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Financial Ratios and Stock Return Predictability (Evidence from Pakistan)

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Abstract

The purpose of this research article is to investigate the ability of earning yield (EY), dividend yield (DY) and book-to-market ratio (B/M), to predict stock returns. The sample of the study consists of 100 non-financial companies listed in the "Karachi Stock Exchange". The duration of the study is 7 years from 2005 to 2011. To find whether EY, DY and B/M ratios can predict stock returns we have used generalized least square and panal data models. The results indicate that DY and EY ratios has direct positive association with stock return where as B/M ratio has significant negative relationship with stock return. Therefore we can say that the above mentioned ratios are able to predict stock returns, furthermore it can be seen that as compare to dividend yield and earning yield the ratio of book to market has the highest predictive power. Moreover when we combine these financial ratios the predictability of stock returns will enhance.

Keywords: Financial ratios, Stock return, Karachi Stock Exchange, Dividend Yield, Earning Yield.

1. Introduction

Stock Market plays a very significant role in the economic growth of a country. According to A. Schrimpf (2010) there is significant economic aftermath of the existence of stock return predictability. S. Kheradyar et al, (2011), "The Analytics of Economic Time Series", states that in stocks market share prices move randomly i.e. on certain day share prices are like to go down as they were like to up. Such random behavior worried some of the financial economists and followed by further research. Hence such random movement of share prices lead to a hypothesis called Random Walk Hypothesis. Random walk hypothesis suggest that it is difficult to predict share prices because stock prices evolved, now it will be showing upward trend but after some time such might be showing downward trend. Hence predicting 100% accuracy of stock return is almost impossible. In contrast to Random Walk Behavior is efficient market hypothesis. According to efficient market hypothesis share prices are fairly priced in the stock market or prices of stock demonstrates information in the market is widely and equally available to all and no one in the market can outperform or can beat the market.

With the passage of time researchers tries to find out most accurate variables for predicting stock prices, some were tend towards financial and some were towards profitability ratios i.e. book to market ratio, price to earnings ratio,

dividend yield, etc some were tend towards cash flow ratios like price to cash flow ratio, cash burn ratio, etc and some focused on macroeconomic variable like interest rate, law and order situation and inflation rate etc.

In this research article we have investigated 3 above mentioned ratios to determine whether they predict stock returns. This research study has used the stock return and the above mentioned financial ratios association at two samples as the foundation for the formulation of Eight hypotheses. On the grounds of their appropriate regression models the eight hypotheses are divided into two sets. In this study we have used the two models of simple and multiple regressions to apply Predictive regression; it is an important tool for predicting stock returns. A set of panal data is used for the formulation of these two models. For tackling the problem of heteroskedasticity and non-normality distributed residuals, we applied generalized least squares method.

2. Literature Review

Campbell and Shiller (1988) stated in their study that as dividend yield has the ability to confine expected return and expectation about growth in dividend yield so dividend yield is good predictor of stock return. Chan, L. Hamao, Y. Yakonishok, J. (1991), found that in Japanese market fundamental variables like dividend yield, price to earnings ratio, book to market ratio and firm's size have significant impact on expected earning/returns of stocks. They notify that there is indirect relationship between earning yield and stocks returns in Japan. In comparison of the size of the firm and earning yield, B/M and dividend yield (cash flow yield) are significantly related with returns of stocks. They further added that an important variable both economically and statistically is book to market ratio and this need to be observe because either the afterward half of the sample is judged or for the first time test is applied the book to market ratio shows it continuation.

Mukerji, S. Dhatt, M. Kim, Y. (1997), on Korean Stock market for a period of 1982-1992 establish a direct relationship between return of stocks and D/E, S/P and B/M, moreover an indirect relationship between size of firm and return of stocks. They demonstrated that P/E ratio is less trustworthy indicator than B/M and S/P. Beta is a week proxy for assessment of risk when compare with debt to equity ratio. B/M and S/P are responsible for the direct relationship between return of stocks and debt to equity. However a P/E and B/M ratio becomes the base for indirect relationship between return of stocks and size of the firm. Kothari and Shanken (1997) found for US market that dividend yield and book to market ratios have dependable proof for expected real return over a period 1926-1991, and there lies a track of time series variations. Pontiff and Schall (1998) stated that as for predicting power is concerned book to market ratio has some predictability power for predicting stock returns. Lewellen (2002) conducted his study in US he found that predictability power of dividend yield for predicting stock returns is more than P/E and B/M ratios. Ang, A., and Bekaert, G., (2006), in their studies tried to forecast interest rate and stock returns with the help of predictive power of dividend yield. They found for short term forecasting, dividend yield predictive power is more than the long term forecasting. But as for the expected growth of cash flow prediction is concerned than dividend yield is a good predictive variable.

Akyol, A. (2006), "analyzed the effect of firm's size, beta, and book-to-market value on the stock returns in Istanbul stock exchange. He used data from July 1993 to December 2005 for Istanbul Stock Exchange and used Fama and French (1992) methodology to construct portfolios represented accurately by size-beta and then size-book-to-market, he found that book to market and Beta of a firms have no effect on the stock return's in Istanbul stock exchange. Size of the firm was the only variable which was negatively related to the stock returns in Istanbul stock exchange. He also found that book to market, size and beta is not related with January effects. Hjalmarsson, E. (2004), in his study tried to find out Global stock returns predictability. He took twenty thousand monthly observation form forty international stock markets. In which 24 were of developed economy and 16 were of developing economy. However his study showed that dividend yield and price to earnings ratio has little power of predictability and defends his conclusion by adding that international result is showing deviation from traditional view because the method use internationally may not count for determination of variables.

2.1 Hypotheses

H1: return of stock and DY has no association in time (t) and (t-1) respectively in sample one.

H2 return of stock and EY has no association in time (t) and (t-1) respectively in sample one.

H3: return of stock and B/M has no association in time (t) and (t-1) respectively in sample one.

H4: return of stock and DY has no association in time (t) and (t-1) respectively in sample two.

H5: return of stock and EY has no association in time (t) and (t-1) respectively in sample two.

H6: return of stock and B/M has no association in time (t) and (t-1) respectively in sample two.

H7: return of stock and DY, EY, B/M combination has no association in time (t) and (t-1) respectively in sample one.

H8: return of stock and DY, EY, B/M combination has no association in time (t) and (t-1) respectively in sample two.

3. Research Methodology

In order to check predictability power of earning yield, dividend yield and book to market ratios for predicting stock returns the study has taken a sample of 100 firms for a period of 2005-2011. We have applied certain screening criteria's for companies to be included in the sample. First, the firm must be listed on the KSE before Jan 1st 2005. 2nd, for more than twelve months a stock must not be deferred. 3rd, for the study period of seven years a company stock must not be delisted. 4th, data must be available for all sample firms and variables. Finally, for a period of more than twelve months the dividend yield of firms must not be zero. The study has divided the selected firms into two equal samples, which will reduce the effects of random sampling errors and for the predictive regression two samples produce different estimation. The study is based on secondary data, which is collected from, "State Bank of Pakistan", company's annual reports, business recorder and from "Karachi stock exchange". Following S. Kheradyar et al, (2011) this study includes stock returns as dependent variable while dividend yield, earning yield and B/M ratios has been taken as independent variables.

4. Measurement of Variables

4.1 Stock Return

Following Lewellen (2001) and S. Kheradyar et al, (2011) we have used stock return as dependent variable. Stock return is measured by dividing capital gain along with dividend per share on market price per share. Following is the formula for stock returns.

SR*i* = DPs + capital gain/market price

4.2 Book to Market Ratio

For finding value of company by comparison of market value of a share to its book value, study tends towards book to market ratio. For finding book value of a firm the study divide equity of a firm by its total number of outstanding shares. As for market price is concerned study tend towards the ongoing price of share in stock market. If a firm offer high return and having high book value than its market value, the firm is riskier and in future returns of stock will be lowered than today.

The following formula is used for calculating book to market value:

$$\text{B/M} = \frac{\text{Book Value per share}}{\text{Market value per share}}$$

Lewellen (2001) states that as compare to P/E ratio B/M has higher predictive power for predicting stock return. But when study compare B/M ratio with dividend yield than dividend yield is good forecaster than B/M ratio.

4.3 Dividend yield

Following S. Kheradyar et al, (2011) second independent variable in this study is Dividend yield which is calculated as dividing dividend per share on market price per share. If market price is lower than dividend yield will be higher and give a riskier signal for investment. Contrast to higher dividend yield is low dividend yield; such happen when market price per share is higher than dividend yield and gives an optimistic view for investment.

The following formula demonstrates how to calculate dividend yield:

Dividend Yield (%) = (Dividend per Share / Market rate per share) x 100

4.4 Earning Yield

The empirical literatures lay foundations of the predictive power of earning yield on stock return, and find out the association between earning yield and stock return is considerable, because earning yield plays as a risk factor in relation with stock return. Moreover, the earning yield can demonstrate the efficiency of market that has an important role in emerging markets, thus this study uses earning yield as the empirical predictor of stock return. Following S. Kheradyar et al, (2011) we have measured earning yield as earning per share divided by price of share.

5. Regression Model

In this research article we have investigated three financial ratios EY, DY and B/M to determine whether they predict stock returns. This research study has used the stock return and the above mentioned financial ratios association at

two samples as the foundation for the formulation of Eight hypotheses. On the grounds of their appropriate regression models the eight hypotheses are divided into two sets. In this study we have used the two models of simple and multiple regressions to apply Predictive regression; it is an important tool for predicting stock returns. A set of panal data is used for the formulation of these two models. For tackling the problem of heteroskedasticity and non-normality distributed residuals, we applied generalized least squares method. Following S. Kheradyar et al, (2011) we have used panal models to formulate predictive regressions. Hence we have used simple regression model to test the first 6 hypothesis which are formulated on the basis of association between each financial ratio and future stock returns. The simple regression model has the following form:

$SR_{it} = \beta 0 + \beta i \, Xi_{(t-1)} + \varepsilon it$ (1)

Where,

SR it= in time period t, the return of ith stock,

β0= the estimated constant,

βi= ith stock predictable coefficient,

Xi (t-1) = in period t-1 financial ratios of the ith stock,

εit = error term.

Similarly following S. Kheradyar et al, (2011) we have used multiple regression model to test the other two hypotheses H7 and H8, these two hypotheses are formulated on the basis of relationship between combined financial ratios and future stock returns. The model has the following form:

$SR_{it} = \beta 0 + \beta i1 \, DYi_{(t-1)} + \beta i2 \, EYi_{(t-1)} + \beta i3 \, B/Mi_{(t-1)} + \varepsilon it$ (2)

Where,

SR it= in time period t, the return of ith stock,

β0= the estimated constant,

βi1= for DY the Ith stock predictable coefficient,

βi2= for EY the Ith stock predictable coefficient,

βi3= for B/M the Ith stock predictable coefficient,

DYi (t-1) = is ith stock DY factor in period of time t-1,

EYi (t-1) = EY factor of ith stock in period of time t-1,

B/Mi (t-1) = B/M factor of ith stock in t-1 time period,

εit = error terms.

6. Results and Discussion

For the first 6 hypothesis the predictive regression results are summarized in Table 1. The coefficient of dividend yield in Table 1 demonstrates a positive relationship of dividend yield in period (t-1) and stock returns in period (t) in both samples that is when dividend yield increases by one unit it will cause an increase of 0.021 and 0.010 units in stock returns of two samples respectively. As for the p-value of coefficient of Dividend yield is concerned it is 0.016 in sample one which is less than 0.05, so the relationship is statistically significant and the null hypothesis H1 is rejected, however in sample two the association is insignificant so hypothesis H4 cannot be rejected.

The coefficient of earning yield in Table 1 demonstrates a positive relationship of earning yield in period (t-1) and stock returns at period (t) that is when earning yield increases by one unit it will cause an increase of 0.013 and 0.008 units in stock returns in the two samples respectively. As for the p-value of coefficient of earning yield is concerned it is 0.019 and 0.010 in the two samples respectively which is less than 0.05, so the relationship is statistically significant, therefore we will reject hypothesis H2 and H5.

The negative coefficient of Book to market value in table 1 notifies an inverse relationship of B/M and stock returns in both samples that is if B/M ratio increasing the stock return will be decreasing and vice versa. The p-value of coefficient of B/M value 0.000 indicates that the relationship is statistically significant in both samples, so hypothesis H3 and H6 have been rejected. S. Kheradyar et al, (2011) found that DY has negative influence on stock return, and a positive association between EY and stock return. He also found a positive impact of B/M on stock return in

sample 2 but a negative one in sample 1. It can also be noticed by looking at the adjusted R-square that B/M has the highest predictive power, and this result is also supported by S. Kheradyar et al, (2011).

(Insert Table 1 Here)

Now we will test to see whether stock return predictive power increases with the combination of EY, B\M and DY. We will reject H7 and H8 because it can be seen in Table 2 that the predictive regressions are statistically significant. Thus we can say that stock return can be predicted by the combination of EY, B\M and DY. Also we can say that as compare to the other two ratios, the variations of the ratio of book to market has greater impact on stock return, because in both samples it has the highest coefficient. Similarly by looking at the adjusted R-square we can say that in the two samples stock return predictive power increases when the combination of EY, B\M and DY increases.

(Insert Table 2 Here)

6. Conclusion

Literature regarding predictability of stock returns has changed over the last 20 years. With evolution researchers and economists separated price to earnings ratio, dividend yield, inflation, and book to market ratio, beta, industry returns, interest rate, and size of firms from amongst other variables which were considered important for predicting return of stocks. Presently strong evidences are present regarding variables for predicting stock returns. Analysis showed that financial ratios have significant power of predictability for forecasting returns of stock and they predict future stock return of Pakistani market, and B/M has higher predictive power as compare to other ratios. Similarly the predictability of stock return is enhanced by the combination of financial ratios.

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Table 1: Simple Predictive Regression Results

Stock Returns	β0	βi	Adj R2 (%)	p-value
Model DY	**Rit = β0 + βi DYi (t-1) + εit**			
Sample (1)	0.036	0.021	1.19	0.016
Sample (2)	0.017	0.010	1.11	0.071
Model EY	**Rit = β0 + βi EYi (t-1) + εit**			
Sample (1)	0.006	0.013	0.10	0.019
Sample (2)	0.035	0.008	0.18	0.010
Model B/M	**Rit = β0 + βi B/Mi (t-1) + εit**			
Sample (1)	-0.002	0.041	2.22	0.000
Sample (2)	-0.023	0.019	1.65	0.000

Table 2: Multiple Predictive Regression Results

Stock return	β0	βi1	βi2	βi3	Adj.R2	DW	p-value
Model	**Rit = β0 + βi1 DYi (t-1) + βi2 EYi (t-1) + βi3 B/Mi (t-1) + εit**						
Sample (1)	0.014	0.006	0.001	0.029	2.44	1.96	0.000
Sample (2)	0.017	0.002	0.023	0.018	2.09	1.89	0.000