School of Management

Blekinge Institute of Technology

# Determinants of Share Price Movements in Bangladesh:

# Dividends and Retained Earnings

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# Thesis Summary

**Title**:  Determinants of Share Price Movements in Bangladesh: Dividends and Retained Earnings

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**Department:** School of Management, Blekinge Institute of Technology

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**Background and Problem Discussion**: Financial scholars have been conducting studies of dividend policy for several decades; but different researchers have come to different conclusions. Financial economists have come to different conclusion about factors determining dividend policy and effect of dividend policies on common stock price. A general question may arise in the mind of the shareholders that the corporate dividend policy affects the value of their stocks. So, in addition to the theory of dividend policy, it is necessary to discuss the empirical evidence on the dividend payment practices of the corporations and their possible impacts on common stock prices. Empirical testing of dividend policy may focus on whether the determinants carry information in pricing the common stocks and whether the dividends are the only determinants serving as signals in conveying information about the current and future earnings of the corporation.

**Purpose**: The present study will strives on the relative importance of dividends, retained earnings, and other determinants in the explanation of stock prices in Bangladesh with particular stock price of the companies associated with Dhaka Stock Exchange (henceforth DSE), an emerging capital market of Bangladesh. The prime objective of this study is to study determinants of market share price and to examine their functional relationships with the market price of common stocks trades in DSE.

**Method**: Applied several pre-reviewed models to examine the dynamic relations between stock price and different financial variables. Data for selected companies listed in DSE for the period from 2000 to 2006 were collected from the annual reports of the respective companies, daily price quotation of DSE.

**Theory**: Different related theories like, dividend theory, information contents, theory of information asymmetry, signalling theory, clientele effect theory were discussed to explain the basic concepts that is used to analyze the results. Different related models are also discussed to determine the appropriate model for my study.

**Analysis**: I have used different models to explain the dynamic relationships of market price of common stocks with the determinants of market share price like dividends, retained earnings, lagged price earnings ratio and market price of previous year.

**Conclusion**: The results of the empirical analysis evidences that dividends, retained earnings and other determinants have dynamic relationship with market share price. Findings also suggest that the overall impact of dividend on stock prices is comparatively better that that of retained earnings and expected dividends play an important role in the determination of stock prices whatever determinants, like lagged price earnings ratio or lagged price, are considered.

**Keywords**: Signaling effect of dividends, Information asymmetry, Dividend clientele effect, Price earnings ratio, Lagged price.

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# Table of Contents

# 1. Background

When managers think about dividend policy they should take into account a number of insights from academic research on dividend. A number of theories from academic research on dividends are available.

There are three major theories that attempt to explain investors' demand for dividends. The first one is that high dividends are considered as current income of the shareholders. They may sell a portion of their shares each year to get current income. But they would incur transactions costs and possibly also capital gain taxes. Shareholders prefer dividends to retained earnings. Dividends are also less risky and hence more valuable to investors than retained earnings. The second theory of dividend asserts that investors only care about total returns rather than receiving them in the form of dividends or in the price appreciation of a particular share. This irrelevant proposition of dividends is based on the argument that dividend policy is merely a financing decision. At this end, the only important determinant of a company's value is its future earnings power. Therefore, it is largely a matter of indifference to investors whether companies choose to pay low dividends and finance themselves with retained earnings or pay high dividends and retrieve the capital with new stock or debt. The third one implies that investors care about how their total returns are divided between dividends and market price appreciation primarily because of the tax involvement. To the extent dividends are taxed at higher rates than capital gains, investors will prefer a lower payout policy. Empirical studies of announcements of dividend changes confirm, without exception, that the market responds positively to dividend increases and negatively to dividend cuts. There are also studies showing that companies announcing dividend cuts outperform the market significantly in the year following the dividend cut. None of the existing studies provides a conclusive answer to the issue viz., whether companies choosing to pay out higher proportions of their earnings as dividends end up producing higher total returns for their shareholders.

The size of the market negative response to a stock-offering announcement is likely to depend on the extent of the information asymmetry between management and investors. If investors know a great deal about a company and its operations, then the announcement will have been anticipated and there will be relatively little pressure on the stock price. The most important financial impact is the signaling effect of dividends arising from information asymmetries between management and outside investors. When in a mechanism one group of participants enjoy better or more timely information than other groups then information asymmetry occurs. And an action taken by the more informed

group that provides credible information to the less informed is called signal. Typically, the source of the information asymmetry is the superior knowledge that managers have about the firm's prospects, while the investors in the firms comprise the uninformed group (Copeland and Weston, 2005).

The rest of the paper is designed as follows: Section 2 highlights the purpose and research questions of this study; section 3 states some theoretical review; section 4 states the overview of Dhaka Stock Exchange (DSE); section 5 highlights previous studies and suggested models; section 6 furnishes research methodology highlighting model specification, data collection and analytical tools; section 7 explains empirical results; limitations and conclusive remarks with expected policy implications are furnished in section 8 and 9 respectively.

# 2. Purpose and Research Questions

## 2.1. Purpose

The prime purpose of this study is to study determinants of market share price and to examine their functional relationships with the market price of common stocks trades in Dhaka Stock Exchange (henceforth DSE), an emerging capital market of Bangladesh. To conduct this study following research questions are formulated.

## 2.2. Research Questions

(1) What is the functional relationship of dividends and retained earnings with market price of common stock?

(2) What is the functional relationship of dividends, retained earnings and price-earnings ratio of the previous year with market price of common stock?

(3) What is the functional relationship of dividends, retained earnings and share price of the previous year with market price of common stock?

(4) Analyzing these dynamic relations with an attempt to shed more light on the dividend information content.

(5) What are the policy implications and further research direction on the prevailing condition of dynamic relations between the market price of common stock and their determinants?

# 3. Theoretical Review

So many scholars conducted study on dividend policy, information contents of dividend, information asymmetry and their impact on market price of common stock.

## 3.1. Information Contents of Dividends

It is presumed that dividend declaration contains information about the future of the organization. In his study Watts, R. (Watts, 1973) tested the hypothesis `` information content of dividends´´ which states that dividends convey information about future earnings – information that enables market participants to predict future earnings more accurately. Specifically, the objective of his study is to test the hypothesis that knowledge of current and past dividends enables a better prediction of future earnings that is possible with current and past earnings alone. For his study he calculated monthly closing price of 310 firms for June 1945 to June 1968 that are available on the tapes constructed by the Center for Research in Security Prices (CRSP) at the University of Chicago. In his study the effect of the information on future earnings is modified by both the rate at which he adjusted actual dividends to desired dividends and the firm's target dividends payout rates. The main conclusion of his study is that, in general, the information content of dividends can only be trivial.

Empirical question of the study of Joy, O. M. et. al. (Joy et al., 1977) was to reexamine the adjustment of stock prices to announcements of presumed unanticipated changes in earnings. His study presents evidence that, over the period studied, the information contained in quarterly earnings was not fully impounded into stock prices at the time of announcement. In their study, the sample size was 96 firms listed on NYSE and they took weekly closing price, monthly price and dividend data for the period of 1963-1968. He concluded that price adjustments to the information concerning security valuations that are contained in unexpected ``highly favorable´´ quarterly earnings reports are gradual, rather than instantaneous.

Empirical question of the study of Aharony, J. et. al (Aharony and Swary, 1980) was whether dividend information content is useful to capital market participants. The main purpose of his study was to ascertain whether quarterly dividend changes provide information beyond that already provided by quarterly earnings numbers. In their study they took sample of 149 industrial firms listed with NYSE and they considered daily and quarterly data for the period of 1963-76. Their findings of capital market reaction to

dividend announcements strongly support the information content of the dividend hypothesis, namely that changes in quarterly cash dividends do provide information about changes in management's assessment of future prospects of the firm. Furthermore, analyzing only the cases where dividends and earnings are announced at different points in time and obtaining similar results for either group whether earnings announcements precede or follow dividend announcements, lends support to the hypothesis that quarterly dividend announcements contain useful information beyond that already provided by quarterly earnings numbers. The results also support the semi-strong form of the efficient capital market hypothesis that on average, the stock market adjusts in an efficient manner to new dividend information. Findings about capital market reaction to the dividend announcements studied strongly support the hypothesis that changes in quarterly cash dividends provide useful information beyond that provided by corresponding quarterly earnings number. In addition, the results also support the semi-strong form of the efficient capital market hypothesis; that is, on the average, the stock market adjusts in an efficient manner to new quarterly dividend information.

In his study Penman, S. H. (Penman, 1983) compares the properties of dividend announcements and management earnings forecasts as predictors of earnings and firm value. He also studied the effects of dividend announcements on stock prices are considered. He said that his paper compares the information content of dividends with that of management earnings forecasts. In their study they took sample of 541 forecasts from COMPUSTAT ´s Merged Annual Tape and they considered annual earnings per share (EPS) for the period of 1968-73. The results of his study indicate that both the direct forecast and the dividend based forecast possess information. However, there does appear to be more information in the direct forecast than in the dividend-based forecast. He concluded that the evidence indicates that both dividend announcements and managements' earnings forecasts possess information about managements' expectations. His results are representative of well-established firms only.

In his study Bamber, L. S. (Bamber, 1986) investigates the relations between the volume of securities traded and magnitude of annual earnings announcements. His results show a continuous (positive) relationship between trading volume and the magnitude of unexpected earnings. He took 1200 observations of 397 firms listed with NYSE, AMEX and OTC as sample for his study. He considered Daily data for the period from 1977 to 1979. In his study he found that both magnitude of unexpected earnings and firm size were associated with the information content of annual earnings announcements. On average, the greater the absolute value of the earnings surprise, the greater the volume of trading around the

announcement date. He also said, if fewer information sources exist for certain types of firms, we would expect a relatively strong reaction to their annual earnings announcements.

### 3.2. Information Asymmetry

When in a mechanism one group of participants enjoy better or more-timely information than other groups then information asymmetry occurs (Copeland and Weston, 2005). Venkatesh, P. C. and Chiang, R. (Venkatesh and Chiang, 1986) conducted a study to test for an increase in information asymmetry before earnings and dividend announcements. He considered 75 stocks listed with NYSE as sample for his study. He took daily closing prices for the period January 1, 1973 to December 31, 1973. Authors find a strong increase in information asymmetry only before the second announcements and virtually no increase before the joint and first announcements.

The study of Bamber, L. S. and Cheon, Y. S. (Bamber and Cheon, 1995) investigated the frequency with which earnings announcements generate differential price and volume reactions, and then assesses whether these differential reactions are associated with announcement-specific characteristics. That is they investigate differential price and volume reactions associated with earnings announcements. As sample they considered 8180 announcements by 1079 firms listed with NYSE/AMEX. They used daily prices for the period of 1986-89. They concluded that price and volume reactions are independent and closely related. Furthermore, trading volume is likely to be high relative to price reaction when an earnings announcement generates differential belief revisions among investors. They also concluded that their evidence further suggests that earnings announcements that generate a high trading volume reaction relative to price reaction are associated with (1) more divergent financial analysts (predisclosure) earnings forecasts; (2) a large analyst following; (3) higher random –walk-based unexpected earnings relative to analysts-based unexpected earnings; and (4) price increases. Results of their study are broadly consistent with the notion that trading volume reaction is likely to be high (relative to price reaction) when an announcement generates differential belief revisions among individual investors.

Mitra, D. and Owers, J. E. (Mitra and Owers, 1995) examine the information content of dividend initiation announcements in the context of the firm's information environment. They empirically test where the magnitude and volatility of security price reaction to a dividend initiation announcement are associated with the firm's information environment. For their study they obtained data from the CRSP daily master file. And they used daily return for the period from 1976-87. In their study, mean standardized abnormal returns and

volatility of stock returns are estimated. They concluded that dividend initiation announcements are associated with highly significant abnormal returns.

In their study Allen, F. and Michaely, R. (Jarrow et al., 1995) they said that the relationship between dividend changes and subsequent earnings changes is positive, but not significant. Given these, it is rather hard to interpret any of the evidence as supporting the information signaling hypothesis. Researchers find that significant market reaction to dividend changes is positively related to the size of the dividend change. There are numerous studies that show that dividend changes cause a like change in security prices. For example, Pettit [1972] shows that announcements of dividend increases are followed by significant price increase and announcements of dividend decreases are followed by a significant price drop. In their original article, Miller & Modigliani suggested that if management's expectations of future earnings affect their decision about current dividend payouts, then changes in dividends will convey information to the market about future earnings. This notion is labeled 'the information content of dividends'. They concluded that if managers know more about the true worth of their firm, dividends may be used to convey that information to the market, despite the costs associated with paying those dividends. It should be noted that with asymmetric information, dividends can also be views as bad news: firms that pay dividends are the ones without positive NPV projects to invest in.

Lobo, G. J. and Tung, S. (Lobo and Tung, 1997) investigated the effects of earnings announcements and asymmetry information on trading volume. As sample for their study they took 9449 observations of firms listed with NYSE or AMEX and considered daily data between 1987 and 1990. They estimated the deviation of daily percentage of the firm's outstanding shares traded from its non-announcement daily mean percentage volume. Their study provides evidence on whether the net relative information content of quarterly vs. annual accounting information results in differential impacts of their respective announcements on trading volume. They concluded that their study provides empirical evidence on trading volume behavior during quarterly earnings announcements and the effect of pre-disclosure information asymmetry on that behavior. Their study also provides evidence on the relation between pre-disclosure information asymmetry and trading volume prior to and following quarterly earnings announcements.

In their study, Bae, G. S.; Cheon Y. S. and Kang, J. K. (Bae et al., 2008) examined the effect of earnings releases by a chaebol firm on the market value of other firms in the same group. They found that the announcement of increased (decreased) earnings by a chaebol-affiliated firm has a positive (negative) effect on the market value of other non-announcing

affiliates. Their results are consistent with the existence and the market's *ex ante* valuation of intragroup propping.

Valipor, H.; Rostami, V. and Salehi, M. (Valipor et al., 2009) conducted a study that investigates the effect of asymmetric information on dividend policy in listed companies in Tehran Stock Exchange. For their study they considered 111 listed companies in Tehran Stock Exchange for the period of 2003 to 2007. The statistic analysis had done by malt-variable regression analysis. Their study was about the effect of asymmetric information on dividend policy and their analysis was based on signaling model. This model explains that managers know more about the real value of the firm than investors and they direct the information in the market by profit dividing. Their study findings show that there is a meaningful and reverse relationship between asymmetric information and dividend policy. It mean, increasing the asymmetric information reduce the dividend between investors. Some other findings shows there is a meaningful relationship between dividend policy and return on stock but there is no meaningful relationship between dividend policy with firm size and book value to market value of equity ratio.

### 3.3. Signaling Theory

The most important financial impact is the signaling effect of dividends arising from information asymmetries between management and outside investors (Copeland and Weston, 2005). Some study provides unequivocal support of the signaling theory of dividends. Capstaff, J.; Klæboe, A. and Marshall A. P. (Capstaff et al., 2004) tested the signaling theory of dividends by investigating the stock price reaction to dividend announcements on the Oslo Stock Exchange (OSE), and subsequent changes in the cash flows of the firms involved. This paper adds to existing evidence by examining the role of dividends in a market where the corporate ownership structure is notable different from the U.S and the U. K., and where the motivation to use dividends as a signaling mechanism appears to be stronger. The results indicate significant abnormal stock returns are associated with announcements of dividend changes. The results are robust to alternative models of dividend expectations, after controlling for the impact of earnings announcements, and are consistent across sub-periods in the sample. The stock market reaction is most pronounced for large, positive dividend announcements that are followed by permanent cash flow increases. This evidence provides modest support for the signaling theory of dividends in Norway, but it does not support the proposition that corporate ownership structure is an important influence on the use of dividends as a signaling mechanism. They concluded that the ownership structure in Norway, with its implications for agency costs and information

asymmetry, increases the likelihood of a signaling theory explanation of dividends. Significant abnormal stock price returns are present on the announcement day for both the positive and negative portfolios of dividend announcements whilst neutral announcements are associated with insignificant negative returns. The market reaction is greater the larger the change in dividend. They also concluded that their evidence does not provide unequivocal support of the signaling theory of dividends but their overall results support the first stage of the signaling hypothesis that announced changes in dividends convey information to the market. More specifically, the evidence from Norway suggests that lower agency costs and greater information asymmetry do not increase the likelihood that mangers will use dividends as a signaling mechanism.

Brav, A.; Graham, J. R.; Harvey, C. R. And Michaely, R. (Brav et al., 2005) conducted the study on payout policy of 21$^{st}$ century shedding more light on repurchase. They surveyed 384 financial executives and conduct in-depth interviews with an additional 23 to determine the factors that drive dividend and share repurchase decisions. Their findings indicate that maintaining the dividend level is on par with investment decisions, while repurchases are made out of the residual cash flow after investment spending. They also found that the link between dividends and earnings has weakened. Many managers now favor repurchases because they are viewed as being more flexible than dividends and can be used in an attempt to time the equity market or to increase earnings per share. Furthermore, management views provide little support for agency, signaling, and clientele hypotheses of payout policy and tax considerations play a secondary role.

Pettit, R. R. (Pettit, 1972) conducted a study on 625 firms listed in NYSE to offer further evidence about the validity of the efficient market's hypothesis by estimating the speed and accuracy with which market prices react to announcements of changes in the level of dividend payments. His results tend to support the proposition that market participants make considerable use of the information implicit in announcements of changes in dividend payments. The market reacts very dramatically to these announcements when dividends are reduced or when a substantial increase takes place. The effect of a more moderate dividend increase is proportionately less. His results demonstrate that substantial information is conveyed by announcements of dividend changes. But more than this the results imply that a dividend announcement, when forthcoming, may convey significantly more information than the information implicit in an earnings announcement. The results of his investigation clearly support the proposition that the market makes use of announcements of changes in dividend payments in assessing the value of a security. Management's fear of reducing or

omitting dividends seems well founded and leads to a desire to delay increasing dividends until the lever of cash flows can be estimated with little uncertainty.

Management is obviously reluctant to cut dividends and therefore they increase dividend only if they are confident that future earnings and cash flows will enable them to maintain the new higher payout. Eventually, management will suffer the embarrassment of having to cut the dividend (or cut elsewhere), and the market will respond by reducing the stock price (Barclay and Smith, 1995). Investors are aware of this behavior as they know that management is likely to have a clearer view of their company's prospects than outsiders, a dividend increase functions as a fairly reliable signal that management foresee a rosy future, and a dividend reduction signals a gloomy forecast. If a firm increases dividend payout then it signals that it has expected future cash flows to meet debt payment and dividend payments without increasing the probability of bankruptcy. A dividend increase is regarded as a more credible signal of future good times than just to say, a management forecast of higher future earnings. As a result we may find empirical evidence that shows the value of the firm increases. It happens because dividends are taken as signals that the firm is expected to have permanently higher level future cash flows from investment. We may then observe an increase in share prices associated with that dividend announcement. Adversely, some companies might increase dividend because of a decline in the available investment opportunities, which would not be regarded as good news by investors. So, dividend change is not sufficient to convey information about future cash flows of a particular company. Investors may get the same information via other sources. The prime objective of management in changing dividend policy is not to provide accurate signals to the market but rather to establish the right financial structure for a more competitive environment.

### 3.4. Dividend Clientele Effect

Dividend clientele effect suggested by (Miller and Modigliani, 1961) is a possible explanation for management reluctance to alter established payout ratios because such changes might cause current shareholders to incur unwanted transactions costs.

The dividend clientele effect was originally suggested by Miller and Modigliani:

If for example the frequency distribution of corporate payout ratios happened to correspond exactly with the distribution of investor preferences for payout ratios, then the existence of these preferences would clearly lead ultimately to a situation whose implications were different, in no fundamental respect, from the perfect market case. Each corporation would

tend to attract to itself a ``clientele´´ consisting of those preferring its particular payout ratio, but one clientele would be as good as another in terms of the valuation it would imply for firms.

So the second consideration is the clientele effect associated with changing dividend policy. The argument behind this proposition implies that companies, by virtue of their past dividend payouts, attract investors whose characteristics cause them to prefer a particular company's dividend policy. Such investors requiring regular cash income are in relatively low tax brackets and seek relatively safe, defensive investments. Growth firms pay lower dividends, reinvest more of their earnings, and provide a greater percentage of their total returns in the form of capital gains. Investors in high tax brackets with no pressing need for cash income tend to be attracted to such firms.

Dividend clientele theory suggests that management should maintain a stable dividend policy because change could require shareholders to switch companies, which would involve brokerage costs, and capital gain tax. If the stock price drops because of selling by one group of investors, the theory says that value-based bargain hunters should be attracted to the firm's stock.

Both financial analysts and investors commit that dividends are more valuable than capital gains because they are more reliable and hence less risky. What this proposition fails to recognize is that dividend can ultimately be paid only out of future cash flow, and it is the riskiness of the future cash flow stream that determines the degree of certainty with which investors can view future dividends. According to more recent academic thinking, firms in mature industries with excess capital have a tendency to retain and then waste that capital, either by overinvesting in core business or diversifying through acquisitions. Acquisitions are one way managers spend cash instead of paying it out to shareholders (Jensen, 1986).

According to Barclay and Smith (1995), companies with few major investment opportunities can limit management's temptation to overinvest by paying out a larger percentage of their earnings. And, for this reason alone, we would expect higher dividends in stable, low-growth industries. By contrast, high-growth companies with lots of investment opportunities are likely to pay low dividends because they have profitable uses for the capital. Whereas their slow-growth counterparts tend to use higher dividends to address a potential overinvestment problem, high-growth firms pay low dividends (recall that over one-fourth of all companies pay no dividends at all) in part to guard against an underinvestment problem.

15

So, they document that those matured firms with few promising investment opportunities tend to have significantly higher dividend yields and leverage ratios than growth firms. With few investment opportunities and thus limited requirements for new capital, matured firms pay high dividends in part to prevent themselves from wasting their excess cash, or from becoming a takeover target as a consequence of having too much cash. Adversely, growth firms tend to have lower dividend payouts and debt ratios not only because there is no temptation to waste capital but also because raising outside capital can be very costly. Though there are exceptions to this rule, growth firms tend to be in riskier businesses than matured firms, and higher business risk is likely to mean a greater likelihood of not having access to capital at reasonable cost across market cycles. Under these circumstances, a policy of high dividends can lead to high flotation costs including dilution of equity as well as investment banker fees or, still worse, an inability to capitalize upon valuable investment opportunities. For sure high-risk firms tend to use equity-dominated capital structures and to conserve their equity capital by retaining rather than paying out earnings. High-quality (or undervalued) companies will have higher leverage and make higher dividend payments than low-quality (overvalued) firms. A change from regulated and unregulated status might have predictable effects on a firm's dividend policy. More specifically, regulated firms have systematically higher dividend payouts and leverage ratios than unregulated firms, Barclay and Smith (1995).

From the above discussion it is therefore becomes an empirical question whether or not dividend policy, dividend announcement changes etc. actually have any effect on share price. This study, however, will present the underlying rationale for a selected subset of the empirical literature on dividend, retained earnings, and other determinants of stock prices and empirical evidence showing the relationship among them.

# 4. Overview of Dhaka Stock Exchange (DSE)

## 4.1. Formation

The necessity of establishing a Stock Exchange in the then East Pakistan was first decided by the Government when, early in 1952 it was learnt that the Calcutta Stock Exchange had prohibited the transactions in Pakistani Shared and Securities.

According to the decision of then Pakistan, 8 promoters incorporated the formation as the East Pakistan Stock Exchange Association Ltd. on 28.04.1954 as public company. On 23.06.1962 the name was revised to East Pakistan Stock Exchange Ltd. Again on 14.05.1964 the name of East Pakistan Stock Exchange Limited was change to ``Dhaka Stock Exchange Ltd.´´

At the time of incorporation the authorized capital of the exchange was Rs. 300000 divided into 150 shares of Rs. 2000 each and by an extra ordinary general meeting held on 22.02.1964 the authorized capital of the exchange was increased to Tk. 500000 divided into 250 share of Tk. 2000 each. The paid up capital of the exchange now stood at Tk. 460000 divided into 230 shares of Tk. 2000 each. However 35 shares out of 230 shares were issued at Tk. 8000000 only per share of Tk. 2000 with a premium of Tk. 7998000.

Although incorporated in 1954, the formal trading was started in 1956 at Narayanganj after obtaining the certificates of commencement of business. But in 1958 it was shifted to Dhaka and started functioning at the Narayangonj chamber building in Motijheel C/A.

## 4.2. Legal Control

The Dhaka Stock Exchange (DSE) is registered as a Public Limited Company and its activities are regulated by its Articles of Association rules and regulations and bye-laws along with the Securities and Exchange Ordinance, 1969, Companies Act 1994 & Securities & Exchange Commission Act, 1993.

### 4.3. Major Functions

- Listing of Companies. (As per Listing Regulations).
- Providing the screen based automated trading of listed Securities.
- Settlement of trading.(As per Settlement of Transaction Regulations)
- Gifting of share / granting approval to the transaction/transfer of share outside the trading system of the exchange (As per Listing Regulations 42)
- Market Administration & Control.
- Market Surveillance.
- Publication of Monthly Review.
- Monitoring the activities of listed companies. (As per Listing Regulations).
- Investors grievance Cell (Disposal of complaint by laws 1997).
- Investors Protection Fund (As per investor protection fund Regulations 1999)
- Announcement of Price sensitive or other information about listed companies through online.

[Source: www.dsebd.org]

### 4.4. Prevailing Market Condition:

Rahman and Hossain (Rahman and Hossain, 2006) conducted their study to seek evidence whether Dhaka stock Exchange (DSE) is efficient in the weak form or not. Overall results from their empirical analysis suggest that the Dhaka Stock Market of Bangladesh is not efficient in weak-form. They also explained that the absorption of good and bad news or any other price forming information may take late effect of share price because of available advance technology, control system and publication of business journals. So, before denouncing an inefficient market, above factors should get priority. However, DSE deviated from weak form Efficient Market Hypothesis (EMH). But it would not be wise to label it as inefficient, because market efficiency changes over time and capital market is subject to be tested continuously.

Furthermore, Uddin and Khoda (Uddin and Khoda, 2009) investigated evidence supporting the existence of market efficiency in the Dhaka Stock Exchange (DSE). Their study provided evidence that the Dhaka Stock exchange (DSE) is not efficient even in weak form and DSE does not follow the random walk model. They also concluded that the reason for the market inefficiency is the poor institutional infrastructure, weak regulatory framework, lack of supervision, and a lack of accountability, poor corporate governance, slow development of the market infrastructure, and low level of capacity of major market players and lack of transparency of market transactions.

# 5. Previous Studies and Suggested Models

## 5.1. Dividend Hypothesis

Empirical research regarding corporate dividend practice first include the historical work of Lintner (Lintner, 1956) who provided a study by interviewing the top managements of 28 firms with a view to identifying the determinants of corporate dividend payment practice. In summary of his study, he concluded that corporate management tends to i) establish target dividend payouts as a proportion of earnings and ii) set their dividend payments to adjust slowly over time toward the desired fraction of earnings. He develops the theory that a dispute over the dependence of a firm's market value on the rate at which dividends is paid out of earnings. Establishing a stable dividend hypothesis Lintner showed the following relation between dividends and earning:

$$D_t^* = rE_t$$

where,

$D_t^*$ = dividend payment (targeted) per share during the period t,

r = the payout ratio, and

$E_t$ = firm's earnings per share during period t.

To maintain a stable dividend payouts by adjusting them each year by only a fraction of the change indicated by earnings in conjunction with the target payout ratios, Lintern then developed his above observation as under:

$$D_t - D_{t-1} = a + c(D_t^* - D_{t-1})$$

Where,

a = constant and

c = constant speed of adjustment factor.

However, Lintern further developed the following Equation to elucidate the corporate dividend payment practice by adjusting the above observations to obtain a partial adjustment model as follows:

$$D_t = a + b_1E_t + b_2D_{t-1} + E_t$$

where,

$b_1 = cr$,

$b_2 = 1-c$ and

$E_t$ = error term during period t.

Lintern (Lintner, 1962, Lintner, 1964) used the above Equation to explain the behavior of corporate dividend policy along with other variables explaining the stock prices using aggregate data in most of his tests.

Fama and Babiak (Fama and Babiak, 1968) on the other hand, used firm-specific data to test his hypothesis. They investigated a different model for explaining dividend behavior using a sample of 201 firms with data of 17 years to i) explain dividend policy for a holdout sample of 191 firms and ii) predict dividend payments one year hence.

### 5.2. Dividend Payout and Value of the Firm

On the other hand Miller and Modigliani (Miller and Modigliani, 1958) argue, under the assumption of perfect capital market, that rational behavior and zero taxes that the value of the firm does not depend on the firm's dividend payout rate. But Durand (Durand, 1959) finds a strong positive cross-sectional correlation of price with dividends and the current earnings. Miller and Modigliani (Miller and Modigliani, 1961) proposition suggests that dividend policy is irrelevant to the value of the firm. They argued that the value of the firm is unaffected by its dividend policy in a world without taxes, transaction costs, and other market imperfections. When personal taxes are introduced with a capital gains rate that is less than ordinary income, their doctrine may be changed. Under this set of assumptions, no company would pay dividends.

Dividend effect under tax environment is also studied by Bali, R. and Hite, G. L. (Bali and Hite, 1998). They conducted their study to investigate the effects of discreteness in trading prices on ex-dividend day stock price changes. As sample they considered 207499 observations in the CRSP files for the period from July 2, 1962 to December 31, 1994. They concluded Taxable cash dividends and nontaxable stock dividends exhibit similar ex-day behavior.

Frank, M. and Jagannathan, R. (Frank and Jagannathan, 1998) conducted their study to examine the trading behavior of investors around ex-dividend days. In their study they considered 1896 observations by 351 firms listed with Hong Kong Stock Exchange. They took daily data for the period from 1980 to 1993. In their study it is well documented that stock prices on ex-dividend days drop by less than the value of the dividend on average. This has commonly been attributed to the effect of tax clienteles.

To test these theories it is necessary to look at the relationship between dividend payout and the share price. Friend and Puckett (Friend and Puckett, 1964) used cross-sectional data to test the effect of dividend payout on share value. They suggested that stock market generally experienced the view that the dividends have several times the impact on the prices of retained earnings. The dividend multiplier was found several times the retained earnings multiplier by their study. Their comments are directed at the following regression equation, which is commonly applied to cross-sectional data:

$$P_{it} = a + bD_{it} + cR_{it} + \varepsilon_{it}$$

where,

$P_{it}$ = price per share at time t,

$D_{it}$ = dividend paid out at time t,

$R_{it}$ = retained earnings at time t and

$\varepsilon_{it}$ = error term.

Beaver, W. H. (Beaver, 1968) conducted an empirical test to analyze price and volume reaction surrounding the earnings announcement dates. He examines the extent to which common stock investors perceive earnings to possess informational value. His study directs its attention to investor reaction to earnings announcements, as reflected in the volume and price movements of common stocks in the weeks surrounding the announcement date. His study was based upon a sample of annual earnings announcements released by 143 firms listed in NYSE during the years 1961 through 1965. He concluded that, the behavior of the price changes uniformly supports the contention that earnings reports possess information content. He also concluded that, not only are expectations of individual investors altered by the earnings report but also the expectations of the market as a whole, as reflected in the changes in equilibrium prices. In a world of uncertainty, the price change from each transaction can be treated as an observation from a probability distribution of the investor's

assessment of what the price change should be. The price change per period, then, is a sum of random variables. The findings indicate that reported earnings are associated with underlying events that are perceived by investors to affect the market price.

Patell, J. M. conducted a study (Patell, 1976) to examine the common stock price behavior accompanied by voluntary disclosure of corporate forecasts of Earnings per share. For his test he considered weekly data of 258 firms listed with NYSE for the period of 1963 to 1967. He took 336 observations for his test. His result indicates that disclosures of forecasts of earnings per share were accompanied by significant price adjustments, from which the inference may be drawn that either the data presented in a management forecast, the act of voluntary disclosure, or both convey information to investors. Subsequent price behavior was relatively level for the positive forecast group and continued to decline for negative forecast group. In his study Woolridge, J. R. (Woolridge, 1983) investigated stock price behavior around the ex-day. For his study he considered 188 firms listed with NYSE as sample and he took daily stock prices from CRSP over the 1974-76 for his analysis. Stock price behavior around ex-stock dividend days is analyzed in two stages. He concluded that small stock distributions increase shareholder wealth due to less than full stock price adjustment on the ex-date. He also states that stock dividend declarations increase the value of stockholdings.

Atiase, R. K (Atiase, 1985): His study focuses on the security price reaction to earnings announcements. In his study he took sample of 200 listed with NYSE and he considered weekly security prices for the period of 1969-72. His study strongly support the hypothesis that the degree of unexpected security price changes in response to earnings reports is inversely related to the capitalized value (size) of firms. He concluded that the degree of a security's price revaluation in response to its second-quarter earnings report is inversely related to the capitalized value of the firm.

Bajaj, M and Vijh, A. M. (Bajaj and Vijh, 1995) conducted their study to examine the price formation process during dividend announcement day. As sample they considered 67256 observations from firms listed with NYSE. They used daily closing prices and transactions data for the period of 1962-87. They found that the unconditional positive excess returns

are higher for small-firm and low-priced stocks. They also found that the average excess return to all dividend announcements increases as the firm size and stock price decrease.

Beaver, W. H., McAnally, M. L. and Stinson, C. H. (Beaver and Stinson, 1997) developed a model determining cross-sectional price changes and earnings changes those are jointly influenced by a set of information variables. In their study they took 176 companies as sample from the Compustat Bank file and they computed annual betas with the samples' daily return of the period from 1973 to 1991. Three estimation approaches like ordinary least squares, two-stage least squares and three-stage least squares are used in their study to measure simultaneous equation results. The simultaneous equations approach explored in their study yields larger estimates than the single-equation approach. The central observation of their paper is that the price-earnings relation can be characterized as a system of simultaneous equations.

Bhattacharya, N. (Bhattacharya, 2001) conducted a study to develop a hypothesis regarding the earnings expectations of small traders that are associated with predictions from the seasonal random walk model. As a sample he took 16,444 earnings announcements of firms listed with NYSE or AMEX. In his study he used Institutional Brokers Estimate System earnings forecast data for the period of 1988-1992 in order to minimize noise in the forecast error metrics. Total number of trades and total number of shares traded (trading volume) are used to measure trading behavior. He concluded that a segment of the market appears to rely on the seasonal random-walk earnings expectation model. His study's empirical evidence also reveals that earnings announcements can generate differential trading responses among different classes of investors.

In his study Kanas, A. (Kanas, 2005) provides an empirical evidence of nonlinearities in the present value (PV) model of stock prices. He tested both in the contemporaneous and in the dynamic stock price–dividend relation for the UK, the US, Japan, and Germany and employed three nonlinear nonparametric techniques, namely nonlinear co integration, locally-weighted regression, and nonlinear Granger causality tests. In his study he found that there is no evidence of linear co integration and Granger causality for any country. Rather, there is significant evidence of nonlinear co integration and nonlinear Granger

causality for all four countries. Furthermore, his results are in line with empirical evidence that expected stock returns are time-varying. He concluded that lagged dividends have no linear predictive power for stock returns, they appear to have a nonlinear predictive power. Thus, nonlinearities do exist both in the contemporaneous and in the dynamic stock price–dividend relation. His results evidenced for all four countries that stock returns are predictable and expected stock returns are time-varying and thus the correct PV model is nonlinear. They suggest that researchers should consider nonlinear empirical regularities when evaluating and developing models of the joint dynamics of stock prices and dividends.

On the contrary some study proved that dividend is irrelevant with the market price of common stock. Michaely, R. (Michaely, 1991) analyzed the behavior of stock prices around ex-dividend days after the implementation of the 1986 Tax Reform Act. He studied 6522 events of firms listed on NYSE and considered daily closing prices for the period of 1986-1989. In his study he found that the imposition of tax reform had no effect on the ex-dividend stock price behavior, which is consistent with the hypothesis that long-term individual investors have no significant effect on ex-day stock prices during this time period.

Allen, D. E. and Rachim, V. S. (Allen and Rachim, 1996) conducted the study to find out the linkage between dividend policy and stock price risk. They said that dividend policy remains a source of controversy despite years of theoretical and empirical research, including one aspect of dividend policy: the linkage between dividend policy and stock price risk. As sample they considered 173 Australian listed companies for the period from 1972 to 1985. They concluded that no evidence is found that dividend yield is correlated with stock price volatility. On the other hand, consistent with expectations, there is evidence of significant positive correlations between stock price volatility and earnings volatility and leverage, plus a significant negative correlation with the payout ratio. It is also discovered that a significant positive correlation exists between size and stock price volatility. The results do not support that dividend policy per se can influence stock price volatility.

Sadka, G. (Sadka, 2007) conducted his study to explain the variation in the dividend-price ratio by changes in expected earnings. Moreover, his paper documents a significant negative correlation between expected returns and expected earnings and variations in a common factor to both may generate significant price volatility. His results are consistent with the dividend-policy irrelevance hypothesis. He stated that, research on stock price volatility documents that variation in expected returns explains most of the variation in the aggregate dividend-price ration (dividend yield), while the variation in expected cash flows (dividends) does not seem to have such an effect. He concluded that the dividend yield does not contain information about cash flows, i.e., that the dividend yield does not predict dividend growth. However, the results of his study suggest that the cash flow information embedded in the dividend-price ration shows up in terms of profitability growth rather than dividend growth.

### 5.3. Dividend Payout and Riskiness of the Firm

There are some criticisms of the approach Friend and Puckett. It assumes that the riskiness of the firm is uncorrelated with dividend payout and price/earnings ratios. There exists almost no measurement error in dividends, whereas considerable measurement error exists in retained earnings. Even, if dividends and earnings do have different impacts on the share price, their coefficients are equal. However, Friend and Puckett (1964) showed the relationship between the dividend payout rate and the market value of the firm and their possible biases. They suggested that firms would change their dividend payout until the managerial effect of dividends is equal to the managerial effect of retained earnings, which will provide the optimal effect on their price per share. They eliminate the measurement error on retained earnings by calculating normalized earnings variable based on a time series fit of the following equation:

$$(E/P)_{it} / (E/P)_{kt} = a_i + b_{it} + \varepsilon_{it}$$

where,

$(E/P)_{it}$ = earnings/price ratio of firm i at time at time t,

$(E/P)_{kt}$ = average earnings/price ratio for the industry/market at time t,

t = time index, and

$\varepsilon_{it}$ = error term.

The difference between the dividend and retained earnings coefficients may be reduced if normalized retained earnings were calculated by subtracting dividends from normalized earnings. Participants in the stock market seek to determine whether there is a variable omitted in the capital asset pricing model (CAPM) related to dividend yield. To explain the impact of dividend yield on common stock return, Brennan (Brennan, 1970) developed an after-tax version of the CAPM to perform a cross-sectional test using data for many different firms sampled on a given date by using the following model:

$$R_p = a_0 + a_1\beta_p + a_2Y_p + E_p$$

where,

$R_p$ = holding period return on a portfolio of stocks,

$\beta_p$ = portfolio beta,

$Y_p$ = dividend yield, and

$E_p$ = error term.

The coefficient on dividend yield ($a_2$) was found here both positive and statistically significant indicating that investors require a higher risk-adjusted return on dividends as opposed to capital gains. This implies that, other things remaining the same, the higher a firm's dividend yield, the higher its required rate of return, and lowers its market value. In order to avoid the problems inherent in Brennan's cross-sectional research, Black and Scholes (Black and Scholes, 1974) derived a time series test using the following model:

$$R_i = \delta_0 + \beta_i (R_M - \delta_0) + \delta_1(Y_i - Y_M)/Y_M$$

where,

$R_i$ = return on security i,

$\beta_i$ = beta of security i,

$Y_i$ = dividend yield on security i,

$R_M$ = return on market portfolio,

$Y_M$ = dividend yield on market portfolio and

$\delta_0$, $\delta_1$ = parameters.

$\delta_1$ measures the yield effect and $\delta_0$ estimates the zero beta return. Zero beta return refers to the notion of a zero beta asset whose returns are uncorrelated with those of market portfolio. Black and Scholes (1974) estimated the value of $\delta_1$ from the time series of stock returns on the zero-beta portfolio concluding that there was no significant relationship between stock returns and dividend yield. Usually, dividend yields are measured as the ratio of dividends paid over the holding period under study divided by the end-of-period stock price. One problem inherited here relates to the potential information impact of a dividend announcement. If the announced dividend is larger than expected, the stock price may actually rise such that the dividend yield will decline. Black (Black, 1976) opined the lack of consensus by saying ``the harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together.´´

## 5.4. Determinants of Market Price of Common Stock

Present, past and future earnings of the company generally guide the shareholders' expectations of dividends and capital gains. The portion of earnings into dividends, and retained earnings is taken into account by the investors. Two major hypotheses are basically developed to explain the determinants of share price viz., i) dividend hypothesis and ii) retained earnings hypothesis. The former attributes the explanation of share prices to the proportion of earnings that are distributed as dividends. Share price of a company with higher dividend payout would be higher. Even, if earnings remain the same, share price will increase as dividend payout increases. Several arguments, however, are developed in favor of dividend hypothesis as: a) dividends tend to reduce the risk and uncertainty attached to a share, b) it refers to the psychological preference of investors for current rather than future earnings, and c) it relates to the information content of dividend payout as dividends are taken by investors as a tangible evidence of earnings capacity of a firm. Retained earnings hypothesis, on the other hand, contends that higher share prices are consequences of higher retained earnings. Retained earnings being an important source of internal financing for business expansion effect share prices by their influence on future earnings. Kumar and Mohan (Kumar and Mohan, 1975) hypothesized that the market price of share is a function dividends and retained earnings and used the following regression Equation:

$$P_{it} = a + bD_{it} + cR_{it}$$

where,

$P_{it}$ = price of stock i at time t,

$D_{it}$ = dividend per share of stock i at time t and

$R_{it}$ = retained earnings of stock i at time t.

The coefficients they estimated for the two explanatory variables, dividends and retained earnings, are more or less equally significant. They argued that the dividend hypothesis has a little superiority over the retained earnings in determining the share prices, as T value is found slightly higher in case of dividends. Consistently, Nishat (Nishat, 1995) attempted to judge the relative importance of the dividend vis-à-vis retained earnings hypothesis in determining the share prices. He developed the following model to compare the dividend and retained earnings influence on the share prices in highly profitable growth industries of Pakistan:

$$P_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 R_{it}$$

Where,

$P_{it}$ = price of stock i at time t,

$D_{it}$ = dividend per share of stock i at time t and

$R_{it}$ = retained earnings.

The above model might cause an upward bias in the dividend coefficient due to two major reasons. Firstly, the relationship is misspecified as it assumed that the riskiness of the firm was uncorrelated with dividend payout and share prices. This problem should be eliminated by introducing a variable namely lag of earning price ratio, to measure individual deviation from the sample average earning price ratio in the previous year periods as follows:

$$P_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3 [P/E]_{i(t-1)}$$

Where,

$[P/E]_{i(t-1)}$ = price earnings ratio of the previous year.

Secondly, the income reported by a corporation in any particular period is subject to a host of short-run economic and accounting factors. If prices were related to normal than reported income, in regression equation, it would produce biased results in favor of dividend payout. However, the difference between the dividend and retained earnings coefficient might be reduced by use the following model:

$$P_{it} = \lambda_0 + \lambda_1 D_{it} + \lambda_2 R_{it} + \lambda_3 P_{i(t-1)}$$

Where,

$P_{i(t-1)}$ = share price of the previous year.

# 6. Research Methodology

## 6.1. Model Specification

In this research I will apply several models to examine the dynamic relations between stock price and different financial variables like dividends, retained earnings, earnings price ratio and lagged prices with an attempt to shed more light on the dividend information content.

So, the equations and variables use for the study are given below:

$$P_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 R_{it}$$

$$P_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3 [P/E]_{i(t-1)}$$

$$P_{it} = \lambda_0 + \lambda_1 D_{it} + \lambda_2 R_{it} + \lambda_3 P_{i(t-1)}$$

where,

$P_{it}$ = price of stock i at time t,

$D_{it}$ = dividend per share of stock i at time t and

$R_{it}$ = retained earnings.

$[P/E]_{i(t-1)}$ = price earnings ratio of the previous year.

$P_{i(t-1)}$ = share price of the previous year.

## 6.2. Data collection

Data on dividends, retained earnings, earnings price ratio, lagged price for the selected companies associated with Dhaka Stock Exchange (DSE) for the period from 2000 to 2006 were collected and analyzed from the annual reports of the respective companies, daily price quotation of DSE.

Dividend decision is taken in the meeting of the board of directors and is subsequently declared in the annual general meeting of the company. Such type of financing decision taken by the board is immediately furnished to the respective stock exchange for the maintenance of proper records and conveying information to the investors, and the concerns.

In my study I considered 96 listed companies in Dhaka Stock Exchange for the period of 2000 to 2006. Summary of sample is stated in the following table:

Table: Summary of sample firms

| Industry Classification | No. of Firms |
| --- | --- |
| Banking | 13 |
| Insurance | 13 |
| Investment | 10 |
| Engineering | 14 |
| Food and Allied | 07 |
| Fuel and Power | 03 |
| Textile | 11 |
| Pharmaceuticals and Chemical | 12 |
| Cement | 05 |

| | |
|---|---|
| Tannery, Ceramics and Misc. | 08 |
| Total | 96 |

Sources of my data are:

i) Annual reports of the sample firms for the period under study,

ii) Dividend declaration record, DSE and

iii) Daily price quotation, DSE.

The companies those required data are available are included in the sample. I eliminated the firms with missing information. I have used the pooled data for the suitable estimation for the study. The study stresses the combination of combination of cross-section and time series data for efficient statistical estimation like generalized least square. In order to remove statistical errors I have used the normalized data. In order to normalized required data I brought them in same scale of percentile.

### 6.3. Analytical tools

In this paper I apply several test procedure to examine the dynamic relations between stock price and different financial variables like dividends, retained earnings, earnings price ratio and lagged prices with an attempt to shed more light on the dividend information content. The relative importance of dividend and retained earning behavior in DSE has been established through different theoretical models. Using statistical software SPSS the paper will present some descriptive statistics, model specification, multicollinearity, goodness of fit etc.

Multicollinearity is a case of multiple regression in which the predictor variables are themselves highly correlated. Studying multicollinearity one will know that collinearity is present in any given situation, especially in models involving more than two explanatory variables.

On the other hand, by considering "Goodness of Fit" of the fitted regression line for a set of data, we shall find out how "well" the sample regression line fits the data. "Goodness of Fit" is measured by the coefficient of determination. The coefficient of determination $r^2$ (for two-variable case) or $R^2$ (for multiple regressions) is a summary measure which tells how well the sample regression line fits the data. Two important properties of $r^2$ may be noted [(**Gujarati, 1988**)]:

1. It is a nonnegative quantity
2. Its limits are $0 \leq r^2 \leq 1$. An $r^2$ of 1 mean s a perfect fit, whereas an $r^2$ of zero means no relationship between the dependent variable and the explanatory variable(s).

# 7. Empirical Results

Stock price behavior of the companies listed with DSE and its relation with dividends, retained earnings, earnings price ratio of the previous year and lagged prices are analyzed in this section. I have used the pooled data for the estimation during the period under study. These pooled data take care of the short-term influences of transitory effects of the dependent and independent variables. Therefore, the combination of cross-section and time-series data is conducted to provide the effective coefficient estimates.

## 7.1. Overall Results

Following Tables presents the usual simple linear relationships (overall) among stock prices, dividends, retained earnings, lagged price earnings ratio and lagged price of the sample observations during study period.

*Linear Relationships between Share Price, Dividend and Retained Earnings of the Sample Observations.*

| Regression Result for overall market: $P_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 R_{it}$ | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\bar{R}^2$ | D.W. | F | n |
| 122.188 (4.707) | 11.305 (17.036) | 5.565 (14.097) | .484 | 1.745 | 313.753 | 672 |

**Note:** i) *P, D* and *R* represent stock price, dividends and retained earnings respectively,
ii) *t* values of regression coefficients are shown in the parentheses.
iii) $\bar{R}^2$ refers to coefficient of determination adjusted for degrees of freedom.
iv) n = number of observations.

*Linear Relationships among Share Price, Dividend, Retained Earnings and Earning Price Ratio of the Previous Year of the Sample Observations.*

| Regression Result for overall market: $P_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3\, P/E_{\,i\,(t-1)}$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | $\bar{R}^2$ | D.W. | F | n |
| 89.367 (2.637) | 11.506 (15.695) | 5.967 (13.580) | 3.112 (2.713) | .492 | 1.810 | 184.804 | 576 |

**Note:** i) *P/E* $_{i\,(t-1)}$ refer to price earnings ratio of the previous year.
ii) *t* values of regression coefficients are shown in the parentheses.
iii) $\bar{R}^2$ refers to coefficient of determination adjusted for degrees of freedom.
iv) n = number of observations.

*Linear Relationships among Share Price, Dividend, Retained Earnings and Lagged Price of the Sample Observations.*

| Regression Result for overall market: $P_{it} = \lambda_0 + \lambda_1 D_{it} + \lambda_2 R_{it} + \lambda_3 P_{i(t-1)}$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| $\lambda_0$ | $\lambda_1$ | $\lambda_2$ | $\lambda_3$ | $\bar{R}^2$ | D.W. | F | n |
| 13.594 (.696) | 2.072 (3.538) | 1.701 (5.255) | .861 (27.847) | .782 | 1.964 | 682.587 | 576 |

**Note:** i) $P_{i(t-1)}$ = share price of the previous year.
     ii) *t* values of regression coefficients are shown in the parentheses.
     iii) $\bar{R}^2$ refers to coefficient of determination adjusted for degrees of freedom.
     iv) n = number of observations.

The results reveal that all the industries associated with DSE indicate strong dividend and relatively weak retained earnings effect on stock price during the period under study. But dividend has relatively strong effect in case of some industry (Table 1 in Appendix). The dividend effect has superiority over the retained earnings in explaining stock prices. *t* values are slightly higher in case of dividend. In some industries the estimated coefficients of both dividends and retained earnings are found very close (Table 1 in Appendix).

Analysis of variance is performed on each year of all stocks and the analysis of variance F-ratios are also shown in above tables. At 5 per cent level, the statistical significance of regression coefficients of dividends are found significantly higher than that of retained earnings.

The estimations presented in second table reveal regression results (overall) with the addition of earnings price ratio of previous year as an additional explanatory variable in the explanation of the stock price. With the inclusion of price earnings ratio, the adjusted R-square increases substantially. Same impacts of dividend and retained earnings are still found. And relatively strong dividend and weak retained earnings impacts on stock prices are still present with the inclusion of price earnings ratio. The estimation reveals that regression coefficients are statistically significant at 5 per cent level of significance.

Third table depicts the regression results (overall) with the addition of lagged prices along with dividends and retained earnings as explanatory variables of stock prices of the sample observations during the study period. Adjusted R-square increases in all the industries when stock prices of the previous year are taken as an additional explanatory variable instead of earnings price ratio for the previous year. Difference between the dividends and retained

earnings coefficients are reduced when lagged prices instead of earnings price ration for the previous year of the stocks are considered as an additional explanatory variable. Hence, the impact of dividends show superior explanatory power over the impact of retained earnings in explaining stock prices with lagged prices as an additional explanatory variable of the stock prices of DSE listed firms.

Furthermore, Tables presented in appendix depicts the usual simple linear relationships (industry-wise) among stock prices, dividends, retained earnings, lagged price earnings ratio and lagged price of the sample observations during study period.

## 7.2. Industry-wise Results

*Linear Relationships between Share Price, Dividend and Retained Earnings of the Sample Observations.*

| Regression Result: $P_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 R_{it}$ | | | | |
|---|---|---|---|---|
| Industries | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | n |
| Banking | 353.304 | 1.420 | 2.727 | 91 |
| Insurance | 150.663 | 6.629 | 5.364 | 91 |
| Investment | -14.678 | 11.857 | .621 | 70 |
| Engineering | 15.963 | 16.449 | 4.148 | 98 |
| Food & Allied | 261.885 | 10.089 | .965 | 49 |
| Fuel & Power | 1292.378 | 5.745 | 9.351 | 21 |
| Textile | -128.663 | 33.208 | -1.167 | 77 |
| Pharmaceuticals and Chem. | 230.787 | 8.833 | 8.114 | 84 |
| Cement | 151.434 | 5.653 | 3.647 | 35 |
| Tannery, Ceramics & Misc. | 141.297 | 7.307 | 6.534 | 56 |

**Note:** i) *P, D* and *R* represent stock price, dividends and retained earnings respectively,
ii) n = number of observations.

Above table presents the usual simple linear relationships (industry-wise) among stock prices, dividends and retained earnings of the sample observations during study period. The results (Detailed in Table-1 of Appendix) reveal that all the industries associated with DSE indicate mixed effect of dividend and retained earnings on stock price during the period under study. But dividend has relatively strong effect in case of some industry. Furthermore, in case of some industry retained earnings effect on stock prices have relatively little superiority over dividend effect. However, the coefficients of the two explanatory variables, dividend and retained earnings are more or less equally significant with low explanatory power of the equation. The dividend effect has a little superiority over the retained earnings in explaining stock prices. *t* values are slightly higher in case of dividend. In some industries the estimated coefficients of both dividends and retained earnings are found very close. Analysis of variance is performed on each industry and the analysis of variance F-ratios are also shown in Table-1. At 5 per cent level, the statistical significance of regression coefficients of dividends are found significantly higher than that of retained earnings. In case of industries like Investment, Engineering, Food & Allied, Textile and Tannery, Ceramics & Miscellaneous, the impact of dividend on stock prices seems stronger than that of retained earnings. The impact of dividend on stock prices is

significantly stronger than that of retained earnings in case of Investment, Engineering, Food & Allied and Textile. The impact of dividend on stock prices has a little superiority over the impact of retained earnings in industries like Tannery, Ceramics & Miscellaneous. Whereas the retained earnings impact has a little superiority over dividend impact in explaining share prices in case of Banking, Insurance, Fuel & Power, Pharmaceuticals and Chemicals and Cement industry as t value seems slight higher in case if retained earnings.

*Linear Relationships among Share Price, Dividend, Retained Earnings and Earning Price Ratio of the Previous Year of the Sample Observations.*

| Regression Result: $P_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3 P/E_{i(t-1)}$ | | | | | |
|---|---|---|---|---|---|
| Industries | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | n |
| Banking | 293.361 | 2.062 | 3.325 | 4.641 | 78 |
| Insurance | -61.024 | 10.394 | 7.980 | 9.630 | 78 |
| Investment | -119.386 | 11.958 | 2.504 | 9.001 | 60 |
| Engineering | 15.122 | 17.246 | 4.012 | .243 | 84 |
| Food & Allied | 214.173 | 11.195 | .783 | 2.672 | 42 |
| Fuel & Power | 284.077 | 10.882 | 12.984 | 30.428 | 18 |
| Textile | -157.577 | 37.849 | -2.115 | .503 | 66 |
| Pharmaceuticals and Chem. | 144.555 | 8.061 | 8.474 | 9.795 | 72 |
| Cement | 149.224 | 5.461 | 4.035 | .534 | 30 |
| Tannery, Ceramics & Misc. | 104.067 | 7.283 | 7.098 | 2.378 | 48 |

**Note:** *P/E $_{i(t-1)}$* refer to price earnings ratio of the previous year.

The estimations in the above Table (also presented in Table-2 of the appendix) reveal regression results (industry-wise) with the addition of earnings price ratio of previous year as an additional explanatory variable in the explanation of the stock price. With the inclusion of price earnings ratio, the adjusted R-square increases substantially almost all the industries. Mixed impacts of dividend and retained earnings are still found. And relatively strong dividend and weak retained earnings impacts on stock prices are still present with the inclusion of price earnings ratio. The estimation reveals that regression coefficients are statistically significant at 5 per cent level of significance. The differences between the dividends and retained earnings coefficients in industries like Banking, Insurance, Investment, Engineering and Tannery, Ceramics & Miscellaneous are reduced except for Food & Allied, Fuel & Power, Textile, Pharmaceuticals & Chemicals and Cement industries when price earnings ratios for the previous year are taken as an additional variable in the explanation of stock prices of the firms listed with DSE.

*Linear Relationships among Share Price, Dividend, Retained Earnings and Lagged Price of the Sample Observations.*

| Regression Result: $P_{it} = \lambda_0 + \lambda_1 D_{it} + \lambda_2 R_{it} + \lambda_3 P_{i(t-1)}$ | | | | | |
|---|---|---|---|---|---|
| Industries | $\lambda_0$ | $\lambda_1$ | $\lambda_2$ | $\lambda_3$ | n |
| Banking | 217.407 | -1.143 | 1.234 | .586 | 78 |
| Insurance | 18.652 | 5.672 | 2.200 | .606 | 78 |
| Investment | -19.737 | 8.395 | 1.149 | .329 | 60 |
| Engineering | 18.204 | 11.929 | 3.637 | .271 | 84 |
| Food & Allied | 140.099 | 6.882 | .657 | .409 | 42 |
| Fuel & Power | 218.531 | -2.426 | -4.042 | 1.246 | 18 |
| Textile | -91.294 | 17.217 | -1.501 | .766 | 66 |
| Pharmaceuticals and Chem. | 140.574 | 4.330 | 4.509 | .508 | 72 |
| Cement | 72.247 | 2.889 | 2.725 | .433 | 30 |
| Tannery, Ceramics & Misc. | 44.577 | 3.302 | 5.380 | .488 | 48 |

**Note:** $P_{i(t-1)}$ = share price of the previous year.

Above Table (also refer to the Table-3 of Appendix) depicts the regression results (industry-wise) with the addition of lagged prices along with dividends and retained earnings as explanatory variables of stock prices of the sample observations during the study period. Adjusted R-square increases in all the industries when stock prices of the previous year are taken as an additional explanatory variable instead of earnings price ratio for the previous year. Except for Textile, Cement and Tannery, Ceramics & Miscellaneous industry, the differences between the dividends and retained earnings coefficients for all the industries are reduced when lagged prices instead of earnings price ratio for the previous year of the stocks are considered as an additional explanatory variable. Study shows that after introducing lagged price the impact of dividends show superior explanatory power in case of Insurance, Investment, Food & Allied and Textile industries and that of retained earnings shows superior explanatory power in case of Banking, Fuel & Power, Pharmaceuticals & Chemicals, Cement and Tannery, Ceramics & Misc. industries. Hence, the impact of dividends and retained earnings have mixed explanatory power in explaining stock prices with lagged prices as an additional explanatory variable of the stock prices of DSE listed firms.

## 8. Limitations

Unlike developed stock market around the world in DSE, an emerging capital market in Bangladesh, there exist different manipulation, anomalies, misspecification, mispresentation in preserving and processing the required data for investors, analysts, and the professionalists. The required information and data all are not available in the profile of Dhaka Stock Exchange. So I considered available data from the Daily Price Quotation of DSE and other concerned data and information was collected from the annual reports of the respective companies.

# 9. Conclusion and Policy Implications

This study attempts to analyze different theoretical models in explaining the impact of dividend vis-à-vis retained earnings along with other independent variables like price earnings ratio of the previous year, lagged price on the prices of the stocks associated with DSE. To this end, some empirical studies relating stock prices to dividends and retained earnings conducted elsewhere have been analyzed. These studies produced considerable controversy and confusion regarding relative importance of dividend and retained earnings in the explanation of stock prices. In my study, the relative importance of dividend, retained earnings, price earnings ratio of the previous year and lagged price in explaining stock prices of the companies listed with DSE are explained.

The findings suggest that in the market of DSE the overall impact of dividend on stock prices is comparatively better than that of retained earnings when dividend and retained earnings are taken as explanatory variables. It is also found that the impact of dividend and retained earnings is above the impact of additional explanatory variables like price earning ratio for the previous year and lagged prices. It means that whatever explanatory variable is taken announcements of expected dividends of the firms listed with DSE play an important role in the determination of stock prices.

On the other hand, the study evidenced little bit different view when industry-wise dynamic relations are revealed. In some industries the impact of dividend on stock prices is stronger than that of retained earnings when dividend and retained earnings are taken as explanatory variables. In some cases the dividend impact remains very close to the retained earnings impact and in some cases impact of retained earnings on stock prices is comparatively better than that of dividend. It is also found that the impact of dividend and retained earnings is above the impact of additional explanatory variables like price earnings ratio for the previous year. But the impact of dividend and retained earnings is not above the impact of additional explanatory variables like lagged prices. Finally, it may, however, be concluded that whatever explanatory variable is taken announcements of expected dividends of the firms listed with DSE does not play an important role in the determination of stock prices in all industries. Although the study does not uncover the exact reasons of the dividend relevance like these, it merely provides that dividend announcement of the organizations in all industries does not have substantial explanatory power in explaining stock prices of the firms listed with Dhaka Stock Exchange.

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# **Appendix**

**Table-1:** *Linear Relationships between Share Price, Dividend and Retained Earnings of the Sample Observations.*

| Industries | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\bar{\bar{R}}^2$ | D.W. | F | n |
|---|---|---|---|---|---|---|---|
| Regression Result: $P_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 R_{it}$ |
| Banking | 353.304 (4.297) | 1.420 (.493) | 2.727 (2.730) | .080 | 1.955 | 3.817 | 91 |
| Insurance | 150.663 (4.493) | 6.629 (3.671) | 5.364 (5.821) | .389 | 1.463 | 27.997 | 91 |
| Investment | -14.678 (-.864) | 11.857 (47.100) | .621 (.881) | .971 | 1.057 | 1109.381 | 70 |
| Engineering | 15.963 (.358) | 16.449 (12.663) | 4.148 (6.713) | .788 | 2.065 | 176.794 | 98 |
| Food & Allied | 261.885 (5.791) | 10.089 (8.458) | .965 (1.911) | .681 | 2.221 | 49.152 | 49 |
| Fuel & Power | 1292.378 (1.613) | 5.745 (.538) | 9.351 (1.682) | .140 | 2.229 | 1.466 | 21 |
| Textile | -128.663 (-4.015) | 33.208 (8.534) | -1.167 (-1.714) | .712 | 1.817 | 91.670 | 77 |
| Pharmaceuticals and Chem. | 230.787 (2.902) | 8.833 (3.775) | 8.114 (8.536) | .672 | 1.973 | 83.149 | 84 |
| Cement | 151.434 (4.334) | 5.653 (2.765) | 3.647 (4.072) | .750 | 1.712 | 48.101 | 35 |
| Tannery, Ceramics & Misc. | 141.297 (3.573) | 7.307 (11.462) | 6.534 (7.694) | .812 | 2.119 | 114.683 | 56 |

**Note:** i) *P, D* and *R* represent stock price, dividends and retained earnings respectively,

ii) *t* values of regression coefficients are shown in the parentheses.

iii) $\bar{R}^2$ refers to coefficient of determination adjusted for degrees of freedom.

iv) n = number of observations.

**Table-2:** *Linear Relationships among Share Price, Dividend, Retained Earnings and Earning Price Ratio of the Previous Year of the Sample Observations.*

| Regression Result: $P_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3\ P/E_{\ i(t-1)}$ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Industries | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | $\bar{R}^2$ | D.W. | F | n |
| Banking | 293.361 (2.703) | 2.062 (.641) | 3.325 (2.731) | 4.641 (1.199) | .102 | 1.978 | 2.803 | 78 |
| Insurance | -61.024 (-.948) | 10.394 (5.199) | 7.980 (7.074) | 9.630 (3.990) | .497 | 1.705 | 24.416 | 78 |
| Investment | -119.386 (-2.880) | 11.958 (43.558) | 2.504 (2.090) | 9.001 (2.543) | .974 | 1.177 | 689.425 | 60 |
| Engineering | 15.122 (.268) | 17.246 (11.238) | 4.012 (5.788) | .243 (.219) | .791 | 2.111 | 100.827 | 84 |
| Food & Allied | 214.173 (3.560) | 11.195 (9.083) | .783 (1.531) | 2.672 (1.035) | .759 | 2.178 | 39.852 | 42 |
| Fuel & Power | 284.077 (.186) | 10.882 (.827) | 12.984 (1.977) | 30.428 (.947) | .223 | 2.484 | 1.339 | 18 |
| Textile | -157.577 (-4.120) | 37.849 (8.328) | -2.115 (-2.431) | .503 (.872) | .731 | 1.902 | 56.165 | 66 |
| Pharmaceuticals and Chem. | 144.555 (1.179) | 8.061 (3.300) | 8.474 (8.463) | 9.795 (1.481) | .691 | 1.978 | 50.639 | 72 |
| Cement | 149.224 (3.302) | 5.461 (2.138) | 4.035 (4.036) | .534 (.198) | .714 | 1.696 | 21.609 | 30 |
| Tannery, Ceramics & Misc. | 104.067 (1.422) | 7.283 (9.544) | 7.098 (6.834) | 2.378 (.695) | .809 | 2.108 | 62.249 | 48 |

**Note:** i) $P/E_{\ i(t-1)}$ refers to price earnings ratio of the previous year.

ii) $t$ values of regression coefficients are shown in the parentheses.

iii) $\bar{R}^2$ refers to coefficient of determination adjusted for degrees of freedom.

iv) n = number of observations.

**Table-3:** *Linear Relationships among Share Price, Dividend, Retained Earnings and Lagged Price of the Sample Observations.*

| Industries | $\lambda_0$ | $\lambda_1$ | $\lambda_2$ | $\lambda_3$ | $\bar{R}^2$ | D.W. | F | n |
|---|---|---|---|---|---|---|---|---|
| Regression Result: $P_{it} = \lambda_0 + \lambda_1 D_{it} + \lambda_2 R_{it} + \lambda_3 P_{i(t-1)}$ | | | | | | | | |
| Banking | 217.407 (2.418) | -1.143 (-.391) | 1.234 (1.049) | .586 (4.241) | .264 | 2.021 | 8.829 | 78 |
| Insurance | 18.652 (.571) | 5.672 (3.724) | 2.200 (2.684) | .606 (7.813) | .665 | 1.758 | 49.053 | 78 |
| Investment | -19.737 (-.985) | 8.395 (6.688) | 1.149 (.951) | .329 (2.952) | .975 | .895 | 714.920 | 60 |
| Engineering | 18.204 (.380) | 11.929 (5.233) | 3.637 (5.466) | .271 (3.019) | .812 | 2.180 | 115.269 | 84 |
| Food & Allied | 140.099 (2.787) | 6.882 (4.523) | .657 (1.535) | .409 (3.697) | .818 | 2.042 | 56.782 | 42 |
| Fuel & Power | 218.531 (.450) | -2.426 (-.413) | -4.042 (-1.044) | 1.246 (6.593) | .799 | 2.316 | 18.501 | 18 |
| Textile | -91.294 (-5.624) | 17.217 (7.294) | -1.501 (-3.883) | .766 (16.069) | .947 | 1.845 | 371.344 | 66 |
| Pharmaceuticals and Chem. | 140.574 (1.791) | 4.330 (1.940) | 4.509 (4.047) | .508 (5.175) | .771 | 1.842 | 76.317 | 72 |
| Cement | 72.247 (1.799) | 2.889 (1.333) | 2.725 (3.121) | .433 (3.704) | .812 | 1.566 | 37.515 | 30 |
| Tannery, Ceramics & Misc. | 44.577 (1.142) | 3.302 (3.666) | 5.380 (6.773) | .488 (5.640) | .888 | 1.815 | 116.422 | 48 |

**Note:** i) $P_{i(t-1)}$ = share price of the previous year.

ii) *t* values of regression coefficients are shown in the parentheses.

iii) $\bar{R}^2$ refers to coefficient of determination adjusted for degrees of freedom.

iv) n = number of observations.