The impact of daily market-based ratios on daily stock market return: evidence from Colombo Stock Exchange, Sri Lanka

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Introduction

Analysts and investors over the years have used the Price Earnings ratio (PER), Market to Book ratio (MBR) and Dividend Yield ratio (DYR) for stock selection. They have continued to investigate the impact of market-based ratios on the stock exchange in the recent years. In order to determine the earnings and market return, book value and dividend would be useful for predicting the behaviour of future stock return. The effects of PER states that stocks with low PER earn significantly higher return than stocks with high PER. As a result, there is an inverse relationship between the PER and stock return, and therefore, an investor could attain increasingly higher return by investing the right stock with low PER. Likewise, the effects of MBR states that securities with high ratios between market value and book value, obtain lower return than those securities with low MBR. The predictive power of DYR stems from the role of dividends in capturing the permanent element of return (Guler and Mustafa, 2008). The All Share Price Index (ASPI) measures the movement of share return of all listed companies in Colombo Stock Exchange (CSE). It is based on market capitalization. The weighting of shares is conducted in proportion to the issued ordinary capital of the listed companies, valued at a current market price. This is the longest and broadest measure of the CSE. The ASPI is a market capitalization weighted index where the weight of any company is taken as the number of ordinary shares listed in the market. As of the 31st of March, 2017, the total market capitalization of CSE was LKR 2,662.86 Billion. This research study would be significant to the stock market players and all interested parties in the CSE who use the effect of daily market-based ratios to measure their trading expectations. Also, this study would assist the investment managers to make the investment analysis in the CSE. Findings of this study can be used by analysts and investors for their day-to-day investing strategies.

Research problem

Previous studies have examined the impact of market ratios on stock market return mainly for the developed countries with very little studies being done on the developing countries. These results cannot be generalized to the CSE due to the differences in stock market activities. The CSE has undergone numerous changes such as the introduction of the Central Depository System and Automated Trading System (ATS) (version 7) and after the implementation of ATS (version 7), it provides the platform for both debt and equity. As a result, these changes contribute to the calculations of daily share return. This study attempts to contribute to the existing literature on the impact of daily market ratios on the daily stock market return of a developing country like Sri Lanka. In this context, this study addresses the impact of daily market ratios (PER, MBR and DYR) on daily stock market return (ASPI). This research, therefore, sought to fill this research gap by answering the following research questions.

- What would be the impact of daily market ratios on the daily stock market return of CSE?
- What would be the relationship between daily market ratios and daily stock market return of CSE?

Objectives of the study

- to investigate the impact of daily market ratios on the daily stock market return of CSE
- to identify the relationship between daily market-based ratios and daily stock market return of CSE.

Literature review

Fama and French (1992) examined MBR and PER effects in the New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) stocks during the period from 1963 to 1990. In this study, they observed the significant relationships between PER and stock return, MBR and stock return and size and stock return. Basu (1977) investigated a study to identify the relationship between the investment performance of the common stock and PER of NYSE during the period from September 1956 to August 1971. The results found that there was a significant inverse relationship between investment performance of common stock and PER. Aydogan and Guner. (2000) investigated the effect of market-based ratios on stock price across 19 emerging equity markets. The results reveal that PER and MBR have predictive power of future stock price for a longer period of time. Akdeniz, Altay and Aydogan (2000) examined the impact of firm-specific factors on stock return in the ISE during the period from 1992 to 1998. The found

that MBR and firm size explain stock return. They also found that there was no significant impact of earnings-price ratio on the stock price. Lau, Lee and McInish(2002) examined the relationship between stock return and systematic risk with firm size, MBR, PER, the ratio of cash flow to price and sale growth in 163 companies listed in the Kuala Lumpur Stock Exchange and 82 companies listed in the Singapore Stock Exchange during the period from 1988 to 1996. Analysis for Singapore Stock Exchange found that there was no significant relationship between the MBR and PER with stock return. Analysis for the Kuala Lumpur Stock Exchange found that there was a significantly positive relationship between the PER and stock return. But the relationship between the MBR and stock return was not significant.

Muthui (2003) examined whether there is any significant difference in return between low PER stocks and high PER stocks for companies quoted in the NSE using the NSE 20 share index. The analysis found that there was no statistically significant difference in return of shares with low PER and those of high PER. Guler and Mustafa (2008) examined the predictability of stock return in the 12 emerging stock markets by using PER, DYR and MBR during the period from 1997 to 2003. They found that MBR and DYR had a significant impact on predicting stock return. Fun and Basana (2012) empirically examined the relationship between the PER and stock price of 45 companies listed in the Indonesia Stock Exchange during the period from 2005 to 2010. The results found that there was no significant relationship between PER and stock return. Maxwell and Kehinde (2012) examined the relationship between the PER and stock price of 50 companies listed on the Nigerian Stock Exchange during the period 2001 to 2006. The results found that there was no significant relationship between PER and stock return. Muhammad and Rashid (2014) empirically examined the impact of DYR and PER on Stock Return for 111 non-financial listed firms in Karachi Stock Exchange (KSE), Pakistan during the period from 1998 to 2009. They found that PER and size of the firm have a significant positive impact on stock return. Also, they found that there was a significant negative relationship between DYR and stock return.

Deyshappriya (2014) investigated trading strategies of the day of the week effect in the CSE. The study confirmed the existence of stock market anomalies as both days of the week effect and monthly effect, particularly during the war period. It found that these seasonality patterns limit the validity of the Efficient Market Hypothesis in the context of CSE.

Gaps in the Literature

Most studies focused on only the foreign stock markets and considered a few years' data set. This study would be capable of providing in-depth analysis considering the period of 22 years from 2nd of January, 1996 to 31st of March, 2017.

Methodology

Research approach

This research study adopts ex-post facto research approach as it seeks to explore the impact of daily market ratios on the daily stock market return by following quantitative method. Historical data is used for the analysis.

Data collection

The data used for this research was generated from the CSE official CD (Microsoft Excel track sheets of daily market indices and daily market ratio) from 2nd of January, 1996 to 31st of March, 2017.

Conceptual framework

Figure-1 below shows the conceptual framework of this research study, which is based on the extant empirical literature review, depicts the relationship between independent variables and dependent variables.
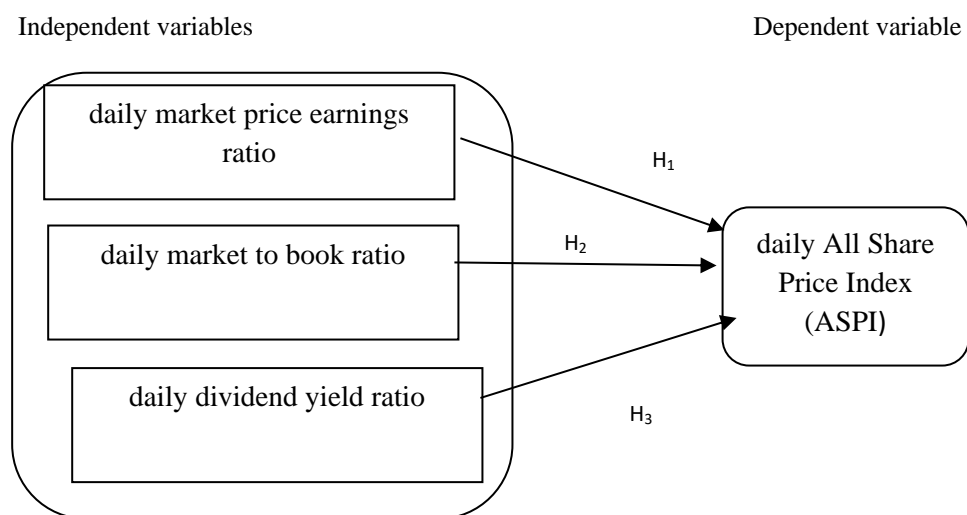
Independent variables   Dependent variable

Fig. 1. conceptual framework
Source: Researcher's compilation.

Hypotheses of the study

As a follow-up to the research questions and objectives of the study, the following series of hypotheses were formulated.

H_{1a0}: There is no significant impact of daily market price earnings ratio on daily ASPI of CSE.
H_{1a1}: There is a significant impact of daily market price earnings ratio on daily ASPI of CSE.
H_{2a0}: There is no significant impact of the daily market to book ratio on daily ASPI of CSE.
H_{2a1}: There is a significant impact of the daily market to book ratio on daily ASPI of CSE.
H_{3a0}: There is no significant impact of daily dividend yield ratio on daily ASPI of CSE.
H_{3a1}: There is a significant impact of daily dividend yield ratio on daily ASPI of CSE.

Results and Discussions

The analyses were performed by E-Views using the unit root test, causality test, diagnostic test, correlation analysis and regression analysis.

Unit root test
The Augmented Dickey-Fuller (ADF) test was employed to check the unit root test. To reject the null hypothesis, the data are non –stationary, the ADF statistics must be negative than the critical values and significant.

Table 1: Unit root test

Variables	Augmented Dickey-Fuller test statistic	Prob.*	Order of Integration
D(LASPI)	-37.33650	0.0000	I (1)
D(PER)	-68.52932	0.0000	I (1)
D(MBR)	-84.98805	0.0001	I (1)
D(DYR)	-45.99139	0.0000	I (1)
Test critical values: 1% level		-3.959839	
5% level		-3.410686	
10% level		-3.127127	
*MacKinnon (1996) one-sided p-values.			

Source: Researcher's E-Views result.

According to the Table 1, there is the presence of stationarity at first differencing level of series since the ADF statistics are less than the critical values at 1%, 5% and 10% respectively. Tests of ADF is applied for stability first difference relating to data for the period from 2nd of January, 1996 to 31st of March, 2017 of ASPI.

Causality test

The Granger causality test was conducted to test the causality of the impact of the independent variables on the dependent variable.

Table 2: Granger Causality Tests

Sample: 5098, Lags:2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Probability**
DPER does not Granger Cause DLASPI	5091	0.01377	0.9863
DLASPI does not Granger Cause DPER		42.9795	3.E-19
DMBR does not Granger Cause DLASPI	5091	5.52241	0.0040
DLASPI does not Granger Cause DMBR		143.516	2.E-61
DDYR does not Granger Cause DLASPI	5091	0.78890	0.4544
DLASPI does not Granger Cause DDYR		48.8846	9.E-22

Source: Researcher's E-Views result.

As indicated in the Table 2, it was revealed that PER does not granger cause ASPI (p – value $0.9863 > 0.05$) however, ASPI of the CSE granger cause PER (p-value $= 3.E\text{-}19 < 0.05$). Hence, there is a unidirectional relationship between ASPI and PER. MBR does granger cause ASPI since (p-value $= 0.0040 < 0.05$), also the ASPI granger cause MBR at (p-value $= 2.E\text{-}61 < 0.05$). The DYR does not granger cause ASPI (p-value $= 0.4544 > 0.05$), but the ASPI granger cause DYR as indicated (p-value $= 9.E\text{-}22 < 0.05$).

Diagnostic test

There are often two problems, namely heteroscedasticity and multicollinearity, which will impair the effect of estimation of a multiple regression model. Heteroscedasticity occurs when the variance of the error terms differs across observations, the presence of which results in inefficient estimates of the coefficients although they remain unbiased.

Table 3: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	68.54375	Prob. F(3,5091)	0.0000
Obs*R-squared	197.8033	Prob. Chi-Square(3)	0.0000
Scaled explained SS	4403.531	Prob. Chi-Square(3)	0.0000
Heteroskedasticity Test: White			
F-statistic	2269.518	Prob. F(9,5085)	0.0000
Obs*R-squared	4079.422	Prob. Chi-Square(9)	0.0000
Scaled explained SS	90816.78	Prob. Chi-Square(9)	0.0000

Source: Researcher's E-Views result.

In this study, the researcher used the Breusch-Pagan-Godfrey test and White test to detect whether there was a problem of heteroscedasticity. The results indicate that all had no presence of such a problem.

Correlation analysis

Table 4 shows the correlation between the dependent and independent variables. Correlations between independent variables should not be considered harmful until they exceed 0.80 or 0.90. If the correlations among independent variables are more than 0.8, the problem of multicollinearity will occur. This problem may lead to strange results in regression analysis, for instance, the adjusted R^2 becomes too high and not statistically significant. In this study, all the correlations among independent variables are lower than 0.80 indicating that no multicollinearity exists between the variables.

Table 4: Correlation matrix

Variables	DLASPI	DPER	DPBR	DDYR
DLASPI	-			
DPER	0.646626	-		
DMBR	0.508462	0.588603	-	
DDYR	-0.593878	-0.403538	-0.325213	-

Source: Researcher's E-Views result
Note: *p<.05, **p<.01

According to the Table-4, there was a positive correlation between PER and ASPI (r = 0.65). There was also a positive correlation between MBR and ASPI (r = 0.51). There was a negative correlation between DYRR and ASPI (r = -0.59).

Regression analysis

Table 5: Regression analysis

Dependent Variable: DLASPI				
Sample (adjusted): 2 5098 Included observations:			5095	
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.000181	4.35E-05	4.166483	0.0000
DPER	0.009512	0.000278	34.18167	0.0000
DMBR	0.022711	0.001815	12.51608	0.0000
DDYR	-0.026734	0.000712	-37.55751	0.0000
R^2	0.563954			
Adjusted R^2	0.563697			
F-statistic	2194.792			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.908844			

Source: Researcher's E-Views result.

The result reveals that the model for this study is well fitted (F-statistic= 2194.792). The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 56.39% of the variations observed in the dependent variable were explained by the independent variables. The result shows that PER

has a positive and significant impact on ASPI (PER coefficient = 0.009512, p = 0.00 < 0.05, t-value = 34.18167). Therefore, the alternative hypothesis H_{1a1} is supported. The results are in line with previous studies performed by Fama and French (1992), Lau, Lee and McInish(2002) and Muhammad and Rashid (2014). However, these findings are contrary to Altay and Aydogan (2000), Muthui (2003), Fun and Basana (2012) and Maxwell and Kehinde (2012) found that there was no significant impact of PER on stock market price. MBR has a positive and significant impact on ASPI (MBR coefficient = 0.022711, p = 0.00 < 0.05, t-value = 12.51608). Therefore, the alternative hypothesis H_{2a1} is supported. The results are in line with previous studies performed by Fama and French (1992) and Guler and Mustafa (2008). However, these findings are contrary to Lau, Lee and McInish(2002) found that there was no significant impact of PBR on stock market price. DYR has a negative and significant impact on ASPI (DYR coefficient = -0.026734, p = 0.00 < 0.05, t-value = -37.55751). Therefore, the alternative hypothesis H_{3a1} is supported. The results are in line with previous studies performed by Guler and Mustafa (2008) and Muhammad and Rashid (2014). The Durbin Watson statistic is 1.908844 which indicates that there is no autocorrelation.

Conclusions and Recommendations

The results from the analysis revealed that there was a positive correlation between PER and ASPI. There was also a positive correlation between MBR and ASPI and there was a negative correlation between DYR and ASPI. Results also reveal that PER has a significant and positive impact on ASPI of the CSE. PBR has a significant and positive impact on ASPI of the CSE. And DYR has a significant and negative impact on ASPI of the CSE. The analysis of this study would be helpful for the financial analysts, potential investors and future researchers.

This study recommends that the CSE should consider this impact while revising their strategies in order to make value for the shareholders as the relationship in PER, MBR and DYR has the significant impact on the daily return on ASPI. This study also recommends that potential investors to use the daily market-based ratio to predict the daily stock return. CSE should create the policies that will enhance the companies' (which are listed in the CSE) earnings after tax and number of shares traded and dividends since these variables are statistically significant.

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