

An Empirical Investigation of the Underpricing of Initial Public Offerings in the Chittagong Stock Exchange

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Abstract

This study analyzes the levels of underpricing in IPOs and its determinants of the Chittagong Stock Exchange (CSE). The degree of underpricing in the Bangladesh capital market is rather high compared to that of other Asian and advanced stock markets. Key trends in the levels of underpricing and overpricing are highlighted on a year to year, and industry to industry bases. The overall level of underpricing at the Chittagong Stock Exchange was 480.72% with a standard deviation of 1217.25. Out of the 191 companies that were listed in the years 1995 to 2005, 173 (90.57%) IPOs were found to be underpriced, 16 (8.37%) overpriced while only 2 were accurately priced. The overall level of overpricing was 17.87% with a standard deviation of 14.14. Regression analysis shows that age of the firm, and size of the company is positively related to the degree of underpricing. The industry type and offer size are found to be negatively related to the degree of underpricing. However the timing of offer was found to have no significant influence on the degree of underpricing of IPOs in the Chittagong Stock Exchange.

Keywords: Initial public offering, Underpricing, Determinants of underpricing, Chittagong Stock Exchange

1. Introduction

Initial public offering (IPO) underpricing, or high IPO return is a common phenomenon to most stock markets, regardless of whether these markets are in developed or emerging economies (Ritter et al., 1984). A common perception is that underpricing of IPOs is a contradiction to market efficiency and may worsen emerging firms trying to raise capital for expansion. This perception has spawned an extensive literature attempting to explain this apparent financial anomaly. A number of IPOs underpricing have been put forth and tested using the data of various stock markets. According to Ritter (1984), IPO underpricing occurs depending on the period a firm chooses to go public. Rock's model of "underpricing" as an expected equilibrium results are supported by Beatty and Ritter (1986), who, in turn, proposed that underpricing is related to *ex ante* uncertainty. As a follow up to IPOs underpricing, McDonald and Fisher (1972), Reilly (1978), Dawson (1987), Yong (1996), Haque and Musa (2002), Lowry et al. (2006), and Taufil (2007) maintained that there are significant returns to the investors in the short run. Although hundreds of empirical studies have been carried out and theoretical literature written to enhance people's knowledge towards these issues; yet it is arduous for people to clearly understand the various issues related to IPOs especially with different types of equities in different industries and in different markets.

Previous studies indicated that underpricing occurs across a number of different times and samples (McGuinness, 1992). The degree of underpricing varies from one issue to another. Studies on Malaysian new stock offers (e.g., Dawson, 1987; Yong, 1991, 1996; Sufar, 1987; Ismail *et al.*, 1993; Yeap, 2006; Taufil, 2007) indicate significant returns received by investors at the time of initial listing. Studies on Bangladesh new stock offers (e.g., Islam, 1999; Haque & Musa, 2002) indicate existence of higher degree of underpricing. The analysis of the excess returns after

trading began also reveals that the price adjusts rapidly to the underpricing of the initial offers. This result is consistent regardless of whether the amount of increase registered at the opening day is high or low.

The degree of underpricing in Bangladesh capital market is rather higher compared to that of other Asian and advanced stock markets. Islam (1999) documented that the average initial returns is 116.01 percent with a standard deviation of 261.94 percent during 1994-1999. Hoque and Musa (2002) find that between 1994 and 2001 the IPOs of Dhaka Stock Exchange was largely underpriced at 285.21 percent. For the same time period, the degree of underpricing in Malaysia was 46.44% (Yeap, 2006), in Singapore and Turkey 31.4% and 13.6%, respectively (Laughran et al., 2000) and in the US market 22% (Lowry et al., 2006).

Bloomberg (Oct.9, 2007) reported that the Dhaka Stock Exchange Index is at a 10-year high, up 66 percent this year, making it Asia's top performer after China. Citigroup Inc., JPMorgan Chase & Co. and Merrill Lynch & Co. are betting Bangladesh capital market may be the next Asian success story. September 2007, New York-based Citigroup, the largest U.S. bank, became the first foreign lender to get a license to offer merchant- banking and investment-banking services. JPMorgan named Bangladesh one of the "Frontier Five" markets worth investigating in an April 4 note, along with Kazakhstan, Kenya, Nigeria and Vietnam.

The purpose of this study is to investigate the price behavior of initial public offerings of the Chittagong Stock Exchange during the period of 1995-2005. This study will provide an insight for the future investors regarding the types of IPOs that is best to invest in as in-depth analysis of the issue of underpricing and the stock price behavior shall be explored. Different levels of underpricing observed in different countries show that there might be some unique features in each country and these features might affect underpricing. Institutional differences in pricing and allocation of shares play an important role in explaining the degree of underpricing (Loughran et al., 1994). Bangladesh capital market is unique with an interesting characteristic which IPOs are allowed for dual listing. It is found that 95% IPOs that are listed with CSE are also listed at DSE. Therefore it will be interesting to find out the extent of underpricing and its determinants in Bangladesh capital market.

2. Bangladesh capital market:- an overview

Bangladesh capital market is quite small compared to other regional markets and the size of its economy. Though generally a capital market has two prongs, the stock market and the debt market, Bangladesh market has only stock market in active operation, as a debt market is still in initial stage.

Among over 40,000 small and medium companies only 310 have become listed till April 30, 2007, of which 33 have been de-listed in the past 15 years. Though the governments tried to attract the growing private companies to turn their enterprises into public limited and get listed to reap benefits and avail incentives offered time to time, on average only 10 companies have joined the market each year.

Though industrialization has picked pace in Bangladesh almost three decades back, capital market has failed to attract the entrepreneurs as the key source of capital, which has usually been occupied by the banking system since beginning. That is why Bangladesh capital market has the lowest market capital as percentage of GDP in the region as well as other similar sized economies, while its neighbouring country, India, sharing almost the same industrial history, has the highest. (Table 1)

Bangladesh has two Stock Exchanges, Dhaka Stock Exchange (DSE), established in 1954 where trading is conducted by Computerized Automated Trading System and Chittagong Stock Exchange (CSE), established in 1995 which is also conducted by Computerized Automated Trading System. All exchanges are self-regulated, private sector entities which must have their operating rules approved by the Securities and Exchange Commission (SEC). As of 31 December 2006, the total issued capital of all listed securities of Dhaka Stock Exchange was TK 71,745 million (US\$1037 million) where as in Chittagong Stock Exchange the total issued capital was TK 68,554.72 million (US\$979.35 million). Total market capitalization of all securities listed with the Dhaka Stock Exchange was TK 3,23,368 million (US\$4673 million) as on 31 December 2006 compared to TK 2,67,480 million (US\$3821.14 million) in the Chittagong Stock Exchange.

3. Literature review

Initial public offerings (IPOs) are rapidly becoming one of the most thoroughly tackled topics in empirical finance. Early research related to initial public offerings (IPOs) documented the tendency of IPOs to provide abnormal returns to investors who purchased them at the initial offering (Stoll & Curly, 1970). Refinements and extensions followed, including efforts to explain the variation in abnormal returns across firms and underwriters (Miller and Reilly, 1987). Information asymmetry, legal liability, and signaling theories have also been incorporated into IPO related research (Allen and Fauhaber, 1989; Baron, 1982; Rock, 1982; Tinic, 1988).

The theory of efficient markets suggests that the price of the newly issued stock will quickly adjust to reflect the available set of relevant information (Fama, 1970). The persistence of underpricing has raised questions about what happens when firms go public. The decision to go public is one of the most important issues in corporate finance. Even in countries with developed capital markets like the United States, some large companies – such as United Parcel Service or Bechtel – are not public. In other countries, like Germany and Italy, publicly traded companies are the exception rather than the rule, and quite a few private companies are much larger than the average publicly traded companies. These cross-sectional and cross-country differences indicate that going public is not a stage that all the companies eventually reach, but is a choice, begging the question of why some companies choose to use public equity markets and some do not (Pagano et al., 1998). Basically, a firm enters the IPO market with two principal reasons (Rock, 1986). First, the founders of the firm may want to diversify their portfolios. The second reason is that the firm has no alternative source of funds to finance its investment project. Pagano et al., (1998) documented that a firm enters the IPO market for various reasons, including overcoming borrowing constraints, greater bargaining power with banks, liquidity and portfolio diversification, monitoring investor recognition, change of controls and windows of opportunity.

The price formation process for IPOs may be susceptible to the existence of significant conditional price trends in the short-run aftermarket for several reasons: first, there exists a growing body of literature noting that market reaction to the signals or news announcements issued by seasoned firms is not completed immediately (Agrawal, Jaffe, and Mandelkar, 1992). Instead, market prices adjust slowly to such news or signals, with trends extending over several months. IPOs are characterized by a great deal of uncertainty about their true value because of the scarcity of public information at the time of the initial offering. In such a noisy environment, judging the true value of a new issue is extremely difficult. Consequently, the initial return on an IPO (i.e., the difference between the first market price and the offer price) reveals significant information because it provides the first public indication that the market's average assessment of the IPO differs from that of the underwriter and the issuing firm. In addition, under the signaling theories (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; and Welch, 1989) the initial market price provides a signal of the quality of the IPO.

Second, the first market price may fail to reflect fully all available information because of the potentially fragmented market for IPOs. The issue size of IPOs is typically small and the underwriters, often facing excess demand, ration new issues to their regular clients, who constitute a small subset of potential investors. Initial trading in the aftermarket serves to disseminate information about the value of IPOs to other investors. While initial upward price movement of underpriced IPOs spreads favorable information, the available supply of shares is restricted because underwriters typically discourage initial subscribers from selling their allotments in the aftermarket. Investors who were unable to obtain their full subscriptions at the offering may seek to buy shares in the aftermarket, resulting in a sequence of daily positive returns. In the case of an overpriced issue, the first market price fails to reflect the available information because of price stabilization by the underwriting syndicate. As the syndicates disband at varying times for the different IPOs, this leads to a gradual downward price adjustment on the average and sequential negative daily average cross-sectional returns over the short-run for overpriced IPOs. Such effects, however, may be offset by incentives provided by the syndicate to induce informed traders to reveal their private information while the offering price is being set. For example, in Benveniste and Spindt (1989) informed traders have an incentive to understate their interest in a new issue in the premarket, but underpricing induces them to be truthful in their indications of interest.

3.1 Evidence from major stock exchanges

A summary of average initial returns on IPOs across the major stock markets is shown in Table 2. (Table 2)

3.2 Evidence from Asian stock exchanges

The IPO behavior and after market performance have been examined by few researchers (Hoque and Musa, 2002; Islam, 1999 etc.) in Bangladesh context. The focus of these studies were primarily the underpricing and initial returns of IPOs, IPO flipping, market efficiency and effect of capital structures on the returns. Islam (1999) documented that the average initial returns is 116.01 percent with a standard deviation of 261.94 percent during the period between 1994-1999. Hoque and Musa (2002) find that during the period between 1994 and 2001, the IPOs of DSE was largely underpriced (285.21%). A summary of average initial returns on IPOs across the major stock markets is shown in Table 3. (Table 3)

IPO underpricing - the phenomenon of a large positive gain to a new issue (relative to its offering price) immediately - after listing has been found in many markets. The magnitude of underpricing in China is even more phenomenal. Mok and Hui (1998) found that the underpricing A shares in Shanghai is 289%. Su and Fleisher (1999) showed that the underpricing could exceed 948% if IPOs from earlier years were included in the sample.

3.3 Reasons for underpricing

Much of the theoretical research on IPOs has focused on explaining IPO underpricing. Possible reasons for underpricing include self-interested investment bankers (Baron and Holmstrom, 1980; Baron, 1982), the “winner’s curse” (Rock, 1986), lawsuit avoidance (Tinic, 1988), signaling (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989), market incompleteness (Mauer and Senbet, 1992), bookbuilding (Benveniste and Spindt, 1989), and informational cascades (Welch, 1992). Evidence also suggests that in some countries IPO underpricing may be due to the regulatory environment (Loughran, Ritter, and Rydqvist, 1994), or because the allocation of IPO shares can be used as a bribe. One possible explanation for the strong fluctuations in IPO volume is that the cost of issuing (Ibbotson and Ritter, 1995) for a survey of the research on initial public offerings. Attempts were made to examine the reasons for the initial high returns of these new issues. Some theoretical work suggests that the underpricing of IPOs is associated with asymmetric information and investors' concerns that the decision to issue equity is an attempt to expropriate wealth from outsiders (Ibbotson, 1994). Empirical studies have found evidence that the underpricing for IPOs of financial institutions is related to proxies for asymmetric information. Offer size (Megginson & Weiss, 1991), age of the firm (Muscarella & Vetsuypens, 1987; Barry & Brown, 1994; Megginson & Weiss, 1991; Logue, 1973; McDonald & Fisher, 1972), and the volatility of the post-offer return (Ritter, 1984) have all been associated with IPO underpricing. Recently Taufil Mohd (2007) conducted empirical tests on the relationship between regulations and underpricing using 546 initial public offerings on the Kuala Lumpur Stock Exchange from 1990 to 2002 and finds that the length of time from price setting to listing date is negatively related to underpricing. However the fraction of shares set aside for indigenous investors and the concerns of ethnic associations that leads to lower offering prices do not seem to affect underpricing. Finally, it was found that the protective mechanisms lead to more underpricing for firms that went public between 1996 and November 6, 1997 or those that went public after the Asian financial crisis.

4. Research methodology

With regard to initial returns, underpricing for IPOs is a well-known phenomenon both in advanced markets in Western countries and also in emerging market such as Bangladesh. Studies on Dhaka Stock Exchange earlier documented higher degree of underpricing. Islam (1999) documented that the average initial returns is 116.01 percent with a standard deviation of 261.94 percent during the period between 1994-1999. In a recent study, Hoque and Musa (2002) find that during the period between 1994 and 2001, the IPOs of DSE was largely underpriced (285.21%).

Attempts were made to examine the reasons for the initial high returns of these new issues. Offer size (Megginson & Weiss, 1991), age of the firm (Muscarella & Vetsuypens, 1987; Barry & Brown, 1988; Megginson & Weiss, 1991; Logue, 1973; McDonald & Fisher, 1972; Balwinder Singh and Mittal, 2003), and the volatility of the post-offer return (Ritter, 1984) have all been associated with IPO underpricing. Recently, Taufil (2007) conducted empirical tests on the relationship between regulations and underpricing using 546 initial public offerings on the Kuala Lumpur Stock Exchange from 1990 to 2002 and finds that the length of time from price setting to listing date is negatively related to underpricing. Addition to these factors, the researcher expects size of the firm (as there is no division of main board and second board in Bangladesh) and the type of industry (as there is evidence of sectoral dominance among the listed firms) to be positively related to underpricing. Therefore, the following hypotheses are proposed:

H1: IPOs listed with DSE are underpriced.

H2: There is a positive relationship between age of firms and degree of Underpricing.

H3: The larger the size of offer, the lower the underpricing.

H4: There is a relationship between timing of offer and degree of underpricing.

H5: The larger the size of firm, the lower the underpricing.

H6: There is a significant difference between IPOs in different industry and degree of underpricing.

The underpricing/overpricing was measured by taking the difference of the closing price at the specific date in question with the offering price and divided by the offer price as shown below:

$$R_{j,t} = [P_{j,t} - P_{j,0}] / P_{j,0}$$

Where $R_{j,t}$ is the return of stock j in the period t , $P_{j,t}$ is the price of stock j at the period t , and $P_{j,0}$ is the offer price of stock j . Returns was measured with $P_{j,0}$ using the opening price to determine the return for investors who were unable to buy the stock when it was offered but bought it on the opening day.

Multiple regression was employed to find out factors that significantly affect underpricing at Bangladesh capital market. The model is described below:

$$UND = \alpha_0 + \alpha_1 AOF + \alpha_2 SOF + \alpha_3 SOFF + \alpha_4 TIME + \alpha_5 TYPE + \varepsilon$$

Where

UND = Underpricing/Overpricing, AOF = Age of the firm, SOF = Size of the firm, SOFF = Size of the offer, TIME = Timing of the offer, and TYPE = Type of industry

Age of the firm was computed from the date of incorporation to the date of IPO (David, 2002). The company size was measured by using the net assets of the company in the year of IPO as done by Khurshid, Mudambi and Georgen (1999). Timing of offer was measured by Balwinder Singh and Mittal, (2003) and Taufil (2007) as the time taken from the date of listing to the offer date.

This study examined new companies, which were listed on the CSE for the period 1995-2005. All the data used in this study will be secondary data gathered from: Prospectuses, CSE Daily Diaries, CSE and SEC websites, and Annual Report of listed Companies. The population of this study includes all listed companies in the CSE. This study includes IPO issuers in all sectors such as Financial sector that include Bank, Insurance and Investment; Manufacturing sector that include Cement, Engineering, Ceramics, Food and Allied products, Jute, Paper and Printing, Pharmaceuticals and Chemicals, Tannery Industry and Textiles. Finally Service & miscellaneous that include Fuel and Power, IT, Services and Real Estates, and Miscellaneous. The objective of this study is to gauge the new issue stock price behavior in IPO firms as listed in the CSE. This research also serves to examine the determinants of underpricing in the Chittagong Stock Exchange.

5. Results

The sample data is consisted of companies that are listed into CSE between the periods of 1995 to 2005. Table 4 presents the sample profile of listed companies in the sample period at CSE. (Table 4)

Table 4 shows that the highest number of companies that were listed with the Chittagong Stock Exchange was from the financial sector. There were 53 companies listed during this period. Financial sector includes Banks, Insurance, finance, leasing and investment companies. The next highest number of companies that were listed with CSE was from tannery and textile companies. Tannery and textile companies include textiles, spinning, leather and foot wears. There were 40 companies listed in the CSE during this period. The 3rd largest sector was manufacturing. There were 28 companies listed during the sample period into the CSE. The next highest contributing listing was from the Miscellaneous. There were 27 companies listed with CSE from this sector during this period. The lowest number of companies that were listed in the CSE during the sample period was paper and printing sector. There were only six companies listed during this period.

There were 51 companies listed during the year 1995. This is the year the Chittagong Stock Exchange was launched. The next highest listing was in 1996. There were 49 companies listed with CSE during this year. The next highest contributing year in terms listing was 1997. There were 18 companies listed during this year. After that the number of companies listed with the Chittagong Stock Exchange at the average rate of 10 companies a year. The lowest number of companies listed in the year 1998. There were only five companies listed in this year in the Chittagong Stock Exchange.

5.1 Level of underpricing/overpricing

This section presents the level of underpricing and overpricing in the Chittagong Stock Exchange. The overall level of underpricing at the Chittagong Stock Exchange was 480.72% with a standard deviation of 1217.25. There were 173 (90.57%) IPOs underpriced and only 16 (8.37%) were overpriced. The overall level of overpricing was 17.87% with a standard deviation of 14.14. There were only two (1.04%) IPOs where the 1st day opening prices were same as the issue price. Table 5 presents the overall level of underpricing/overpricing at the Chittagong Stock Exchange. (Table 5)

The maximum level of underpricing at CSE was 11900% and minimum level of underpricing was 1%. The maximum level of overpricing at DSE was 50% whereby the minimum level of overpricing was 2%.

5.1.1 IPO underpricing on yearly basis

The highest degree of underpricing at the Chittagong Stock Exchange was registered in the year 1996 (1006.69% with a standard deviation of 2053.05%). There were 20 companies listed in this year. The next highest level of underpricing was recorded in the year 1995 (490.41% with a standard deviation of 905.10). There were 48 companies listed with DSE in this year. The CSE was launched in this year. The 3rd highest level of IPO underpricing at DSE was recorded in the year 2004 (438.76% with a standard deviation of 466.36). There were 11

companies listed in this year. The next highest level of underpricing recorded in the year 2005 which recorded underpricing of 290.40% with a standard deviation of 190.44. Table 6 presents the IPO underpricing on a yearly basis among CSE listed companies. (Table 6)

The lowest number of underpricing recorded in the year 1998. The level of underpricing was 11.33% with a standard deviation of 7.77.

5.1.2 IPO overpricing on yearly basis

The highest level of overpricing recorded at the Chittagong Stock Exchange in the year 2003 (32.50% with a standard deviation of 24.75). There were two IPOs (16.67%) overpriced in this year out of twelve companies listed at DSE. The second highest number of IPOs that were overpriced was the year 1996 (32.00% with a standard deviation of 11.31). There were two (11%) companies out of twenty two companies listed into CSE in this year. The lowest level of overpricing recorded in the year 2004 (4%).

5.1.3 IPO underpricing on industry basis

The highest level of underpricing recorded at the Chittagong Stock Exchange was the manufacturing sector (971.84% with a standard deviation of 2207.36). There were forty seven companies underpriced from this sector. The next highest level of underpricing registered in the Food and allied products sector (639.77% with a standard deviation of 1373.83). There were 18 companies underpriced from this sector. The services and miscellaneous sector recorded the next highest level of underpricing (583.99% with a standard deviation of 1291.95). There were 23 IPOs listed in this sector during the sample period. The lowest level of underpricing recorded in the paper and printing sector (180.83% with a standard deviation of 306.15). Tannery and textiles sector recorded the next lowest level of underpricing (225.71% with standard deviation of 404.90). There were 34 IPOs underpriced in this sector. (Table 7)

5.1.4 IPO overpricing on industry basis

The highest level of overpricing at the Chittagong Stock Exchange recorded in the food and allied products sector (25.50% with a standard deviation of 10.61). There were two companies overpriced in this sector during sample period. The highest number of companies overpriced recorded in the financial sector. There were five (12.19%) companies overpriced in this sector out of 41 listed companies. The lowest level of overpricing was recorded in the pharmaceuticals and chemical sector (5%). There was only one (5.88%) IPO overpriced out of 17 listed IPOs. There were no overpriced IPOs in the manufacturing sector during the sample period.

5.1.5 Determinants of underpricing

Multiple Regression analysis was used to find out whether offer size, size of the company, years of operation before listing, timing of offer and sector have any significant effect on the degree of underpricing or overpricing at Chittagong Stock Exchange. Table 8 presents the results of regression analysis. (Table 8)

Based on the regression analysis results offer size is found to be significant with a negative beta at 5% significance level ($\text{sig } t = .000$). This indicates that offer size has significant negative effect on the degree of underpricing at the Dhaka Stock Exchange. Therefore hypothesis 3 on Chittagong Stock Exchange is substantiated.

Size of the company is found to be significant at 5% significance level ($\text{Sig } t = .017$) with a positive beta. This means that size of the company positively influences the degree of underpricing at Dhaka Stock Exchange. Therefore Hypothesis 5 is accepted. Dummy variables were created for sectors that companies are listed at Chittagong Stock Exchange because it was a categorical variable. Six dummies were created for CSE sectors. Regression analysis results show that the sector that a company belongs to has significant effect on the degree of underpricing at 5% significance level. Therefore hypothesis 6 is substantiated.

Years of operation before listing into the CSE were also found to have a significant effect ($\text{Sig } t = .020$) on the degree of underpricing at Chittagong Stock Exchange. Therefore hypothesis 2 was accepted. Timing of offer was found to have no significant effect on the degree of underpricing at the CSE. Therefore hypothesis 4 was not substantiated.

The R square was 32.8%. This means that age of the firm, timing of offer, offer size, size of the company and sector that a company listed into can explain 32.8% variations of the degree of underpricing at the Dhaka Stock Exchange. This indicates that there are other factors that may explain 67.2% variations of the degree of underpricing at the Dhaka Stock Exchange. Initially the R square was low due to the outliers. Outliers were then taken out and R square increased significantly. The Durbin-Watson falls within the acceptable range (1.542). Therefore there was no serial correlation problem in the data. The VIF (1 – 10), tolerance (0.1 – 1) and the condition index (7.029) all fell into the acceptable range. Hence there was no multicollinearity problem in the regression model. The histogram shows that data were normally distributed. Scatter plot shows that data were not concentrated and therefore there was no

homoscedasticity in the data. Normal P-P plot shows that the data were linear. The F-value was large (3.850) and found to be significant at 1% significance level (Sig F = .000). These all construct that the regression model used for the analysis was fit or in another word there was an adequate model.

6. Conclusion

The degree of underpricing in the Bangladesh capital market is rather high compared to that of other Asian and advanced stock markets. Islam M.S. (1999) documented that the average initial returns is 116.01 percent with a standard deviation of 261.94 percent during the period between 1994-1999. Hoque and Musa (2002) find that during the period between 1994 and 2001, the IPOs of DSE was largely underpriced at 285.21 percent. At the same period the degree of underpricing in Malaysia was 46.44% (Yeap, M. 2006), Singapore and Turkey were 31.4% and 13.6% respectively (Laughran et al., 2000), India was 96.56% (Balwinder Singh and RK Mittal., 2003) and in US market was 22% (Lowry et al., 2006). Our findings are consistent with earlier findings of Hoque and Musa (2002) and Islam M.S. (1999). Out of the 117 companies that were listed in the years 1995 to 2005, 102 (87.18%) IPOs were found to be underpriced, 13 (11.11%) overpriced while only 2 were accurately priced. The overall level of underpricing was 480.71% with a standard deviation of 1217.24. This is considered very high as compared to other stock exchanges and the Dhaka stock exchange as well. This could be due the fact that the study sample data taken from inaugural year to subsequent nine years. The overall level of overpricing was 17.87% with a standard deviation of 14.14. The high degree of underpricing is still persistent. In order to reduce the persistent higher degree of underpricing the Securities and Exchange Commission should review the fixed pricing system. It is recommended that Book building pricing be implemented to reduce the persistent higher degree of underpricing. Regression Analysis shows that age of the firm and size of the company is positively related to the degree of underpricing. The industry type and the offer size are found to be negatively related to the degree of underpricing. However timing of offer was found to have no significant influence on the degree of underpricing of IPOs in the Chittagong Stock Exchange. The finding on the industry type affects on degree of underpricing is somewhat new and therefore it contributes to body of existing knowledge.

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Table 1. Market capital as percentage of GDP (As of December 2006)

Country	GDP size	Market capital of the listed stocks	Market capital as percentage of GDP
Indonesia	\$353.00b	\$134.00b	38.0%
Pakistan	\$127.00b	\$48.00b	41.0%
Philippines	\$117.00b	\$73.70b	63.0%
South Korea	\$886.00b	\$824.00b	93.0%
Malaysia	\$150.00b	\$160.00b	106.67%
India	\$750.00b	\$810.00	108.0%
Bangladesh	\$62.02b	\$8.47b	15.0%
Iran	\$182.00b	\$38.30b	21.0%
Vietnam	\$61.00b	\$14.00b	23.0%

Source: www.devdata.worldbank.org

Table 2. Average initial returns in major stock markets

Country	Researcher	Sample size	Time period	Average initial return
Australia	Lee, Taylor and Walter; Woo	381	1976 - 1995	12.1%
Austria	Aussenegg	76	1984 - 1999	6.5%
Belgium	Rogiers, Manigard and Ooghe	28	1984 - 1990	10.1%
Brazil	Aggarwal, Leal and Hernandex; Maturana	62	1979 - 1990	78.5%
Canada	Job and Riding; Jog and Srivastava	258	1971 - 1992	5.4%
Chile	Aggarwal, Leal and Hernandex; Maturana	55	1982 - 1997	8.8%
Denmark	Jakobsen and Sorenson	117	1984 - 1998	6.4%
Finland	Keloharju	85	1984 - 1992	9.6%
France	Husson and Jacquillat; Leleux and Muzyka; Pallard and Belletante	187	1983 - 1992	4.2%
Germany	Ljungqvist	407	1978 - 1999	27.7%
Greece	Kazantzis and Levis	79	1987 - 1991	48.5%
Israel	Kandel, Sarig and Wohl	28	1993 - 1994	4.5%
Italy	Cherubini and Ratti; Giudici and Paleari	135	1985 - 1998	20.3%
Mexico	Aggarwal, Leal and Hernandex	37	1987 - 1990	33%
Netherlands	Wessels; Jenkinson	143	1982 - 1999	10.2%
New Zealand	Vos and Cheung; Camp	201	1979 - 1999	23%
Nigeria	Ikoku	63	1989 - 1993	19.1%
Norway	Emilsen, Paderson and Sættern	68	1984 - 1996	12.5%
Poland	Aussenegg	149	1991 - 1998	35.6%
Portugal	Alpalhao	62	1986 - 1987	54.4%
Spain	Rahnema and Fernandex	71	1985 - 1990	35%
Sweedden	Rydqvist	251	1980 - 1994	34.1%
Switzerland	Kunz and Aggarwal	42	1983 - 1989	35.8%

Source: Loughran et al (2000)

Table 3. Average initial returns in Asian stock markets

Country	Researcher	Sample size	Time period	Average initial return
Bangladesh	Mohammad Sadequul Islam	95	1994 - 1999	116.01%
	Hoque and Musa	113	1994 - 2001	285.21%
China	Datar and Mao	226	1990 - 1996	388 %
	Chan et al	701	1992-1997	145%
Hong Kong	McGuiness; Chao and Wu	334	1980 - 1996	15.9%
India	Krishnamurti and Kumar	98	1992 - 1993	35.3%
	Balwilder Singh and RK Mittal	500	1992-1996	96.56%
Japan	Fukuda; Dawson and Hiraki	975	1970 - 1996	24%
Korea	Jhatt, Kim and Lim	347	1980 -1990	78.1%
Malaysia	Isa and Yong	401	1980 – 1998	104.1%
	Mellisa yeap	323	2000 - 2005	46.44%
Philippines	Sullivan and Unite	104	1987 - 1997	22.7%
Singapore	Leep, Taylor and Walter	128	1973 - 1992	31.4%
Taiwan	Lin and Sheu	241	1986 - 1995	34.6%
Thailand	Wethyavivorn and Koo-Smith	32	1988 - 1989	58.1%
Turkey	Kiyamaz	138	1990 - 1996	13.6%

Table 4. New issues on an industry to industry basis

Sector	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Financial	14	09	03	01	00	04	03	00	04	09	06	53
Manufacturing	05	12	03	02	02	01	00	02	01	00	00	28
Food and allied Products	04	06	02	02	00	01	03	02	00	00	00	20
Paper and Printing	00	01	01	00	02	01	01	00	00	00	00	06
Pharmaceutical and Chemicals	06	04	03	00	00	00	01	01	01	00	01	17
Tannery and Textiles	15	12	04	00	03	01	02	02	00	01	00	40
Services and Misc.	07	05	02	00	01	00	02	01	06	02	01	27
Total	51	49	18	05	09	08	12	08	12	12	08	191

Table 5. Overall levels of IPO underpricing and overpricing

	Number of companies	Mean Level of Underpricing	Maximum	Minimum	Standard Deviation
Underpricing	173	480.7126	11900.00	1.00	1217.24466
Overpricing	16	17.8750	-2.00	-50.00	14.13683
Similar Pricing	02	0.00	0.00	0.00	0.00
Total	191	433.9125	11900.00	-50.00	1167.2595

Table 6. IPO underpricing on a yearly Basis

Year	Number of Companies	Mean Level of Underpricing	Standard Deviation	Maximum	Minimum
1995	48	490.4167	905.09892	5100.00	2.00
1996	20	1006.6957	2053.04872	11900.00	5.00
1997	17	172.7059	260.75006	950.00	3.00
1998	03	11.3333	7.76745	20.00	5.00
1999	06	135.0000	172.29510	480.00	30.00
2000	08	167.6250	417.28132	1200.00	1.00
2001	11	84.3409	91.61688	290.00	9.00
2002	07	46.5714	43.48891	113.00	1.00
2003	10	37.1750	29.13476	96.25	1.00
2004	11	438.7640	466.36044	1500.00	10.00
2005	06	290.3968	190.44149	560.00	38.42
2006	10	141.3767	98.54854	372.00	60.00
2007	14	281.0000	212.16189	695.00	18.00

Table 7. IPO underpricing on an industry basis

Industry	Number of Companies	Mean Level of Underpricing	Standard Deviation	Maximum	Minimum
Financial	47	324.6246	842.48633	5800.00	1.00
Manufacturing	28	971.8393	2207.36307	11900.00	1.00
Food and Allied Products	18	639.7778	1373.82624	5100.00	10.00
Paper and Printing	06	180.83333	306.15252	800.00	9.00
Pharmaceutical and Chemicals	16	433.5885	540.81152	1810.00	1.00
Tannery and Textiles	34	225.7132	404.90114	1595.00	3.00
Services and Misc.	23	583.9876	1291.94616	6000.00	2.00
Total	173	480.7126	1217.24466	11900.00	1.00

Table 8. Results of regression analysis (determinants of underpricing)

Factors	Beta	T-Ratio	Sig t
Years of Operations before listing	.189	2.341	.020
Offer Size	-.262	-3.852	.000
Size of the company	.183	2.418	.017
Timing of offer	.065	.974	.331
Dummy_Com1	.420	5.184	.000
Dummy_Com2	-.088	-1.071	.286
Dummy_Com3	.051	.716	.475
Dummy_Com4	.041	.511	.610
Dummy_Com5	-.121	-1.272	.205
Dummy_Com6	.011	.132	.895
R Square = 32.8% Adjusted R Square = 28.7% Durbin-Watson = 1.542 F = 8.093, Sig F = .000 Condition Index = 7.029			