

## Article

# Firm Size Effect and Cross-Sectional Returns: A Study of Automobile Sector

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## A B S T R A C T

The size effect is an anomaly in the stock market which shows the volatility of the market. The study has been conducted on yearly basis data relating to market capitalization, earning per share, book value and daily returns for the period of 2005 to 2014 of selected Indian automobile companies which are listed in Bombay Stock Exchange. The study highlights individual and market returns of the companies and measures the impact of firm size on cross-sectional returns. The study also tries to stretch on comparing return and size of the company across industry and concludes that small cap securities generate greater returns than large- cap and medium-cap securities.

**Keywords:** Efficient Market, Portfolio Returns, Size Effect, Stock Market

## Introduction

The stock market is a place where an individual investor or a group of investors invest their money for the purpose of generating a profitable return from their investments. But many investors are not able to make a profitable return from their investments; rather they try to outperform or beat the market. However, in this context Fama suggested that the price always reflects with the all available information in the market.<sup>7</sup> Thus in an efficient market, the stock price is always equal to its fundamental value at all times and there is no scope for bargains in the market (Fama, 1965).

The existence of the firm size effect is one of the major issues for the investors in investment decision making in Indian stock market and they are very much fond of getting the best returns from their invested amount, which is based on a number of other factors such as financial performance of an individual firm, and their stocks performance that are behaving in response to the stock market fluctuation. Similarly, day and month trading is also one of the factors which affect the return pattern in stock market. In this regard, past literature relating to various researchers was discussed about the factor which affects the stock return

such as Banz,<sup>2</sup> Bettman et al.<sup>3</sup> Fama and French, 1995.

Size of the firm and the cross-sectional returns of a particular stock always remain one of the key factor for investment decision making. Moreover, in India investors are always facing difficulty in selecting and constructing the best portfolio that will maximize the return and minimize the cost. Empirically, it was believed that small firm gives more returns as compared to a large firm. Amihud investigated the relationship between returns and liquidity of the stocks in NYSE where the results showed a significant and negative effect on stocks.<sup>1</sup> Similarly, the size and momentum pattern in North America, Europe, Japan and Asia-Pacific which results in a declining trend in momentum and the return of smaller firms to bigger (Fama and French, 2012). In the light of above context, the present study tries to measure whether there is an impact of firm size on cross-sectional returns. The data relating to market capitalization, earning per share (EPS), book value and daily closing value for the period of 2005 to 2014 is data source for this study. The study was further divided into six sections including introduction, literature review, objectives of study, followed by research methodology, results and discussion, and conclusion.

## Review of Literature

Slowly, interest of the researcher is growing by highlighting various literatures on firm size effect on stock returns where stock price is always equal to its fundamental value at all times in an efficient market and there is no scope for bargain in the market (Fama, 1965).

Banz examined the relationship in stock traded in NYSE and the result suggested that size had very little effect on return of large- and medium-sized firms.<sup>2</sup> Similarly, a higher return is associated with higher profitable firms not with unprofitable firms (Fama and French, 2008).

Gupta tested the semi-strong efficiency of the Indian stock market over the period 1995 to 2000 by employing event study where she concluded that the Indian stock market was in semi-strong form.<sup>15</sup>

In same way, Iqbal and Mallikarjunappa tested market reaction to quarterly earnings announcement of 149 companies listed on the Bombay Stock Exchange.<sup>13</sup> They concluded that the Indian stock market is not efficient in semi-strong form.

Hearn investigated CAPM model with size and liquidity factors in Bangladesh, India, Pakistan, and Sri-Lanka firm size effects where he found significant responses from all four countries.<sup>10</sup> Similarly, Hearn also focused on sub-Saharan countries with evidence of existence of size and liquidity impact on return.<sup>11</sup>

Minovic and Boško selected the companies listed in Belgrade Stock Exchange, Serbia for investing size, book to market ratio and liquidity risk on asset return where result suggested the significance of firm size on equity pricing and return.<sup>14</sup>

Gandhi et al. studied the size, return and risk associated with banks operating in US and result suggested that a lower risk adjusting return for larger bank.<sup>9</sup> Furthermore, the consistency in Karachi Stock Exchange with risk adjustment and the evidence regarding existence of firm size was also found in Zimbabwe with significant positive relationship.<sup>13</sup>

Farhan and Sharif examined the effect of firm size on stock returns with time variant factor of January and July where their result suggested that the size of the firm is negatively and significantly related to the stock returns and July effect is positively and significantly related to the returns of the firm.<sup>8</sup>

On the basis of above literature, the study aims to measure the impact of firm size on cross-sectional returns and its comparing the return and size of the company across industry groups.

## Objective of the Study

The present study aims:

- To measure the impact of firm size on cross- sectional returns.
- To compare return and size of the company across industry groups.

## Research Methodology

The present study was secondary in nature which has been conducted on yearly basis data relating to market capitalization, earning per share, book value and daily returns for the period of 2005 to 2014. The sample size was 13 Indian automobile companies listed in Bombay Stock Exchange. The empirical data and index prices were taken from the official websites of BSE, Money control and Yahoo Finance.

**Table I. List of Automobile Companies**

| S. No. | Name of Company      |
|--------|----------------------|
| 1      | Eicher Motors        |
| 2      | SML ISUZU            |
| 3      | Atul Auto            |
| 4      | Maharashtra Scooters |
| 5      | Force Motors         |
| 6      | VST Till. Tractors   |
| 7      | Hero Motocorp        |
| 8      | Ashok Leyland        |
| 9      | Maruti Suzuki India  |
| 10     | Scooters India       |
| 11     | TVS Motor            |
| 12     | M & M Auto           |
| 13     | HMT Tractors         |

## Technique for Data Analysis

The returns are calculated as follows:

1. The daily returns of individual stocks were computed by logarithmic returns using MS- Excel and the inferential statistics were computed with the help of SPSS.

$$R_{jt} = 100 * \ln(P_{jt}/P_{jt-1})$$

Where,

$R_{jt}$ =Daily mean return of present form to the j

security, P=price of stock,

t=current day, t-1=the immediate preceding time.

Average Returns were calculated by using AVERAGE function in Microsoft Excel, i.e.,

=AVERAGE (number1, [number2], ...)

Where, (number1, [number2] ...) will be the daily returns of given securities.

- The size of the firm were computed by calculating median of all the firms on yearly basis, where size of the firm was categorized as small-cap, medium-cap and large-cap firms such as: Small Cap.<Median Value<Large Cap. (Medium Cap)
- The expected return on a portfolio is computed as the weighted average of the expected returns on the stocks which comprise the portfolio. The weights reflect the proportion of the portfolio invested in the stocks. This can be expressed as follows:  

$$E[R_p] = W_1E[R_1] + (1 - w_1)E[R_2]$$

Where,  $E[R_p]$ =the expected return on the portfolio,  $W_i$ =the proportion of the portfolio invested in stock i, and  $E[R_i]$ =the expected return on stock
- The data has been analyzed by applying the statistical tools such as the correlation and regression analysis addresses the objective of the study.

## Results and Discussion

### Expected Return of Portfolio

The empirical findings of the research showed a rationality under which the inferences are made. The results of different data figures with their description were given below. Table 2, presents the expected return of a portfolio which is computed as the weighted average of the expected returns on the stocks that comprise the portfolio and the

firm size which are categorized on small, medium and large cap basis. The result shows that a small-cap firm has a greater positive (+Ve) returns for the entire period of 2005 to 2014 (excluding- 0.274209804, -0.064068005 for small cap and- 0.358066455, -0.12947999 for large cap in 2008 and 2011. In an overall, it was concluded that small-cap securities generate greater returns than large-cap and medium-cap securities.

## Regression and ANOVA Result

### Hypothesis Testing

$H_{01}$ : There is no significant impact of firm size on cross-sectional returns.

Table 3, discusses the regression result. R represents the multiple correlation coefficients, which show a linear correlation among different variables. Higher the value of R, results in a strong relationship between the predictor's value, i.e., firm size and the critical value, i.e., portfolio return. In this study, predictor's values of R for small-cap firm, medium-cap firm and large-cap firm were 0.513, 0.712 and 0.476 respectively, which indicates strong positive relationship between firm size and the returns. The value of R-square shows the variability of firm size effect in response to its cross-sectional returns, i.e., 0.263 (26.3%) for small, 0.507 (50.7%) for medium and 0.227 (22.7%) for large-cap firms. The values of Durbin-Watson autocorrelation in the residuals from a statistical regression analysis are almost

**Table 2.Expected Return of a Portfolio and Firm Size**

| Year | Portfolio average return sand firm size |                 |                |
|------|-----------------------------------------|-----------------|----------------|
|      | Small cap firm                          | Medium cap firm | Large cap firm |
| 2005 | 0.166607659                             | 0.159668388     | 0.180818132    |
| 2006 | 0.084553942                             | -0.017662667    | 0.013869747    |
| 2007 | 0.066627421                             | -0.017769575    | 0.08677033     |
| 2008 | -0.274209804                            | 0.087339778     | -0.358066455   |
| 2009 | 0.477514327                             | 0.308082041     | 0.427217416    |
| 2010 | 0.260575135                             | 0.075390371     | 0.107125329    |
| 2011 | -0.064068005                            | 0.003481697     | -0.12947999    |
| 2012 | 0.178169963                             | 0.025873843     | 0.08265161     |
| 2013 | 0.037589682                             | 0.048123234     | 0.025461389    |
| 2014 | 0.418768861                             | 0.164875074     | 0.318465273    |

**Table 3.Results of Firm Size Effect on Cross-Sectional Returns**

| Firm size       | Effect of firm size on cross-sectional returns |          |               |       |                    | Hypothesis   |
|-----------------|------------------------------------------------|----------|---------------|-------|--------------------|--------------|
|                 | R                                              | R-Square | Durbin-Watson | F     | P-value            |              |
| Small cap firm  | 0.513 <sup>a</sup>                             | 0.263    | 2.541         | 0.714 | 0.579 <sup>a</sup> | not rejected |
| Medium cap firm | 0.712 <sup>a</sup>                             | 0.507    | 2.524         | 2.059 | 0.207 <sup>a</sup> | not rejected |
| Large cap firm  | 0.476 <sup>a</sup>                             | 0.227    | 2.854         | 0.586 | 0.646 <sup>a</sup> | not rejected |

Source: Author estimations. P-value >0.05% level

closer to 3 (i.e., for small = 2.541, medium = 2.524 and large = 2.854), which symbolize better prediction for assumption which is shown in Table 2.

The result of ANOVA on the same Table 2 showed the variation effect of firm size on cross-sectional returns. The result revealed that in all cases of firm size, the p-value shows higher degree of significance at 5% level of significance, i.e., p-value > 0.05% level, which indicates there was no significant impact of firm size effect on cross-sectional return. Thus the null hypothesis was not rejected.

## Conclusion

It was believed that the existence of firm size effect usually was recognized because of limited scope of finance literature. This research tries to examine the effect of firm size on return of Indian automobile sector. On the basis of the results and discussion, it was concluded that the expected portfolio return shows a positive return for the entire period of 2005 to 2014 and small cap firm result a greater positive return than that of a medium-cap firm and large-cap firm. Moreover, the results also revealed that the size of the firm has positively and statistically no insignificant impact on the stock returns that may be due to bad stock market momentum, economic crises or due to anomaly size effect.

## References

1. Amihud Y. Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets* 2002; 5(1): 31-56.
2. Banz RW. The relationship between return and market value of common stocks. *Journal of Financial Economics* 1981; 9(1): 3-18.
3. Bettman JL, Wen NG, Stephen JS. The economic significance of trading based on the size effect in Australia. *Australian Journal of Management* 2011; 36(1): 59-73.
4. Fama EF. Random walks in stock market prices. *Financial Analysts Journal* 1995; 51(1): 75-80.
5. Fama EF, French KR. Size and book-to-market factors in earnings and returns. *The Journal of Finance* 1995; 50(1): 131-55.
6. Fama EF, French KR. Size, value, and momentum in international stock returns. *Journal of Financial Economics* 2012; 105(3): 457-72.
7. Fama EF. Efficient capital markets: A review of theory and empirical work. *The Journal of Finance* 1970; 25(2): 383-417.
8. Farhan M, Sharif S. Impact of size on returns at Karachi stock exchange (KSE). 2015: 1-37. Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2605460](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2605460). Accessed on: Sep 3, 2015.
9. Gandhi P, Hanno L. Size anomalies in US bank stock returns. *The Journal of Finance* 2015; 70(2): 733-68.
10. Hearn B. Time varying size and liquidity effects in South Asian equity markets: A study of blue-chip industry stocks. *International Review of Financial Analysis* 2010; 19(4): 242-57.
11. Hearn B. Size and liquidity effects in African frontier equity markets. *Applied Financial Economics* 2012; 22(9): 681-707.
12. Mallikarjunappa T. Market reaction to earnings information: An empirical study. *AIMS International* 2007; 1(2): 153-67.
13. Mazviona BW, Nyangara D. Does firm size affect stock returns? Evidence from the Zimbabwe Stock Exchange. *International Journal of Business & Economic Development* 2014; 2(3).
14. Minović J, Boško Ž. The impact of liquidity and size premium on equity price formation in Serbia. *Economic Annals* 2012; 57(195): 43-78.
15. Gupta V. Announcement effects of bonus issues on equity prices: The Indian experience. *Indian Journal of Finance and Research* 2003; 13(1&2).