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Firm Size and Book-to-Market Equity on Behavior of Stock Returns: Empirical Evidence from Colombo Stock Exchange

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Abstract: The aim of this paper is to examine thebehaviour of stock returns of Sri Lankan companies with respect to two popularly known firm level characteristics: firm size and book-to-market equity, employing multi factor model for the period span from 2007 to 2011.Empirical findings from multiple regression analysisreveal that book-to-market equity has positive role in behavior of stock returns while firm size has expected negative direction in behavior of stock returns and not significant.

Keywords: Firm Size, Book-to-Market Equity,Stock Returns

Introduction

The relationship between risk and return is a fundamental financial relationship that explains behaviour of expected stock returnsdeterminebytwo kinds of risk which are firm specific factors and macro-economic variables. Even though previous studies {e.g: Gordon (1959); Friendand Puckett (1964); Bower and Bower (1969);malkielandcragg (1970); Zahir (1992)} believed that expected stock returnsare highly sensitive to macroeconomic events, firm specific factors alsoone side of coin impact on behavior of expected stock returns.

Capital Asset Pricing Model of Sharpe (1964), Lintner(1965) and Mossi(1966) or Sharpe (1964), Lintner (1965) and Black (1972) is the first model to explain the relationship between risk and returns. The limitation of this model is employed only market beta as a risk factor and not employed macro and firm specific factors to explain the behavior of expected stock returns.Most of therecent researchersStattman (1980),Reinganum (1981), Rosenberg,Reid and Lanstein(1985), Lakonishok and Shapiro (1986), Chan, Hamao and Lakonishok(1991), Fama and French (1992),Patel (1998),Chui and Wei (1998), Rouwenhorst (1998),Fama and French (1998) and Claessens, DasguptaandGlen (1998) reportedthe market beta has little or no ability in explaining the behavior of stock returns and also found that firm sizeand book-to-market equity play significant role in explaining the behavior of stock returns. From this finding, Fama and French (1992) developed a new model in which they added two supplementary risk factors which are firm size and Book to Marketequity to Capital Assets Pricing Model (CAPM). This model is call as FF (Fama and French) three-factor pricing model.

Even though previous studies enough concernedon behaviors of stock returns with respect to firm specific factors in both developed and developing countries, there have been very few of studies in Sri Lankan context {except a few-e.g, Samarakoon (1998);Mahawanniarachchi (2006) and Anuradha (2007)}to assist to financial interested parties to have good knowledgeon behavior of stock returnsdetermine by internal factors such as earnings, dividends, leverage, firm size, book to market equity, right issue and bonus issues.Therefore, the objective of this study is to examine the behavior of stock returns of Sri Lankan companies with respect to two popularly known firm level characteristics: firm size and book-to-market equity. For this purpose, this study is employed multi factor model for yearly data of selected companies listedon Colombo Stock Exchange for theperiod span from 2007 to 2011.

Literature Review

After 1980, the relationship between firm-level characteristics and stock returns is extensively investigated in developed, developing and group of countries. The findings of the literature suggest that there is a significant linkage between firm specific factors and stock returns in the countries examined.

The size effect was first documented by Banz (1981) and Reinganum (1981) who found a return premium on small stocks during the 1936-1975 period for the stocks quoted on the NYSE. The size effect or size premium was later confirmed by Blume and Stambaugh (1983) and Brown, Keim, Kleidon and Marsh (1983) in USA and Australia respectively. The book-to-market equity effect was first documented by Rosenberg, Reid and Lanstein(1985) who found a return premium to stocks with high ratios of book value to market value of equity in US stock markets. This book-to-market equity effect or value premium was confirmed byChan, Hamao and Lakonishok(1991) and Capaul, Rowley and Sharpe(1993) in outside the USA and Davis and Jaznes(1994) in USA. These findings revealed that firm size and book-to-market equity are significantly impact on expected stock returns, negative and positive, respectively.

The first group of the studies covers developed countries. Fama and French (1992) reportedthe market beta has little or no ability in explaining the behaviourof stock returns of selected non-financial firms in USA market and on the other hand, they foundthe variation of cross – sectional stock returns can be captured by two firm characteristics: firm size and book-to-market equity during the period of 1962 to1989. According to Fama and French (1992), the associated risk premiums of firm size and book-to-market equity variables are easily measurable, significantly negative and positive, respectively. Bryant and Eleswarapu (1997) for the periodof 1971 to 1993 and Pinfold. Wilson and Li (2001) for the period of mid-1993 to March 2001,documented thebook-to-market equity effect but has weak size effect in US stocks. On the other hand, Vos and Pepper (1997) reportedstrong size and book-to-market equity effect over the period 1991-1995 in New Zealand, while Li and Pinfold (2000), replicating Vos and Pepper (1997) for the period starting at the end of 1995 to June 1999, did not find book to market effect. Chui and Wei (1998) foundthe book-to-market equity plays a significant role in explaining the cross – sectional behaviour of stock returns in Japanese market.

Andreas and Eleni (2004) empirically tested the FF (1993) three factor model using Japanese data over the period of 1992 to 2001. Theyfoundthatmarket beta, firm size and book-to-market equity havesignificant relationship with expected stock returns in Japanese market. Further, it clearly shownthe market factor has most explanatory power in behaviour of stock returns. The explanatory power of the size factor (SMB) dominates the explanatory power of the book-to-market equity factor (HML) when the testing portfolios consist of small stocks and the opposite occurs when the testing portfolios consist of big stocks.

Second group of studies investigate this relationship for developing market including Sri Lankan Stock Market. Samarakoon (1998) testedthe relation between stock returns and fundamental variables in Sri Lanka, this study employed two methodologies. The first isinformal tests which examined averages returns and averages of fundamental variables for portfolios formed on the basis of size alone, beta alone, and size and beta. The second is a formal asset pricing test which used the Fama-MacBeth (1973) cross-sectional regression procedure. In the formal tests, returns are regressed on β, size, book-to-market equity, leverage, and earnings-price ratio, both individually and jointly, in every month in the cross-section. The results show that, inconsistent with the central prediction of the Capital Asset Pricing Model, the relation between average returns and beta is strongly negative. Firm size and book-to-market equity are not related to average returns in any significant manner.

Drew and Veeraraghavan (2002) presented evidence of firm size and value premium for the case of Malaysia used multifactor model approach. They reportedfactors identified by FF (1993), better explained the variation in stock returns in Malaysia. Drew,Naughton and Veeraraghavan(2003) also

reported a firm size effect and a less pervasive book to market effect in the Shanghai stock market. Mahawanniarachchi(2006) reportedthe significant negative relationship between size and individual stock returns and positive relationship between book-to-market equity, market and individual stock returns. Further, it reportedthe size, market and book-to-market equity factors have significant explanatory powers in explaining the Sri Lankan stock returns. Anuradha (2007) also investigated above two most popular factors on stock returns in the CSE and reported the negative size to return relation and positive book-to-market equity to return relation.

Senthilkumar (2009) employed Fama-MacBeth (1973) cross-sectional regression model in selected Indian industries to examine the behaviour of stock returnswithrespect to firm size and market-to-book ratio. They found that no size effect in all the markets and a significant market-to-book effect in all the groups. When the test allow both variables, the negative relationship between size and average return was less significant; the inclusion of market-to-book equity seems to absorb the role of size in selected Indian stock returns.

There is another group of studies that examines the situation for more than one country. Fama and French (1998) and Patel (1998) found a premium for small firms and value stocks in 17 emerging market countries. These results differ from Claessens, DasguptaandGlen (1998) who reported a premium for large firms and growth stocks in earlier sample of 19 emerging markets. Rouwenhorst (1998) revealed the return factors in 20 emerging markets are qualitatively similar to those documented. On the contrary, Chui and Wei (1998) revealed the book-to-market equity can explain the cross-sectional variation of expected stock returns in three out of five Pacific Basin emerging markets, while firm size effectis significant in all markets except Taiwan. Maroney and Protopapadakis (2002) tested the three factor model (FF, 1993) on different equity markets of Australia, Canada, Germany, France, UK and US. The size effect and the value premium survive for all the countries examined. They concluded the size and book-to-market equity

effects are international in character. Thestock return haspositive relationship with book-to-market equity and negative relationship with size remains in the model. Mirela and Madhu (2004) investigated the robustness of the three factor model (FF, 1993) for equities listed in three main European markets namely France, German and United Kingdom and paper provided evidence that the beta of the CAPM alone is not sufficient to describe the variation in average equity returns for the three of the markets concerned.

Even though empirical research has been evidence on firm size and book to markets impact in behavior of stock returns in Sri Lankan context, there have been a very few of studies in Sri Lankan stock market {except a few-e.g, Samarakoon (1998); Mahawanniarachchi, (2006) and Anuradha (2007)}. Therefore, the objective of this study is to examine the behavior of stock returns of Sri Lankan companies with respect to two popularly known firm level characteristics: firm size and book-to-market equity, employing multi factor model for yearly data of selected companies listed on Colombo Stock Exchange for the period span from 2007 to 2011.

Data, Hypotheses and Methodology

Sample and Data Collection

This study isused firm size and book-to-market equity as independent variables to examine the behavior of stock returns in Sri Lankan context. Firm size is measured as logarithm of total assets, book-to-market equity as book equity divided by market equity at financial year t and stock return as income plus changes in price divided by beginning price. Data of selected variables have been collected from annual report of selected 35 companies listed on CSEfor the period from 2007 to 2011. The criteria for selecting the companies is that only 40 companies' financial year ended in December around total number of listed companies in CSE. From these 40 companies, 35 companies were selected since its have only available information for this study. Table 1 is shown the selected companies from different sectors listed on CSE.

Table 1:
No of Selected Companies from Different Sectors

Sectors	Number of Selected Companies
Banking, Finance and Insurance	09
Beverage, Food and Tobacco	02
Chemicals and Pharmaticals	01
Construction and Engineering	01
Health Care	01
Hotels and Travels	01
Land and Property	03
Manufacturing	05
Plantation	09
Telecommunication	02
Trading	01
Total	**35**

Hypotheses

The objective of this study is toinvestigate the behavior of stock returnswith two most popular known firm level characteristics: firm size and book-to-market equity in Sri Lankan context. In order to achieve the objective of the study, the following hypotheses have been generated.

H_1: **Firm size has negativerole in behavior of stock returns**

H_2:**Book-to-market equityhas positive role in behavior of stock returns**

Methodology

The multiple factor model is adopted in this study to analyzing the relationship between selected firm specific characteristic and stock returns in the emerging Sri Lankan Stock Market.

$$SR_{it} = \beta_o + \beta_1 \ln(TA_{it}) + \beta_2(BE/ME_{it}) + \varepsilon_t \quad [1]$$

Where: SR_{it} is the stock returnsof i^{th} company for theperiod of t,TA_{it} is the logarithm of total assetsof i^{th} company for the period of tto measure the firm size and BE/ME_{it} is the book-to-market equityof i^{th} company for theperiod of t. βo is the intercept of the regression, β_1 and β_2 are the coefficient of variables and ε_t is the error term of regression.

All estimations have been performed in SPSS software package, whereas the ordinary calculations were done in Excel.

Empirical Results

As a first step, correlation matrix is presented. In the second step, the impact of selected firm specific factors on stock returns is evaluated by estimating equation 1 using multiple regression analysis.

Correlation Matrix

Table 2: Correlation Matrix

Variables	Stock Return	Book to Market Equity	Firm Size
Stock Return	1		
Book to Market Equity	0.181*	1	
Firm Size	-0.085	-0.087	1

* Correlation is significant at the 0.05 level.

Table 2 presents correlation coefficients among selected variables. Here stock return is dependent variable and book to market equity and firm size are independent variables. There is a significant positive weak correlation between stock returnand book to market equityat the 0.05 significantlevel. But there is a negative weak correlation between stock return and firm size and not significant at the 0.05 significant level.Besides, thereis no significant correlation between independent variable.

Multiple Regression Analysis

The results of the multiple regression analysis are in Table 3. It reports that F value is significant at the 0.05 significant level. Therefore at 5% significance level,

it can be statistically concluded that the model fits to examine the behavior of stock returns from selected firm specificvariables. The R^2 and adjusted R^2 have less value. Therefore, these coefficients statistically concluded that both selected firm specific factors have very lessrolein behavior of stock returns and other variables which may be other non-selected firm specific variables and macro-economic variables heavily impact on behavior of stock returns.

The hypotheses of the present study are tested with standardized coefficients and significant. H_1 posits that firm size has negative role in behavior of stock returns. The standardized coefficient between firm size and stock returns is -0.070.It is in line with the expected directionbutit is not significant at the 0.05 significant level hence H_1 is rejected. Therefore at 5% significance level, it's statistically concluded that firm size does not have significant role in behavior of stock returns.H_2 posits that Book-to-market equity has positive role in behavior of stock returns. The standardized coefficient between book to market equity and firm size is 0.175 and is significant at the 0.05 significant level hence H_2 is accepted.Therefore at 5% significance level, it's statistically concluded that book-to-market equity has positive role in behavior of stock returns.

Table 3: Multiple Regression Results

Variables	βa
Book to Market Equity	0.175*
Firm Size	-0.070
R^2	0.038
Adjusted R^2	0.025
F	3.075
Prob (F-Statistic)	0.049

Notes =175,aStandardized coefficients,
* Correlation is significant at the 0.05 level.

Conclusions and Recommendations

Firm specific characteristicsare one side of coinimpact on behavior of expectedstock returns. There have been a very few of studies in Sri Lankancontext {except a few-e.g, Samarakoon (1998); Mahawanniarachchi, (2006) andAnuradha (2007)}.Therefore, the aim of this study is to investigate the behavior of stock returns of Sri Lankan companies with respect to two popularly known firm level characteristics: firm size and book-to-market equity for the period span from 2007 to 2011.

Empirical findings reveal that book-to-market equity has a positive role in stock returns while firm size has expected negative direction in behavior of stock returns and not significant.The finding of Book-to-market equity is consistent with the results of Banz (1981), Reinganum (1981), Blume and Stambaugh (1983), Brown, Keim, Kleidon and Marsh (1983),Rosenberg, Reid and Lanstein(1985), Davis (1994), Chan, Hamao and Lakonishok(1991), Capaul, Rowley and Sharpe (1993), Chui and Wei (1998) , Fama and French (1992) and Maroney and Protopapadakis (2002) and also this finding is consistent with the results of Anuradha (2007) and Mahawanniarachchi (2006) in Sri Lankan context.These studies documented significant positive relationship between book-to-market equity and stock returns.But, these previous studies are not consistent with finding of firm size of this study. These studies documented significant negative relationship between size and stock returns. But, the finding of firm size of this study is consistent with results of Samarakoon (1998)in Sri Lankan context, who revealeda firm size is not related to average returns in any significant manner.

This finding implies that firm size is not significant factor in decision making of different interested parties of companies. For an example, Investors can invest in small or large firms which have high ratios of book-to-market equity because findings of this study reveal that no relation in the economy between firm size and return, and positive relation between firm book-to-market equity and return. Also the findings of this study is not prove modern financial

theory prediction that when there is no relation in the economy between firm size and return, there will be a negative relation between firm book-to-market value and return.

The limitations of this study are that even though there are plenty of sources determine the behavior of expected stock returns, this study has only employed two popularly known firm level characteristics to examine the behavior of expected stock returns and covers only six years' annual data of35 companies listed on CSE.Thus, future researchers can investigate the behavior of stock returns by employing macroeconomic variables and other firm specific variables with consideration of long time period, large sample and take another methodology to vast analysis on this topic in order to obtain a better insight about the return generation process. Further, they can use various frequencies data setsuch as daily, weekly and quarterly.

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