

SIZE EFFECT ON STOCK RETURNS IN SRI LANKAN CAPITAL MARKET

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ABSTRACT: This study examines whether size effect exist on stocks returns in the Colombo stock market as an emerging capital market. The sample of study includes all non-financial companies listed on main board of Colombo Stock Exchange during the period from 2000 to 2013. The size of the firm is measured based on market capitalization at the end of each year. All sample of stocks are formed into five portfolios based on market capitalization and equally weighted average monthly portfolio return is calculated and assigned to respective quintile portfolios at the end of each year. The existence of size effect is estimated by the differences of portfolio return between smallest and biggest quintile portfolio. The analyses show that the smallest quintile portfolio of stocks earns significantly higher return than biggest quintile portfolio of stocks. Therefore, the study concludes that the size effect exists in the Colombo Stock Exchange during the study period and the finding consistent with the previous studies on USA and international markets.

Keywords: Size Effect, Colombo Stock Exchange, Market Capitalization, Stock Return

INTRODUCTION

The classical version of Capital asset pricing model (CAPM) developed by Sharpe (1964) and Lintner (1965) and Black (1972) is commonly used to estimate cost of capital and to value financial asset. The CAPM postulates that the market factor is the only factors that determine variations of expected return of stocks. Earlier studies after the formulation of the model find supportive evidences for CAPM that is there is a linear positive relationship existed between stock return and market factor (Black, 1972; Black, Jensen & Scholes, 1972; Douglas, 1967; Fama & MacBeth, 1973; Miller & Scholes, 1972; Stambaugh, 1982). However, Subsequent studies find evidences contrast to such existence of linear relationship (Davis, 1994; Fama & French, 1992, 1993, 1996; Grinold, 1993; Lakonishok & Shapiro, 1984). These findings have risen doubt on CAPM that ability of the market factor to determine the expected stock return. Due to the inability of the market factor, researchers have focused on identification of other risk factor that determines stock return. Banz (1981) finds the firm size able to determine the variations of expected return of stock. He states that there is a negative linear relationship exist between firm size and stock return. The stocks with smaller market capitalization earn higher return than stock with bigger market capitalization. The return differences between smallest and biggest market capitalization stocks is known as size premium. The size premium arises due to the size effect in the market.

The existence of size premium and negative relationship between firm market capitalization and stock return were confirmed by the study of Reinganum (1981), Bhandari (1988), Lamoureux and Sanger (1989) and Fama and French (1992), in US market. The size premium is found in international market also, for example Herrera and Lockwood (1994) in Mexican Stock Market; Dimson and Marsh (1984), Lewis (1985) and Mills and Jordanov (2001) in London Stock Exchange; Heston, Wessels and Rouwenhorst (1999) in European countries; Hodoshima, Garza-Gómez and Kunimura (2000) in Japanese market; Wahlroos and Berglund (1986) in Finland and Elfakhani, Lockwood and Zaher (1998) in Canada. Even though the existence of the size premium are found in several developed and emerging

markets, evidences for existence of size effect in the context of Sri Lankan market seems hard to find in literature. Therefore, this study empirically test the size effect of stock returns in the Colombo Stock Market.

LITERATURE REVIEW

Banz (1981) provided the first empirical study which offers evidences for size effect in US stock market. He analyzed all common stocks listed in the NYSE during the period from January 1936–December 1975. He found that the portfolio quintile consisting smallest market capitalization firms earn higher monthly risk adjusted return than remaining firms. Reinganum (1981) analyzed the size effect in using sample of 566 stocks listed in NYSE and AMEX during the period between from 1975–1977. His approach differed from that of Banz (1981). He formed portfolio based on market capitalization. The study revealed that the smallest decile portfolio consisting of smallest 10% of stocks outperform by 1.77% per month (approximately 30% p.a.) over the portfolio consisting largest size 10% of the stock. The study provided evidence for the size effect / premium on stock return. That is small firms performed better than large firms.

Herrera and Lockwood (1994) investigated the size effect in the Mexican Stock Market. He used all stocks listed in the Mexican stock exchange and similar stocks from the NASDAQ during the period from January 1987–December 1992. To construct the sample of NASDAQ stocks, a NASDAQ stock with similar industry characteristics was selected for each Mexican stock. There is a negative relation between average return and size of the firm. Lamoureux and Sanger (1989) examines the turn-of-the-year effect, the firm size effect, and the relation between these two effects. They used stocks traded on the OTC of NASDAQ and NYSE/Amex stocks during the period 1973–1985. The study found that the size premium of NASDAQ stocks earns 2.0% per month, while 1.7% for NYSE/Amex stocks. Levis (1985) examined the average return and size in the London Stock Exchange (LSE) by constructing ten portfolios during the period between from January 1958 to December 1982. His study reported that existence of a size effect on the LSE. However, he reported that the size effect is not statistically significant.

Dimson and Marsh (1984) examined the size effect evidence based on portfolio formed from the sample of stocks taken from London Share Price Database during the period from 1977–1983. The study revealed that the portfolio consisting smallest stocks earned 41% compounded annual return before adjusted for risk, while portfolio consisting largest stocks earned 18% only.

Bhandari (1988) examined the relationship between expected common stock return and Debt/Equity ratio and size. He used all stocks listed in NYSE during the period between from January 1948 to December 1979. The study found that the impact of size was negative and beta was positive on return and in January only. Heston et al. (1999) examined the relationship between stock return and firm size in 12 European countries 2100 stocks during the period from January 1978 to December 1995. The study observed that the size effect in five countries out of twelve countries.

Hodoshima et al. (2000) examined relationship between beta and return in Japanese market using cross-sectional regression analysis during the period between from January 1956 to December 1995. The entire period divided into four sub periods, such as 1956–1965, 1966–1975, 1976–1985 and 1986–1995. When considering beta with size and BE/ME ratio, the only significant variable was size with negative premium during the period July 1962–December 1995. The beta and size had positive and negative effect on return respectively. The size became insignificant and beta had negative effect on return during down market. However, BE/ME ratio was insignificant in both during up market and down market.

METHODOLOGY

The market data for this study were taken from the official website of the Colombo Stock Exchange website (www.cse.lk) and CSE data library. Other relevant data were taken from financial statements of respective companies published in annual reports. All listed companies are taken into considered for this study during the period from April 2000 to March 2013. However, the financial firms were excluded from the sample of this study. The market capitalization is calculated at end of March each year. The firm size is defined as the number of shares outstanding times closing price as at end of last trading day of financial year end of respective firm. Market equity is sorted in ascending order and divided into five equal number of portfolios. First quintile portfolios labeled as Q1, second quintile portfolios labeled as Q2 and so on. So that the stocks with smallest Market Equity in the first portfolio Q1 and the biggest Market Equity stocks are in the last portfolio Q5. The equally weighted monthly portfolio return is assigned to respective portfolio from April t to March t+1. The stock return calculated by incorporating capital gain and dividend yield during the month t. The portfolio is reformed each year at end of March. The existence of size effect is tested by significance of size premium i.e. the return differences between two extreme decile portfolios.

3.1 Hypothesis

H_0 : size effect is not exist in the Colombo stock market.

H_0 : average portfolio return of Q5 \geq average portfolio return of Q1

$H_0: \bar{x}_{Q5} \geq \bar{x}_{Q1}$

H_1 : size effect is exist in the Colombo stock market.

H_1 : average portfolio return of Q5 < average portfolio return of Q1

$H_1: \bar{x}_{Q5} < \bar{x}_{Q1}$

RESULTS AND DISCUSSION

Table 1 shows number of stocks included in the sample of this study in each quintile portfolio at end of March t each year.

Table 1. Number of Stocks of Portfolios

Number of Stocks					
Year	Q1	Q2	Q3	Q4	Q5
2000	33	34	34	31	36
2001	35	32	35	32	35
2002	33	35	36	33	36
2003	34	38	36	33	37
2004	35	39	38	34	37
2005	37	39	37	36	39
2006	39	39	39	39	38
2007	38	40	40	38	37
2008	37	40	39	38	36
2009	37	39	39	38	38

2010	67	39	38	39	39
2011	67	39	38	39	39
2012	38	39	37	38	38

Table 2 shows average market value for respective size quintile portfolio each year as at end of March. The given market value is calculated by aggregating whole market value of each stock and divided by number of stocks outstanding of the respective portfolio. The values demonstrate that the average market value is increases from smallquintile portfolio to big quintile portfolio each year.

Table 2. Average Market Capitalization of Portfolio
Average Market Capitalization in Million Rupees

Year	D1	D2	D3	D4	D5
2000	18.36	73.52	170.07	324.59	1444.79
2001	17.44	62.80	133.85	255.49	1202.63
2002	27.52	106.45	230.17	445.20	2451.34
2003	36.88	146.39	321.29	737.44	7750.58
2004	65.71	205.98	448.44	995.60	6167.20
2005	118.92	335.28	725.75	1630.40	13262.66
2006	120.28	344.05	784.24	1541.93	12954.61
2007	117.44	343.34	762.10	1556.47	15389.12
2008	132.58	367.67	799.35	1800.27	12216.89
2009	151.66	444.92	1016.82	2365.65	15820.50
2010	311.04	1060.51	2559.04	5507.90	35684.82
2011	529.65	1369.81	2705.52	5865.61	34207.45
2012	394.22	1078.58	2115.15	4757.89	33626.31

Table 3 shows average annual monthly equally weighted return for respective quintile portfolio each year as at end of March t+1. The average annual monthly return of each stock is the average of twelve-month return from April t to March t+1. The given average annual monthly portfolio return of each quintile portfolio is calculated by aggregating whole average annual monthlyreturn of each stock and divided by number of stocks outstanding of the respective portfolio. The values indicate that the smallest quintile portfolio return is higher than the biggest quintile portfolio. The differences of return between smallest and biggest quintileportfolios provide evidence for existence size effect.

Table 4 shows the test result of Pearson correlation between Natural Logarithm of Market capitalization of each stock and monthly return of each stock. The correlation coefficient is -

0.12 on 25813 observations during the study period. The p value is 0.0235 is less than alpha value of 0.05. Therefore, the null hypothesis there is no correlation between firm market capitalizations, stock return is rejected at 95% confidence level, and the correlation is significant. It is evidence that there is a weak negative correlation between market capitalization and stock return exist in stocks listed on CSE during the study period.

Table 3. Average Monthly Return of Portfolios

Average Monthly Return					
Year	Q1	Q2	Q3	Q4	Q5
2000	-0.4393	0.6496	-0.5344	-0.1855	0.0406
2001	7.0468	4.7628	3.1479	5.0925	4.3045
2002	3.4928	2.7459	2.3954	2.7601	2.9049
2003	7.9840	3.7400	2.9964	6.1806	6.6947
2004	12.8148	7.4714	7.5121	6.7526	3.6788
2005	3.0386	2.5225	3.2725	3.6413	3.0152
2006	0.8927	-0.4935	1.0861	4.0667	1.5444
2007	4.9886	2.9376	4.1660	2.1700	0.7101
2008	-1.2859	-0.6867	-2.1638	-0.7234	-1.2293
2009	6.8801	7.6411	8.1413	9.1371	9.3624
2010	8.3658	13.1802	8.7671	8.3953	6.4695
2011	-0.7306	-1.6616	-1.5500	-2.3375	-1.0375
2012	0.7160	-0.1619	0.2202	0.6197	0.9482

Table 4. Correlation coefficient

Variables	Pearson Correlation	Sig
Ln Market Equity and Monthly Return	-0.12	0.0235*
*Correlation is significant at the 0.05 level		

Table 5. Descriptive Statistics

Descriptive Statistics					
Statistic	Q1	Q2	Q3	Q4	Q5
No. of observations	156	156	156	156	156
Mean	4.14	3.29	2.90	3.50	2.87
Median	2.13	1.44	2.12	2.05	1.76
Minimum	-28.01	-20.85	-21.48	-19.68	-17.48
Maximum	60.32	63.48	38.72	30.71	29.89
Range	88.33	84.32	60.19	50.39	47.37
Variance (n-1)	147.16	125.19	91.82	88.87	66.49
Standard deviation (n-1)	12.13	11.19	9.58	9.43	8.15
Standard error of the mean	0.97	0.90	0.77	0.75	0.65
Mean absolute deviation	8.99	7.94	7.27	7.39	6.17

Table five shows descriptive statistic summary of monthly observation of each portfolio average monthly return from April 2000 to March 2013. The average portfolio return of smallest quintile portfolio Q1 return is 4.1410% per month while biggest quintile portfolio

Q5 return is 2.8661% per month. The size premium i.e. differences between smallest and biggest quintile portfolio return is 1.2748%, standard Deviation is 9.58848 %, Standard Error of Mean is 0.76769% and t statistic is 1.661 % with 155 degree of freedom. The statistical test shows that the p value is 0.049406, which is less than alpha value of 0.05. Therefore, null hypothesis of the study; there is no size effect exist in the market is rejected at 95% confidence level. The alternative hypothesis; the average monthly return of smallest quintile portfolio Q1 is higher than biggest quintile portfolio is accepted. Therefore, the study provides evidence for existence of size effect in the Colombo stock market during the study period.

CONCLUSION

This study examines existence of size effect on stocks returns in the Colombo Stock Exchange. The sample of study includes all non-financial companies listed on main board of Colombo Stock Exchange during the period from 2000 to 2013. All sample of stocks are formed into five portfolios based on market capitalization and equally weighted average monthly portfolio return is calculated and assigned to respective quintile portfolios at the end of each year. The existence of size effect is estimated by the differences of portfolio return between smallest and biggest sizequintile portfolio. The analyses show that a significant size premium i.e. the smallest quintile portfolio of stocks earns higher return than biggest quintile portfolio of stocks. Further, it finds that there is a weak correlation between firm size and stock return. Therefore, the study concludes that the size effect exists in the Colombo Stock Exchange during the study period and the finding consistent with the previous studies in international markets.

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