Towards identifying the determinants of revenue and earnings forecast bias and the impact of ambitious revenue forecast on earnings forecast optimism during IPOs: Evidence from an emerging market

1. Introduction

Most studies on the accuracy or bias in management forecasts made *via* annual reports or other forms of public communications made prior to initial public offerings (IPOs) tend to concentrate on earnings forecasts (for a comprehensive review, see Hirst *et al*, 2008). An assumption underlying this line of inquiry is that the market, or at least the audience to whom those forecasts are addressed, is primarily concerned about potential earnings, and accordingly, place utmost emphasis on earnings. It also follows the traditional accounting myth that forecast earnings would generally be consistent with forecast revenues and, in the long run, with dividends. While dividend is irrelevant (M-M) and the net income (NI) approach to valuation of the firm is flawed (also argued by M-M), net operating income (NOI) appears to be a more sound metric used by the market in valuing the firms. The focus of contemporary equity valuation models therefore shifted from pricing dividend and free cash flows to pricing book values (i.e., residual earnings) and earnings (i.e., abnormal earnings growth). In spite of the flurry of valuation models available to the analyst, none of the extant models appear to do a decent job in valuing most securities on a consistent basis. While a consensus metric to firm valuation remains elusive, most analysts use a combination of metrics along with firm-specific, industry-specific, and even, extraneous, variables – both quantitative and qualitative – in valuing firms. The same applies to the valuation of IPOs as investors factor in key firm, industry, and macro-economic data of the past as well as the future. They also use qualitative data such as the quality of management, prestige of the underwriter, reputation of the auditor and the operating history of the firm in valuing an IPO. Unlike seasoned equity offerings and issues with a reasonable trading history, IPOs typically face a more rigorous scrutiny as the market is unlikely to be familiar with the issuing firm, its management, its underwriter, or its auditor. Therefore, investors are likely to be as interested in the forecast revenues as they are in forecasts of earnings. Depending on the scope and prevalence of earnings management in a given market, revenue forecasts are bound to be less susceptible to potential threats of earnings management. Despite the fact that the most frequently cited cause of Securities and Exchange Commission (SEC) enforcement actions in

the United States is violation of revenue recognition principle, earnings are more vulnerable than revenues to accounting abuse and therefore remain more difficult to predict than revenues. Moreover, forecast revenues are easier to verify than forecast earnings as investors' unfamiliarity with a firm could be mitigated by their familiarity with the industry in which the firm belongs. Therefore, the difficulty an outsider encounters in predicting a firm's revenues is expected to be significantly less than that in predicting its earnings. This is claimed on a number of grounds. *First*, forecast earnings are subject to the interaction of both forecast revenues and forecast expenses while forecast revenues do not depend on expenses. Therefore, even if both forecast revenues and forecast expenses are subject to forecast errors, forecast earnings are subject to the compounded effect (multiplier effect) of the two forecast errors while forecast revenues are subject to only one of the two errors and hence are likely to suffer from half the combined bias introduced by the two forecasts. *Second*, as forecast revenues depend on forecast volume of sales and forecast unit prices, it uses information that is much more in the public domain. These two pieces of forecasts (a firm's forecast volume of sales and its forecast unit price) are more easily verifiable than the firm's forecast expenses as investors are more likely to know more information about the demand side of a firm's products and services than their supply side. Therefore, managers have less scope of introducing a bias in their estimates of revenues than they do in their estimates of expenses and thereby in their estimates of profits. *Third*, even if investors are considered naïve and argued that individual investors are only price takers, institutional investors are equipped with expert professionals capable of verifying both revenue and expense forecasts. However, the presence of management discretions in allocating accruals poses a threat to accuracy of profits as a valuation tool. Therefore, *ceteris paribus*, an investor – naïve or expert – is more likely to understand and verify a firm's revenue forecasts than its earnings forecasts.

Based on the above argument, this study aims first to examine the determinants of revenue forecast bias in addition to those of earnings forecast bias. Second, it incorporates revenue forecast bias in modeling earnings forecast bias and tries to identify the incremental contribution of issuer characteristics such as issuer size, auditor reputation, underwriter prestige, private and foreign shareholdings, issue timing, and leverage, on earnings forecast bias. The analysis therefore is performed in two layers. The first layer of the analysis

involves running two sets of traditional OLS regressions whereby revenue forecast optimism[1] (RFO) and earnings forecast optimism (EFO) variables are regressed on a single set of plausible explanatory variables of issuer size, auditor reputation, underwriter prestige, private shareholding, foreign shareholding, issue timing (issues offered during a bullish market and otherwise), forecast horizon, operating history, and leverage. The second layer of the analysis involves running a third set of OLS regressions whereby EFO is regressed on the same explanatory variables as in the first layer of the analysis plus revenue forecast optimism (RFO). The premise of this second layer of analysis is that since forecast earnings is the result of the interaction between forecast revenues and forecast expenses, forecast revenue bias would be embedded in forecast earnings bias in addition to the effect of other plausible explanatory variables on earnings forecast bias.

Management issues forecasts for a number of reasons. The primary motivation behind issuing forecasts arises from the management's efforts to minimize agency costs (Jensen and Meckling, 1976) while a secondary motive behind such disclosure might arise from a cost of capital perspective (Botosan, 1997). A third incentive to issue forecasts could be regulatory, whereby firms face a potential cost of non-compliance for non-disclosure of required amount of forecast information, especially, when they intend to issue securities for public subscription. A fourth motive behind issuing forecasts could be to legitimize a particular course of action pursued by management. While the consequences of a particular course of action (say, a recent merger or launch of a particular product or service or a significant financing arrangement) *ex-ante* are not known to managers and owners alike, managers have incentives to tailor their forecasts in order for avoiding future backlash in the event the pursued course of action leads to outcomes not likely to be approved by the owners.

In the absence of moral hazard, managers are likely to exploit their asymmetric information advantage to issue forecasts based on their best estimates of possible future scenarios of future revenues, cash flows, and earnings. On the other hand, managers could use information asymmetry to serve their own self-interest by misleading the market with biased forecasts that suit their own preferences regardless of their objectivity. Forecasts issued during Initial Public Offerings (IPOs) are particularly significant as they have the potential to

[1] Forecast error is used with the meaning of forecast bias or forecast optimism, i.e., signed forecast error, to encompass the direction of the error. It is argued that a negative error (i.e., actual results smaller than forecast figures) indicate an optimistic forecast and *vice-versa*.

influence prospective investors and cause them to make suboptimal investment decisions and, at a macro level, it could lead to a suboptimal resource allocation within the economy. Forecast error refers to the degree to which actual outcomes turn out to be at variance from forecasts. Forecast errors could therefore be in either direction – positive when actual outcomes exceed forecasts or negative when the opposite occurs. The literature on management forecast error is reasonably robust (see Hirst *et al*, 2008). Studies on emerging and newly industrialized economies have mostly examined firm characteristics associated with forecast errors and their magnitude (Mohammad *et al*, 1994; Chan *et al*, 1996; Jaggi, 1997; Jelic *et al*, 1998; Lee *et al*, 2006; Ismail and Weetman, 2007).

The present study does not consider forecast error as sign neutral because we believe the incentives behind the two types of forecast errors are asymmetric. This means incentives behind an optimistic forecast, i.e., actual results trailing forecasts, are different from those of a conservative forecast, i.e., actual results beating forecasts. Secondly, the two types of inaccuracies have different sets of public policy implications. No one would ever sue a manager for beating forecasts by any conceivable margin! No one would accuse an oversight body for its constituents' forecast errors caused by actual results being better than promised. Market reactions to forecast errors are also asymmetric in that markets have never been seen to penalize firms for beating forecasts while markets are ruthless when the other type of forecast error is made, i.e., actual results fail to meet forecasts. The thrust of the present study therefore is to put forecast error in perspective and consider errors from their respective signs. Once signs are imposed, a negative forecast error (actual – forecast when actual <forecast) is considered a sign of an optimistic forecast while a positive forecast error (actual – forecast when actual>forecast) is considered a sign of a conservative forecast. The present study extends the boundary of research on forecast error not just by looking at both revenue and earnings forecasts but, more importantly, by trying to isolate the effects of revenue forecast error on earnings forecasts while controlling for the traditional determinants of earnings forecast error. It develops two models of earnings forecast error, one with traditional drivers of forecast error and the other with those drivers plus the revenue forecast error. Thus, the present study makes a unique contribution to allow comparison of the two models to highlight the effect of revenue forecast error on earnings forecast error. Moreover, this study is the first of its kind to examine forecast bias over a forecast window longer than 12 months. All studies undertaken so far on IPO forecast accuracy look at a 1-year window, typically the first year of forecast, while the present study covers a 5-year period and runs

separate analysis on each of the 5 years before combining the five years in a pooled cross-section for both revenue forecasts and earnings forecasts. Analysis over an extended forecast window allows us to test the consistency of findings and stability of the models. It also contributes to the literature by offering opportunities to: (i) See whether any observed bias is only prominent in the first period post-IPO or whether it is a systematic phenomenon following a pattern across the whole or for most part of the forecast window. (ii) Find whether biases are random, i.e., self-correcting in nature or systematic and tend to move in one direction – positive or negative and do not reverse directions. If biases are random or self-correcting, an optimistic forecast in one period is likely to be compensated by a pessimistic forecast in the next or another future period. On the other hand, if they are systematic, they are likely to be persistent over the whole or most of the forecast window. Random biases do not reveal as much about forecaster attributes as do systematic ones. Random biases could be attributed to managerial incompetence or uncertainty of operations but not to managerial opportunism or deliberate action to mislead the market while systematic biases could be attributed to more serious managerial attributes such as weak governance and poor underwriting and auditing overseeing the forecasts. (iii) Check whether findings are robust across a longer forecast period and whether they hold when the observations are pooled together to form a combined sample covering the whole forecast window.

The remainder of this paper is organized as follows. Having introduced the paper in the preceding paragraphs, a brief review of relevant literature is presented in Section 2, followed by a discussion on the Bangladesh scenario and its institutional setting in Section 3. Section 4 deals with the development of testable hypotheses while the research methods and data are introduced in Section 5. The results of the analysis are presented and discussed in Section 6 while a summary of the findings and the conclusions are presented in Section 7.

2. Prior Research

As mentioned at the beginning of this paper, research on accuracy or bias in management forecasts have mainly looked at the degree of bias in management *earnings* forecasts, generally within prospectuses published as part of an IPO process. The approach generally taken is to regress forecast error in earnings on a series of explanatory variables capturing

issuer attributes along with those of the underwriters and auditors of the issuing firm. The earliest work in this area was that of Dev and Webb's (1972) who identified six possible determinants of company profit forecast accuracy. They include firm size, length of the forecast period, year of forecast, industry classification, issuing house, and type of issue. Ferris and Hayes (1977) analyzed 279 prospectuses issued during the period 1970 through 1973 in the London or provincial stock exchanges. They examined the effects of firm size, length of the forecast period, and the economic conditions prevailing at the date of issue on profit forecast accuracy. Using path analysis, they found that none of the variables on their own were able to significantly and consistently explain forecast accuracy. Contrary to the findings of Dev and Webb (1972) and to the general intuition, they found an inverse relationship between firm size and forecast accuracy and a positive association between length of the forecast period and forecast accuracy with the exception of one of the four years under study. With respect to the general economic conditions measured by a 200-day average of the Financial Times All-Share Index, they found a negative association with forecast accuracy with the exception of one out of four years.

Three studies were carried out on Singapore IPOs. The first one was based on 51 IPOs issued during the period 1972 to 1984 (Tan 1987). The study aimed at examining the reliability of earnings and dividend forecasts and found a mean profit forecast error of 24% and a mean dividend forecast error of 16%. A comparative analysis of forecast error across industries revealed a relatively low forecast error in the hotel and finance sectors. The second Singaporean study examined the impact of auditor quality on mean forecast error IPO earnings (Lam and Chang 1994) who did not find any significant association between auditor quality and earnings forecast error. In the third Singaporean study, Firth et al (1995) studied the accuracy of profit forecasts provided in 114 IPOs issued by Singapore companies during the period 1980 to 1993. They attempted to see whether firm characteristics had any bearing on forecast accuracy. Their findings imply that the overall degree of forecast accuracy of Singapore companies was relatively higher than that of Australian, Canadian, or New Zealand companies. However, the regression results revealed that forecast error was positively associated with forecast horizon suggesting that the shorter the forecast horizon, the lower the forecast error. All other explanatory variables including company size and company's auditor were found to be insignificant in explaining forecast error.

Mak (1989) studied the relationship between company, industry, general economic and forecast characteristics, and the accuracy of management earnings forecasts in a New Zealand context. Over the period of 1983 to 1987 he found that forecast accuracy was negatively associated with the length of forecast horizon and with changes in economic conditions while it was positively associated with firm's operating history. However, firm size and industry sector were found to be unrelated to forecast accuracy. His study provides empirical support to the a priori belief that prediction accuracy is achievable more in the short run than in the long run. It also supports the general intuition that a decline in general economic condition makes it increasingly more difficult to achieve the forecasted results and that companies who have been in existence for a descent period of time are more likely to make realistic and more accurate forecasts than those without any operating history. It may be noted that Mak (1989) was the first to explore any association between operating history and forecast accuracy.

Keasey and McGuinness (1991) attempted to extend the work of Dev and Webb (1972), Ferris and Hayes (1977) and Mak (1989) by investigating the accuracy and bias of prospectus earnings forecasts. The study is based on 194 placements on the Unlisted Securities Market (USM) in the UK during the years 1984, 1985, and 1986. They compared the actual earnings with three forecasts to determine accuracy or bias. These are: forecasts in the prospectus, random walk forecasts, and a trend forecast. The random walk forecast is the last available earnings figure prior to floatation while the trend forecast is obtained by adding the average growth in earnings over three years prior to floatation with the pre-floatation earnings figure. In their sample, all three types of forecast exhibited positive bias. However, the prospectus earnings error and trend earnings error were significantly less biased than random walk forecast error at the 5% level. In terms of the absolute measure of error, the prospectus earnings forecasts were found to be statistically more accurate that the random walk and trend forecasts.

Firth and Smith (1992) extended the work of Mak (1989) by studying the forecast accuracy of the IPO prospectuses in New Zealand Stock Exchange following enactment of the Securities Regulations 1983 that contained certain requirements pertinent to new issue of securities. Their sample comprised 89 prospectus earnings forecasts issued over a period of 3 years from 1983 to 1986. Three measures of forecast error were used: the forecast error (not ignoring signs), the absolute forecast error (ignoring signs), and the squared forecast error. The mean forecast error reported in their study was – 92% while the mean absolute forecast

error was 328%. Their results indicate that company size is significantly positively associated with forecasting error. However, forecasting horizon, length of operating history, leverage, and existence prior to issue had expected signs while auditor quality variable had a positive sign contrary to expectations signifying higher quality audit associated with higher forecasting error. The rationale for using of both length of operation and existence was not clear.

Hartnett (1993) examined the impact of industry classification, trading history, and interval length on corporate earnings and revenue forecasts on a sample of 61 Australian listing documents using bivariate non-parametric analysis. It was found that in general, revenue estimates were more accurate than profit estimates. Neither revenue nor profit forecast accuracy was found to be significantly influenced by industry classification. Trading history was found to have significant influence on revenue, but not profit forecasts. However, a moderate, negative association was found between forecast accuracy and forecast interval.

Another Australian study on profit forecasts has been undertaken by Lee et al (1993) on a sample of 98 IPOs issued between 1976 and 1989. They found highly inaccurate forecasts with a mean absolute of 1138.3% and a median forecast error of 42%. Their findings also indicated that the forecasts were overly optimistic. The results failed to identify any association between the degree of accuracy and firm-specific variables except the forecast horizon which indicated that shorter the time horizon was linked to higher forecast accuracy.

Neu and Simmons (1995) critically examined the predominant view that underwriters and auditors are neutral participants in the stock issue process and the presence of a high reputation intermediary will be negatively linked to the provision of an optimistic forecast. The popular belief is that high quality auditors and underwriters invest heavily on reputation capital and to safeguard that capital they have incentives not to engage in the provision of optimistic forecasts and thereby jeopardizing their reputation in the market. The authors used data from 110 firms that included an earnings forecast in prospectuses filed with the Ontario Securities Commission. While trying to reveal possible association between intermediary quality and relative prediction error, they controlled for owner-manager's shareholdings, past profitability, manager's option holdings, and underwriter's option holdings. Companies in general, were found to provide optimistic forecasts, as the median prediction error was 8% over-prediction. The results clearly suggest that the intermediaries are not neutral

participants in the underwriting process and that 'incentives rather than reputation influence underwriter behaviour' (ibid, p 41). All three underwriter and accountant variables were found to be positively associated with systematic provision of optimistic forecasts. This study did not use explanatory variables like company size, leverage age, forecasting horizon, or industry classification and all the variables were operationalized by use of dichotomous variables.

Chan et al (1996) continued the work of previous researchers mentioned above in an emerging capital market context. Their study encompassed 110 IPOs issued in the Hong Kong stock exchange during the period 1990 to 1992. The study involved testing a series of hypotheses dealing with possible determinants of forecast accuracy including forecast horizon, company size, financial leverage, past profit variability, changes in economic conditions, auditor size, industrial classification, and year of floatation. Mean absolute forecast error is reported to be 18% with a standard deviation of 31%. However, 60% of the IPOs had their respective actual earnings within a deviation of $\pm$ 8% of the forecast earnings signifying that earnings forecasts of Hong Kong IPOs are quite accurate. The multiple regression results indicate that past profit variability and change in economic conditions are significant determinants of forecast accuracy. One but all other variables exhibited the expected sign but had very weak explanatory power.

Jaggi (1997) studied 161 Hong Kong companies listed over a 5-year period from 1990 to 1994 to examine the degree of forecast accuracy and identify its determinants. His findings confirm the findings of Chan et al (1996) in that the Hong Kong companies do not overestimate their earnings. He also found that the level of accuracy is to some extent associated with length of period the company has been in business. No other company-specific variable appeared to have any significant influence on earnings forecasts. McConomy (1998) studied the impact of the introduction of an audit level assurance requirement for forecasts within Canadian prospectuses. He found that positive bias significantly decreased following the audit level requirement but the overall accuracy of such forecasts improved only marginally. Clarkson (2000) extend McConomy's (1998) study by introducing measures of issuer's business risk and finds that once controls for business risk are incorporated, auditor quality is no longer significant in explaining forecast accuracy for review-level assurance period. However, during the audit-level assurance period, higher quality audit appears to significantly reduce absolute forecast error.

In a recent Australian study, Lee *et al* (2006) find some evidence to support a link between audit quality, proxied by audit firm size, and forecast accuracy. They also find that audit quality is inversely related to forecast optimism across alternative measures of forecast bias. Most recently, Ismail and Weetman (2007) examine the role of internal and external factors using Malaysian firms' earning forecasts during economic boom, recession and recovery. They report that that regulation has no significant impact, but economic condition and management optimism are significantly associated with forecast accuracy.

3. The Bangladesh scenario and its IPO process

The Dhaka Stock Exchange (DSE) witnessed 120 initial public offerings (IPOs) in the Nineties alone. The trend of floating equity and debt securities to raise external finance by companies during the stock market boom in the second half of 1996 was spectacular when the DSE All Share Price index in Bangladesh rose from a June low of 859.89 points to a November high of 3,648.75 points, a growth of over 400 percent over a period as short as 5 months. The IPOs were regularly oversubscribed 10-15 times. During that period, the market witnessed a mushroom growth of issue managers, many of whom neither had the resources nor the expertise to actually 'manage' new issues. However, the bullish run continued and the market kept denying all fundamentals as tens of thousands of investors were rallying behind a handful of shares. The market experienced unprecedented events ranging from artificial transactions to insider trading, to trading of fake share certificates until a sudden fall in the index halved the shareholders' wealth in the following year. Many stock market participants alleged that during the boom period optimistic forecasts were made by senior corporate managers with a view to attract capital without making the necessary investment in growth options and correcting fundamental weaknesses. Although the Securities and Exchange Commission (SEC) is primary responsible for monitoring the quality of prospectuses, earnings forecasts made by the issuing firms are still voluntary in Bangladesh as there is no requirement for the firms to include them and have them audited.

IPOs in Bangladesh are governed by the Securities and Exchange Commission (Public Issue) Rules, 2006 (henceforth the Rules). The Rules of 2006 is the amended version of the similar Rules of 1998. Before the Rules of 1998, IPOs used to be regulated by the former Comptroller of Capital Issues (CCI) through its own rules. Following the establishment of

the SEC in 1993, the CCI was abolished and its functions were vested upon the SEC. Until promulgation of the Rules of 1998, the SEC used to process public issues of securities through the provisions of the rules inherited from the CCI. During the CCI regime, Bangladesh economy was significantly smaller, the market was correspondingly small and shallow, trading used to be thin, IPOs used to be few and far between and entrepreneurs used to look to commercial banks and development financial institutions (DFIs), not the stock market, to meet their capital needs. As a matter of fact, despite manifold growth of the equity market in Bangladesh, it still represents less than 7 percent of the total business financing performed by the financial services sector. As on May 2008, total market capitalization Dhaka Stock Exchange (DSE) represents less than 10 percent of the country's GDP. Financing growth, called balancing, modernization, replacement and expansion (BMRE), of firms is almost entirely performed by the commercial banks. Unlike Anglo-Saxon markets, equity market has not historically been viewed as the main or even a significant source of capital. The CCI used to be a highly bureaucratic institution that saw its role more as a gatekeeper of the securities market than a facilitator of security issues. This was amply reflected in the number of securities issued prior to establishment of the SEC (in 1993) and the volume of capital raised through public issues. The Rules of 1998 were more detailed than the CCI rules but still not comprehensive enough to cater for investor needs of the time. For example, the procedure of obtaining SEC approval was not as clearly outlined as in the 2006 Rules, the disclosure of sponsor directors' interests in other businesses and their expertise relevant to the industry in which the firm operates were not required to be disclosed by issuers in the prospectus. The Rules of 2006 sets out detailed procedure and guidelines regarding public issue of securities. According to the Rules, issuer applications for SEC approval of a public issue must accompany ten copies of prospectus and audited financial statements of the issuing firm, not older than 120 days of the end of the period for which the said financial statements are prepared. Upon receiving the consent of the SEC, the issuer is required to publish an abridged version of the prospectus in four national dailies (2 Bengali and 2 English newspapers). The full prospectus is required to be posted on the websites of the issuer, the SEC, the two stock exchanges, and the issue manager. The prospectus shall contain information on the firm's current assets and liabilities, financial position, profits and losses, its future prospect, the rights attached to the security being offered, among others. The Rules includes a caveat with regard to the required content of a prospectus. Section 8A(1) outlines a blanket provision that stipulates that in addition to information specifically required by the Rules, the prospectus shall contain all material information necessary to

enable investors to make an informed assessment of the business in which the issuing company is or will be engaged in. This is an all-inclusive requirement. Subject to interpretation, this provision could potentially require disclosure of anything and every thing because there is no universal agreement as to what information is *material* and *necessary* to *enable* investors to make an *informed assessment* of the business in which the company is currently engaged in or might engage in the future. However, issuing companies are not required to include forecasts of any kind let alone earnings forecasts in the prospectus and there is no requirement of the prospectus to be audited. As regards publication of forecasts of any kind, the Rules requires disclosure of projected financial statements up to the year of commercial operation and such requirement applies only to those issuers who have not started commercial operations before going public. In other words, issuers already in commercial operations do not require publishing forecasts of any kind (Section 7). For vast majority of issuers, therefore, publication of earnings forecasts during IPOs is voluntary. In addition, there is no statutory requirement to monitor the quality of these forecasts. However, such issuers are required to provide comparative income statements, balance sheets and selected financial ratios for five years immediately preceding the year of issue. If the company had been in existence for a shorter period of time, then the above information must be provided for the period since inception. Interestingly, the Rules show a clear preference for backward looking information to forward looking ones! Therefore, Bangladesh IPO market provides a useful setting to test the motivation of issuers in issuing forecasts while such disclosure is voluntary. It could also be used to see whether managers use their discretion of issuing forecasts for efficiency reasons – to enhancing transparency or for opportunistic reasons – to mislead investors. Given the level of sophistication of investors and the SEC's oversight capability in Bangladesh, there are opportunities for owner-managers to provide biased or ambitious forecasts, especially earnings and dividend forecasts, to lure investors because private investors in Bangladesh tend to invest in companies that pay regular dividends.

4. Model Development and Data Collection

4.1 Issue Timing

In Bangladesh, IPOs floated during the stock market boom of 1996 are expected to demonstrate higher degrees of forecast error than those floated during other periods. Such a

relationship is expected because unscrupulous issuers have incentives to "fish in the muddled water" during these periods of hysteria in the market. Hysteria would be an understatement to describe the July-September 1996 period the country witnessed in the two stock exchanges. A high-powered government-commissioned enquiry following the 1996 market crash also reveals significant wrongdoing on the parts of several issue management houses, underwriters, and company promoters who are accused of being involved in market manipulations during the period. Their revelations support the suspicion that some opportunist issuers might have taken advantage of the buying frenzy of thousands of naïve investors. It is also worth mentioning that the main surveillance watchdog, the SEC, was at its infancy at that time[2]. A dummy variable, labeled BOOMTIME is used, coded 1 if the issue was offered during the boom period in 1996, i.e., between July 1, 1996 to October 30, 1996 and 0 otherwise. The following hypothesis is proposed to test the effect of timing of the IPO on the level of forecast error:

H_1: The extent of forecast error in IPOs issued during boom period will be higher than in those issued during non-boom period.

4.2 Ownership Structure

A total of three ownership measures are considered while developing the forecast error model. They represent: the existence foreign shareholding, extent of management shareholding and the extent of private investors' shareholding respectively.

Foreign shareholding: Overseas investors, making both direct (FDI) and portfolio investments have incentives to care about the quality of information disclosed in host country financial statements. Fifty-two out of the 85 offerings included in the present sample have varying degrees of foreign participation in respective companies' equity capital[3]. In underdeveloped capital markets, the presence of a significant proportion of foreign equity participation is expected to enhance the credibility of published financial statements including forecast information. Firms with higher proportions of foreign sponsor shareholdings are less likely to issue optimistic forecasts for several reasons: first, foreign investors are more likely to possess the skills or have access to skills required to analyze securities and value them and hence are

[2] The Securities and Exchange Commission (SEC) was established in 1993. While its surveillance role is still not satisfactory, in 1996 it was even weaker.
[3] Average shareholding of foreign sponsors in the whole sample is 15.16 per cent of the proposed total paid up capital inclusive of IPOs.

less susceptible to managerial abuse of forecasts. For the same reason, managers are more likely to take caution in producing ambitious forecasts as they are aware of the technical and knowledge advantage possessed by their foreign partners. A second reason why higher proportions of foreign ownerships is inconsistent with forecast optimism is that foreign sponsors themselves are actually insiders and hence possess more or less the same inside information possessed by local managers. As a result, the asymmetric information that exists between managers and domestic private investors is either nonexistent or exists to a significantly lesser degree between managers and foreign sponsors. The proportion of foreign sponsor shareholding is measured as the ratio of foreign sponsor shareholding to post-IPO total capital. A negative association is expected between forecast optimism and foreign sponsor shareholding. The variable is labeled FRGNSPONSOR.

Management shareholding: Financial reporting quality is often believed to be closely linked to the quality of corporate governance within the firm. While it is almost impossible to find a modern corporation without a separation of management from ownership, it is not uncommon to find companies with high proportions of management shareholding. Under an agency framework, the relationship between management (or board) shareholding and demand for high quality financial reporting and auditing may be drawn to be an inverse one. This is because in companies with high management shareholding, less information asymmetry could be expected and hence the reliance on the auditor in minimizing moral hazard is consequently less. Therefore, companies a with high proportions of management (or board or sponsor) shareholding are not expected to 'die' for high quality audit work and thereby pay more in audit fees and *vice-versa*. In the contrary, from a potential wealth transfer point of view, high proportion of management ownership coupled with managerial reluctance to dilute existing level of ownership signal high firm value as the manager seemingly does not want to part with existing wealth by 'giving away' too big a slice of the cake. This would be evident from the proportion of equity ultimately offered for public subscription in an IPO. Therefore, from a managerial wealth transfer perspective, it could be argued that issues with higher management shareholding have *less* incentive to misguide the market as they are unlikely to be desperately looking to cause an *inward* wealth transfer, i.e., transfer from private investors to the owner-managers. Therefore, the degree of forecast error is expected to have a negative association with the degree of management shareholding and *vice-versa*. A continuous measure, i.e., actual proportions, of management shareholding is considered in the proposed model. The three categories of shareholdings – management shareholding, private shareholding, and foreign sponsors' shareholding – are effectively complementary to each

other and hence are highly correlated. Therefore, only two ownership variables, private investors' shareholding and foreign investors' shareholding, are used in the regressions.

Private shareholding: In the absence of specific quota of offerings made to several categories of investors including company employees, non-resident Bangladeshis (NRBs) and the state-owned institutional investor – The Investment Corporation of Bangladesh (ICB) – private shareholding is simply 1 minus the proportion of management shareholding. Because of the broad definition of management shareholding used in the present study, shares not held by owner-managers are conventionally offered to the general public[4]. Therefore, issues that preserve higher quotas for employees, government and others (viz., NRBs) would end up with lower proportions of shareholding available to the general public. Because of managers' asymmetric information advantage, i.e., their likelihood of possessing superior knowledge of the "value" of the security under offer, they have incentives to minimize possible "outward" wealth transfer and maximize "inward" wealth transfer by systematically utilizing their information advantage. One way they can influence such wealth transfers, both inward and outward, is by inducing investors to invest in the firm's securities when the offer price is greater than their perceived "value" of the security and *vice-versa*. Optimistic IPO forecasts could be used as one of the instruments in their efforts to induce such investors. Therefore, the level of optimism in IPO forecasts is likely to be higher when a higher proportion of total IPO offering is made available to the general public and *vice-versa*. Based on this argument, a positive association is hypothesized between the extent of forecast error and the degree of private investors' shareholding. In order to examine this hypothesized relationship, private shareholding is considered alongside the two other ownership measures in the present study. Needless to say, the three ownership measures described above are highly correlated *pair wise* among themselves. However, only private shareholding showed a significant correlation with the dependent variable – forecast error. As we decided to choose only one ownership measure since they broadly represent the same phenomenon[5] and for implicit reason of avoiding possible multicollinearity, we chose private shareholding for inclusion in our proposed model. The variable is labeled PVTSHARE. The following hypothesis is proposed to test the effect of ownership on forecast error:

[4] It is customary to retain 50 percent of the equity among sponsors (i.e., directors and promoters – both local and foreign) and offer 10 percent of the residual offering to the ICB. Occasionally further quotas of 10 percent each is preserved for company employees and NRBs.

H_2: The extent of forecast error is higher (lower) in IPOs issued by firms with higher (lower) proportion of private investor shareholding.

4.3 Other Control Variables

Issuer size: One of the commonly used explanatory variables in the literature on management forecast error is issuer size (Lee *et al*, 2003). It is argued that larger issuers have incentives to demonstrate greater accuracy in their forecasts than their smaller peers because the likely cost of an inaccurate estimate would be higher for a larger issuer than that for a smaller one (Dev and Webb, 1972). Moreover, larger issuers are likely to have easier access to technology that should allow them access to information vital for making more accurate forecasts. Both total assets and net sales reported in the most recent financial statements accompanying the prospectus are found to have been used in prior research. In the present study, neither of these size measures was considered appropriate because of the preponderance of many start-ups in the sample – for whom these measures were either not available or would not fairly represent the phenomenon. Therefore, a combination of issuer size and issue size was contemplated whereby size is measured by the sum of the newly issued capital and the existing capital of the firm. The size of the newly issued capital represents the issue size while the size of the pre-issue equity capital can be a reasonable proxy of issuer size. As this combined measure is used to represent both firm size and issue size, two possibilities arise as to the direction of the possible association of this variable with the dependent variable – forecast optimism. On the one hand, if it represents firm size, Dev and Webb (1972) assertion would apply, i.e., the higher the firm size, the lower the degree of optimism in its forecasts, hence a negative association would be expected. On the other hand, if the variable represents issue size, the issuer has incentives to make optimistic forecasts to attract the desired volume of subscription. The underwriters of large issues also have incentive to encourage the issuer to try all legitimate means to make the issue appear as attractive as possible because if the issue is not fully subscribed, they are bound to subscribe the unsold equity regardless of the quality of the securities. Therefore, they stand to lose more when a larger issue is undersubscribed than when a smaller one experiences the same. The interaction of these two counteractive forces would determine the direction of the association between the variable and forecast optimism. We expect this relationship to go in either direction. The post-issue paid up capital of the firm is therefore

[5] For example, in the absence of foreign or government shareholding, management shareholding and private investors' shareholding are effectively reciprocal to each other as the proportion of private investors' shareholding = 1 – the proportion of management shareholding.

used to proxy issuer size. As the variable is not normally distributed natural log transformation is carried out before using it in the model. The variable is labeled LOGCAPTOTAL.

Auditor reputation: Another important variable used in the literature is auditor reputation, typically proxied by audit firm size (Lam and Chang, 1994; McConomy, 1998). The rationale for its use lies behind the argument that auditors stand to lose their reputational capital by signing financial statements that cannot be relied upon by creditors and investors. Except for green field issues[6], IPO prospectuses are required to and normally include a set of most recent audited financial statements. The sponsors have incentives to invest in high quality audit because it is likely to add credibility not only to the historical accounting numbers but also to the forecast information provided alongside. By generating more interest in the security offering a high quality audit would cause a reduction in floatation costs and ultimately in the cost of capital.

Although audit services market is quality differentiated and reputation is related with audit firm size, a dummy variable is traditionally used to capture auditor reputation. In jurisdictions where the Big 4 operate, segregation is usually made between Big 4 (formerly Big 8, Big 6, or Big 5) and non-Big 4 firms. In the present study, it was difficult to partition the audit firms in the absence of internationally recognised Big and non-Big firm categories in Bangladesh. A reasonable partition was to call large, those audit firms employing four or more chartered accountants (including partners). There were eight such firms. In addition, from the available information, it was possible to identify the international link of the audit firms, mostly with the Big 6, Big 5 or the Big 4 over the study period. Consequently, two criteria were used to identify Big and non-Big audit firms. Firms with four or more chartered accountants and with an international link were classified as large. This produced six audit firms which could be recognised as large firms in the context of Bangladesh. Four of these firms are currently affiliated with the international Big 4 firms while the other two are affiliated with two international non-Big firms. Thus the size and international link were jointly used to categorize audit firms and hence capture auditor reputation. The variable was labeled AUDITREP.

[6] Companies that go for initial public offering while still a green field project let alone going into commercial production. Examples of such issues include Monno Fabrics, Shine Pukur Holdings, La-Farge Surma Cement etc.

Underwriter Prestige: One of the most popularly used variables in forecast accuracy studies is the prestige, or reputation, of the issue manager (Dev and Webb, 1972; Neu and Simmons, 1995; Lee et al, 2006 etc). Sometimes underwriter prestige and issue manager prestige are used as substitutes of each other. The reasons for its use are similar to those put forward for auditor reputation perhaps underwriter prestige is more relevant than auditor reputation in the context of IPOs. A prestigious underwriter is unlikely to underwrite securities issued by issuers who do not employ high quality auditors. It is expected that like auditors, issue managers invest heavily in reputation capital and therefore have incentives to protect their reputation against opportunist managers who might want to mislead the naïve investor. In developed capital markets prestigious underwriters stand out and are considered to agree to tag their names only with credible security offerings. In Bangladesh the capital market is reasonably new and inexperienced. Issue management and underwriting activities are yet to establish themselves as serious industries. There are, of course, scores of issue managers engaged in the market. Some issuers even create their own "in house" issue manager firm to handle their own issue management. Not enough is known about issue management firms to enable us to categorize existing issue managers into quality differentiated categories. Most issue management firms also perform underwriting functions. However, a number of commercial banks are also engaged in underwriting alongside the few recognised investment banking firms. In the absence of adequate information and for the purpose of this study the only established bridge financing cum underwriting institution of the country – the Investment Corporation of Bangladesh (ICB) – was separated from all other underwriters including several investment banks in the private sector. As a result, issues underwritten by the ICB (in conjunction with others or exclusively by itself) are separated from the rest. Using a dichotomous procedure, the variable is coded 1 if the issue was underwritten by the ICB and 0 otherwise. The variable is coded PRESTIGE.

Green field Issues: Green field issues refer to securities issued by start-up firms. These firms are called green fields because they had not commenced commercial operations before going public. Twenty-seven firms in our sample of 75 firms are green fields. These firms are considered to be more likely to issue ambitious, i.e., optimistic, forecasts than those that have been around for some time for several reasons. First, the act of forecasting is a challenging job. Even with the best of intentions and with perfect knowledge of the past, forecasts are likely to go wrong in one direction or the other. This

is more so in the absence of prior experience of operations because for green fields, past does not exist. Therefore, managers of green fields have to rely on assumptions alone in preparing forecasts. On the other hand, firms with any amount of operating experience are likely to make more realistic forecasts because of the availability of past operational information at their disposal. This is assuming all managers are acting honestly and do not intend to use forecasts to deliberately mislead investors. In other words, even if managers are making all efforts to undertake efficient forecasting, managers of green fields are likely to issue more optimistic forecasts. If managerial opportunism is added to the forecast behavior of a green field's manager, the joint effect of the two phenomena will significantly increase the likelihood of the manager to issue optimistic forecasts. A positive association is expected between a firm being a green field and the degree of optimism in its forecasts. A dichotomous variable is used to proxy green fields. An issue is awarded the value of 1 if the issuing firm has no operating history prior to going public and zero otherwise. The variable is labeled GRNFELD.

Hypothesis 7: The degree of forecast optimism is higher in IPOs issued by start-ups, i.e., green fields and *vice versa*.

Forecast Horizon: Forecasting involves making estimates about parameters that is observable at a future point in time. It gets more and more difficult to maintain forecast accuracy as the forecast horizon gets longer and longer. Therefore, forecast accuracy is often tested against, *inter alia*, forecast horizon (Dev and Webb, 1972; Mak, 1989; Clarkson, 2000; Lee *et al*, 2006 etc) and often tested found to be a significant factor determining forecast accuracy (such as in Firth *et al*, 1995). In the present study, some issuers published no forecasts at all while others issued forecasts for up to 10 years. The length of the forecasts, measured by the number of years for which forecasts were made, is used as an explanatory variable in the present study. The variable is coded HORIZON.

Operating History: Existing literature also provides support for the idea that the length of a company's operating history provides some explanation as to how reliable its forecasts are likely to be (for example, Mak, 1989; Lee *et al*, 2003 etc). The longer the company had been in operation, the more accurate its forecasts are likely to be. The longer the company has been

in operation the more accurate its forecasts are likely to be as they are expected to have a better appreciation of market dynamics and have better control over their operations. A lack of historical base and appreciation of market dynamics may hinder the capabilities of younger companies to make accurate forecasts. It may be worth mentioning at this point why we test both the operating history and the green field variable in the same model. It is indeed correct that the two variables have a significant positive pair wise correlation. Nevertheless we use both of them as the green field variable is a dummy variable distinguishing green field firms from the rest in the sample. It does not, however, capture the variability in firms' operating histories across the non-green field firms in the sample. The operating history variable allows us to test if firms with longer operating histories indeed make more realistic (i.e, less optimistic) forecasts than their counterparts with shorter or no operating history. Operating history is calculated as the number of years between the year a company starts commercial operations and the year it goes public. This variable is labeled as OPHIST..

Leverage: Financial leverage is a double-edged sword. When the firm's rate of return (r) is higher than its cost of capital (k), leverage acts as a multiplier to boost EPS at a higher rate in response to a smaller increase in operating income (EBIT). However, during bad times, financial leverage works the other way around – a small decrease in EBIT triggers a much bigger decrease (times the degree of financial leverage) in EPS. Because of its multiplier effect and due to the priority of debt holders' claims ahead of that of the equity holders on firm's assets in the event of a bankruptcy, leverage is used in accounting and finance literature as one of the proxies of financial risk. Firms with high leverage are likely to be monitored by debt providers. For this reason, managers of highly levered firms have incentives to issue less optimistic forecasts. Firms in our sample have varying degrees of financial leverage, ranging from a leverage ratio of 2.10 to 11.42. We expect a positive relationship between a firm's leverage and its forecast optimism. We use the ratio of debt (both current and non-current) to equity to represent leverage. The variable is labeled LEVERAGE.

Hypothesis 10: The magnitude of forecast optimism increases as a firm's financial leverage increase and *vice versa*.

4.4 Measurement of Forecast Error

Following previous studies (e.g. Chan *et al*., 1996; Cheng and Firth, 2000; Hartnett and Romcke, 2000), we measure two forecast errors – revenue forecast error (RFE) and earnings forecast error (EFE) for each firm year in the sample. RFE is positive where actual revenue exceeds forecast revenue and *vice-versa*. Likewise the EFE is positive where actual earnings exceed forecast earnings and *vice-versa*. Forecast revenues and earnings for each firm for up to 5 years of forecast have been subtracted from corresponding actual revenues and earnings of the respective years to compute the two measures of forecast errors.

Revenue Forecast Error (RFE) = (Actual $revenue_{it}$, - Forecast $revenue_{it}$)/ Forecast $revenue_{it}$
Earnings Forecast Error (EFE) = (Actual $earnings_{it}$, - Forecast $earnings_{it}$)/ Forecast $earnings_{it}$

The Models

A total of 3 models have been developed in the study. Two of them were developed in the first layer of analysis while the third was estimated in the second layer. The two models in the first layer of analysis involve estimation of RFE and EFE using the same set of explanatory variables. The third model, developed in the second layer of analysis, involves estimation of EFE using all the explanatory variables included in the first two models plus the additional explanatory variable, RFE. Therefore, the dependent variable of the RFE equation is used as an explanatory variable in the EFE model in the second layer. The two models in the first layer are as follows:

$$RFO = \alpha + \beta_1 BOOMTIME + \beta_2 SIZE + \beta_3 AUDITREP + \beta_4 UPRESTIGE + \beta_5 PVTSHLD + \beta_6 FRGNSHLD + \beta_7 GRNFELD + \beta_8 HORIZON + \beta_9 OPHIST + \beta_{10} LEVERAGE + \varepsilon$$

$$EFO = \alpha + \beta_1 BOOMTIME + \beta_2 SIZE + \beta_3 AUDITREP + \beta_4 UPRESTIGE + \beta_5 PVTSHLD + \beta_6 FRGNSHLD + \beta_7 GRNFELD + \beta_8 HORIZON + \beta_9 OPHIST + \beta_{10} LEVERAGE + \varepsilon$$

While the only model in the second layer of analysis is:

$$EFO = \alpha + \beta_1 RFO + \beta_2 BOOMTIME + \beta_3 SIZE + \beta_4 AUDITREP + \beta_{45} UPRESTIGE + \beta_6 PVTSHLD + \beta_7 FRGNSHLD + \beta_8 GRNFELD + \beta_9 HORIZON + \beta_{10} OPHIST + \beta_{11} LEVERAGE + \varepsilon$$

Where, RFO denotes revenue forecast optimism, EFO denotes earnings forecast optimism, BOOMTIME means whether the IPO issued during the 1996-97 boom, Size denotes issuer size, AUDITREP denotes auditor reputation, PRESTIGE denotes issue manager prestige, PVTSHLD means percentage of the IPO amount issued to private investors, FRGNSHLD means percentage of post-issue total equity held by foreign investors, GRNFELD means

whether the firm was a green field operation at the time of going public, HORIZON indicates forecast horizon, OPHIST indicates operating history of the firm, and LEVERAGE means pre-IPO financial leverage (debt-equity ratio) of the issuer and ε means the error term. Details of variable definitions, how they are operationalized, and their expected signs in forecast optimism regressions are provided in Table 1.

5. Data and Sample

The prospectuses of all new issues of shares and debentures offered for public subscription between January 1990 and December 2006 were collected. It is interesting to observe that prospectuses issued in recent years do not provide forecasts at all. This might be due to the fact that like the 2006 Rules, the 1998 Rules did not require issuers to issue forecasts in their prospectuses. Under the CCI regime that continued well after the SEC establishment, issue of forecast was not mandatory either, however, it was a norm and the majority of issues that came to the market prior to 1998 appear to follow the norm. As a result of the 1998 Rules, issue of forecasts has completely disappeared and prospectuses post-2000 rarely issued forecasts of any kind. Therefore, the number of observations post-2000 is very small in our sample due to lack of usable data. As will be seen later in this section, many issuers tend not to include forecasts in their prospectuses even when it was required; therefore, it was not surprising to find no forecasts in prospectuses issued in 2001 and beyond. The selection of January 1990 as the beginning cut-off point was based on several reasons. One reason was that the market has actually not seen many IPOs before 1990. Some of the highest annual frequencies of IPOs were indeed seen in the years following the establishment of SEC in 1993. The 4 years from 1994 to 1997 saw 67 new issues to arrive in the market. It took a whole decade for the market to see similar numbers of IPOs to arrive annually[7]. A second reason was coverage. A 16-year period (from 1990 to 2005) that saw XXXX IPOs is considered to allow substantial coverage of the market. A third reason was to choose a period that essentially covers important historical events like the 1993 creation of the SEC, opening of a second stock exchange in Chittagong in 1995, and most importantly, the 1996 boom and crash that immediately followed. Upon collection of the prospectuses, the annual reports of the same companies for a period of up to 5 years after listing on the Dhaka Stock Exchange and/or Chittagong Stock Exchange were collected. The prospectuses and the

[7] 17 and 22 IPOs hit the market respectively in 2005 and 2006.

corresponding annual reports formed the main source of data for the study[8].

A total of XXXX new issues were made during this period. All but 4 of these prospectuses were collected using all publicly available sources. Upon a preliminary scrutiny of the collected prospectuses, it was found that only 85 of them provided forecasts of any kind, and most of them prior to 2001. All the forecast data and corresponding actual data (from annual reports of respective years following the forecast year) were collected. The number of years' forecasts contained in these 85 prospectuses ranged from 1 to 10. Only 5 of them provided 10-year forecasts while the maximum number of years for which forecasts were provided in the rest of the prospectuses was 5. Therefore, forecasts beyond the 5th year were discarded without discarding the prospectus concerned. Over a 5-year forecast horizon, these 85 prospectuses could potentially yield 425 firm-years. However, due to non-availability of corresponding annual reports, a total of 10 firms had to be dropped from the analysis. The analysis in this paper is, therefore, based on 75 prospectuses[9] the combined market capitalization of the companies included in this study represents approximately 35 percent of the total market capitalization of the DSE as on 31 October 2008. A preliminary idea of the level of forecast errors in different years can be gained from Table 2.

[Table 2 about here]

The above 75 firms issued revenue and earnings forecasts for years ranging from 1 through 5. However, we could only use a firm's forecasts for a particular year if the annual report for the corresponding year was also available for us to compute the two forecast errors. Table 3 shows the number of firms and the number of years for which all necessary information (prospectus, annual report and information of all explanatory variables) was available.

[Table 3 about here]

As Table 3 shows, 5 firms had the maximum 10 years of forecasts while 4 firms had only 1 year forecasts available for inclusion in this study. Together the 85 firms had a total of 413 firm years of forecast errors and all necessary information to carry out the analysis. As the

[8] Issuers who issue forecasts, tend to issue 5-year forecasts. Therefore, a 5-year window was originally envisaged. This paper, however, is based on the first-year forecasts.
[9] A list of companies included in the study is annexed with the paper.

number of firms issuing forecasts beyond 5 years is only 12, 5th year is considered to be a reasonable cutoff period for further analysis. Therefore, only the first 5 years' forecasts of firms issuing forecasts for 6 to 10 years were used. This produced a total of 379 forecasts involving all 85 firms over a maximum of 5-year period. In order to compute forecast bias, we needed to match forecasts with actual results. Actual results were not available for a total of 65 firm-years for a number of reasons including (a) discontinuing operations, (b) being delisted, or (c) for non-publishing annual reports within 2 years of the cutoff period of 31 December 2007. That means forecast error could be computed for a total of 314 firm-years. Among these 314 observations, 15, 11, and 22 observations had to be dropped respectively from the RFO, EFO and the combined RFO-EFO regressions as they were considered outliers. The analysis carried out in the remainder of this paper are therefore based on 299, 303, and 292 observations respectively in the RFO, EFO and the combined RFO-EFO regressions.

6. Analysis of Data

The analysis in this section begins with providing a discussion of forecast issue trend of IPO firms during the sample period. As mentioned in the previous section, not all prospectuses contain forecast information. Only 85 of the 137 firms in our sample issued forecast information ranging from a narrow set of items such as sales, profit, and dividend to a wide set of items including even pro forma income statements and balance sheets of up to 10 years. Given this cross sectional variation in the magnitude of forecasts issued by sample firms, we consider it helpful to compile a summary of all major forecast items issued by firms in our sample. The summary, presented in Table 4, shows that tabular forecasts (81 out of 137) are the most common form of issuing forecasts followed by forecast income statements, balance sheets and cash flow statements. Among the 16 major items listed in Table 4 surveyed, sales forecast is the most frequently issued forecast information followed by gross and net profits while net asset value (NAV) followed by operating margin are the most rarely issued forecasts. Focusing on the length of forecasts issued, a 5-year forecast horizon appears to be the most common. This is closely followed by 3-year and 10-year horizons respectively. The 'mean forecast period' column in Table 4 shows the average length (in number of years) for which a particular forecast is issued. Average lengths of different forecasts issued appear to cluster around 5 years with a minimum and maximum of 4.82 years and 5.48 years respectively.

[Table 4 about here]

With the above introduction of forecast issue trend, we now move to introducing the variables used in the multivariate analysis. Descriptive statistics of all relevant variables are provided in Table 5.

[Table 5 about here]

Table 5 shows an average overestimation of revenues by nearly 36 percent over the 5-year period while an average overestimation of earnings is over 66 percent. The median revenue forecast optimism was 39.83 percent while that of earnings forecast optimism was 75.96 percent. A ranking of revenue forecast bias shows that only 51 of the 306 firm-years show conservative forecasts (actual revenue greater than forecast revenue) while the ranking of earnings forecast bias shows an even worse situation – just 30 firm-years making conservative forecasts against a huge, 275 firm-years, making optimistic forecasts (actual earnings less than forecast earnings). A year-by-year comparison of revenue forecast optimism shows that the degree of bias increases steadily from 33.14 per cent in year 1 to 38.61 percent in year 3 and then steadies in year 4 before dropping to 32.61 per cent in the fifth year. Year-wise trend of earnings forecast optimism shows an increasing trend from 47.99 per cent in the first year to 79.01 per cent in the fourth year until dropping to 73.92 per cent in the fifth year. The trend appearing in Table 5 is based on observations used in the multivariate analysis and hence upon exclusion of firm-year observations considered outliers. Yearly trends of revenue and earnings forecast optimisms for all available forecasts are summarized in Tables 6(a) and 6(b). The tables and corresponding graphs [1(a) and 1(b)] show that, with the exception of second year revenue forecasts, the levels of both revenue and earnings forecast optimisms steadily increase as forecast horizon gets longer and longer.

[Table 6(a) and 6(b) about here]
[Graph 1(a) and 1(b) about here]

However, the trend in earnings forecast optimism is steeper than that of revenue forecast optimism. Descriptive statistics furnished above also shows that fifteen percent of the issues were made during ‘boomtime’, average shareholding of private investors was 32.20 percent, average issue size was approximately Tk213 million, nineteen percent of the firms in this

sample were audited by auditors affiliated with international Big-6 (or Big 8), thirty-nine percent of issues were underwritten by prestigious underwriters, average proportions of publicly offered capital raised from individual investors (i.e., from members of the public) is 73.62 per cent, average proportion of foreign shareholding is 13.2 per cent, thirty-six per cent of IPOs are green field operations, average forecast horizon (period for which forecast is issued) is 60.21 months, average operating history of 4.72 years while the average leverage ratio of the sample firms is 2.10.

6.1 Univariate analysis

Table 7 shows how the forecast optimism is distributed across various dimensions of the issuer and supports the hypotheses developed earlier for all our explanatory variables. Issues going public during boom time show significantly higher optimistic bias on both revenue and earnings forecasts than issues going public at other times. Forecast revenue of boom time issues are, on average, 50.35 per cent higher than their actual revenues while their forecast earnings exceed actual earnings by 87.35 per cent. Although both categories of issues – boom time issues and others – show significant levels of upward bias in their revenue and earnings forecasts, non-parametric t-test shows that the bias in forecasts made by boom time issues is significantly higher than that made by non-boom time issues. For the issuer size variable we did not have a particular expected sign as we posited it could go either way. Results in Table 7 show that smaller firms appear to have greater biases in forecasts of both revenue and earnings. Average revenue forecast optimism of smaller than median firms is 36.33 per cent while that for the larger than median firms is 34.08 per cent. Similarly, average earnings forecasts of smaller firms is lower, 67.81 per cent, compared to that of larger firms, 64.61 per cent. When classified by auditor reputation, the clients of non-big auditors have average revenue and earnings forecast biases of 40.03 per cent and 72.56 per cent respectively while those of the big auditors have a lower average, only 18.32 per cent of revenue bias and 43.63 per cent of earnings bias. The t-test shows that the differences between big and non-big audit clients' forecast biases are statistically significant. Significant differences in bias can also be observed between firms with smaller than median private investor shareholdings and firms with larger than median private investor shareholdings, between firms having smaller than median percentage of foreign shareholding and

those with larger than median percentage of foreign shareholding and also in revenue forecasts between green field operations and other firms. For all other classification bases differences in either forecasts bias between categories appear to be statistically insignificant.

Univariate analysis based on mean differences between sub-samples created along different dimensions (representing each of the hypotheses formulated earlier) of issuer attributes and issue timing gives us some insight as to the magnitude and direction of variability in forecast optimism and relevant attributes. However, it cannot capture the effect of one dimension, say, issue size, while controlling for another, say forecast horizon. Literature on forecast accuracy and/or bias provides evidence that forecast bias is a complex phenomenon and is a likely function of multiple issuer characteristics. Hypotheses developed in the study and the models proposed therein to test the hypotheses are designed to capture the association between all possible issuer attributes that explain their forecast behavior, at least in terms of how optimistic or otherwise their forecasts are likely to be. The following sub-section presents the results and discussions of the multivariate analysis carried out using multiple linear regressions.

6.2 Multivariate Analysis

Regression Results

Tables 8(a) through 8(c) present the regression results of the revenue, earnings and combined earnings and revenue forecast error models developed in the first layer of analysis. Each of these tables summarize results of a series of year-wise regressions for forecast years 1 through 5 before providing the summary of an unbalanced pooled regression upon combining all 5 year observations in one regression.

[Table 8(a) about here]

[Table 8(b) about here]

[Table 8(c) about here]

Table 8(a) shows that the reputation of the issuer's audit firm, proportion of private shareholding, whether the issuer is a green field operation and leverage are significant determinants of revenue forecast optimism (all but leverage with $p<.05$). Auditor reputation is significant in the 1st, 2nd, and 3rd year regressions as well as in the pooled regression. A positive sign, as expected, of the beta co-efficient of the auditor reputation variable suggests that clients of Big 4 affiliated firms demonstrate significantly lower optimism in their revenue forecasts than those of unaffiliated domestic firms.

Private investors' shareholding also appears to have a significantly negative impact on revenue forecast bias. The variable is significant in the 4th and 5th year regressions as well as in the pooled one. It shows that there is a negative association between the proportion of capital raised from small private investors and the degree of optimistic bias in revenue forecasts. The negative association means the higher the proportion of private investor shareholding the lower the value of the bias measure, i.e., the higher the bias. The third significant driver of revenue forecast bias is whether the issuer is a green field company. The variable is significant in the 1st, 2nd, and polled regressions, all with expected negative signs. This means green field companies issue significantly ambitious estimates of revenues than companies having operations prior to going public. Finally, leverage appears to have a significant but weak effect on revenue forecast bias. Leverage is significant in the 3rd year ($p<0.05$) and in the pooled regression ($p<0.10$) showing that firms with higher leverage issue significantly less optimistic forecasts than firms with lower or no leverage. This may occur due to the monitoring of the debt holders.

Table 8(a) also suggests that all other variables tested in the first set of regressions have no significant bearing on revenue forecast optimism. They include whether the company went public during the 1996 boom, issuer size, underwriter prestige, foreign investor shareholding, forecast horizon and operating history.

Table 8(b) summarizes the results of earnings forecast bias regressions. Similar to the series of revenue forecast regressions, a series of 6 regressions were carried out to identify the determinants of earnings forecast bias. The results are pretty straightforward. Auditor reputation and the proportion of shares issued to private investors appear to have the most dominant effects on the level of earnings forecast bias. These two variables are significant in

each of the five yearly regressions and the pooled regression with the expected sign. These results provide overwhelming evidence of the positive contribution made by Big 4 affiliated auditors in improving forecast quality. At the same time, the proportion of equity offered to private shareholders (PVTSHLD) also appears to have significant bearing on the level of optimism in management earnings forecasts ($p<0.01$). The sign of the beta co-efficient is negative, which suggests that the higher the proportion of private shareholding the higher the error[10] and *vice-versa*. This supports our hypothesis and is consistent with agency framework. By offering a higher proportion of equity the mangers can potentially engage in "inward" wealth transfer. Unless the EMH holds in its strong form, inward wealth transfer is possible, at least in the short-term, by making ambitious forecasts. This is particularly easy given the general weakness of the SEC in performing its oversight function.

The other variables that emerged significant in earnings forecast regressions are whether the firm went public during the 1996 boom (in the pooled regression only), issuer size (in the 1st year regression), foreign investor shareholding (in the 1st year regression only), and whether the firm was a green field operation (1st year and the pooled regressions). Underwriter prestige, forecast horizon, operating history and leverage do not seem to have any significant impact on earnings forecast bias.

The negative sign of the coefficient of the boom time issues variable suggests that IPOs issued during the boom period had significantly higher forecast earnings than actual earnings which suggest that managers of the issuing firms had made significantly optimistic forecasts. The results appear to suggest further that issuers who rush to go public should be dealt with caution as they are likely to make significantly ambitious earnings forecasts than their peers who took longer to go public. Results of the earnings forecast regressions are generally consistent with those found in the revenue forecast bias models. As expected, firms with higher quality auditors demonstrate greater accuracy in not only their revenue forecasts but also their earnings forecasts. The same applies to private shareholding, which suggests firms who raise a higher proportion of capital from small individual investors made significantly optimistic forecasts than their counterparts who raised relatively lower fractions of IPO

[10] The forecast error formula used in the study results in a greater negative number for higher levels of error. Mathematically a greater negative number is smaller than a smaller negative number which in turn, is smaller than zero. Although a negative beta indicates an inverse relationship between the dependent and relevant independent variable, in this case a greater degree of error is actually a smaller number by virtue of being a greater negative number.

capital from the general public. This is important to note that the proportion of capital raised from general public is dependent on proportions of capital raised from other sources including pre-IPO private placement, institutional offerings, employee offerings, non-resident Bangladeshi offerings, and most importantly, domestic and foreign sponsors' subscription on IPOs. If a firm is successful in tapping these sources to raise capital, the proportion left for general public would be correspondingly smaller, and hence a smaller public offering would mean the issuer is not desperate to attract subscription and hence has less incentive to bias forecasts.

Table 8(c) presents the findings of our second layer of analysis which regresses earnings forecast bias on revenue forecast bias in addition to regressing it on other determinants of earnings forecast bias tested in the first layer of analysis. The results of this regression show that revenue forecast error is the single most important determinant of earnings forecast error. That means a large part of the error in earnings forecast is explained by the forecaster's ambitious revenue estimates. Having accounted for revenue forecast error, the other significant determinants of earnings forecast bias are auditor reputation, private shareholding, foreign shareholding (1st year model alone), issuer size (1st and 5th years), forecast horizon (2nd, 4th and pooled regressions) and leverage (4th year and pooled regressions). The role of auditor reputation and private shareholding are highlighted once again as in the two other models. This reinforces the importance of audit quality and institutional and foreign participation in IPOs in ensuring credibility of forecast information in the context of Bangladesh and, possibly, other developing countries. The issue timing is not significant after accounting for revenue forecast error. None of the other variables are significant in this third equation.

8. Summary and Conclusion

This study enhances our understanding of the quantity and quality of forecasts (both earnings and revenue) made in prospectuses issued during IPOs in Bangladesh. The amount of forecast information provided in IPO prospectuses in the country is quite disappointing. Fewer than half the prospectuses issued during the study period are found to contain forecasts of any kind. The situation in the financial services sector is even worse in this respect. Financial services sector has dominated the new issues market in recent years. The combined market capitalization of banks, insurance companies, leasing firms and investment banks is in

excess of sixty percent of the total market capitalization of all securities listed on the two exchanges. The overall quality of prospectuses issued by companies in this sector is more than satisfactory. They are comprehensive and thorough in many respects, e.g., review of past performance, provision of highlights data and description of products etc. Yet the provision of forecast information is almost non-existent in their prospectuses. Whatever forecast information is available in the market is generally provided by the manufacturing sector companies. There does not seem to be a great deal of awareness among the SEC, the two stock exchanges and the prospective buyers of the importance of forecast information. The IPO market in the country could well be called a seller's market. With odd exceptions IPOs are oversubscribed by 12-14 times. This allows management a considerable leverage in deciding the volume of information they would like to disclose to potential investors.

Provision of forecasts in prospectuses is not mandatory in Bangladesh. It is mandatory, however, to issue and publicize a prospectus. However, there are no specific requirements with regard to the inclusion of forecasts although the SEC's Public Issue Rules of 2006 provides a comprehensive checklist as to what minimum information and statements must be disclosed in a prospectus by all issuers.

Issuers who do issue forecasts generally provide forecasts of sales, earnings, production, breakdown between domestic and export sales (if applicable), dividend, equity, debt, book value of shares, market price and a few significant ratios such as EPS, P/E and ROE. Most of the above information comes in the form of forecast summary income statements and balance sheets, generally for a 5-year period.

The present study reveals that the average revenue forecast error is 35.16 per cent while the average earnings forecast error is 66.16 percent. In more than ninety percent of the cases issuers failed to meet either of the forecasts studied in this paper, revenue or earnings. We find that issuers who offered higher proportions of shares privately tend to produce significantly optimistic forecasts than their counterparts. Auditor reputation and private shareholding emerged as the two most significant determinants of forecast bias. They are significant in all 3 models, suggesting a very important role played by higher quality auditors in minimizing forecast errors at all levels. Apart from these two, green field also emerged significant in some of the regressions suggesting significantly ambitious estimates issued by those firms.

The study has made a number of significant contributions. The use of issue timing (Boom time) and green field variables are new to this branch of literature. Although operating history can be a close substitute of green field operations, green field has the power to discriminate issuers who do not have any operating history and can be virtual black hole for investors. The significance of the auditor variable across all the models underlines the importance of this industry in Bangladesh. In the absence of strong oversight bodies and other means to protect investors, high quality audit could act as a surrogate monitoring role to ensure forecast quality. Another important contribution of the study is the dominance of private shareholding variable. This reinforces the moral hazard problem whereby issuers deliberately inflate forecasts to influence subscription by small investors. This is particularly noteworthy in markets characterized by weak oversight infrastructure and virtual absence of credit rating for IPOs. Under the Public Issue Rules 2006, credit rating is only required for IPOs issued at a premium. IPOs issued at par values do not need to attach credit rating reports to their prospectuses. More importantly, whatever credit rating rules exist today, do not apply to our sample and therefore the significance of the private shareholding variable has important implications for the SEC in so far their role of scrutinizing prospectuses are concerned. Finally, the adjusted R squares of the earnings regression series and pooled regression series are reasonably high for studies similar to ours.

The study suffers from a number of limitations. The findings may not be generalised for several reasons. Data is based on the respective forecast periods of IPOs appearing over a 16 year period, rather than for static period for all firms. In addition, the accounting policies followed by the companies in arriving at respective reported income numbers is not controlled for. Therefore, the general issues surrounding reported income apply. Nevertheless its potential contributions far outweigh its limitations. It contributes to literature by examining both revenue and earnings forecasts and by documenting that erroneous revenue forecasts only compound the error in forecast earnings. The study also isolates the impact of revenue forecasts on earnings forecasts while controlling for other more traditional determinants of forecast errors. This might be a controversial approach as the two forecast errors are likely to be highly correlated anyway. An important contribution of the study's upholding the importance of auditing as a mechanism of improving financial reporting quality. This reinforces the need to invest in auditing infrastructure in developing countries. It strongly points to the fact that production of high quality financial information

in developing countries cannot be achieved through regulation alone as attempted by the SEC in its promulgation of a series of regulations throughout the Nineties and the current decade.

The principal implications of the study are that the SEC and the two exchanges must improve their game. Provision of at least selected forecast information should be mandated. This would allow stakeholders to use forecasts as an accountability device in the future. The SEC should be extra cautious with green field issuers and during periods of bull market. The findings show that issuers have incentives to invest in the quality of their auditing if they aim to produce credible forecasts.

References

Botosan, C (1997) *Disclosure Level and the Cost of Equity Capital.* The Accounting Review, July 1997.

Chan, A M Y, C L K Sit, M M L Tong, D C K Wong and C W Y Ricko (1996) "Possible Factors of the Accuracy of Prospectus Earnings Forecasts in Hong Kong", *The International Journal of Accounting*, 31(3): 381-398.

Clarkson, P M (2000) "Auditor Quality and the Accuracy of Management Earnings Forecasts", *Contemporary Accounting Research*, 17(4): 595-622.

Dev, S and M Webb (1972) "The Accuracy of Company Profit Forecasts", *Journal of Business Finance*, 4(3): 26-39.

Ferris, K R and D C Hayes (1977) "Some Evidence on the Determinants of Profit Forecast Accuracy in the United Kingdom", *The International Journal of Accounting*, 12(2): 27-36.

Firth, M, B C H Kwok and C K Liau-Tan (1995) "Accuracy of Profit Forecasts Contained in IPO Prospectuses", *Accounting and Business Review*, 2(1): 55-83.

Firth, M and A M L Smith (1992) "The Accuracy of Profits Forecasts in Initial Public Offering Prospectuses", *Accounting and Business Research*, 22, No, 87: 239-247.

Hartnett, N A (1993) "Corporate Financial Forecast Accuracy: An Australian Study", *The International Journal of Accounting*, 28: 248-258.

Hartnett, N and J Romcke (2000) "The Predictability of Management Forecast Error: A Study of Australian IPO Disclosures", *Multinational Finance Journal*, 4: 101-132.

Hirst, E., L. Koonce, and S. Venkataraman (2008) Management Earnings Forecasts: A Review and Framework, *Accounting Horizons*, 22(3): 315-338.

Ismail, N and P Weetman (2007) "Forecast Accuracy in Initial Public Offerings and the Impact of External Constraints relative to managerial Choice: A Research Note", *Accounting and Finance*, 47(3): 513-525.

Jaggi, B (1997) "Accuracy of Forecast Information Disclosed in the IPO Prospectuses of Hong Kong Companies", *The International Journal of Accounting*, 32(3):301-319.

Jelic, R, B Saadouni and R Briston (1998) "The Accuracy of Earnings Forecasts in IPO Prospectuses on the Kuala Lumpur Stock Exchange", *Accounting and Business Research*, 29:57-72.

Jensen, M C and W H Meckling (1976) "Theory of the firm: Managerial behavior, agency costs, and ownership structure", Journal of Financial Economics, 3:305-360.

Keasey, K. and P McGuinness (1991) “An Examination of the Accuracy and Bias of Prospectus Earnings Forecasts: UK Evidence”, *The International Journal of Accounting*, 26: 252-263.

Lam, S S and S L Chang (1994) “Auditor service quality and Auditor Size: Evidence from Initial Public Offerings in Singapore”, *Journal of International Accounting Auditing and Taxation*, 3(1), 103-114.

Lee, P, C Yee and M Yee (1993) “Prospectus Earnings Forecasts: Evidence and Explanations", *Australian Accounting Review*, 21-32.

Lee, P J, S J Taylor and S L Taylor (2006) “Auditor Conservatism and Audit Quality: Evidence from IPO Earnings Forecasts”, *International Journal of Auditing*, 10: 183-199.

Lee, P, D Stokes, S Taylor and T Walter (2003) “The Association Between Audit Quality, Accounting Disclosures and Firm-Specific Risk: Evidence from Initial Public Offerings”, *Journal of Accounting and Public Policy*, 22: 377-400.

Mak, Y T (1989) “The Determinants of Forecast accuracy of Management Earnings Forecasts: A New Zealand Study”, *The International Journal of Accounting*, 24: 267-280.

McConomy, Bruce J. 1998. “Bias and Accuracy of Management Earnings Forecasts: An Evaluation of the Impact of Auditing.” *Contemporary Accounting Research*, 15(2): 167-195.

Mohammad, S, A Nassir, T K Kuing and M Ariff (1994) “The Accuracy of Profit Forecasts of Malaysian IPOs”, *Capital Markets Review*, 2: 46-69.

Neu, Dean and Cynthia Simmons. 1995. “Intermediary Independence and the Strategic Use of Accounting Numbers.” *Critical Perspectives on Accounting*, 6(1): 29-47.

Table 1: Variable Description

Variable	Description	Method of operationalization	Expected sign
RFO	Revenue Forecast Optimism	[Actual revenue – Forecast revenue] ÷ Forecast revenue	n/a
EFO	Earnings Forecast Optimism	[Actual earnings – Forecast earnings] ÷ Forecast earnings	n/a
BOOMTIME	Boom time issues	A value of 1 if the IPO was issued during the 1996 stock market boom (between July 1, 1996 to October 30, 1996) and 0 otherwise.	–
LGCAPTOTAL	Issuer size	Natural log of post-issue paid up capital of the firm	–
AUDITREP	Auditor reputation	A value of 1 if the financial statements presented in the prospectus of the IPO firm are audited by a Big 4 affiliated firm and 0 otherwise	+
PRESTIGE	Underwriter prestige	A value of 1 if the issue is underwritten by Investment Corporation of Bangladesh (ICB) and 0 otherwise	+
PVTSHLD	Private investor shareholding	Proportion of IPO capital raised from individual investors, i.e., members of the public.	–
FRGNSPONSOR	Foreign investor shareholding	Proportion of foreign investors' shareholding in the post-issue paid up capital.	+
GRNFELD	Green field operations	A value of 1 if the firm is a green field operation at the time of going public and 0 otherwise.	–
HORIZON	Forecast horizon	Number of months between the date prospectus is issued and the last date of forecast issued.	–
OPHIST	Operating history	Number of years the firm was in operation at the time of going public.	+
LEVERAGE	Financial leverage	Debt-equity ratio of the issue balance sheet.	–

Table 2

Year of Issue	No. of IPOs	No. of IPOs covered in the sample	No. of IPOs in the sample that issued forecasts	Max. No of IPOs used in the regressions in any one year	Year of Issue	No. of IPOs	No. of IPOs covered in the sample	No. of IPOs in the sample that issued forecasts	Max. No of IPOs used in the regressions in any one year
1988		1	0	0	1998		4	3	3
1989		0	0	0	1999		10	3	3
1990		14	6	3	2000		6	2	1

1991		4	2	1	2001		9	2	2
1992		4	3	2	2002		7	1	1
1993		4	2	2	2003		6	0	0
1994		18	17	15	2004		0	0	0
1995		18	12	12	2005		1	1	1
1996		20	20	19					
1997		11	11	10	Total		137	85	75

Table 3: Firm-year distribution of the sample firms

No. of firms	**No. of years' forecasts**
4	1
0	2
13	3
4	4
52	5
5	6
2	7
0	8
0	9
5	10
85	413

Table 4
Forecast Issue Trend

Forecast item	Forecast length											Mean forecast period
	1-Year	2-Year	3-Year	4-Year	5-Year	6-Year	7-Year	8-Year	9-Year	10-Year	Total	
Sales	4	0	13	4	52	5	2	0	0	5	85	4.86
Gross profit	4	0	13	3	50	6	2	0	0	4	82	4.82
Operating profit	1	0	9	2	38	5	2	0	0	4	61	5.08
Net profit before WPPF	0	0	8	1	30	4	2	0	0	5	50	5.32
Net profit (before tax)	4	0	13	3	49	5	2	0	0	5	81	4.86
Net profit after tax	0	0	8	1	30	4	2	0	0	5	50	5.32
EPS	1	0	6	1	44	4	2	0	0	3	61	5.10
DPS	1	0	6	2	42	5	2	0	0	3	61	5.10
NAV	0	0	3	1	20	4	1	0	0	1	30	5.13
GP margin	0	0	4	2	33	4	2	0	0	3	48	5.27
Operating margin	0	0	1	2	22	2	1	0	0	3	31	5.48

NP margin	0	0	4	1	33	4	2	0	0	3	47	5.30
Total assets	2	0	7	2	45	6	2	0	0	3	67	5.01
Retained earnings	2	0	7	2	45	6	2	0	0	3	67	5.01
Total equity	2	0	4	1	31	6	2	0	0	3	49	5.16
Total debt	2	0	4	1	31	6	2	0	0	3	49	5.16
Income Statement	2	0	8	2	47	7	2	0	0	3	71	5.00
Balance Sheet	2	0	7	2	45	6	2	0	0	3	67	5.01
Cash Flow Statement	2	0	7	2	45	6	2	0	0	3	67	5.01
Tabular forecasts	4	0	13	3	49	5	2	0	0	5	81	4.86

Table 5
Descriptive Statistics

	N	Min	Max	Mean	Median	Std. Dev.
Revenue forecast optimism in Year 1	74	-1.00	0.50	-.3314	-0.1919	0.40019
Revenue forecast optimism in Year 2	63	-0.99	0.29	-.3811	-0.4463	0.31974
Revenue forecast optimism in Year 3	57	-0.91	0.22	-.3861	-0.4112	0.30077
Revenue forecast optimism in Year 4	56	-1.00	0.41	-.3827	-0.4269	0.35001
Revenue forecast optimism in Year 5	56	-1.00	1.39	-.3261	-0.4240	0.48620
5 years' revenue forecast optimism	306	-1.00	1.39	-.3602	**-0.3983**	0.37572
Earnings forecast optimism in Year 1	75	-1.52	0.75	-.4799	-0.5383	0.46174
Earnings forecast optimism in Year 2	62	-1.51	0.41	-.6700	-0.7618	0.43292
Earnings forecast optimism in Year 3	61	-1.71	0.26	-.7080	-0.7067	0.41184
Earnings forecast optimism in Year 4	56	-1.49	0.19	-.7901	-0.8598	0.35015
Earnings forecast optimism in Year 5	51	-1.29	0.34	-.7392	-0.8595	0.37564
5 years' earnings forecast optimism	305	-1.71	0.75	-.6645	**-0.7596**	0.42545
Boom Time Issues	375	0	1	0.15	0	0.354
Issuer Size (Log of post-issue total capital)	375	7.10	9.26	8.1034	8.0792	0.41862
Issuer Size (Post-issue total capital in Tk million)	375	12.516	1,800	213	120	301.20
Auditor Size	375	0	1	0.19	0	0.390
Underwriter Prestige	375	0	1	0.39	0	0.488
Proportion of capital raised from public sources	375	0.08	1.00	0.7362	0.8000	.1896
Proportion of capital contributed by foreign sponsors	375	0	0.61	0.1320	0.0831	0.1484
Green Field	375	0	1	.36	0	.481

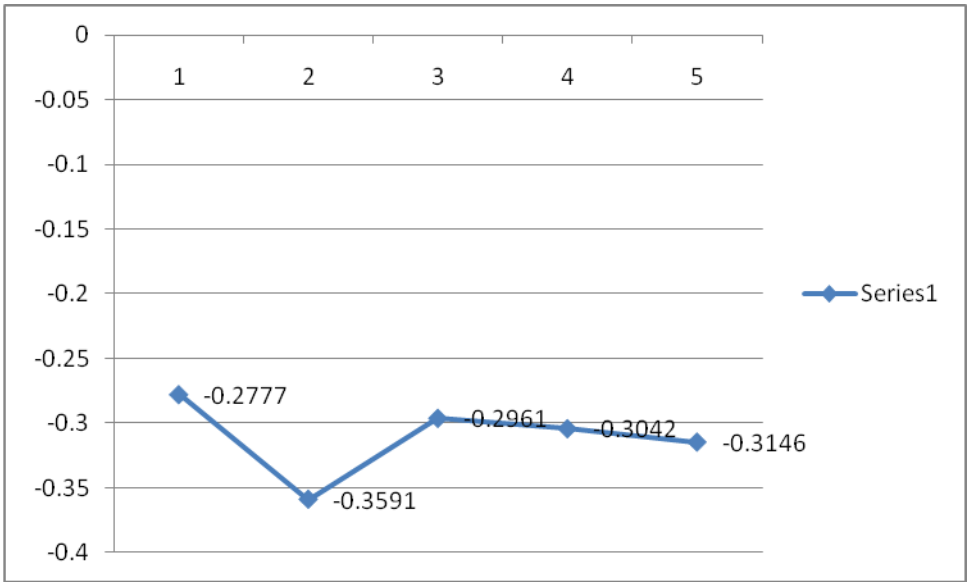
Forecast horizon	375	12	120	60.21	60	21.546
Operating history (years)	375	0	32	4.72	2	6.521
Leverage	375	0	11.42	2.1030	0.9677	2.4428

Table 6(a)
5-year revenue forecast optimism

	N	Minimum	Maximum	Mean	Std. Deviation
First year of forecast	75	-1.00	1.77	**-0.2777**	.48453
Second year of forecast	62	-.99	1.07	**-0.3591**	.36676
Third year of forecast	61	-.99	1.34	**-0.2961**	.45020
Fourth year of forecast	57	-1.00	.98	**-0.3042**	.44354
Fifth year of forecast	55	-1.00	1.39	**-0.3146**	.48298

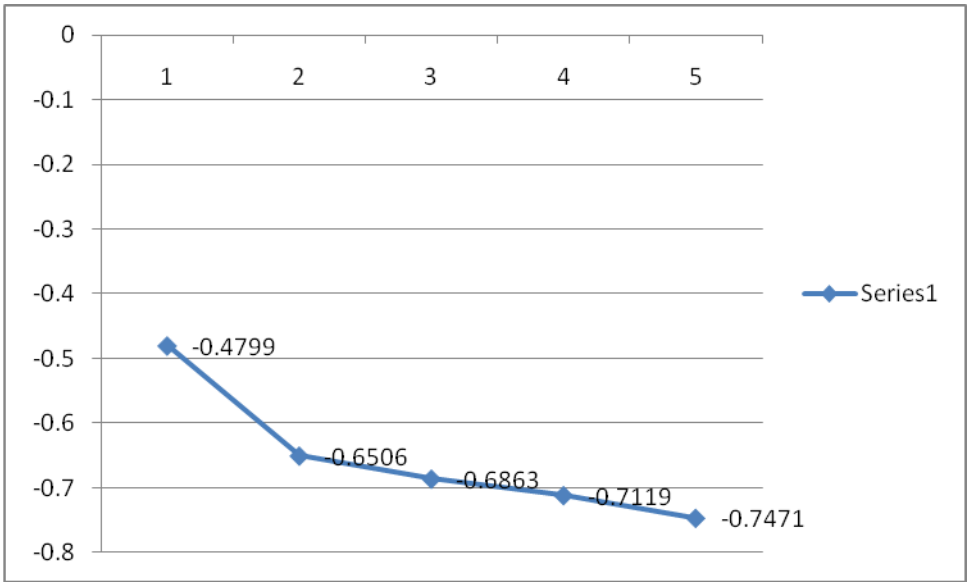
Table 6(b)
5-year earnings forecast optimism

	N	Minimum	Maximum	Mean	Std. Deviation
First year of forecast	75	-1.52	.75	**-0.4799**	.46174
Second year of forecast	62	-1.51	.62	**-0.6506**	.46290
Third year of forecast	61	-1.71	.62	**-0.6863**	.44567
Fourth year of forecast	57	-1.37	1.14	**-0.7119**	.48110
Fifth year of forecast	55	-1.56	.66	**-0.7471**	.45855



Revenue Forecast Optimism

Graph 1(a)



Earnings Forecast Optimism

Graph 1(b)

Table 7

Univariate Analysis of Mean Revenue and Earnings Forecast Bias

Variable	Mean ***Revenue*** Forecast Optimism	No. of Issues	*t* - test for equality of means (2-tailed sig.)	Mean ***Earnings*** Forecast Optimism	No. of Issues	*t* - test for equality of means
Boom Period						
Boom Period Issues	-.5035	50	***t* = -3.185** **sig. = .002**	-.8735	51	***t* = -4.009** **sig. = .000**
Non-Boom Period Issues	-.3211	249		-.6187	252	
Total	-.3516	299		-.6616	303	
Issuer Size						
Smaller than Median	-.3633	144	*t* = .518 sig. = .605	-.6781	147	*t* = .654 sig. = .514
Larger than Median	-.3408	155		-.6461	156	
Total	-.3516	299		-.6616	303	
Auditor Reputation						
Non-Big Auditor	-.4003	232	***t* = 4.293** **sig. = .000**	-.7256	236	***t* = 5.129** **sig. = .000**
Big Auditor	-.1832	67		-.4363	67	
Total	-.3516	299		-.6616	303	
Underwriter Prestige						
Prestigious Underwriters	-.3805	121	*t* = -1.096 sig. = .274	-.6860	118	*t* = -.797 sig. = .426
Other Cases	-.3320	178		-.6461	185	
Total	-.3516	299		-.6616	303	
Shares Held by General Investors						
Smaller than Median Shareholding	-.3103	143	***t* = -1.830** **sig. = .068**	-.5299	149	***t* = -5.577** **sig. = .000**
Larger than Median Shareholding	-.3896	156		-.7891	154	
Total	-.3516	299		-.6616	303	

Shares Held by Foreign Investors						
Smaller than Median Shareholding	-.4034	154	***t* = 2.480 sig. = .014**	-.7147	154	***t* = 2.227 sig. = .027**
Larger than Median Shareholding	-.2967	145		-.6068	149	
Total	-.3516	299		-.6616	303	
Green Field						
Green Field Issues (start-up firms)	-.4169	105	***t* = -2.228 sig. = .027**	-.7028	102	*t* = -1.205 sig. = .229
Other Issues	-.3163	194		-.6407	201	
Total	-.3516	299		-.6616	303	
Forecast Horizon						
Smaller than Median	-.3625	156	*t* = -.521 sig.= .603	-.6769	165	*t* = -.684 sig.= .494
Larger than Median	-.3398	143		-.6434	138	
Total	-.3516	299		-.6616	303	
Operating History						
Smaller than Median	-.3797	145	*t* = -1.255 sig.= .210	-.6834	145	*t* = -.856 sig.= .392
Larger than Median	-.3252	154		-.6416	158	
Total	-.3516	299		-.6616	303	
Leverage						
Below Median Leverage Firms	-.3748	146	*t* = -1.043 sig.= .298	-.6322	150	*t* = -1.197 sig.= .232
Above Median Leverage Firms	-.3295	153		-.6905	153	
Total						

Table 8(a): Revenue Forecast Optimism Regressions

$$RFO = \alpha + \beta_1 BOOMTIME + \beta_2 LGCAPTOTAL + \beta_3 AUDITREP + \beta_4 UPRESTIGE + \beta_5 PVTSHLD + \beta_6 FRGNSPONSOR + \beta_7 GRNFELD + \beta_8 HORIZON + \beta_9 OPHIST + \beta_{10} LEVERAGE + \varepsilon$$

	RFO in 1st Year of Forecast		RFO in 2nd Year of Forecast		RFO in 3rd Year of Forecast		RFO in 4th Year of Forecast		RFO in 5th Year of Forecast		RFO in First 5 Years of Forecast	
Dependent Variable	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic
(Constant)	-.115	-.120	.731	.831	-.693	-.727	-.331	-.303	.443	.314	-.005	-.011
Boom Time Issues	-.024	-.196	-.096	-.938	-.008	-.068	-.114	-.876	-.087	-.487	-.068	-1.167
Issuer Size	-.017	-.146	-.150	-1.396	.046	.404	.034	.258	.014	.080	-.018	-.313
Auditor Reputation	.335	**2.815*** **	.337	**3.247*** **	.293	**2.503** **	.149	1.077	.225	1.305	.293	**5.019*** **
Underwriter Prestige	-.024	-.259	.022	.266	-.061	-.672	-.009	-.085	-.032	-.228	-.018	-.394
Shares Held by General Investors	.131	.552	-.206	-.941	-.289	-1.233	-.608	**-2.231** **	-1.237	**-3.393*** **	-.369	**-3.075*** **
Shares Held by Foreign Investors	-.101	-.322	.068	.243	.112	.370	.422	1.191	.273	.561	.156	1.005
Green Field Issues	-.478	**-4.235*** **	-.198	**-1.854* **	-.192	-1.537	-.006	-.044	-.197	-1.045	-.233	**-3.897*** **
Forecast Horizon	-.001	-.185	.011	1.472	.006	.763	.003	.259	.007	.541	.004	1.028
Operating History	-.003	-.376	.008	1.110	-.002	-.224	.000	.016	-.019	-1.199	-.001	-.327
Leverage	.003	.146	.024	1.577	.037	**2.209** **	.018	.861	.018	.620	.016	**1.846* **
F Statistic	2.350		2.816		1.588		1.452		1.948		5.913	
Model Significance	0.002		0.007		0.142		0.191		0.064		0.000	
Adjusted R^2	0.238		0.229		0.098		0.079		0.149		0.142	
N	73		62		55		54		55		299	

Table 8(b): Earnings Forecast Optimism Regressions

$$EFO = \alpha + \beta_1 BOOMTIME + \beta_2 LGCAPTOTAL + \beta_3 AUDITREP + \beta_4 UPRESTIGE + \beta_5 PVTSHLD + \beta_6 FRGNSPONSOR + \beta_7 GRNFELD + \beta_8 HORIZON + \beta_9 OPHIST + \beta_{10} LEVERAGE + \varepsilon$$

	EFO in 1st Year of Forecast		EFO in 2nd Year of Forecast		EFO in 3rd Year of Forecast		EFO in 4th Year of Forecast		EFO in 5th Year of Forecast		EFO in First 5 Years of Forecast	
Dependent Variable	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic
(Constant)	2.815	2.694	.215	.192	.945	.839	-.370	-.430	-1.183	-1.303	.703	1.397
Boom Time Issues	-.017	-.126	-.216	-1.657	-.184	-1.334	-.041	-.388	-.041	-.363	-.115	**-1.854***
Issuer Size	-.323	**-2.547****	-.024	-.178	-.121	-.880	.038	.356	.155	1.379	-.090	-1.457
Auditor Reputation	.353	**2.663****	.575	**4.301*****	.422	**3.101*****	.337	**3.141*****	.264	**2.353****	.364	**5.883*****
Underwriter Prestige	.074	.732	.023	.211	-.119	-1.102	.028	.330	.045	.481	.024	.487
Shares Held by General Investors	-.549	**-2.136****	-.735	**-2.657****	-.842	**-2.965*****	-.860	**-3.964*****	-1.221	**-5.243*****	-.798	**-6.300*****
Shares Held by Foreign Investors	.597	**1.747***	-.203	-.577	.056	.157	.178	.648	-.125	-.398	.195	1.197
Green Field Issues	-.482	**-3.864*****	-.092	-.666	.007	.045	.021	.184	.099	.770	-.108	**-1.673***
Forecast Horizon	-.012	-1.377	-.016	-1.631	-.008	-.857	-.012	-1.437	4.996E-5	.006	-.007	-1.556
Operating History	-.008	-.869	.007	.694	.007	.761	.007	.935	-.003	-.305	.004	.856
Leverage	-.026	-1.361	.012	.629	.008	.394	-.026	-1.482	.011	.584	-.008	-.797
F Statistic	4.137		3.756		2.903		4.155		4.918		9.955	
Model Significance	0.000		0.001		0.006		0.000		0.000		0.000	
Adjusted R^2	0.298		0.311		0.244		0.369		0.439		0.229	
N	75		62		60		55		51		303	

Table 8(c): Earnings Forecast Optimism Regressions (RFO as an independent variable)

$$EFO = \alpha + \beta_1 RFO + \beta_2 BOOMTIME + \beta_3 LGCAPTOTAL + \beta_4 AUDITREP + \beta_{45} UPRESTIGE + \beta_6 PVTSHLD + \beta_7 FRGNSPONSOR + \beta_8 GRNFELD + \beta_9 HORIZON + \beta_{10} OPHIST + \beta_{11} LEVERAGE + \varepsilon$$

	EFO in 1st Year of Forecast		EFO in 2nd Year of Forecast		EFO in 3rd Year of Forecast		EFO in 4th Year of Forecast		EFO in 5th Year of Forecast		EFO in First 5 Years of Forecast	
Dependent Variable	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic
(Constant)	2.821	3.114	-.585	-.653	.532	.595	-.412	-.561	-1.238	-1.846	.478	1.153
RFO	.624	**5.186*** **	.692	**4.678*** **	.742	**5.275*** **	.466	**4.550*** **	.244	**3.212*** **	.592	**11.258*** **
Boom Time Issues	-.003	-.030	-.159	-1.532	-.075	-.690	.011	.129	.023	.273	-.055	-1.092
Issuer Size	-.306	**-2.831*** **	.098	.887	-.055	-.513	.039	.431	.161	**1.930* **	-.058	-1.156
Auditor Reputation	.146	1.218	.331	**2.789*** **	.255	**2.184** **	.235	**2.458** **	.290	**3.240*** **	.197	**3.648*** **
Underwriter Prestige	.092	1.064	.045	.532	-.082	-.963	.040	.559	.107	1.520	.055	1.372
Shares Held by General Investors	-.616	**-2.726*** **	-.495	**-2.220** **	-.529	**-2.383** **	-.544	**-2.814*** **	-1.027	**-5.304*** **	-.542	**-5.127*** **
Shares Held by Foreign Investors	.618	**2.072** **	-.384	-1.346	-.232	-.822	-.024	-.101	-.290	-1.236	.017	.123
Green Field Issues	-.174	-1.429	.059	.525	.105	.878	.051	.522	.041	.423	.019	.358
Forecast Horizon	-.011	-1.437	-.021	**-2.637** **	-.011	-1.511	-.012	**-1.760* **	-.006	-.840	-.009	**-2.322** **
Operating History	-.005	-.658	.004	.523	.009	1.284	.008	1.201	.000	-.102	.006	1.595
Leverage	-.027	-1.666	-.003	-.204	-.015	-.898	-.031	**-2.121** **	.007	.543	-.015	**-1.983** **
F Statistic	7.125		7.465		6.259		6.940		9.460		24.190	
Model Significance	0.000		0.000		0.000		0.000		0.000		0.000	

Adjusted R^2	0.483		0.542		0.517		0.557		0.655		0.467	
N	73		61		55		53		50		292	

Annexure 1: Correlation Matrix

	5-Year RFO	5-Year EFO	Boom Time Issues	Log of Post-Issue Total Capital	Auditor Reputation	Underwriter Prestige	Shares Held by General Investors	Shares Held by Foreign Investors	Green Field Issues	Forecast Horizon	Operating History
5-Year EFO	.621**										
Boom Time Issues	-.182**	-.225**									
Log of Post-Issue Total Capital	.021	.023	.007								
Auditor Reputation	.242**	.284**	-.199**	.153**							
Underwriter Prestige	-.063	-.046	-.020	-.112*	.182**						
Shares Held by General Investors	-.148*	-.294**	.123*	-.174**	.123*	.261**					
Shares Held by Foreign Investors	.109	.134*	-.216**	.362**	.222**	.018	.028				
Green Field Issues	-.128*	-.069	-.075	.118*	.282**	.203**	-.082	.079			
Forecast Horizon	.051	-.036	-.104*	.126*	.243**	-.066	-.137**	-.028	.409**		
Operating History	.088	.119*	.110*	.159**	-.032	-.201**	.017	.022	-.544**	-.358**	
Leverage	.047	-.070	-.006	-.243**	-.098	.118*	.074	-.095	.052	-.082	-.029

* Correlation is significant at the 0.10 level (2-tailed)
** Correlation is significant at the 0.05 level (2-tailed)
*** Correlation is significant at the 0.01 level (2-tailed)

Annexure 2: List of companies and the length of forecasts in the sample

Sl No.	Company Name	No. of years' forecast provided
1	Aims 1st Mutual Fund	5
2	Al-Amin Chemical Industries Ltd.	1
3	Alltex Industries Limited	5
4	AMCL (Pran)	5
5	Anlima Yearn & Dyeing	5
6	Anwar Galvanizing Ltd	5
7	Apex Footwear Ltd	5
8	Apex Spinning	5
9	Apex Tannery	5
10	Apex Weaving & Finishing Mills Ltd	5
11	Aramit Cement Limited	10
12	Arbee Textiles Limited	3
13	Bangladesh Dyeing & Finishing Industries Ltd	5
14	Bangladesh Luggage Industries Ltd	7
15	Bangladesh Thai Aluminum	3
16	BD Zipper Industries	5
17	BEMCO Ltd	3
18	Bengal Biscuits Ltd	4
19	Bengal Fine Ceramics Ltd	6
20	Berger Paints Bangladesh Limited	5
21	Beximco Denims	10
22	Beximco Fisheries Limited	10
23	Beximco Infusions Ltd	5
24	Beximco Knitting Ltd	10
25	Beximco Synthetics Ltd	5
26	Beximco Textiles Ltd	10
27	Chic Tex Ltd	5
28	CMC-Kamal Textile Mills Ltd	5
29	Confidence Cement Ltd	5
30	Dandy Dyeing Ltd	5
31	Delta Millers Ltd	3
32	Dulamia Cotton	3
33	Dynamic Textile Industries Ltd	5
34	Eastern Housing Ltd	6
35	Excelsior Shoes Ltd	5
36	Fu Wang Foods Ltd	5
37	Fu-Wang Ceramic Limited	5
38	Gachihata Aquaculture Farms	6
39	GEM Knitwear Fabrics	5
40	Gulf Foods Limited	5
41	H.R. Textile Mills Ltd	5
42	Imam Button Industries Ltd.	5
43	Kay & Que (BD) Ltd	5
44	Lexco Ltd	5
45	Libra Pharmaceuticals Ltd	4

46	M. Hossain Garments Washing & Dying Ltd.	5
47	Magura Paper Mills Limited	3
48	Maq Enterprises Ltd.	5
49	Maq Paper Industries	3
50	Mark Bangladesh Shilpa & Engineering Ltd	5
51	Meghna Cement Mills	5
52	Meghna Condensed Milk	1
53	Meghna Shrimp & Culture	3
54	Meghna Vegetable Oil Industries	1
55	Mita Textile Mills	5
56	Mithun Corporation Ltd	3
57	Modern Cement Ltd	1
58	Mona Food Industry	5
59	Monno Fabrics Ltd	5
60	New Dhaka Refractories Ltd	3
61	Niloy Cement Inds. Ltd	6
62	Orion Infusion (Mala)	5
63	Paragon Leather & Footwea	5
64	Perfume Chemeicals Ltd (Manola)	5
65	Prime Textile	5
66	Rahima Food Corporation Ltd.	5
67	Rangpur Foundry Ltd	7
68	Rose Heaven Ball Pen Ltd	5
69	Safko Spinning	5
70	Sajib Knitwear	5
71	Saleh Carpet	4
72	Samata Leather Complex	5
73	Samorita Hostipal	6
74	Silver Carp Limited	3
75	Sinobangla Industries Ltd	5
76	Sonargaon Textiles	5
77	Square Pharma	5
78	Sreepur Textile Mills Ltd	5
79	Standard Ceramic Industries Limited	5
80	Tamijuddin Textile Mills Ltd	3
81	Tulip Dairy & Food	3
82	Wata Chemicals	1
83	Wonderland Toys Ltd	5