Does Categorization Influence Price Behavior of Shares?
A Study on Dhaka Stock Exchange

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Abstract: Appropriate information has an important implication for the investment analysis and management of portfolio. Various signaling devices are used to convey this information to potential investors. Categorization of shares is one of them. It aims at providing the investors' information with company performance in order that it helps the investors a lot in choosing companies before making decision. So it argues that the categorization influences price behavior of shares. This study actually concentrates on finding out whether categorization of securities has any impact on price behavior of shares. In assessing the impact, a non-parametric statistical test (Chi-square test) and ANOVA technique have been carried out on some selected securities traded in DSE. The study reveals that categorization does not influence the price behavior of shares. It is hoped that this study will draw attention for further study to improve the concept of 'Categorization' as a signaling device.

1. Introduction

Researchers, investors and practitioners all yearn for easy to-read indicators of corporate performance that can be used to judge the quality of share. This collective desire is so powerful that it has led regulators to do Categorization to pass on some signals regarding the company to the sophisticated investors. There had been several empirical studies conducted by different researchers in different efficient capital markets of the world. But very few studies have been carried out to test how quality of shares works as a signaling device on the performance of shares. The necessity of categorization of shares in Dhaka Stock Exchange Ltd. is one of those issues to be tested. Categorization of stocks was intended to work as an instrument for signaling the performance of the public limited companies so that the investors can correctly identify the viable companies and can make appropriate investment decisions. By categorization potential investors are able to know the companies that do not hold annual general meetings as stipulated in company guidelines, do not declare dividends or invest the retained earnings in value maximizing investments, which keep the investors into darkness regarding company performance. This necessitates the categorization of companies to signal their performance to the investors. So it has been widely acclaimed by the investors. But there is a question

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whether or not the investors are really influenced by such categorization of stocks. Hence, the present study aims at revealing whether investors consider categorization of shares in case of investment decision in DSE.

2.   Objective of the Study

Categorization conveys important information regarding the companies to the potential investors. The study tries to examine whether those investors consider categorization seriously in case of investment decision. Specifically this study focuses on the impact of categorization on share price movement in Bangladesh.

3.   Brief Overview of DSE

DSE, being the largest institution in the capital market of the country plays a significant role. Like any other stock exchange, it provides opportunity to the investors for immediate liquidity of their investment. It was first incorporated as the East Pakistan Stock Exchange Association Limited on April 28, 1954. However, formal trading began in 1956 with 196 securities listed on the DSE. On May 14, 1964 it was renamed as Dhaka Stock Exchange (DSE) Limited. It is registered as a Public Limited Company and its activities are regulated by its Articles of Association and its own rules, regulations, and by-laws along with the Securities and Exchange Ordinance, 1969; the Companies Act, 1994; and the Securities and Exchange Commission Act, 1993 (DSE, 1999). As per the DSE Article 105B, its management is separated from the Council. The status of DSE as on Dec-2006 is depicted in Appendix-1.

4. Share Categorization and its Turnover:

The prime bourse of the country introduced the 'Group "A" & 'Group "B" from July 2, 2000 based on its financial strength and performance to give information to investors for taking informed decision. DSE has further categorized the listed securities by introducing 'Group "Z" which came into effect from September 26, 2000. The Stock Exchange introduced another category of the listed securities as Group "G" for Greenfield companies on June 30, 2002. The "N" category was introduced through an SEC order no. SEC/SRMID/94-231/612 dated July 03, 2006 which is applicable for all newly listed companies other than Greenfield companies (DSE Monthly Review: year 2006). Criteria for Share Categorization are shown in Table-1.

Table-1: Criteria for Share Categorization

| Category	Conditions
A	o Held current AGM regularly o Declare dividend @ 10% or more in the English calendar year
B	o Held current AGM regularly o Failed to declare dividend at least @ 10% in English calendar year
G	o Enlisted but yet to start its operation
Z	o Failed to hold current AGM regularly o Failed to declare any dividend o Not in operation continuously for more than six months o Accumulated loss after adjustment of revenue reserve, if any, is negative and exceeded its paid-up capital.
N	o All newly listed companies except Greenfield companies (only for an initial period).

Fig.-1: Category-wise Share Turnover-Dec.-05
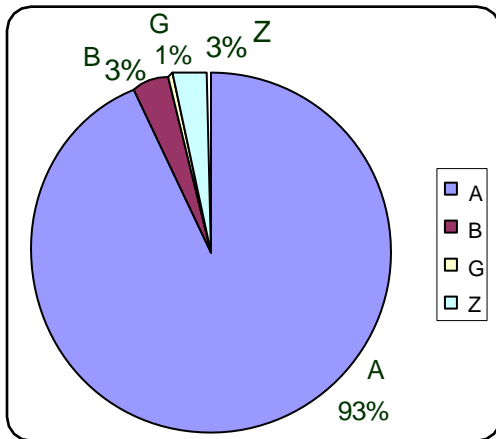
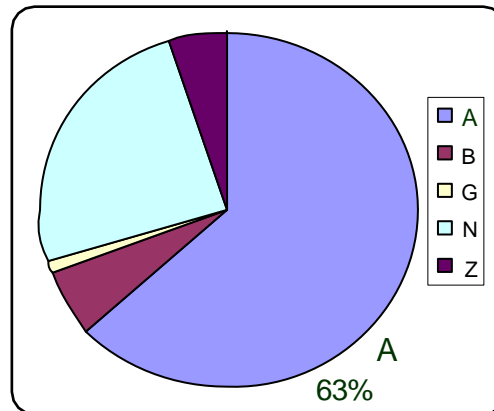**Fig.- 2: Category-wise Share Turnover-Dec.-06**

**Table - 2: Growth and development of the capital market
in Bangladesh (DSE) for year 2005 & 2006**

Year	No. of listed com.	Market capitalization (mil. Tk.)	Trading value (mil.Tk.)	No. of shares issued	No. of shares traded
2005	286	234211.73	64860.00	1244142000	883300000
2006	310	323367.94	65079.11	1546050000	797770000

The year 2006 witnessed a growth of transaction in terms of value compared to the preceding year though a good number of days were without trading because of political agitations. A total of 832.71 million shares and debentures valued at Tk. 65,079.12 million were traded in 2006 as against 883.30 million shares and debentures valued TK. 64,835.28 million of 2005 (DSE Monthly Review: year 2005 & year 2006). In figure-1 & figure-2, categorize-wise share turn over for year 2005 & 2006 have been shown. During year 2005, share turnover of A category companies is highest amongst other categories. It continues during year 2006 but the percentage is lower comparative to previous one as there is an increment in category "B" & "Z" along with an introduction of new category "N".

5. Literature Review

Though categorization of shares is likely to assist investors in making investment decision, no recognized study has been carried out on the effect of such categorization. The important aspect of categorization is that, it provides good degree of information to public based on –holding A.G.M and dividend declaration. There are various indicators that convey information to the public regarding the probable performance of the shares. Albanis and Batchelor (1999) carried out a study at London Stock Exchange aiming at finding rules to classify a particular share as high performing (H) or low performing (L) in order to provide some degree signal for investment. They find that all methods produce consistent excess returns in ex ante forecasting. The nonlinear methods yield improvements in classification over the linear model which are statistically significant, but translate to only small increases in financial returns.

The changes in the share price of a company are the result of influences by numerous factors. Relating to that, Ahsan & Bashar (1999, Pp. 100-116) assume, effect of frictionless capital market, transaction cost, personal tax, corporate tax, announcement of dividend on share price movement-all these issues demand wide-spread and in-depth

analysis. A study by Stout (2005) offers a brief reminder of some of the many reasons why stock prices often fail to reflect true corporate performance, including the problem of private information; obstacles to effective arbitrage; investors' cognitive defects and biases; options theory and the problem of multiple residual claimants; and the problem of corporate spillover effects that erode diversified shareholders' returns. These considerations argue against assuming there is a tight connection between stock prices and underlying corporate wealth generation. The Essay concludes that, if we allow our desire for a universal performance measure to blind us to the fallibility of share price, we court costly error. In this study the author examines three recent examples of just such erroneous triumphs of hope over experience.

In their 1932 classic The Modern Corporation and Private Property, Adolph Berle and Gardiner Means noted that "the values accorded to securities on the faith of market quotations are only 'paper' and perhaps ought not to be invested with any great amounts of significance." John Maynard Keynes had an even more cynical view. In his 1936 The General Theory of Employment, Interest, and Money, Keynes famously described the stock market as a "beauty contest" in which prices were largely disconnected from value.

Consistent with prior studies, a study has been conducted on some selected securities traded in the Dhaka Stock Exchange Ltd. to find out whether categorization really influence on price behavior of shares.

6. Research Methodology

This is an exploratory research based on secondary data collected from DSE library.

6.1. Population and Sample: The daily closing prices of companies listed on the DSE for a period of almost two years (January 01, 2005 to December 28, 2006) were considered as the target population for this study. A handsome number of companies (54 companies) have been taken randomly as sample which is about 20% of the total population (268 listed companies). Sample has been chosen from those companies whose categories remain same in year 2005 and year 2006. The sample periods include a total of 258 trading days of 260 listed companies for year 2005 and a total of 228 trading days of 268 listed companies for year 2006.

6.2. Scope of Study: Usually the population (all listed companies) is grouped into five categories (four categories during year 2005) but the sample of 54 listed companies is grouped into four categories as N category has been avoided. The reason of doing so is enumerated later. However, these companies are again sub-grouped into 16 classes based on the industry they belong to. The sample size is about $1/5^{th}$ of total trading companies which has proportionate representation from each category and industry. However, there

being only one company in G category, it has been selected as a sample. Though this company is yet to start operation, its shares are regularly traded in the stock market. Representation of this company has been considered relevant. N category companies are not considered as sample as their status do not remain same after a specific time. Number of randomly selected companies from different industries is shown in Table 3.

Table 3: Randomly selected companies from different industries of DSE for the study

	Bank	Inv.	Eng.	Food	Fuel	J	Tex.	Phar.	Pap.	Ser.	Cem.	IT	Tan.	Cer.	In.	Mis.	
A	6	6	3	3	1	1	2	1	0	0	1	0	0	0	3	1	28
B	1	0	1	0	0	0	1	0	0	0	1	0	0	2	0	0	6
G	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Z	1	0	1	3	0	1	2	2	2	1	0	1	1	0	3	1	19
Total Company																	**54**

6.3. Data Analysis: Chi-Square Test (a non-parametric test) and Analysis of Variance (ANOVA) have been conducted to statistically analyze whether the categorization influences price behavior of shares. Here, Chi-Square test is used to find out whether there is any association between the quality (categorization) and performance (price behavior) of the shares i.e. whether the attributes are independent and ANOVA is used to explain whether mean prices of shares differ significantly according to their category traded on capital market in Bangladesh.

7. Analysis of the impact of Share Categorization on Price Behavior

7.1. Chi-square Test for the Study

As a test of independence, chi-square test enables us to explain whether or not two attributes are associated (Kothari:2005). The study seeks evidence whether the categorization really affects the market price of shares i.e. whether there is any association between categorization and market price of securities at DSE. For this, Chi-square test has been conducted where hypotheses are taken as follows:

Null Hypothesis (H_0): There is no significant relationship between categorization and price behavior of securities.

Alternative Hypothesis (H_1): There is significant relationship between categorization and price behavior of securities.

Table-4 shows the number of category-wise companies having market value higher/lower than face value. Appendix – 2 shows the list of the sample companies with their face value and average price.

Table 4: Data arrangement for Chi-square Analysis

Security Category	Market Price Higher than Face Value	Market Price Lower than Face Value	Total
A	25	3	28
B	4	2	6
G	1	0	1
Z	11	8	19
Total	41	13	**54**

From Table-4, we see there are three means of proportion; Security category, market price higher than face value and market price lower than face value. Table-5 depicts the result of Chi-Square (Appendix-3 shows the calculation of Chi-Square Analysis).

Table-5: Chi-Square Result

Chi-Square	Chi Values
$\chi^2_{observed}$	6.71
χ^2_{table}	7.82

Here, $\chi^2_{observed} = \sum \dfrac{(f_o - f_e)^2}{e}$ and, fe = Expected frequency, fo = Observed frequency

and, df= degrees of freedom where, df = (Row-1) x (Column -1) = (4-1) x (2-1) = 3

From table-5 it is seen that the table value of χ^2 for 3 degrees of freedom at 5% significance level (α = 0.05) is 7.82 which is greater than the calculated value of χ^2 (6.71). Therefore, the null hypothesis (H_0) is accepted. Hence, it can be concluded that there is no association between Categorization and price behavior of shares. That means, categorization does not influence the price behavior of shares.

7.2. ANOVA technique for the Study

The "Analysis of Variance" procedure or "F-test" is used in such problems where we want to test for the significance of the difference among more than two sample means (Gupta & Gupta: 1999, p.664). Here 'ANOVA' is used to examine whether mean prices of shares differ significantly according to their category traded in Bangladesh. For conducting this technique, the following hypotheses are taken:

Null Hypothesis (H_0): There is no significant difference among mean prices of shares of different categories.

Alternative Hypothesis (H_1): There is significant difference among mean prices of shares of different categories.

At first, average closing price of January-2005 has been taken to find out the value of F through ANOVA. Appendix - 4 shows the arrangement of mean of daily closing price of January-2005 of 54 listed companies (N, sample size) according to categorization along with the calculation for ANOVA table. After processing the data, Table-6 (ANOVA table) is resulted.

Table 6: Analysis of Variance (ANOVA) Results

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
SSB	704364.31	3	234788.10	**0.67**
SSW	17474882.14	50	349497.64	
SST	18179246.45	53		

The table value of F for (3, 50) degrees of freedom at 5% significance level ($\alpha = 0.05$) is 3.19 which is greater than the calculated value of F (0.67). Therefore, the null hypothesis (H_0) is accepted. Hence, it can be concluded that mean prices of shares do not differ significantly according to their category traded on capital market in Bangladesh.

Again, ANOVA technique is applied for other 23 months (from February-2005 to December-2006) and in all cases null hypothesis is accepted which concludes that, mean prices of shares of different categories traded on capital market are same at different point of time. This implies that the trading of company shares do not depend on the categorization they get.

The table of the results of F statistic per month of year 2005 & year 2006 is shown in Appendix – 5 (The table of mean closing price per month of year 2005 & year 2006 for each company of the sample is shown in Appendix – 6 & 7).

8. Findings, Implications, Conclusion and Scope for further research

(i) The result of Chi-square test & ANOVA test confirms that the market price of a stock does not depend on its categorization status. Thus it implies, investors do not take the stock categorization into consideration while trading their stocks in Dse. Though categorization of shares/company is likely to assist those investors in investment decision making, investors merely consider such categorization whenever they take investment decision.

(ii) However, categorization is a device to assist the investors in an emerging capital market like DSE, which is backed by the rational that, investors get good degree of information about performance of the companies. Though the yard stick of measuring the company performance are only two – holding AGM and declaration of dividend; still it works as a source of information gathering prior to making an investment decision.

(iii) According to the efficient market hypothesis (EMH), the capital market in Bangladesh is far below the level of an efficient market. The lack of awareness on part of the investors in such an inefficient market causes them to make improper investment decisions quite frequently. The nature of market imperfections could also be in the form of transaction costs, lack of timely information, cost of acquiring new information, and possible greater uncertainty about the future. Thus, in such a situation, categorization may be required to protect investors' interest as the companies will be forced to hold AGM and declare dividends to avoid adverse categorization. Then the dividend and the ultimate capital gain go to the investors' pocket. However, with the improvement of market efficiency, such categorization may not be required by the investors for investment decision making.

(iv) In Bangladesh, there is no recognized research work on the effect of categorization on price behavior. From this point of view, it is hoped that through exploring the necessity of categorization, this study will draw attention for further study to improve the concept of 'Categorization' as a signaling device so that investors consider it seriously while making investment decision.

(v) The present study has been conducted for 2 years, which is limited to 54 listed companies on DSE (about 20% of the total population). Use of population, in place of sample data and extended time period could reveal more accurate scenario of the results on whether categorization of securities has any impact on price behavior of shares. So, a further study can be suggested for a significant contextual attribute that shapes more real picture of the necessity of categorization.

9. References

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Appendex-1: Status of DSE as on December-2006

Total number of listed securities	310
Total number of companies	255
Total number of mutual funds	13
Total number of shares of all listed companies (In '000)	Tk. 15,46,050
Total market capitalization of all listed securities (mm)	Tk. 323,368
Total market capitalization of all companies (mm)	Tk. 276,429
Total market capitalization of all mutual funds (mm)	Tk. 1,537

Source: (DSE Monthly Review: year 2006)

Appendix – 2: List of sample companies

SL.	Cat.	Indus.	Listed Companies	FV(Tk.)	Average Price	High/ Low
1	**A**		Dutch-Bangla Bank Limited	100	1819.69	H
2			Eastern Bank Ltd.	100	873.374	H
3			Exim Bank Ltd.	100	507.544	H
4		**Bank**	Industrial Development Leasing Company	100	906.563	H
5			Bank Asia	100	466.061	H
6			United Leasing Company Ltd	100	907.279	H
7			Investment Corporation of Bangladesh (ICB)	100	163.756	H
8			6th ICB AMCL First Mutual Fund	100	196.29	H
9		**Invest.**	7th ICB AMCL First Mutual Fund	100	196.959	H
10			8th ICB AMCL First Mutual Fund	100	187.064	H
11			ICB AMCL First Mutual Fund	100	243.586	H
12			First BSRS Mutual Fund	100	91.5294	L
13		**Eng.**	Olympic Industries Limited	100	148.44	H

14			National Polymer Ind. Ltd.	100	360.362	H
15			Aftab Automobiles Limited	100	384.479	H
16		**Food**	AMCL (Pran)	100	442.535	H
17			FU-WANG Foods Ltd.	10	12.8695	H
18			British American Tobacco Bangladesh	10	95.7895	H
19		**Fuel**	BOC Bangladesh	10	117.905	H
20		**Jute**	Jute Spinners Ltd.	100	310.112	H
21		**Tex.**	Sonargaon Textiles Ltd.	100	90.3057	L
22			Square Textiles Ltd.	10	81.5406	H
23		**Phar.**	Beximco Synthetics Limited	100	84.1232	L
24		**Cem.**	HeidelbergCement Bangladesh Limited	100	641.757	H
25		**Ins.**	Federal Insurance Co. Ltd.	100	119.393	H
26			Purabi General Insurance Co. Ltd.	100	110.312	H
27			Bangladesh General Insurance Co. Ltd.	100	291.184	H
28		**Misc.**	Usmania Glass Sheet Factory Ltd.	100	1253.77	H
1		**Bank**	Arab Bangladesh Bank Ltd	100	418.424	H
2		**Cem.**	Confidence Cement Ltd.	100	129.895	H
3	**B**	**Eng.**	Kay & Que (Bangladesh) Ltd.	100	122.575	H
4		**Tex.**	Dulamia Cotton Spinning Mills Ltd.	100	65.1753	L
5		**Cer.**	FU-WANG Ceramic Ltd.	100	81.7402	L
6			Standard Ceramic	100	102.546	H
1	**G**	**Cem.**	Lafarge Surma Cement Ltd	100	415.633	H
1	**Z**	**Bank**	United Commercial Bank Ltd	100	1431.35	H
2		**Eng.**	Renwick Jajneswar & Co(Bd) Ltd	100	109.016	H
3		**Food**	Alpha Tobacco Mfg.Co. Ltd.	10	10.9388	H
4			Bangladesh Leaf Tobacco Co. Ltd.	100	176.781	H
5			Meghna Shrimp Culture Ltd	100	20.0211	L

6		**Jute**	Sonali Aansh Ind.Ltd	100	308.388	H
7		**Tex.**	Tamijuddin Textile Mills Ltd	100	42.8851	L
8			Desh Garments Limited	100	61.2289	L
9		**Phar.**	Wata Chemicals Ltd.	100	104.216	H
10			Bangla Process Ind. Ltd.	100	142.591	H
11		**Paper**	Bangladesh Monospool Paper Mgf.Co.Ltd.	100	27.8567	L
12			Padma Printers and Color Limited	10	2.17361	L
13		**Serv.**	Shine Pukur Holdings Ltd.	100	32.6567	L
14		**IT**	Raspit Data Management	10	3.45794	L
15		**TAN.**	Phoenix Leather Complex Ltd.	100	396.816	H
16		**Ins.**	Janata Insurance Co. Ltd.	100	131.956	H
17			Delta Life Insurance Company Ltd.	100	3124.56	H
18			Prime Insurance Company Ltd.	100	116.255	H
19		**Misc.**	Savar Refractories Ltd.	100	78.2552	L

Appendix-3: Chi-Square Table

fo	fe	(fo-fe)	(fo-fe)^2	(fo-fe)^2/e	df
25	21.26	3.74	13.99	0.66	
4	4.56	-0.56	0.31	0.07	
1	0.76	0.24	0.06	0.08	
11	14.43	-3.43	11.74	0.81	3
3	6.74	-3.74	13.99	2.08	
2	1.44	0.56	0.31	0.21	
0	0.24	-0.24	0.06	0.24	
8	4.57	3.43	11.74	2.57	
$\chi^2_{observed}$				**6.71**	

Appendix - 4: Average of daily closing price of January-2005 according to categorization

A category		B category		G category		Z category	
X1	X1^2	X2	X2^2	X3	X3^2	X4	X4^2
1609.78	2591375.55	354.83	125900.78	228.25	52098.06	1242.68	1544241.16
771.20	594749.44	153.95	23700.60			107.69	11596.60
704.33	496073.71	174.51	30454.61			22.18	491.73
1083.16	1173241.00	70.80	5012.64			280.00	78400.00
685.75	470253.06	99.04	9808.43			21.05	443.10
1705.73	2909497.78	141.46	20011.64			289.00	83521.00
186.70	34856.89					51.01	2602.28
204.01	41621.10					58.79	3455.97
209.74	43989.82					175.51	30804.64
198.81	39526.41					115.65	13374.92
239.49	57354.26					33.95	1152.60
103.64	10740.73					1.60	2.56
206.86	42792.09					41.09	1688.18
242.21	58666.90					4.39	19.27
535.35	286599.62					400.00	160000.00
525.98	276649.70					206.51	42647.41
14.36	206.07					3228.23	10421436.65
135.01	18227.70					182.56	33329.07
136.61	18660.93					66.95	4482.30
360.00	129600.00						
80.20	6432.04						
118.52	14045.81						
132.01	17427.30						
1044.55	1091084.70						
185.49	34405.61						
171.10	29275.21						
585.75	343103.06						
1852.96	3433470.03						
$\Sigma X_1 =$	$\Sigma X_1^2 =$	$\Sigma X_2 =$	$\Sigma X_2^2 =$	$\Sigma X_3 =$	$\Sigma X_3^2 =$	$\Sigma X_4 =$	$\Sigma X_4^2 =$
14029.27	**14263926.51**	**994.59**	**214888.7**	**228**	**52098**	**6529**	**12433689.44**
$n_1 = 28$		$n_2 = 6$		$n_3 = 1$		$n_4 = 19$	

Appendix-5: Result of F distribution for different point of time

Month	F (calculated)	F (from table)
Jan-05	0.67	
Feb-05	0.66	
Mar-05	0.48	
Apr-05	0.34	
May-05	0.36	
Jun-05	0.41	
Jul-05	0.40	
Aug-05	0.40	
Sep-05	0.45	
Oct-05	0.54	
Nov-05	0.52	
Dec-05	0.48	**3.19**
Jan-06	0.43	
Feb-06	0.44	
Mar-06	0.44	
Apr-06	0.37	
May-06	0.33	
Jun-06	0.31	
Jul-06	0.28	
Aug-06	0.21	
Sep-06	0.09	
Oct-06	0.09	
Nov-06	0.10	
Dec-06	0.10	

Table-6

Table-7