

Bi-Variate Causal Estimates of Dividend Yield, Earning Yield Ratios and Stock Index: A Case of Karachi Stock exchange

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Abstract

The study examines the relationships between Pakistan's market stock returns, dividend yields and earning yield ratios. Specifically, it examines the existence of long-run and short-run relationships between and among stock market return, dividend yield and earnings earning yield ratios. Using the monthly data from 1997-2007, the study finds that all these fundamental variables have a strong long run relationships. As for the short run relationship, the results show significant predictive power from dividend yield to stock return and stock market return to earning yield ratio. In addition to applying vector error correction model, the results show that there is the significant long-term equilibrium between stock market index, dividend yield and earning yield ratios. Hence, fundamental variables are an important source of information in determining the stock market returns and useful to investors and other stakeholders in making their investment decisions.

Keywords: Causal Relationship, Dividend Yield, Earning Yield and Stock Index.

Introduction

The stock returns were the point of concern for the researchers in the 70's decade. They have carried out a lot of studies on stock returns because shareholders and organizations keep an eye on their benefits. (Mahmood & Fatah 2007) The performance and behaviour of stocks are always the vital concern for the investors or any individual involved directly or indirectly linked with the market activities and performance. The predictability of returns has become an important issue in the financial markets. It has found a lot of significance importance for the researchers and other stakeholders because predictability of stock returns refer to making surplus returns by using the financial ratios especially earning yield and dividend yield. A lot of evidences on the dividend-price ratio have altered the way researchers make out stock markets. It has put back the old view of stock returns that stock returns remain the same. (Lettau & Ludvigson, 2005). According to existing literature, valuation ratios predict stock returns, and the predictability shows a strong relationship for longer horizons (Campbell, 1991) Stock returns are always determined by fundamental variables. Dividend yields and Earnings yield are considered as important information for investors. In different factors involving predict stock returns, dividend yield and earnings yield are being greatly considered (Nagayasu, 2007). The dynamic nature of stock performance has enforced scholars to draw theoretical and empirical reasons since it influences the country's growth and development. In the time of seventies extensive studies have been carried out to know what influences investors return and company stock value. Dividend yield and earnings yield are one of the most important factors that influence the stock prices. Although, a lot of controversies has been made on the dividend yield, earnings yield and stock returns by different researchers. Some of them concluded in a positive and some have negative opinion between dividend yield, earnings yield and stock returns.

In the development stage of the dividend to stock return predictability the studies have just emerge the impact of dividend yield on the stock returns and established that the dividends are the coastal predictors of returns (Black & Scholes, 1974; Blume, 1980). The direction of the relationship between the dividend yield and stock returns measured in second phase and studies have proved that the dividend yield influenced positively to the stock returns (Campbell & Shiller, 1988; Fama & French, 1988 and Lyn & Zyowicsch, 2004). Intensity of the relationship has measured later on and scholars have envisaged the long term equilibrium and short term dynamics between the dividend and stock returns (Goetzmann & Jorion, 1995; Naranjo et al., 1998; Wolf, 2000; and Mahmood & Fatah, 2007). Along with the dividend yield ratio the earnings yield has also long been of importance to both scholars and shareholders to predict the returns. Bartholdy (1998) the study concluded that earnings price ratio can predict future stock returns. Moreover lots of studies have proved the relationship between earning yield and stock returns not only in short but also in long run (Kumar & Sehgal, 2004; Samarakoon, 1997; and Raof et al., 2010).

The Karachi Stock Exchange has vital role in the stock markets of the South Asian stock markets especially developing countries and it is also considered a high risk and high return stock market in the region where investors earn high returns (Nishat, 1999). Dividends are the rewards to shareholders on investments (Shamsi, 2000). Smooth dividend moves are being seen in developed world but the situation in developing countries is

quiet drastic. Pakistan is a developing country and has an emerging capital market of Asia. But the case of Pakistan is shocking for researchers that; companies are reluctant to pay dividend and only 40% companies of Karachi stock exchange were dividend payers (Hussain, Raza, & Saheen, 2007). The amount of dividend paid by Pakistani companies is pathetically low ranges from 0-2.5 Rupees per share (Naeem & Nasr, 2007).

According to Christie (1990), firms with zero dividends make negative stock returns. It does mean that investors at here are not in favour of dividends, investors run after dividends payments, which shoot up turnover of dividend paying (announcing) stocks by 100% to 300% (Kaleem & Salahudin, 2006). Most of the empirical relationships between dividend policy, determinants and returns proved wrong in Pakistani scenario and scare body of literature is just available. It is going to investigate the relationship between dividend yield and return with extended sample size and modern tests. The study investigates the predictive power of dividend yields and earnings yield in order to determine whether a predictability phenomenon exists in small and emerging stock markets such as Pakistan. The study in verge of finding long term relationship or short term causality between these variables.

It is a vital move to investigate the behavior of these variables in Pakistan's capital market after the messive economic reforms. The study also contributes to the literature by investigating the relationships between the dividend yield, the earnings yield and the stock returns in an emerging stock exchange of Asia. The amount of relevant literature review, methodology, prominent findings and conclusion are on following leafs.

Literature Review

The study examines the power of earning yield and dividend yield especially in short and long run to predict whether any causal relations exist or not among concerned variables. Following are the few glimpses of relevant to the literature that have been explored to comment our theory.

Existing body of literature provides handful knowledge about the dividend payments practices across the world at different time span. A lot of previous studies presented the predictability of stock returns through dividend yield and earnings yield. Especially after 1970, the relation between earnings yield, dividend yield and stock returns has extensively examined. Lamont (2002) conducted a study on earnings, dividends and market prices and concluded that both earnings and dividend enhance the stock prices sharply. Similarly, Wu & Wang (2000) conducted a study to inspect the dividend yield and earnings yield through long-term returns and the outcomes of the study identified that dividend yield and earnings yield have same influence to forecast future stock returns. Barnhart & Giannetti (2009) investigated a study to inspect the earnings yield and stock returns predictability by using S&P 500 index. The study decomposed earnings yield into positive and negative to check the forecasting power. More importantly, Davis (1994) investigated a cross sectional study by using primary data over a period of 1940 to 1962 with a sample of 100 firms of New York Stock Exchange and study found that earnings yield have explanatory power of predicting returns.

Moreover, Kim (1997) also conducted a cross sectional study on 5,597 firms listed at NYSE and AMEX over a period of 1958 to 1993 and the results exhibited a significant relationship between earnings yield and stock returns. Accordingly, Wong & Lye (1990) made an investigation in Singapore stock market over a period of 1975–1985 to explain a relationship between earnings price ratio, firm size and stock returns and concluded that earnings price ratio and stock returns are significantly related to each other. The study further suggested that high earnings yield stocks exhibit high returns. According to Lam (2002) earnings price ratio capture the monthly variation in returns. Similarly, Falk & Yalovsky (1986) investigated the relationship between stock returns and earnings yield by employing the Stochastic Dominance Analysis and showed the positive association between returns and earnings yield. Raj & Thurston (1995) have studied the predictability of dividend yield and earnings yield in New Zealand stock market by using three months lagged data and outcomes of the study identified that there is little predictive power exist between dividend yield and earnings yield. Giannetti (2007) carried out a study to detect the short term predictability to ensure the predictability of earnings price ratio to returns. Park & Kim (2010) carried out a study in the Korean Stock market to find out the relationship between stock returns and dividend yield. Hussainey (2011) employed a Multiple regression analysis by using the listed firm of London Stock Exchange and the study revealed a positive relation between dividend yield and stock prices.

On the other hand, Ang & Bekaert (2007) exhibited that dividend yield and earnings yield have negative relationship with stock return. Moreover, Fama & French (1992) also made an insignificant relationship between earnings price ratio and returns. Later on, Michailidis et al. (2007) carried out a cross sectional study at the Athens stock exchange the study found no relation between earnings price ratio and stock returns. So several studies show a weak relation between dividend yield, earnings yield and stock returns based on annually, monthly, weekly and daily data. Leong et al. (2009) found that high earnings yield portfolios exhibit higher returns. Similarly, Basu (2002) reported the relationship between firm size, earnings yield and returns and concluded that the high earnings yield firms face higher risk-adjusted returns as compare to low. Lewellen (2002) has investigated this issue in different way to predict the returns by using dividend yield, the earnings-price ratio and Book-to-market ratio during 1946–2000 and found that dividend yield predicts the long run impact on stock prices.

Kothari & Shanken (1997) investigated a study and found that dividend yield and stock return have a strong relation. Jaffe et al. (1989) investigated the effect of earnings yield and the study found a significant relation between earnings yield and stock returns. Basu (1983) has also studied the same and concluded the same. Similarly, Wei Su et al. (2007) conducted a study on Taiwan stock market to investigate the impact of dividend on stock prices in long run period concluded that most of the firms have an impact of dividend on stock prices in long run period. Moreover, Al-Mwalla et al. (2010) concluded a long run relation between dividend yield and the return.

Tse (2002) investigated the effect of dividend yields and returns on the price earnings ratio and used real estate stocks. The results of the study indicated that there was an inverse relationship between dividend yield and returns. Alesii (2006) made a study on the fundamental efficiency of Italian stock market and checked the predictability of stock returns through dividend yield constructed and found a positive relation between dividend yield and stock return. Later on, Alessandri et al. (2008) also identified similar results. Sezgin (2010) used Granger causality tests, Johansen cointegration tests and error-correction models in Istanbul Stock Exchange to find out short-run and long-run relationship among dividend yields and stock returns. Whereas, Kazi (2009) investigated the Australian stock market during 1983 to 2002 by applying unit root and cointegration test and elicited that stock prices are influenced by dividend yield. Levis (1989) used data from 1961 to 1985 in London Stock Exchange and the results of the study identified a strong relationship between dividend yield and stock returns. Hodrick (1992) carried out a study in NYSE over a period of 1926 to 1987 by using vector autoregression to observe the ability to predict stock returns through dividend yield and found that stock returns are predictable. Campbell & Shiller (2001) investigated the predicting power of dividend yields for the stock returns from 1871 to 2000 and concluded that dividend yield estimate the stock return. Whereas Aono & Iwaisako (2010) studied the Japanese Stock Returns through dividend yield during 1970 to 2006 and employed DF-GLS test and Q-test to predict the returns. The findings of the study predicted a weak relationship between dividend yield and stock return.

Similarly, Chen et al. (1990) analyzed the relationship between dividend yield and expected stock returns through four different methods and found no reliable relation. Nazir et al. (2010) carried out a study at Karachi stock exchange to examine dividend yield and stock prices from 2003-2008 of 73 firms. They used a regression model to inspect and the results exhibited a significant relation between dividend yield and stock prices. They also found an increased effect of dividend yield during the 2003-2008. Accordingly, Chordia & Shivakumar (2005) found that Stock prices are affected by earnings. They used cross-sectional and time series asset pricing tests. Conversely, the diverse relationship between unexpected earnings and stock returns exist by using univariate model of time series. (Kormendi & Lipe 1987). Similarly, Das et al. (1998) studied the past information of returns to forecast earnings by using the non-public and public- information and they found that there is a low forecast of high predictability firms.

Bae & Kim (1998) used a regression model to predict the stock returns of Japan stock market through earnings and book value. They found that earnings have a great ability to predict stock returns as compare to the book value. Accordingly, Conroy et al (2000) studied the dividend and earnings in Japan and concluded that earnings has significant effect on the share prices. Similarly, Goddard et al (2006) examined a study in UK from 1970-2003 and found a strong relationship between dividend yield, earnings and stock prices. De Sankar (1975) investigated a study and checked the behaviour of dividend yield and stock prices by using the data from 1964-1972. He observed jute textiles, general engineering and chemicals sector of Indian stock market. Chen and Wu (1999) examined the causal relationship among earnings, dividends and stocks. They concluded that there exists a positive relation among the concerned variables. Similarly, Morgan & Thomas (1998) conducted a study in UK equity market and found a positive relation between returns and dividend yield.

MacDonald & Power (1995) tested a present value model by using a US data based and found a relationship amongst stock prices and dividends. Jiang & Lee (2007) employed unit root and vector error correction model and concluded that dividend yield explains excess stock returns. Campbell & Shiller (2001) exhibited a weak predictability between dividend yield and stock return. Similarly, Henne et al. (2009) suggested that dividend yield have no influence on stock returns. Rao et al. (1992) found a significant dividend yield effect. Gombola and Liu (1993) investigated the relation between dividend yield and stock return in bear and bull market and concluded a positive relation in bear market while a negative relation in bull market. Campbell & Hamao (1992) found that dividend yields have positive effect on stock returns.

The existing literature shows that there are different results according to the researchers that change in earnings yield and dividend yield predicts the stock returns. On the bases of these grounds well effective model developed to investigate the query.

Methodology

Sample:

The study is based on secondary data. The stock indices used in this study are All share price index of Karachi stock exchange. All share price index, a proxy for Karachi stock market indices employing end of the month

closing prices for the period July 1997 to August 2007 along with the corresponding market dividend yields and market earnings yield of all the listed companies of the Karachi stock exchange gathered from the website of the State bank of Pakistan Business Recorder and Karachi Stock exchange. The sample period was consisted upon ten years, more than of three business cycles that is not least enough for study (Kanawer , 2003). Pakistan's economy had passed through lot of thick and thin along with political turmoil during that time span (Ahmad & Javaid, 2009).

Procedure:

Moreover, the majority of the time series were found to be non-stationary. The problem of using non stationary time series leads to the dubious statistical inferences. To remove the problem of non stationary data, logarithmic difference between the two consecutive prices was calculated as a remedial measure. Monthly returns were calculated by taking log difference between two consecutive month prices. (Aono and Iwaisako 2008, 2009), found that lagged returns are good predictors of stock returns. Microsoft excel and EViews softwares were used for the computation and treatment of the data because both these softwares helped out in descriptive and statistical parts of the study. The framework of this study was comprised of following statistical tests; Descriptive Statistics, Unit Root Tests, Co-Integration, Granger Causality and Vector Error Correction Model (Mahmood & Fatah, 2007).

The study used this model for co integration:

$$\lambda_{\text{trace}}(r) = -T \sum \ln(1 - \lambda_i)$$

$$\lambda_{\text{max}}(r, r + 1) = -T \sum \ln(1 - \lambda_i),$$

where T represents observations and λ_i are the eigen values. The λ trace formulation tests the null hypothesis that the number of distinct co integrating vectors is less than or equal to r, against a general alternative. A r = 0 shows that there are no co integrating vectors in the system.

VAR is used to test for causality in the sense of Granger (1969). To implement the Granger test, we estimate the reduced form of VAR equation by equation in an OLS regression. The Granger Causality test can be expressed as follows:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^m \beta_i \Delta Y_{t-i} + \sum_{j=1}^n \delta_j \Delta X_{t-j} + \sum_{k=1}^p \chi_j \Delta Z_{t-k} + \nu_t$$

where changing Y is stock returns (dependent variable) and X, Y and Z are respectively, changing lagged stock return, changing dividend yields ratio and changing earnings price ratio (independent variable).

Empirical Results:

The table 1 shows the results of descriptive statistics of the dividend yield, earnings yield and stock returns because the basic properties of the data are studied by descriptive statistics. Descriptive analysis makes the basis of the data to analyze in quantitative form. The temporal properties of the data have been checked in order to identify the three problems of time series like, Auto-correlation, Heteroscedasticity and Multi-collinearity. Data should be normal if the skewness is near to zero or in the range of +1 to -1. The kurtosis should be near to 3 in the range of 0 to 3.

Table No 01 Descriptive Statistics

	DIVIDEND YEILD	EARNING YEILD	INDEX
Mean	5.315714	10.25849	3.212884
Median	4.690000	10.82500	3.055614
Maximum	10.39000	16.17000	3.989397
Minimum	1.710000	2.470000	2.750740
Std. Dev.	2.153070	3.018965	0.354547
Skewness	0.428330	-0.524207	0.717517
Kurtosis	2.021263	2.678602	2.112747

The test results of the ADF in table 2 show that the null hypothesis of stationary of levels for both the market index and dividend yield ratio series cannot be rejected. Only earning yield ratio is stationary for the level series. However, when the null hypothesis of non-stationary of first difference is tested, it is rejected at 5 percent. All the series are normal at first difference.

Table No 2 Augmented Dickey Fuller Test

Variables	At Level	At First Difference
Index	1.0730	-9.0822
Dividend Yield	-2.2787	-11.2248
Earning Yield	-3.2469	-13.3344

MacKinnon (1996) one-sided p-values. 5% critical value -2.886

The results of the Johansen and Juselius test are in table 3 which show the co-integration between the variables. There are the co-integrations between; the market index, dividend yield and earnings yield and dividend yield ratios. Granger causality and vector error correction model are further applied to check the short-term causalities and long-term dynamics between the variables.

Table No 3 Co-Integration Tests

	T-Statistic	Critical value
Relation No 1		
Index and Dividend Yield	21.38334	18.39771
Relation No 2		
Index and Earning Yield	9.594299	15.49471
Relation No 3		
Dividend Yield and Earning Yield	16.24402	15.49471

The results of Granger causality test are reported in table 4. The results show that DY and P/E ratio Granger-cause the stock return at 5% percent critical level while earning yield and dividend yield are not Granger causing to each other. In general, our findings suggest that dividend yield and price earnings ratio Granger caused stock return significantly. The dividend announcements are normally used by the managers as signaling devices to convey information to the market participants about the potentials of the firm. Therefore, stock prices changed temporarily in response to dividend changes because the market believes that the change suggests probable future course of earnings of the firm. That will lead to more returns.

Table No 4 Granger Causality Tests

Relationships	Obs	Lags	F-Statistic	P-Value
Relation No 1				
Index does not Granger causes to Dividend Yield	124	2	2.39099	0.1246
Dividend Yield does not Granger causes to Index		2	4.28620	0.0405
Relation No 2				
Index does Granger causes to Earning Yield	124	2	3.15424	0.0035
Earning Yield does not Granger causes Index		2	2.00421	0.0047
Relation No 3				
Earning Yield does not Granger causes to Dividend Yield	124	2	1.25064	0.2901
Dividend Yield does not Granger causes to Earning Yield		2	0.63517	0.5316

The results of Vector Error Correction model are reported in table 5. VECM is used to test for the long-term equilibrium relationships between the variables. The results indicate that there are the long-term equilibrium relationships between stock returns and dividend yields, and earning yield and dividend yield ratios.

Table No 5 Vector Error Correction Model

Cointegrating Eq:	CointEq1	Cointegrating Eq:	CointEq1	Cointegrating Eq:	CointEq1
Index	1.000000	Index	1.000000	Earning Yield	1.000000
Earning Yield	0.212590	Dividend Yield	0.164388	Dividend Yield	0.201224
	(0.03927)		(0.04118)		(0.19513)
	[5.41362]		[3.99201]		[1.03121]

Conclusion

The study is intended to explore the bivariate estimate of dividend yield, earnings yield and expected

stock returns. Identifying the causality and dynamics between the dividend yields, earnings yield and stock prices in short- run and long- run. The Karachi Stock exchange is the benchmark of Pakistan's capital market. It has been selected to explore and test the hypothesis of the study. The study is based on secondary data. The stock indices used in this study are All share price index of the Karachi stock exchange employing end of the month closing prices for the period July 1996 to August 2007 along with the corresponding market dividend yields and market earnings yield of all the listed companies of the Karachi stock exchange. The sample period is quiet curial because , the Pakistan's economy had passed through lot of thick and thin along with political turmoil during that time span. Through a sequential process following results are assembled in a way to give some meaningful picture. In the first stage the stationarity of the time series has been marked through descriptive statistics at this stage most of the economic time series looked stationary. After that the unit root test has been used to cement the validation of the postulate of normality. The time series of dividend yield and index are not normal at first stage to make these normal first difference has been taken that has made the all series normal.

The Johnson and Juselius is the first move in the co-integration arena. It has systematically been applied on all the time series. There are the co-integrations between the dividend yield, earning yield and index respectively. However, earning yield and index remained are none co-integrated. The study has also employed bi-variate co integration analysis and the bi-variate error correction model to conclude that there is strong evidence of long-run and short-run relationship among variables. The empirical evidence points to the direction that there is significant short run Granger causality among stock returns, dividend yield and earning yield with the most significant direction being from dividend yield to stock returns. The strong predictive power of dividend yield ratio to returns violating the efficient market hypothesis and exhibiting the importance of dividend signaling approach that is being followed by firms in Pakistan. The finding suggests that market player should use fundamental variables in deciding their investment strategies since it is an important source of information in determining stock market returns.

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