Sullivan,2015) supported the study of (Li et al,2012) by arguing that mispricing and systematic risks are the reasons behind this negative relationship. Also argued that firms that increase asset expansion or capital expenditures subsequently earn negative abnormal stock returns. (Titman et al,2013) experienced that asset growth effect is stronger in developed financial markets but it does not associate with the good corporate governance or the cost of trading. Subsequently, argue that firms with lower asset growth outperform the firms with higher asset growth. Moreover, (Fu,2014) argue that low growth firms earn higher stock return as compared to the firms with higher asset growth. Furthermore, he argues that this cross sectional relationship indicates poor operating performance and high probability subsequently to be delisted from stock exchange. Moreover, (Grobys,2015) investigate the relationship between asset growth with macroeconomic factors and argue that there is no such asset growth effect when economy is quiet. However, there is statistically significant asset growth was observed in turbulent economic conditions.

(Iqbal and Wibowo,2015) investigate this negative relationship in Indonesian Market and argue that an equally weighted low-growth portfolio outperforms high-growth portfolio In addition, they also argue that asset growth is not a risk and driven by mispricing due to investor behavioral biasness. Moreover, (Kot et al,2017) argues that asset growth anomaly does not seem to be persuasive and investable in US stock market during 1973 - 2015. Asra and (Kashif ,2017) argue that CAPM and Fama three factor model are not the appropriate models and failed to explain this cross sectional variations in firms asset growth listed in Pakistan Stock Exchange. Moreover, most findings of the study suggested to invest in low growth firms as it is sound strategy to earn higher returns investors may generate positively higher returns in Pakistan.

Hypothesis 1: There is a negative relationship existing between asset growth and stock returns.

Net Operating Assets (NOA) & Stock Return

(Sloan,1996) argues that multi-period component like NOA is also likely to convey mispricing and defines NOA as measures the extent to which past accruals have persistently not translated into realised cashflows. (Sloan,1996) observed 10% abnormal annual profit using trading strategy based on NOA. Consistent with these arguments, (Hirshleifer et al,2004) investigate the strong negative relationship between NOA and future returns in US equity market and proposed two aspects of this relationship. First, net operation asset can calculated by adding the difference between operating income and free cash flows. Second, this addition is planned for temporary accounting treatment to accommodate the timing difference between transaction and cash flows. Additionally, (Hirshleifer et al,2004) observed 15% annual abnormal profit using the same trading strategy based on NOA. (Richardson et al,2006) further extended the study of (Hirshleifer et al,2004) and argue that, by incorporating cumulative past changes in NOA, there are reduction in predictive aptitude of future return.

Moreover, (Zhang,2005) argues that Net operating asset is associated with the industry and cannot be diversified when forming industry portfolios. He argues that NOA of cross and similar industry are strongly negative with future stock returns during 1964-2002. Later on, (Papanastasopoulos et al,2009) reported the negative association between NOA and stock returns by controlling the total accruals. Also find that the hedge strategies on NOA and its components generate abnormal returns and develop statistical arbitrage opportunities. Moreover, (Papanastasopoulos et al,2016) further extended their study in nine European countries to investigate the association between both variables and their findings are consistent with the US evidence i.e. firms having higher Net Operating Assets earns lower returns as compared to the firms having lower net operating assets. (Gray et al,2013) find the significant cross sectional association between NOA and stock returns in Australian market and argued that firms are notably less profitable.

Hypothesis 2: There is a negative relationship existing between net operating assets and stock returns.

Volatility & Stock Return

(Ang et al,2006) investigate the relationship between volatility and expected future returns and argue that stock with highest sensitivity have low returns as per compared to the low sensitivity stocks, who earns high returns. (Adrian and Rosenberg,2008) investigate the negative relationship of volatility by ranking market risk into short run and long run components and argue that prices of risk are negative and significant for both volatility components. (Wong,2011) examines whether individual volatility discount is related to earnings shocks and concluded that risk of individual stock suffer negative earnings surprises both before and after portfolio formation. (Dutt and Jenner,2012) study the relationship between both variables developing markets. Subsequently, they findings show that low volatility stock earns higher returns than high volatility stocks. In addition, operating performance can be considered as an additional variable for the low volatility effect.

(Paye,2012) argue that volatility can be caused by additional factors including uncertain macroeconomic factors, time variation, expected returns and credit conditions. (Bansal et al,2012) investigates the volatility effect on stock returns and argues that volatility risk is persistent and is strongly correlated with discount rate. In addition to this, their results also suggest that volatility is an important channel to understand the macroeconomic and financial markets. (Blitz et al ,2013) argues that the volatility effect seems to be growing stronger over time because of increased delegated portfolio management. Their findings show the weak volatility effect in emerging stock markets which is against the common factor explanation. (Bansal et al,2014) investigate the importance of volatility fluctuations for asset pricing and the macro economy. Their findings concluded up with by arguing that increase in discount rate and decline in consumption leads to an increase in macroeconomic volatility. (Blitz ,2014) argue that irrational behavior of the investor is the reason behind anomalies in financial market and suggested that investor should realize that these biases are costly. (Sohn,2014) proposed a model which explains the risk factors including aggregate volatility, that also supports the cross sectional relation of volatility and future returns. Results show that both short and the long run volatility component strongly predict the future market volatility.

(Jong and Palkar,2016) argue that among a variety of new investment products, low-volatility investing has gained a lot of attention from investors seeking to de-risk their investment portfolios without sacrificing returns. Their finding show that lower volatility drag on investment returns enhances the long term performance of less volatile stocks. In addition, we find less support for the long-term volatility anomaly when stocks are sorted by asymmetric risk measures such as relative variance and relative beta. Consequently, the volatility anomaly is at least partly attributable to the shortcomings of symmetric risk measures such as variance and beta. (Blau and Whitby,2017) argue that rational investors discount stocks by more risk, resulting in positive relation between risk and future returns. (Siddiqui, and Narula,2017) observed the presence of volatility anomaly in Indian market by using various volatility models such as spillover effect (herding), leverage effect (low volatility anomaly) and persistence of long- and short-term volatility.

Hypothesis 3: There is a positive relationship exists between volatility and stock returns.

METHODOLOGY

This study uses secondary data of monthly closing stock prices of hundred non-financial companies, listed in Pakistan Stock Exchange (PSX). The sample period of the study consists of 20 years from Jun-1998 to Jun-2018 with 2000 firm year observations. Companies included in the sample are selected on the basis of market capitalization. Mostly high market capitalization stocks are traded frequently on the PSX. The reason of selection on the basis of market capitalization is to avoid the inactive stocks for the sample. The reason for the exclusion of companies from financial sector is that the accounting period of financial companies closes at December while it closes at June for the non-financial companies. So it is not possible to compare the different variables used in this study at a specific point of time. Moreover, financial and non-financial sectors (companies) have different capital structures. Financial companies usually have higher percentage of debts in their capital structures while non-financial firms usually have higher percentage of equity. Monthly closing stock prices of 100 companies are obtained from the official website of PSX and Business Recorder. Moreover, data used for the calculation of market capitalization, volatility, asset growth and net operating assets including BV of shareholder's equity and No. of ordinary shares is obtained from the annual financial reports of the companies. Monthly risk-free rates of the Pakistani market are obtained from the website of State Bank of Pakistan. These are considered as reliable sources of information.

Variable measurement

Size:

There are different proxies for the measurement of size of companies. It includes market capitalization, total assets, and total sales. In this study, size is measured by the market capitalization.

Size = Market Capitalization=MPS × No of shares

(Fama and French,1992, 1993) use the same proxy for the size measurement.

Asset Growth:

Asset Growth is needed to sort the stocks on the basis of low and high growth values. It is calculated as follows:.

$$AGi,t = \frac{TAi,t\ -\ TA,t-1}{TAi,t-1}$$

Whereas,

AGi,t = Asset Growth of individual stock "i" at time 't"

AGi, t-1 = Previous year Asset growth

Volatility:

Volatility is needed to sort the stocks on the basis of moving averages of low and high standard deviation values. It is calculated as follows:

"Vol=SD(Rit)"

Whereas,

Vol = Volatility

SD = Standard Deviation

Ri,t = Return of an individual stock "i" at time "t"

Net Operating Assets:

Net operating asset is needed to sort the stocks on the basis of low and high net operating asset values. It is calculated as follows:

NOAi,t=(Operating Assetsi,t - Operating Liabilitiesi,t)/(TAi,t-1)

$$NOAi,t = \frac{Operating\ Assetsi,t\ -\ Operating\ Liabilitiesi,t}{TAi,t-1}$$

Whereas,

NOAi,t = Net operating asset of individual company "i" at time 't'

TAi, t-1 = Previous year's total asset

According to CAPM proposed by (Sharpe,1964), who argues that a market risk is the only factor that can explain the cross-sectional variation in the equity returns. But according to APT (Ross, 1976), 'k' many risk factors affect the equity returns. (Campbell et al,2001) identifies idiosyncratic volatility premium as one of the extra-risk factor. Moreover, (Cooper et al,2008) identify asset growth anomaly and (Gray et al,2017) identify net operating assets as extra-risk factors that can explain the cross-sectional variations in the equity returns. Methodologies implemented by above mentioned authors are used in this study for the construction of portfolios.

Construction of Portfolio's

Portfolios are constructed on the basis of different criteria.

Size Sorted Portfolios

Market capitalization is calculated each year for one hundred companies and this process continues from June, 1998 to June, 2018. In order to construct portfolios, companies are sorted in the ascending order based on market capitalization. Once companies are sorted, then monthly average returns are calculated of each four companies in the form of portfolio from S1 to S25 in a given year by using the following formula.

$$R_{i,t}=\ln\frac{P_t}{P_{t-1}} \qquad i=1,2,3,4$$

Whereas,

$R_{i,t}$ = Return of each company 'i' for each month 't'

P_t = Market price of company's stock in current month

P_{t-1} = Market price of company's stock in previous month

Monthly average returns of each portfolio (S1 to S25) are calculated as follows:

$$R_{avg\ S_{n,t}}=\frac{\Sigma R_{i,t}}{4} \qquad n=1,2,\ldots\ldots,25$$

Whereas,

$R_{avg\ S_{n,t}}$ = Monthly average returns of each portfolio (S1 to S25) for month 't'

This process is repeated for each year from Jun-1998 to Jun-2018.

Volatility Based Portfolios:-

Idiosyncratic volatility is calculated by adding all the stock's squared monthly returns minus the sum of the squared monthly returns on the KSE-100 index. The strategy conditions on prior month and involves buying P1 (lowest volatility), selling P5 (highest volatility). On the basis of standard deviation companies are sorted in ascending order first sixty companies are low volatile while last sixty companies are high volatile. Portfolio of sixty companies with low volatility is named as low volatile portfolio whereas, portfolio of sixty companies with high volatility is named as high volatile portfolio.

Monthly average returns are calculated as follows:

$$R_{avg\ S_{n,t}} = \frac{\Sigma R_{i,t}}{50} \qquad n = \text{low and high}$$

Whereas,

$R_{avg\ S_{n,t}}$ = Monthly average returns of each portfolio for month 't'

This process is repeated for each year from Jun-1998 to Jun-2018.

Asset Growth Based Portfolios:-

Companies are sorted in ascending order on the basis of percentage in total assets with respect to previous year (Growth Rate). Portfolio of a first fifty companies is titled as low growth firms. Whereas, portfolio of last fifty sorted companies as high growth firms.
Monthly average returns of high and low portfolios are calculated as follows:

$R_{avg\ S_{n,t}} = \frac{\Sigma R_{i,t}}{50}$ n=low and high Whereas,

$R_{avg\ S_{n,t}}$ = Monthly average returns of each portfolio for month 't'

This process is repeated for each year from Jun-1998 to Jun-2018.

Net Operating Assets Based Portfolios:-

For formation of net operating assets based portfolios, net operating assets are calculated each year for one hundred companies and this process continues from June, 1998 to June, 2018. In order to construct portfolios, Once companies are sorted on the basis of net operating assets then monthly average returns are calculated of each fifty companies in the form of high and low portfolio in a given year by using the following formula.

Monthly average returns of high and low portfolios are calculated as follows:

$R_{avg\,S_{n,t}} = \frac{\Sigma R_{i,t}}{50}$ n=low and high Whereas,

$R_{avg\,S_{n,t}}$ = Monthly average returns of each portfolio for month ‘t’

This process is repeated for each year from Jun-1998 to Jun-2018.

Model Specification

This study uses Multiple Regression analyses to investigate the above stated relationship. Regression analysis is a combination of statistical processes to determine the relationship between variables. Concisely, regression analysis helps to determine the change occurs in dependent variable with respect to independent variable.

Multiple Regression Model

The time series and cross sectional regression analysis is used to estimate the model

$$R_{p,t} = \beta_0 + \beta_1(Marketriskpremiumt) + \mu_t$$

$R_{p,t} = \beta_0 + \beta_1(MKTP_t) + \mu_t$………………………………………………………………….. (i)

$$R_{p,t} = \beta_0 + \beta_1(Volatilitypremium_t) + \beta_2(AssetGrowthpremium_t) + \beta_3(NetOperatingAssetspremium)_t) + \mu_t$$

$R_{p,t} = \beta_0 + \beta_1(VOPLP_t) + \beta_2(\mathrm{AGP}_t) + \beta_3(NOAP_t) + \mu_t$ ……………………………………………. (ii)

$R_{pt} = R_{p,t} = \beta_0 + \beta_1(MKTP_t) + \beta_2(\mathrm{VOLP}_t) + \beta_3(\mathrm{AGP}_t)+) + \beta_4(NOAP_t) + \mu_t$ ………… (iii)

Whereas,

$R_{p,t}$ = Average returns of the size-sorted portfolios for month ‘t’

μ_t = Error Term

ANALYSIS AND RESULTS

Result indicates that portfolio S25 with small size stocks (low market capitalization companies) earns on average more than the portfolio S1 with large size stocks (high market capitalization companies). It is consistent with the theory as risk of small size stocks’ portfolio is higher than the risk of large size stock’s portfolio. Portfolio S1 earns 1.1% in a month with standard deviation of 15.3% while portfolio S25 earns 0.05% in a month with standard deviation of 14.5%.

Table 4.1 : Descriptive Statistics of Size Sorted Portfolios

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
S1-L	0.011	0.000	0.848	-0.848	0.153	0.141	17.266

S2	0.016	0.000	0.819	-0.642	0.146	0.735	10.024
S3	0.011	0.000	0.973	-0.397	0.153	1.105	9.871
S4	0.005	-0.001	0.590	-0.387	0.132	0.759	5.476
S5	0.004	-0.002	0.413	-0.459	0.124	0.247	4.289
S6	0.006	-0.001	0.325	-0.304	0.101	0.386	3.668
S7	0.000	-0.011	0.821	-0.658	0.122	0.546	14.539
S8	0.012	0.000	0.571	-0.642	0.115	-0.167	9.392
S9	0.008	0.002	1.160	-0.658	0.134	2.017	28.149
S10	0.006	0.004	1.283	-1.247	0.155	0.202	39.675
S11	0.005	0.002	0.279	-0.259	0.090	0.038	3.754
S12	0.007	0.007	1.396	-1.466	0.154	-0.578	63.472
S13	0.007	0.006	0.664	-0.561	0.102	0.284	13.651
S14	0.018	0.022	1.918	-1.448	0.181	2.564	69.859
S15	0.018	0.010	1.309	-1.335	0.163	-0.027	37.382
S16	0.003	0.000	1.067	-1.437	0.155	-2.078	41.254
S17	0.009	0.006	0.807	-0.827	0.116	-0.133	22.426
S18	0.004	0.006	0.560	-0.833	0.120	-0.863	14.227
S19	0.007	0.005	1.334	-1.254	0.177	-0.239	35.407
S20	0.012	0.013	0.408	-0.359	0.092	0.069	5.220
S21	0.008	0.003	1.725	-1.757	0.182	-0.266	70.476
S22	0.010	0.011	0.308	-0.510	0.097	-0.608	6.305
S23	0.010	0.006	2.241	-1.507	0.202	3.509	78.072
S24	0.006	0.004	0.597	-0.608	0.100	-0.188	15.403
S25-H	0.005	0.004	1.226	-1.237	0.145	-0.184	44.797

Portfolio S1 has median of 0% while median of portfolio S25 is 4% which means in portfolio S1 50% of companies earn more than 0% in a month and for portfolio S25 50% companies earn more than 4% in a month. Among all the portfolios, the highest return is earned by the portfolio S14 (relatively small size stock's portfolio) which is 1.8% in a month with standard deviation of 18.1%. Moreover, the maximum gain in a month is incurred by the portfolio S14 which is 19.18% in a month while maximum loss is incurred by the portfolio S11 which is 2.59% in a month.The value of skewness can be positive, negative, or undefined. If the value is positive, it means that the data are positively skewed (skewed right). If value is negative, the data are negatively skewed (skewed left).

Here, Results indicates that portfolio including S1, S2, S3, S4, S5, S6, S7, S13, S14, S20, S23 have positive skewness value which means that the data in these portfolios are right skewed and right tail of distribution curve is longer than left tail. Whereas, rest of the portfolios including S8, S12, S15, S16, S17, S18, S19, S21, S22, S24, S25 have negative value of skewness, which means that the data in these portfolios are skewed left and left tail is longer as compared to the right one. Kurtosis is a degree of peakedness (flatness) of the data. If value value is equal to 3, then the data has mesokurtic distribution, stated as normal distribution with respect to peakedness).

If value is greater than 3, then the data has leptokurtic distribution having thin and tall peak. If value is less than 3, then the data has platykurtic distribution having flatter peak. Results indicate that all the portfolios from S1 to S25 have leptokurtic distributions.

Table 4.2: Descriptive Statistics of Market Premium, Asset Growth, Net Operating Asset and Volatility Premium

	RM_RF	HGMLG	HNOAMLNOA	HVMLV
Mean	-0.064	0.000	0.003	0.009
Median	-0.062	0.002	0.006	0.003
Maximum	0.166	0.738	0.377	1.465
Minimum	-0.496	-0.487	-0.398	-0.988
Std. Dev.	0.092	0.085	0.052	0.130
Skewness	-0.712	1.851	-0.599	3.983
Kurtosis	5.599	38.988	28.557	82.746

Table 4.2, shows the descriptive statistics of market premium, asset growth, net operating asset and volatility. As shown in table, mean value of market premium is -0.064 with standard deviation of 0.092 and maximum values of 0.166 and minimum value of -0.496. Mean of asset growth premium is 0.000 with standard deviation of 0.085 and maximum value of 0.738 and minimum value of -0.487. Mean of net operating asset premium is 0.003 with standard deviation of 0.052 and maximum value of 0.377 and minimum value of -0.398. Lastly, mean of volatility premium is 0.009 with standard deviation of 0.130 and maximum value of 1.465 and minimum value of -0.988. Furthermore, results indicate that Market Premium, Asset Growth, Net Operating Assets and Volatility premiums have leptokurtic distributions. In case of

skewness, market premium and net operating assets are skewed left, meaning that the left tail of the distribution curve is longer as compared to right On the other hand, asset growth and volatility premium are positive skewness, meaning that the data in both premiums are positively skewed or skewed right and the right tail of the distribution curve is longer than left.

Table 4.3: Correlation Matrix

	Market Premium	**Asset Growth**	**Net Operating Asset**	**Volatility**
RM_RF	1.000			
HGMLG	0.092	1.000		
HNOAMLNOA	0.053	0.559	1.000	
HVMLV	-0.017	0.602	0.284	1.000

Table 4.3 shows the Correlation among variables and value of the correlation coefficient are always in between -1 and +1. As results indicate that market premium has positive association with asset growth and net operating asset whereas negatively correlated with the volatility premium. Moreover, asset growth has positive relationship with net operating asset and volatility premium. Moreover, net operating asset has positive correlation with volatility. Conclusively, there exists positive relationship among all the variables irrespective of volatility and market premiums.

Table 4.4 :Market Premium and Equity Returns

Portfolios	Description	Constant	Rm-Rf	adj r2	F-statistics	p value
S1	Co-efficient	0.0133	0.6786	0.0008	1.200	0.274
	t statistics	1.3051	1.0957			
	p - value	0.1931	0.2743			
S2	Co-efficient	0.053	0.558	0.118	32.568	0.000
	t statistics	4.827	5.707			
	p - value	0.000	0.000			
S3	Co-efficient	0.030	0.306	0.029	8.136	0.005
	t statistics	2.538	2.852			
	p - value	0.012	0.005			
S4	Co-efficient	0.031	0.404	0.074	19.940	0.000
	t statistics	3.082	4.465			

	P - value	0.002	0.000			
S5	Co-efficient	0.024	0.318	0.051	13.607	0.000
	t statistics	2.477	3.689			
	p - value	0.014	0.000			
S6	Co-efficient	0.028	0.361	0.102	27.949	0.000
	t statistics	3.729	5.287			
	p - value	0.000	0.000			
S7	Co-efficient	0.017	0.286	0.042	11.368	0.001
	t statistics	1.803	3.372			
	p - value	0.073	0.001			
S8	Co-efficient	0.029	0.256	0.038	10.367	0.001
	t statistics	3.279	3.220			
	p - value	0.001	0.002			
S9	Co-efficient	0.033	0.388	0.066	17.872	0.000
	t statistics	3.216	4.227			
	p - value	0.002	0.000			
S10	Co-efficient	0.017	0.175	0.006	2.533	0.113
	t statistics	1.385	1.592			
	p - value	0.167	0.113			
S11	Co-efficient	0.033	0.439	0.195	58.552	0.000
	t statistics	5.154	7.652			
	p - value	0.000	0.000			
S12	Co-efficient	0.029	0.345	0.038	10.328	0.001
	t statistics	2.420	3.214			
	p - value	0.016	0.002			

S13	Co-efficient	0.030	0.368	0.105	28.743	0.000
	t statistics	3.986	5.361			
	p - value	0.000	0.000			
14	Co-efficient	0.038	0.305	0.020	5.727	0.017
	t statistics	2.651	2.393			
	P - value	0.009	0.018			
S15	Co-efficient	0.043	0.388	0.043	11.609	0.001
	t statistics	3.405	3.407			
	p - value	0.001	0.001			
S16	Co-efficient	0.034	0.487	0.078	21.131	0.000
	t statistics	2.913	4.597			
	p - value	0.004	0.000			
S17	Co-efficient	0.032	0.360	0.077	20.707	0.000
	t statistics	3.637	4.550			
	p - value	0.000	0.000			
S18	Co-efficient	0.043	0.615	0.213	65.220	0.000
	t statistics	5.039	8.076			
	p - value	0.000	0.000			
S19	Co-efficient	0.039	0.507	0.064	17.173	0.000
	t statistics	2.897	4.144			
	p - value	0.004	0.000			
S20	Co-efficient	0.051	0.610	0.369	139.874	0.000
	t statistics	8.807	11.827			
	p - value	0.000	0.000			
S21	Co-efficient	0.039	0.480	0.054	14.527	0.000

	t statistics	2.810	3.811			
	p - value	0.005	0.000			
S22	Co-efficient	0.050	0.632	0.347	127.215	0.000
	t statistics	8.081	11.279			
	p - value	0.000	0.000			
S23	Co-efficient	0.047	0.577	0.064	17.221	0.000
	t statistics	3.067	4.150			
	p - value	0.002	0.000			
S24	Co-efficient	0.037	0.489	0.194	58.042	0.000
	t statistics	5.206	7.619			
	p - value	0.000	0.000			
S25	Co-efficient	0.051	0.727	0.206	62.419	0.000
	t statistics	4.989	7.901			
	p - value	0.000	0.000			

Table 4 reports the impact of market premium on return of portfolios from S1 to S25 and concluded that there is a positive and significant impact of size sorted portfolios on market returns from S2 to S9 and S11 to S25, irrespective of S1 and S10. Adjusted R-Square shows the explanatory power of regression models. Here, Adjusted R-square shows the values of small cap and large portfolios, sorted from S1 to S25 respectively.

Adjusted R-Square has maximum value at S22 portfolio which is 0.347 and minimum value at S1 portfolio which is 0.0008. Moreover, F-Statistics tells the overall significance of the regression model so as per above results, it has been concluded that overall regression model is significant in sorted portfolios irrespective of S1 and S10.

Table 4.5: Impact of Asset Growth, Net operating Asset and Volatility on Stock Returns

	Description	**Constant**	**AG**	**NOA**	**Vol**	**Adj r2**	**F- Stat**	**P value**
S1	co-efficient	0.008	-1.107	1.072	-0.020	0.2568	28.521	0.000
	t statistics	0.960	-7.550	5.407	-0.247			
	p –value	0.338	0.000	0.000	0.805			

S2	Co-efficient	0.017	-0.517	0.008	-0.062	0.0994	9.797	0.000
	t statistics	1.882	-3.355	0.039	-0.714			
	p – value	0.061	0.001	0.969	0.476			
S3	Co-efficient	0.008	-0.325	0.094	0.297	0.028	3.297	0.021
	t statistics	0.834	-1.937	0.414	3.136			
	p – value	0.405	0.054	0.679	0.002			
S4	Co-efficient	0.000	-0.282	0.319	0.486	0.1703	17.357	0.000
	t statistics	-0.007	-2.118	1.769	6.458			
	p – value	0.994	0.035	0.078	0.000			
S5	Co-efficient	0.001	-0.601	0.378	0.198	0.0682	6.827	0.000
	t statistics	0.153	-4.519	2.101	2.638			
	p – value	0.878	0.000	0.037	0.009			
S6	Co-efficient	0.005	-0.122	-0.045	0.161	0.0154	2.249	0.083
	t statistics	0.706	-1.095	-0.296	2.545			
	p – value	0.481	0.275	0.768	0.012			
S7	Co-efficient	-0.002	-0.196	0.015	0.188	0.013	2.045	0.108
	t statistics	-0.271	-1.453	0.084	2.466			
	p - value	0.786	0.148	0.933	0.014			
S8	Co-efficient	0.009	0.071	-0.345	0.389	0.1887	19.525	0.000
	t statistics	1.412	0.619	-2.222	6.002			
	p - value	0.159	0.537	0.027	0.000			
S9	Co-efficient	0.003	0.203	-0.032	0.637	0.4792	74.307	0.000
	t statistics	0.429	1.898	-0.224	10.550			
	p - value	0.669	0.059	0.823	0.000			
S10	Co-efficient	-0.002	0.062	0.115	0.835	0.5268	89.679	0.000

	t statistics	-0.295	0.523	0.721	12.499			
	p - value	0.768	0.601	0.472	0.000			
S11	Co-efficient	0.005	-0.127	0.127	-0.017	0.0004	1.029	0.381
	t statistics	0.878	-1.269	0.943	-0.306			
	p - value	0.381	0.206	0.347	0.760			
S12	Co-efficient	0.005	0.754	-0.714	0.492	0.4306	61.238	0.000
	t statistics	0.635	5.855	-4.100	6.760			
	p - value	0.526	0.000	0.000	0.000			
S13	Co-efficient	0.004	0.276	-0.092	0.328	0.3108	36.927	0.000
	t statistics	0.807	2.943	-0.725	6.195			
	p - value	0.421	0.004	0.469	0.000			
S14	Co-efficient	0.010	0.539	-0.085	0.958	0.7194	205.237	0.000
	t statistics	1.571	5.070	-0.593	15.954			
	P - value	0.118	0.000	0.554	0.000			
S15	Co-efficient	0.011	0.315	-0.031	0.803	0.5436	95.898	0.000
	t statistics	1.560	2.573	-0.187	11.614			
	p - value	0.120	0.011	0.852	0.000			
S16	Co-efficient	-0.005	0.018	0.363	0.789	0.4931	78.488	0.000
	t statistics	-0.675	0.146	2.192	11.374			
	p - value	0.500	0.884	0.029	0.000			
S17	Co-efficient	0.005	0.262	-0.112	0.489	0.4283	60.687	0.000
	t statistics	0.842	2.695	-0.856	8.911			
	p - value	0.401	0.008	0.393	0.000			
S18	Co-efficient	0.003	0.402	-0.400	0.247	0.1786	18.327	0.000
	t statistics	0.360	3.315	-2.444	3.615			

	p - value	0.719	0.001	0.015	0.000			
S19	Co-efficient	0.007	1.041	-0.885	0.190	0.2412	26.320	0.000
	t statistics	0.716	6.074	-3.821	1.961			
	p - value	0.475	0.000	0.000	0.051			
S20	Co-efficient	0.011	0.031	0.095	0.026	-0.003	0.731	0.534
	t statistics	1.926	0.308	0.689	0.450			
	p - value	0.055	0.758	0.491	0.653			
S21	Co-efficient	-0.002	0.285	0.233	1.006	0.6762	167.358	0.000
	t statistics	-0.257	2.474	1.501	15.476			
	p - value	0.798	0.014	0.135	0.000			
S22	Co-efficient	0.011	0.127	-0.270	0.002	0.0029	1.235	0.298
	t statistics	1.701	1.177	-1.857	0.030			
	p - value	0.090	0.240	0.065	0.976			
S23	Co-efficient	0.003	0.940	-0.627	0.933	0.6899	178.258	0.000
	t statistics	0.461	7.537	-3.720	13.242			
	p - value	0.645	0.000	0.000	0.000			
S24	Co-efficient	0.004	0.469	-0.183	0.221	0.3152	37.676	0.000
	t statistics	0.796	5.089	-1.472	4.254			
	p - value	0.427	0.000	0.142	0.000			
S25	Co-efficient	-0.002	0.270	0.385	0.596	0.4855	76.181	0.000
	t statistics	-0.265	2.342	2.465	9.142			
	p - value	0.791	0.020	0.014	0.000			

Table 05 reports the impact of asset growth, volatility and net operating assets premiums in explaining equity returns. Results of Asset growth indicate that portfolios including S1, S2, S3, S4 and S5 have negative and significant effect on returns whereas S6, S7 and S11 have negative but insignificant impact. On the other hand, portfolios including S9, S12, S13, S14, S15, S17, S18, S19, S19, S24 & S25 have positive and significant impact on returns whereas portfolios including S8, S12, S16, S20 S24 have positive and insignificant effect.Moreover, results of Net Operating Asset indicates that portfolios including S8, S12, S18, S19 & S23 have negative and significant impact on returns whereas portfolios including S6, S9, S13, S14, S15, S17, S22 & S24 have negative but insignificant impact on returns. On the other hand, portfolios including S1, S5, S16 & S25 have positive and significant impact on returns whereas portfolios including S2, S3, S4, S7, S10, S11, S20 & S21 have positive but insignificant impact.As far as Volatility premium is concerns, the results indicate that portfolios including S1, S2 & S11 have negative and insignificant impact on returns. Furthermore, portfolios including S3, S20 & S22 have positive but insignificant impact whereas portfolios including S4,S5, S6, S7, S8, S9, S10, S12, S13, S14, S15, S16, S17, S18, S19, S21, S23, S24 &S25 have positive and significant impact on returns. The explanatory power of the model remains between 4% to 71.

Table 4.6: Impact of Mkt. Prem., Asset Growth, Net Operating Asset & Volatility Prem. on Equity Ret.

	Description	Constant	RM-RF	AG	NOA	Vol	Adj r2	F-Stat	P-value
S1	Co-efficient	0.014	0.101	-1.150	1.058	0.007	0.264391	22.295	0.000
	t statistics	1.323	1.081	-7.851	5.379	0.084			
	p – value	0.187	0.281	0.000	0.000	0.933			
S2	Co-efficient	0.017	0.056	0.611	-0.624	-0.001	0.241748	19.890	0.000
	t statistics	1.882	5.540	6.685	-4.362	-0.003	-0.134		
	p – value	0.061	0.000	0.000	0.000	0.998	0.894		
S3	Co-efficient	0.030	0.346	-0.400	0.086	0.337	0.069426	5.420	0.000
	t statistics	2.519	3.265	-2.414	0.386	3.596			
	p – value	0.012	0.001	0.017	0.700	0.000			
S4	Co-efficient	0.028	0.438	-0.362	0.320	0.524	0.258457	21.651	0.000
	t statistics	3.046	5.365	-2.837	1.866	7.268			
	p – value	0.003	0.000	0.005	0.063	0.000			
S5	Co-efficient	0.024	0.370	-0.674	0.387	0.232	0.138955	10.562	0.000
	t statistics	2.608	4.463	-5.197	2.223	3.165			
	p – value	0.010	0.000	0.000	0.027	0.002			
S6	Co-efficient	0.028	0.384	-0.197	-0.033	0.194	0.131201	9.948	0.000
	t statistics	3.746	5.662	-1.857	-0.229	3.245			

	p – value	0.000	0.000	0.065	0.819	0.001			
S7	Co-efficient	0.017	0.315	-0.271	0.014	0.227	0.068232	5.339	0.000
	t statistics	1.789	3.726	-2.053	0.078	3.045			
	p – value	0.075	0.000	0.041	0.938	0.003			
S8	Co-efficient	0.027	0.274	0.036	-0.339	0.402	0.230589	18.757	0.000
	t statistics	3.443	3.807	0.320	-2.245	6.330			
	p – value	0.001	0.000	0.749	0.026	0.000			
S9	Co-efficient	0.027	0.395	0.121	-0.035	0.678	0.554367	74.707	0.000
	t statistics	3.835	6.181	1.211	-0.261	12.002			
	p – value	0.000	0.000	0.227	0.794	0.000			
S10	Co-efficient	0.010	0.191	0.022	0.114	0.854	0.538381	70.103	0.000
	t statistics	1.166	2.521	0.188	0.715	12.797			
	p – value	0.245	0.012	0.851	0.475	0.000			
S11	Co-efficient	0.033	0.455	-0.217	0.129	0.026	0.209104	16.665	0.000
	t statistics	5.244	7.918	-2.415	1.072	0.515			
	p – value	0.000	0.000	0.017	0.285	0.607			
S12	Co-efficient	0.024	0.321	0.691	-0.707	0.522	0.464574	52.410	0.000
	t statistics	2.730	3.965	5.459	-4.160	7.303			
	p – value	0.007	0.000	0.000	0.000	0.000			
S13	Co-efficient	0.027	0.361	0.207	-0.088	0.360	0.413407	42.757	0.000
	t statistics	4.346	6.456	2.365	-0.750	7.282			
	p – value	0.000	0.000	0.019	0.454	0.000			
S14	Co-efficient	0.028	0.291	0.478	-0.090	0.989	0.742108	171.497	0.000
	t statistics	3.813	4.416	4.627	-0.651	16.982			
	p – value	0.000	0.000	0.000	0.516	0.000			

S15	Co-efficient	0.036	0.389	0.239	-0.034	0.840	0.590518	86.445	0.000
	t statistics	4.275	5.181	2.034	-0.218	12.676			
	p – value	0.000	0.000	0.043	0.828	0.000			
S16	Co-efficient	0.027	0.504	-0.083	0.355	0.839	0.583413	83.977	0.000
	t statistics	3.361	7.014	-0.736	2.350	13.218			
	p – value	0.001	0.000	0.462	0.020	0.000			
S17	Co-efficient	0.028	0.360	0.192	-0.119	0.524	0.509775	62.613	0.000
	t statistics	4.274	6.192	2.113	-0.977	10.195			
	p – value	0.000	0.000	0.036	0.330	0.000			
S18	Co-efficient	0.041	0.609	0.288	-0.394	0.300	0.38817	38.591	0.000
	t statistics	5.423	9.002	2.721	-2.771	5.018			
	p – value	0.000	0.000	0.007	0.006	0.000			
S19	Co-efficient	0.037	0.457	0.965	-0.889	0.225	0.293877	25.659	0.000
	t statistics	3.081	4.264	5.760	-3.951	2.381			
	p – value	0.002	0.000	0.000	0.000	0.018			
S20	Co-efficient	0.050	0.617	-0.089	0.094	0.084	0.372214	36.129	0.000
	t statistics	8.696	11.883	-1.091	0.863	1.832			
	p – value	0.000	0.000	0.277	0.389	0.068			
S21	Co-efficient	0.029	0.482	0.201	0.224	1.046	0.734673	165.059	0.000
	t statistics	3.926	7.160	1.907	1.582	17.590			
	p – value	0.000	0.000	0.058	0.115	0.000			
S22	Co-efficient	0.051	0.640	0.014	-0.265	0.053	0.357993	34.039	0.000
	t statistics	8.243	11.420	0.164	-2.254	1.072			
	p – value	0.000	0.000	0.870	0.025	0.285			
S23	Co-efficient	0.038	0.548	0.841	-0.634	0.981	0.751515	180.195	0.000

	t statistics	4.786	7.589	7.436	-4.180	15.366			
	p – value	0.000	0.000	0.000	0.000	0.000			
S24	Co-efficient	0.034	0.467	0.388	-0.180	0.258	0.492953	58.603	0.000
	t statistics	5.967	9.107	4.830	-1.668	5.690			
	p – value	0.000	0.000	0.000	0.097	0.000			
S25	Co-efficient	0.044	0.720	0.139	0.388	0.657	0.688438	131.921	0.000
	t statistics	6.758	12.376	1.530	3.173	12.797			
	p – value	0.000	0.000	0.127	0.002	0.000			

Finally, market risk factor is added with rest of the factors. Table 6 reports the impact of market premium on return of portfolios from S1 to S25 and concluded that there is a positive and significant impact of size sorted portfolios on market returns from S2 S25, irrespective of S1. Results of asset growth premium indicates that portfolio including S1, S3, S4, S5, S6, S7 & S11 have negative and significant impact on stock returns whereas portfolios including S16 & S20 has a negative and insignificant impact. On the other hand, portfolios from S2, S12, S13, S14, S15, S17, S18, S19, S23 & S24 have positive and significant impact on stock returns whereas portfolios including S8, S9, S10, S21, S22 & S25 have positive and insignificant impact on returns. In addition, results of net operating asset premium indicates that portfolio including S2, S8, S12, S18, S19, S22 & S23 have negative and significant impact on returns whereas portfolios from S6, S9, S13, S14, S15, S17 & S24 have negative and insignificant impact. On the other hand, portfolios including S1, S5, S16, S20 & S25 have positive and significant impact on returns whereas portfolios including S3, S4, S7, S10, S11 & S21 have positive and insignificant impact on returns. Moreover, results of volatility premium indicate that portfolio S2 has negative and insignificant impact on returns. However, portfolios including S3,S4, S5, S6, S7, S8, S9, S10, S12, S13, S14, S15, S16, S17, S18, S19, S21, S23, S24 & S25 have positive and significant impact on return whereas portfolios including S1, S11, S20 & S22 have positive and insignificant impact. The explanatory power of the model remains between 6.94% to 89%.

CONCLUSION

According to asset pricing theories only risk-adjusted returns can be earned by the investor which means that higher the risk, higher will be the returns and there is no other way to earn abnormal returns. Whereas after Roll’s critique (1977) different anomalies have been identified by which one can earn abnormal returns by adopting such strategies. Time series regression is applied to find the relationship between premiums of investment strategies used in the study and the returns of size-sorted portfolios.

It is found that market premium is able to explain equity returns similarly volatility premium has positive and significant relationship with equity returns which indicates that volatility premiums are able to predict equity returns which proves that hypothesis 3 alternate hypothesis is accepted. Whereas asset growth and net operating asset premium has mixed relationship with the returns of size sorted portfolio which indicates that these strategies are able to predict equity returns differently in Pakistani equity market. So, net operating assets and asset growth strategies are left with the discretion of the investor as they have shown mixed pattern for investment purpose in the Pakistani market.

On the basis of research there is need that Investors should practice volatility investment strategies. While net operating assets and asset growth strategies are left with the discretion of the investor as they have shown mixed pattern for investment purpose in the Pakistani market. Managers are advised to finance operating assets through short term obligation in order to better off the financial worth of the shareholders. Similarly, corporate financial managers should finance long term asset by debt financing in order to better off net worth of the shareholders and to remove uncertainty. In future study can be extended by using different portfolio formation and holding period windows. Further studies can use larger sample size to confirm the findings of this study. This study is focused on the emerging market of Pakistan. The same study can be conducted on the other emerging markets of the world to ensure the consistency of the results.

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