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IMPACT OF FIRM'S CHARACTERISTICS ON STOCK RETURN: A CASE OF NON-FINANCIAL LISTED COMPANIES IN PAKISTAN

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ABSTRACT

The unique characteristics of the firms have some power to predict the expected returns. This study was conducted with an attempt to bridge the gap in the literature by offering empirical evidence about firm's characteristics and their effect to stock returns. The secondary data of 307 Non-financial companies listed in Karachi Stock Exchange (KSE) were collected from the B-Recorder and Basic Balance Sheet Analysis (BBA) issued by the State Bank Of Pakistan for the period from 2000 to 2012. Market Capitalization (MC), sales Growth (SG), Earnings per Share (EPS) and Book to Market value (BMV) were taken as independent variables while Stock Market Returns as dependent variable. First two independent variables were used as proxies for size effect while later as value effect. Economic techniques like Correlation Matrix, Multiple regression analysis, Unit root test and Granger Causality were applied for empirical testing of the data. Results revealed that MC, EPS and BTM value had significant impact while sales growth had no effect on stock market returns.

Keywords: Stock market returns, Size effect, Value effect, Firm characteristics.

INTRODUCTION

The companies can be distinguished from one another on the basis of different financial and non financial characteristics including size, value, profitability, structure etc. These characteristics are unique to specific companies and raise a perception in the mind of the users of that information

regarding the performance and future of the company. In the current scenario where all critical decisions of firm management quickly reach the markets as well as information users, an important issue regarding financial research is the impact of these characteristics on returns of stocks.

The value of a company can be determined in many different ways. There are also just as many different ways to determine the value of its stock. The most basic and easiest to understand way to measure this value, both the company and the stock, is to look at the company's market value. This is also known as the company's market capitalization, or its market cap. Market capitalization is the value you get when you multiply all the outstanding shares of the company's stock by the current price of a single share.

The stock exchange is an exceedingly fluid, dynamic and engaging entity. It facilitates thousands of transactions which occur simultaneously from traders striving to outbid and outsell each other. From the moment it opens there is unceasing activity until the second it closes. Decisions to buy, sell or hedge are based on analysis of sophisticated theoretical models or the instinct of a speculator. New information about company developments and stock recommendations are continuously made available while papers are released on new and different ways in which the market can be exploited. But can the market really be exploited?

Investigators such as Banz (1981) and (Fama and French, 1992) have also found a strong relationship between company size (measured by total market capitalization) and returns. Smaller firms appear to generate higher returns than larger firms. Again, the interpretation of these results is controversial. The excess returns of small firms can be interpreted as inefficiency, but they also may represent compensation for bearing risk. Smaller companies may be far more sensitive to economic shocks than are larger firms. Market Capitalization is total market value of a company's equity. It is one of many ways to value a company and is calculated by multiplying the price of the stock by the number of shares issued. If a firm has one type of stock its market capitalization will be the current market share price multiplied by the number of shares. However, if a company has multiple types of equities then the market cap will be the total of the market caps of the different types of shares.

Sales and income growth can be expected to influence rate of return and market value measures in both simulated and actual industries. It is unclear if growth in one year will affect profitability and market value measures in a succeeding year in simulated and actual environments. Asset growth, which can be used as a proxy for plant and equipment expenditures, and research intensity, may also affect sales and income growth in a base year or succeeding year, indirectly affecting profitability and market value.

One can interpret such findings as being inconsistent with efficient markets. Portfolios made up of stocks with low market values (MV) relative to book values (BV) earn excess risk-adjusted returns when risk is measured by beta from the Capital Asset Pricing Model (CAPM). But any test of market efficiency is a joint test of the relationship of returns to MV/BVs and the efficacy of CAPM's beta to fully measure risk. According to Fama and French, the ratio of market value to book value itself is a risk measure, and therefore the larger returns generated by low MV/BV stocks are simply a compensation for risk. Low MV/BV stocks are often those in some financial distress.

Profitability of the firm is another dimension of the firm's characteristics focused in this study. EPS (Earning per share) usually have significant positive influence on market return as shown in many past researches. This indicates that the higher the firm's EPS, the higher market adjusted return and abnormal return that can be resulted by firm's stock, because a higher EPS means higher profit obtained from every dollar price earned by the firm. Investors/shareholders consider current earnings, future earnings, and earnings stability are important, thus they focus their analysis on firm's profitability. They concern about financial condition which will affect firm's ability to pay dividend and avoid bankruptcy.

Karachi Stock Exchange (KSE)

The Karachi Stock Exchange (KSE) is Pakistan's first and one of the oldest stock exchanges in emerging markets. KSE was established in 18 September 1947 just two months after Pakistan became an independent state. The other exchanges in Pakistan, the Lahore Stock Exchange (LSE) and the Islamabad Stock Exchange (ISE), were established in 1974 and 1997 respectively. A recent estimate shows that approximately 85% of the turnover occurs at KSE, 14% at LSE and 1% at ISE. The following discussion is devoted to the KSE unless otherwise stated. At the end of year 2007, 671 companies were listed on the exchange with a combined market capitalization of US$70.18 billion and listed capital of US$12 billion. According to the Pakistan Economic Survey (2007), for the fiscal year 2006-2007 Pakistan's GDP is estimated to be US$143 billion. This makes market capitalization approximately 49% of the GDP.

Research Objective

Following are the objective of this research:

1. To find out whether there is any relationship between size effect and stock return of public limited companies in Pakistan.
2. To find out whether there is any relationship between value effect and stock return of public limited companies in Pakistan.
3. To find out the extent to which the profitability of the firm affects the expected stock return of Pakistani firms
4. To suggest the investor on different investing strategies based on firm characteristics.

LITERATURE REVIEW

(Fama and French, 1992) showed that the two variables of firm characteristic, firm size and book-to market (B/M) ratio, pooled together can take the place of the market beta in explaining the cross-sectional variation in stock returns. Moreover, firm size had a negative effect (known as "size effect"), while B/M had a positive effect (known as "value effect"), on stock returns. They found that the two non-market risk factors SMB (the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks) and HML (the difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks) were useful factors to explain equity returns variation. .

Christian (2005) discussed risk-return tradeoff which is fundamental to finance. Previous studies found weaker relationship between the risk premium on the market portfolio and variance of its return in spite of the positive relationship. He explained this weakness is due to the fact of small nature of available data, as an extremely large number of time- series observations are required to precisely estimate this relationship. His main focus was on large span of data of each component required to compute the risk-return trade off which is indispensable for theory of finance.

(George and Hwang, 2007) examined how financial distress and leverage affect stock returns. They constructed a regression model that expanded the FF 3-factor model with factors for leverage, momentum (different to the factor used by Carhart (1997), and default risk prediction, and tested U.S. stock returns between 1963 and 2003. Their paper documented that average returns on stocks are negatively related to book leverage, and the leverage factor explained a significant component of time series variations in returns in contradiction to (Fama and French, 1992). George and Hwang concluded that BE/ME measures sensitivity to operating distress risk, while leverage measures sensitivity to financial distress risk, and that both are priced in equity markets. Their interpretation was that leverage and BE/ME factors appear to capture different return premiums.

Huseyin (2008) justified the reason behind the practice of counter cyclical variations of expected value Premium. They concluded their study on time varying expected returns of value versus growth stock using two-state Markov switching framework of (Perez and Timmermann, 2000) that in recessions the expected excess returns of value stocks were most strongly affected, and the expected excess returns of growth stocks were least affected, by worsening economic conditions as measured by higher one-month Treasury bill rates and higher default spreads. Safi and Faisal (2008) while studying Pakistan's stock market, examined empirical causal relationships between trading volume, stock return and return volatility in Pakistan's stock market. The paper focused on the question that whether information about trading volume is useful in improving forecasts of returns and return volatility in a dynamic environment. The study found that there is a feedback relationship between trading volume and stock returns, which is consistent with the theoretical

models that imply information content of volume affects future returns. These findings supported the argument of Gallant, Rossi and Tauchen (1992) that more can be learned about the stock market through studying the joint dynamics of stock prices and trading volume than by focusing only on the single dynamics of stock prices.

Amir (2011) confirmed an inverse relationship between firm size and return, yet with two qualifications. First, the link was stronger during the bull market period (prosperous) than during the bear market period (slump); and second, the momentum effect surpasses the size effect at least in a risk-based specification. The relationship between momentum, firm size and book-to-market warranted a closer look. Hence small tend to be value firms and firms with strong momentum trading. These were the firms which underperform large firms in down markets but outperform in up markets. They in their paper used an instrumental variable estimation to address Berk's critique of a simultaneity bias in prior studies on the small firm effect and to investigate the economic rationale behind firm size as an explanatory variable for the variation in stock returns. The results showed that firm size captures firm characteristic components in stock returns and that this regularity could not be explained by differences in systematic variations.

Xiao-Ming and Xiaoguang (2010) examined the effects of firm characteristics on stock returns for China's investable firms specifying 12 alternative panel regression models to ensure the robustness of results, taking into account several issues e.g. errors in beta estimates, possible flat return-beta relation, and results being sensitive to different proxies for market portfolios, outlier problem, and the possible January effect.

RESEARCH METHODOLOGY

For the purpose of analysis first of all stock price data of all non financial listed companies were collected on the last financial day of the Company i.e. in December of each year. The share price data was then converted into return data to make it suitable for further estimation. For this purpose holding Period Yield was calculated for each year using the formula

$$\mathbf{Hpy} = \frac{(\mathbf{Pn}-(\mathbf{Pn}-\mathbf{1}))}{\mathbf{Pn}-\mathbf{1}} * \mathbf{100} \quad \text{.....(i)}$$

While Pn = Price of the stock in current Year

P_{n-1} = Price of the stock in last Year

Independent Variables

There were chosen four independent variables and tried to identify how they affect on determination of stock returns of the firm. The independent variables were:

Sales Growth

$$\textbf{Sales growth} = \frac{NSn-(NSn-1)}{NSn-1} * 100 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\textbf{(ii)}$$

While NSn = Net sales of the Firm in current Year

NS_{n-1} = Net sales of the Firm in last Year

Sales growth, here, is the percentage increase or decrease in sales of the Company between two years.

Earnings per share was the net earnings after tax per share of the Company and is calculated as Earnings per share = net earnings after tax/ No. of outstanding shares.

Book to Market Value (B/M Value) was the ratio of book value of the firm stock to Market value of the firm stock. Whereas the book value of stock is calculated by deducting the total assets from its total liabilities. Negative Book to Market value of the firm for any particular year is ignored for the purpose of analysis.

Market Capitalization of a firm, here was a product of Market Price per share and No. of outstanding Share .i.e. Market Capitalization = MPS * No. of outstanding shares

THE STATISTICAL MODEL

Descriptive Statistics

Descriptive statistics were used to describe the basic features of the data in a study. They provided simple summaries about the sample and the measures. Together with simple graphics analysis, they formed the basis of virtually every quantitative analysis of data. Descriptive statistics explained the behavior of stock returns that which market does have high return and which markets do have low returns. It also explained the volatility in returns. Descriptive statistics includes mean of returns, maximum and minimum values, Standard Deviation and Variance.

Correlation Matrix

It is an econometric technique which is used to describe the degree of relationship between the two variables. In this study the relationship between rate of return of south Asian and developed stock markets were estimated by using the following formula:

$$r = \frac{SS(xy)}{\sqrt{SS(x)\ SS(y)}}$$

There are three types of relationships. Such as

(i) +1 perfect positive relationship

(ii) -1 perfect negative

(iii) 0 no correlation

Unit Root Test

As the data evolved were of time series in nature. It is necessary to check its stationarity before the application of any economic technique. For this purpose the most frequently used ADF test was applied. For unit root analysis, the model applied was

$$\Delta Y_t = (\rho - 1)\ Yt-1 + U_t = \delta Y_t - 1 + U_t$$

Where

Y_t is the variable of interest,

t is the time index,

ρ is a coefficient,

U_t is the disturbance term.

Where Δ is the first difference operator

δ < 0 then it indicates that data series stationary and vice versa

Co-integration Test

Co integration analysis was, firstly used by Johansen & Josuilius. It can be applied to test the existence of r co integrating vectors. (1) Maximal Eigen value, the maximal Eigen value test the null hypothesis that the no of Co-integrating relationships was less than or equal to or against the alternative r+1. (2) The Trace statistics. The trace statistic is the null hypothesis of r Co-integrating against the alternative of r or more Co-integrating vectors.

Granger Causality Test

In next step Granger Causality test was applied. It is the test which helps researchers to determine the direction of cause i.e whether

$$Y \leftrightarrow X$$

In order to test this hypothesis the F test in the form given below was applied

$$F = (RSS_r - RSS_{ur})/ M \div (RSS_{ur}/n-k)$$

Where

RSSr is the restricted residual sum of squares

RSSur is the unrestricted residual sum of squares

M is the lag term and n-k is the degree of freedom.

If the computed value exceeds critical value of F at some chosen level of significance, then null hypothesis rejected and it is concluded that Y is the cause of X. Such test could be repeated for identification of cause for other variables as well.

Multiple Regression Analysis

A multiple regression model was applied to test the significance of independent variables on dependent variable. The model is as follow

HPYn = α + β1 (SGn-1) + β2 (EPS n-1) + β3 (BMV n-1) + β4 Ln (MCn-1) + Є…….. (vii)

In the above model, the stock market returns is dependent variable while the sales growth rates, Earning per Share, Book to Market Value, and Market Capitalization are independent variables.

Hypotheses

Following hypothesis of the study has been confirmed by applying the above explained methodologies.

HYPOTHESIS: 1

H_{01} Market Capitalization of firms has no impact on stock Market Returns.

HYPOTHESIS: 2

H_{02} EPS of firms has no linkage with Stock Market Returns.

HYPOTHESIS: 3

H_{03} BMV of firms has no association with Stock Market Returns.

HYPOTHESIS: 4

H_{04} Sales growths of firms have impact on Stock Market Returns.

Data Analysis

Descriptive Statistics

Table-1.

Descriptive Statistics	Stock Return(HPY)	EPS	BMV	Sales growth	Market Cap.
Mean	0.302478003	-15.80072704	1.730780175	29.18310421	1504.394777
Standard Deviation	0.823678376	621.7594599	5.782901848	304.2072198	904.293236
Minimum	-0.9914921	-38.00	0	-117.3154753	0.855555556
Maximum	12.00236407	121.4	111.20269	12494.2	180324.364
Count	2745	2745	2745	2745	2745

The data given in Table-1 showed the result of descriptive statistics. The mean value of stock returns was 0.30 with standard deviation 0.82 indicating greater volatility in the stock returns. Average Earning per share of all selected firms is -15.80 that clearly depict not good scenario of Pakistani stock exchange with the high variation of 1621.75. Average book to market value (B/M value) of the firm is 1.73 with relatively smaller standard deviation i.e. 5.783 that shows apparently the undervaluation of the stock having future probability of rise in prices as per the empirical evidences of Banz (1981) and (Fama and French, 1992).

Correlation Matrix

Table-2.

	Stock Return(HPY)	EPS	BMV	Sales growth	Market Cap.
Stock Return(HPY)	1				
EPS	-0.03	1			
BMV	0.04	-0.116538527	1		
Sales growth	0.010	0.006136013	-0.01610	1	
Market Cap.	0.06	0.005326026	-0.05021	-0.00884	1

In Table-2 Correlation matrix showed that share return had a weak but negative relationship with earning per share i.e. 0.03 and positive (weak) relationship with book to market ratio. It had positive (weak) correlation with sales growth and market capitalization as well.

Regression Statistics

Table-3.

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95.0%
Intercept	0.2789	0.017697213	15.7623124	1.19828E-53	0.244247	0.31365
Market Cap.	0.0523	1.73729E-06	3.011304109	0.0036250	1.82497E-06	8.64E-06
EPS	0.0876	2.54226E-05	2.08969211	0.01897364	-4.753E-05	5.21E-05
BMV	0.0056	0.002737098	2.077269196	0.02786663	0.00031705	0.01105
Sales growth	5.714E-06	5.16156E-05	0.1118101	0.910982148	-9.5432E-05	0.000107

The Regression result given in table-3 indicated that MC, EPS, BMV had positively significant impact of on stock returns. The impact of sales growth was positive but insignificant.

Unit Root Test

ADF result in table-4 indicating that the time series data was stationary at same level as the values all coefficients below zero. Thus the time series data had unit root.

Granger Causality Test

Lastly, the assumption of joint causality between the dependent and Independent variables was tested on data. The Granger approach to causality used on the past information of both the variables. To test the causality, two regression equations were set. The results of Granger Causality were reported in Table-5 given below. Rejection of the null hypothesis at 5% indicates existence of unidirectional Granger causality between variables as mentioned in table-5.

Table-4.

	ADF (Level)	Phillips-Perron (level)
BMV	-10.97053	-19.9194
EPS	-14.50813	-52.12007
Market Cap.	-11.20178	-14.97736
MPS	-12.05268	-26.82372
SALE GROWTH	-17.26522	-51.58263

Appendix

Table-5.

Pair wise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
EPS does not Granger Cause BMV	2743	0.00391	0.9502
BMV does not Granger Cause EPS		0.01134	0.9152
MKTCAP does not Granger Cause BMV	2743	0.68929	0.4065
BMV does not Granger Cause MKTCAP		2.29631	0.1298
SALEGROWTH does not Granger Cause BMV	2743	0.05546	0.8138
BMV does not Granger Cause SALEGROW TH		0.41424	0.5199
RETURN does not Granger Cause BMV	2743	3.67848	0.0552
BMV does not Granger Cause RETURN		24.851-03	7.00E-07
MKTCAP does not Granger Cause EPS	2743	0.01665	0.8973
EPS does not Granger Cause MKTCAP		4.80E-05	0.9945
SALEGROWTH does not Granger Cause EPS	2743	0.00031	0.9859
EPS does not Granger Cause SALEGROWTH		0.00031	0.9859
RETURN does not Granger Cause EPS	2743	0.26795	0.6048
EPS does not Granger Cause RETURN		0.06722	0.04954
SALEGROWTH does not Granger Cause MKTCAP	2743	0.04263	0.8364
MKTCAP does not Granger Cause SALEGROWTH		0.00295	0.9567
RETURN does not Granger Cause MKTCAP	2743	2.21354	0.1369
MKTCAP does not Granger Cause RETURN		0.02305	003793.
RETURN does not Granger Cause SALEGROWTH	2743	0.04186	0.8379
SALEGROWTH does not Granger Cause RETURN		0.33599	0.5622

CONCLUSIONS

By the empirical results of econometric techniques applied, it is concluded that MC, BMV, EPS have positive significance impact of stock return while the impact of sales positive but not statistically significant. The insignificant impact of sales growth might be due to presence of very Weak form of Efficiency in Pakistani Equity market. The Study found a support for the impact of firm's size on Pakistani stock returns. The Study also acknowledged a value effect on the Pakistani stock market as both variables i.e. BMV and EPS have positive impact on it.

RECOMMENDATIONS

Due to emerging nature of market and prevailing weak form of efficiency, the FF single factor model is not yet completely dead in Pakistan and can still be used as a determinant of stock returns

in Pakistani stock Market as its yet unable to encompass the impact of wider firm characteristics of return determinations. Since a set of mutually exclusive alternate variables of firm's characteristics can be used to examine its impact on stock returns so it opens the doors of further study that may require more variables and other analysis technique.

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