# The accuracy of earnings forecasts disclosed in IPO prospectuses: The case of the Turkish IPO companies

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## Abstract

This paper examines the accuracy of earnings forecasts made by Turkish Initial Public Offering (IPO) companies during the period the year 2000 to the year 2007. It is a voluntary requirement for the Turkish IPOs to furnish earnings forecasts. The accuracy of earnings forecasts is measured by forecast errors, absolute forecast errors and squared forecast errors in this paper. A number of company specific characteristics such as size, age, forecast interval, gearing and proportion of shares retained by owners are tested. Additionally, both underwriter and auditing firm reputation are tested as well. The results of this study show that like IPO forecasts disclosed in most other countries, IPO forecasts disclosed by Turkish companies do overestimate their earnings, on average, by 13.44 %. On an overall basis, the findings of this study can be intrepreted to mean that IPO forecasts disclosed by Turkish companies provide reliable information.

*Key words*: Earnings management, forecast disclosure, earnings forecasts, forecast accuracy, determinansts of forecast accuracy, Turkish IPOs.

*JEL classification*: C21; G18; G24; G32.

## 1. Introduction

Investors need information to evaluate future performance of IPO companies so that they can decide whether to subscribe to the shares offered. In these situations, firms or issuers have to convey information that can be used to value their shares (Lonkani and Firth, 2005: 269). In the absence of any other reliable information, investors primarily depend on information

disclosed in the prospectuses of the companies which are about to make a public offering listing (Cheng and Firth, 2000: 423). Thus, forecasts disclosed in prospectuses for IPOs provide useful information for evaluating the company's future performance.  In view of the usefulness of IPO forecasts, investors would be interested to know about the reliability of these forecasts. The usefulness of forecast information for investment decisions encouraged several researchers to examine the accuracy of IPO forecasts of the prospectuses in different countries (Firth and Smith, 1992; Lee et al., 1993; Pedwell et al., 1994; Chan et al., 1996; Jaggi, 1997). Findings of earlier studies in different countries have provided mixed signals, but they were mostly optimistic, on the accuracy and reliability of IPO forecasts.

However, studies of the accuracy of earnings forecasts disclosed in IPO prospectuses are relatively limited. This could be due to the fact that either quantitative earnings forecasts are not included in prospectuses or they are voluntarily included in prospectuses. Moreover, this may be due, in part, to the virtual absence of published earnings forecasts in American IPO prospectuses (Jaggi, 1997: 303). In some countries company insiders may entail risks that could be costly. If company insiders are subsequently viewed as unreliable, the firm suffers serious reputational costs. However, the absence of earnings forecasts in American IPOs is due to a concern about legal suits if the forecasts prove to be inaccurate (Firth, 1998: 31).

In countries such as the UK, Sweden and Turkey, most companies disclose information in their IPOs on a voluntary basis. New Zealand, where forecast disclosure is mandatory, is an exception. American companies rarely disclose forecasting information in IPOs because the SEC does not require it. The research in this area is mainly restricted to British Commonwealth countries: Australia, Canada, Hong Kong, Malaysia, New Zealand, Singapore and the UK.  These countries and regions have similar securities laws and institutional frameworks.

In the US, new issue is sold mainly to the underwriters and to investment banks, which then distribute the stocks to preferred clients such as institutional investors and wealthy individuals. The underwriters and investment banks have non-public information on the IPOs and they communicate this to their clients. In this circumstance, public information is not so important for the preferred clients of the issuing house.

However, these circumstances do not prevail in many countries, where IPOs are marketed directly to the general public. The prospectus is the main source of information for investors in such countries. Individual investors have a relatively low capability to acquire and evaluate information on IPO stocks relative to institutional investors. Furthermore, they have to rely on public information since they cannot make contact with issuers directly. In these markets, the information contained in the prospectuses is typically a substantial proportion of the publicly available knowledge about the firm. Thus an earnings forecast contained in the prospectus of an IPO is

potentially more important to investors in countries where IPOs are sold to the general public.

A lack of information and information asymmetry between company insiders and outside investors are especially severe issues in developing economies such as Turkey. Businesses in Turkey are often controlled by tightly-knit families and they are generally unwilling to divulge information to the outside world. Thus, earnings forecasts are one way of reducing information asymmetry between the company insiders and outside potential investors. The inclusion of the earnings forecasts in the IPO prospectuses is a relatively new phenomenon in Turkey due to the fact that more and more companies are taking corporate governance issues into consideration. On the other hand, Turkey has already started to make some arrangements towards informing public in the capital markets as the authorities in the developed markets made some arrangements concerning the investors after the corporate scandals in the 2000s. Furthermore, Turkey has been in a process to make compatible the capital market law with the one of the European Union. In this context, there have already been made some preparations to disclose earnings forecast in the prospectuses. Thus, Turkish IPO firms have had a trend towards disclosing earnings forecast in the prospectuses due to also these developments since the 2000s.

We argue that, in Turkey, the earnings forecast published in an offering prospectus is very important not only for Turkish investors but also for international investors. Currently, nearly eighty percent of the stocks at the Istanbul Stock Exchange (ISE) are owned by international investors. The Turkish market is important as the scale of IPOs will continue to grow in the future, especially in the event that Turkey does become both a member of European Union (EU) and a part of international capital markets. In addition, this type of direct disclosure is especially important in a developing economy, like Turkey, where information asymmetry between company insiders and outside investors is common and more severe. Additionally, financial intermediaries and information vendors are relatively sparse, and where investors are rarely professionals.

The obvious concerns about the forecasts of a firm's future earnings are accuracy and bias. However, unfortunately, there are thus far no studies that evaluate the accuracy of earnings forecasts published in offering prospectuses by Turkish IPO firms. Therefore, this study examines the accuracy of IPO forecasts disclosed by Turkish companies and whether these forecasts are under- or over-estimated. Additionally, it examines whether this accuracy is influenced by company-specific characteristics. The findings of this study provide useful information to investors for evaluating the reliability of IPO forecasts disclosed by Turkish companies.

The analysis and methods we used in the study are based on the ones commonly used in the related literature. The remainder of the paper is organized as follows. Section 2 briefly reviews prior research studies covering international evidence. Section 3 gives an explanation of Turkish

IPO prospectuses. Section 4 describes the data and methodology. Section 5 presents and discusses the empirical results with respect to international evidence, and Section 6 concludes.

## 2. Related literature

The issue of the accuracy of earnings forecasts in IPO prospectuses has been explored by many researchers. However, this literature typically uses data from British Commonwealth countries. This occurs as a result of two factors, first, many of them have a tradition of providing earning forecasts and second in some countries of the British Commomwealth forecasts are mandatory. On an overall basis, the review indicates that the disclosure of earnings forecasts, especially by the British, Australian and Canadian firms on a voluntary basis did not result in disclosure of more optimistic forecasts: this is likely due to the well-developed financial markets in these countries. The findings of studies on the forecasts issued by the UK IPO firms indicate that these forecasts have generally been more conservative than optimistic, i.e. the reported earnings are generally higher than earnings forecasts.

Keasey and McGuiness(1991) evaluated the accuracy of forecasts contained in 121 IPOs issued by UK companies from 1984 to 1986. Their results indicated the mean of forecast error and the mean absolute forecast error as 5 % and 11 %, respectively. Their findings revealed a positive bias that companies generally underestimates future earnings. Their results also revealed that IPO companies which disclosed earnings forecasts in prospectuses, in comparison to the IPO companies which did not include earnings forecasts in their prospectuses, displayed higher initial returns. The authors hypothesised that forecast accuracy is related to the initial returns of IPO stocks. The authors of the study also examined the pricing aspect of the shares offered by UK companies. However, the empirical results provided no support for that hypothesis.

Firth and Smith (1992) examined the accuracy of 89 earnings forecasts contained in the prospectuses of IPOs from the New Zealand Stock Exchange during the period of 1983-1986. They reported a negative mean forecast error of 92 %, meaning that these forecasts were overly optimistic. In addition, they found a significant association between forecasting accuracy and firm size. However, their results did not not indicate any significant relationship between forecast accuracy and firm specific characteristics such as age, gearing, forecast horizon and auditors' reputation. In addition to the study by Firth and Smith (1992), Firth (1997) created a new study that examined the profit forecast accuracy in New Zealand. The data included 143 unseasoned new issues, studied during the period from 1979 to 1987. The results were very similar to those of the previous study by Firth and Smith (1992) with the median forecast error at – 91% and the mean absolute forecast error at 111%.

**Table 1**
Summary of Previous Studies on the Accuracy of Forecast Earnings

| Study | Country | Period | Sample | Forecast Error (%) | Absolute Forecast Error (%) |
|-------|---------|--------|--------|--------------------|-----------------------------|
| Keasey and McGuinness (1991) | U.K. | 1984-1986 | 121 | 5 | 11 |
| Firth and Smith (1992) | New Zealand | 1983-1986 | 89 | -92 | 328 |
| Pedwell et al. (1994) | Canada | 1983-1987 | 112 | -77,7 | 88 |
| Mohamad et al. (1994) | Malaysia | 1975-1988 | 65 | -9,34 | NA |
| Jaggi (1997) | Hong Kong | 1990-1994 | 160 | 6,5 | 12,79 |
| Firth (1997) | New Zealand | 1979-1987 | 143 | -91 | 111 |
| Jelic et al. (1998) | Malaysia | 1984-1995 | 122 | 33,37 | 54,1 |
| Firth (1998) | Singapore | 1977-1992 | 116 | 20,11 | 10,4 |
| Chen and Firth (1999) | China | 1991-1996 | 447 | 23,24 | 43,09 |
| Hartnett and Romcke (2000) | Australia | 1991-1996 | 134 | -30,35 | 88,29 |
| Mbuthia and Ward (2003) | South Africa | 1980-1998 | 506 | 14,3 | NA |
| Gramlich and Sorensen (2004) | Denmark | 1984-1996 | 58 | -3,7 | NA |
| Gounopoulos (2004) | Greece | 1994-2001 | 208 | 8,04 | 42,82 |
| Lonkani and Firth (2005) | Thailand | 1991-1996 | 175 | -6,86 | 35,76 |
| Ström (2006) | Sweden | 1996-2004 | 22 | -228,4 | 240,7 |
| Jaggi et al. (2006) | Taiwan | 1994-2001 | 759 | 20 | NA |
| Chong and Ho (2007) | Singapore | 1990-2000 | 114 | -6,1 | NA |
| Kwag and Small (2007)* | U.S. | 2001-2002 | 502 | -3,54 | 4,37 |

* Results include only Post-FD (Post Fair Disclosure)Period.

The accuracy of earnings forecasts of Australian IPOs has been examined by Pedwell et al. (1994). Their findings indicated that there was a mean forecast error of 76 %, which suggested that these companies overestimate.

Jaggi (1997) examined the accuracy of IPO forecasts disclosed by 160 Hong Kong companies during the period betwen 1990 and 1994. In the study Jaggi used EPS, earnings and dividends. They arrived at a mean forecast error and an absolute forecast error of 6.5 % and 12.79% respectively. Chen et al. (2001) also explored the accuracy of IPO forecasts disclosed by Hong Kong companies between 1993 and 1996 and found a mean forecast error and an absolute forecast error of 9.94% and 21.36 respectively.

Mohamad et al (1994) examined the forecast accuracy of 65 Malaysian IPOs over the period of 1975 to 1988. The results indicated a mean forecast error of 9.34% suggesting that, on average, managers underestimated future earnings. They insisted that this can be explained by the strict regulation of IPOs in Malaysia, and the fact that managers are personally accountable to the Securities Commission for their forecasts. They also examined the relationship between the forecast error and a number of possible explanatory variables such as forecast horizon,

company's size and age, auditor's reputation, gearing and the relationship between the initial premium and the forecast error. The results revealed that only gearing is statistically significantly in relation to the forecast error. No significant relationship was found between the initial premium and the forecast error. Jelic et al. (1998) also examined the accuracy of earnings forecasts made by 122 Malaysian companies in their prospectuses during the period of 1984 to 1995. They reported a forecast error and an absolute forecast error of 33.37 % and 54.1% respectively, meaning that managers underforecasted earnings. Their results revealed that both the age and industry classification of the company were statistically significant.

Gramlich and Sorensen (2004) investigated a sample of 58 Danish IPOs that issue voluntary management earnings forecasts. The sample examined the IPOs between 1984 and 1996. Their results indicated a forecast error of 3.7%. They specified that Denmark and the UK are two countries where managers deliberately choose to make voluntary disclosures in contrast with Canada, where there is a fairly even split between the number of companies that include an earnings forecast.

Jaggi et al. (2006) investigated 759 earnings forecasts included in the prospectuses of Thai IPO companies for eight periods following initial public offering. They found an average of 20 % forecast error. The authors suggested that their results revealed better forecasts with each successive year. However, earnings were much lower than forecasted earnings.

Besides these researchers mentioned above, researchers in China (Chen and Firth, 1999), Australia (Hartnett and Romcke, 2000), South Africa (Mbuthia and Ward, 2003), Greece (Gounopoulos, 2004), Thailand (Lonkani and Firth, 2005) and Sweden (Ström, 2006) explored the accuracy of earnings forecasts in IPO prospectuses. Table 1 summarizes the results of all of these studies. Our study is the first empirical research with respect to earnings forecasts disclosed in the IPO prospectuses in the Turkish market where issuers have recently begun to include earnings forecasts in their prospectuses.

## 3. Turkish prospectuses

A Turkish prospectus needs to be filed with the Capital Market Board (CMB) for registration. The prospectus will include all information reasonably necessary to enable a prospective investor to assess the merits of the issuer and the proposed investment. The CMB may refuse registration if the prospectus has not satisfied the required level of disclosure. The type and scope of information disclosed to the public under CMB regulations is considerably less detailed than disclosure requirements in the US or the UK. If an international offering is made simultaneously with the IPO, the international Offering Circular is not reviewed by the CMB.

The offering period (bookbuilding) in a domestic IPO can be a minimum of two business days. The bookbuilding period starts between

three and five days after the announcement of the prospectus. However, if a pre-bookbuilding is exercised, the pre-bookbuilding period should not exceed 30 days. The prospectuses include the base of initial public offering and sale, attaintments about the company, the statements to specify the company's financial position, the risks which the company will be facing and detailed information about the company's operations.

Underwriters and isssuers jointly sign prospectuses. Issuers are primarily responsible for the data included in the prospectuses. However, underwriters must also take responsibility for the data in prospectuses; otherwise, investors can sue underwriters in case of their losses. Moreover, auditing firms are also legally responsible for the financial tables they prepare for the issuers.

## 4. Research methodology and data collection

This paper examines the accuracy of earnings forecasts contained in the prospectuses of companies seeking listing on the İstanbul Stock Exchange (ISE). We had two constraints for this research. One is related with the time interval we investigated for. Firms started to disclose earnings forecast in their prospectuses after the 2000s. To investigate the long-term performance, we took three-years period after the IPO into consideration. In this study, the period starts with the year 2000 due to the fact that there was no such information concerning forecasting in the prospectuses before the year 2000. There was not even one IPO which disclosed earnings forecast in the prospectuses in the year 2008. So we omitted the year 2008 and investigated the period between 2000 and 2007. The second constraint is about the type of the IPO firms. Investment trusts, real estate investment trusts, and venture capital investment trusts are excluded from the sample due to the fact that they usually go to the public with book value.

During this period (from the year 2000 to the year 2007), except investment trusts, real estate investment trusts and venture capital investment trusts, 33 new issues were listed on the Istanbul Stock Exchange. 30 (91%) of those firms disclosed their earnings forecasts in the prospectuses, thus, our sample consists of those 30 companies. We used proforma balance sheets and income statements in the prospectuses of the IPO firms. We collect prospectuses from the Capital Markets Board of Turkey. The data with regard to determinants of forecasting accuracy such as past financial tables, forecast horizon, age, size, investment bank and auditing firm reputation were collected from the prospectuses. All other related data were extracted from the various publications of ISE.

### 4.1. Forecast error metrics

In this study, the accuracy of earnings forecasts that are disclosed in the Turkish IPO prospectus is examined by using common forecast error measures in the literature (Firth and Smith, 1992; Chan et al., 1996; Jaggi,

1997; Jelic et al., 1998; Cheng and Firth, 2000; Clarkson, 2000; Lonkani and Firth, 2005; Ström, 2006; Siougle, 2007). The most widely used forecast errorr metrics are forecast error, absolute forecast error, and square forecast error. Forecast error is defined as the difference between the actual earnings and the forecast earnings and then divided by absolute value of the actual earnings. Thus, we calculate the forecast error as follows:

$$FE_{it} = \left(FP_{it} - AP_{it}\right)\Big/\left|AP_{it}\right| \tag{1}$$

Where;

   $FE_{it}$ : Forecast error of the company i,

   $AP_{it}$ : Actual earnings of the company i for the period t,

   $FP_{it}$ : Forecast earnings of the company i for the period t.

   The mean forecast error is a measure of bias in a forecsat. It examines whether company management systematically overestimates or underestimates earnings for firms. The signed forecast error shows that whether a company is optimistic or pessimistic about its future earnings. A positive mean value for forecast error implies that, on average, IPO companies have a pessimistic bias indicating firms underforecast. On the other hand, a negative mean value for forecast error implies an optimistic bias indicating firms overforecast.

   However, Jaggi (1997) insists that the average forecast error based on the signed error measure does not provide reliable information on the average size of the error since negative and positive errors cancel each other out. Therefore, according to Jaggi (1997), in order to determine the accuracy of forecasts on an average basis, either of overestimation or underestimation of the forecasts should be included in the calculation. Under this Formula, the absolute forecast error measure is considered to be appropriate.

   The mean absolute forecasts error indicates the overall level of accuracy (Chen and Firth, 1999: 208). Jelic et al. (1998) specify that the mean absolute forecast error provides an indication of how close the forecasts were to actual earnings in absolute terms. Jelic et al. (1998) insists that it is, therefore, an important indicator of forecast accuracy.

   The absolute forecast error is given by;

$$AFE_{it} = \left|\left(FP_{it} - AP_{it}\right) \Big/ \left|AP_{it}\right|\right| \tag{2}$$

Where;

   $AFE_{it}$ : Absolute forecast error for the company i,

   $AP_{it}$ : Actual earnings of the company i for the period t,

   $FP_{it}$ : Forecast earnings of the company i for the period t

   We combine equation 1 and 2 and then the absolute forecast error bcomes as follows:

$$AFE_{it} = \left|FE_{it}\right| \tag{3}$$

Some researchers (Bhaskâr and Morris, 1984; Firth and Smith, 1992; Jelic et al., 1998; Gounopoulos, 2004) use the squared forecast error as a third error metric. This error metric is measured using the square of the forecast error. The squared forecast error gives more weight to large errors, and it is more appropriate for an analysis of investors' losses due to forecast inaccuracy as Bhaskâr and Morris(1984) specify. According to Firth and Smith (1992) squared forecast error better models the loss to investors due to an erroneous forecast. The squared forecast error is estimated as shown below:

$$SQFE_{it} = \left[ \ (FP_{it} - AP_{it})/|AP_{it}| \ \right]^2 \tag{4}$$

Where;

SQFE$_{it}$ : Squared forecast error,

AP$_{it}$    : Actual earnings of company i for period t,

FP$_{it}$    : Forecasting earnings of company for period t.

In this study, three forecast error metrics are used namely forecast error, absolute forecast error, and squared forecast error.

**Table 2**
Summary Statistics of IPO Earnings Accuracy

Panel A: Descriptive Statistics of Dependent Variables

|         | Mean   | Median | Standart Deviation | Minimum | Maximum | Highest negative | Highest positive |
|---------|--------|--------|--------------------|---------|---------|------------------|------------------|
| FE (%)  | -13,44 | -29,91 | 134,77             | -210,84 | 495,63  | -210,84          | 495,63           |
| AFE (%) | 79,01  | 47,49  | 109,05             | 2,32    | 495,63  |                  |                  |
| SQFE (%)| 177,40 | 22,73  | 510,85             | 0,05    | 2456,53 |                  |                  |

Panel B: Parametric and Non Parametric Tests

|      | Parametric Test (One sample T test) | | Non parametric Tests | | | |
|------|--------|-----------|----------|----------|----------|----------|
|      | T-test | p value   | K-S test | p value  | Wilcoxon | p value  |
| FE   | -0,546 | 0,589     | 1,642    | 0,009*** | -4,107   | 0,000*** |
| AFE  | 3,968  | 0,000***  | 1,581    | 0,014**  | -4,083   | 0,000*** |
| SQFE | 1,902  | 0,067*    | 2,433    | 0,000*** | -2,664   | 0,008*** |

This table shows earnings forecast accuracy using three metrics. The measures are forecast error, absolute forecast error, square route forecast error. FE, Forecast Error = (FPit-APit) / |APit| ; AFE, Absolute Forecast Error = |(FPit-APit)| / |APit| and SQFE, Square Forecast Error = [(FPit-APit) / |APit|]2, FE = earnings forecast error; AP = actual earnings; FP = earnings forecast as given in the IPO prospectus. Test statistics and p-values indicate the level of significance different from zero using mean (T-test) and the Wilcoxon median test. *** Significant at the one per cent level, **Significant at the five per cent level *Significant at the ten per cent level.

Table 2 reveals the results of the three forecast error metrics measures. The mean forecast error of minus 13.44 % indicates that companies overestimate the earnings. To test whether the values of mean forecast error and absolute forecast error are different from zero, a t test is used as shown in Table 2. The mean values of forecast error are not significantly different

from zero and the absolute forecast error is different at 1% significant level. Concerning non-parametric test results, the median forecast error and the median squared forecast error values are different from zero at 1 % significant level while the median absolute forecast error value is different from zero at 5 % significant level.

Table 3 classifies IPOs by optimistic / pessimistic forecast earnings, containing 8 and 22 firms respectively. The mean forecast error for optimists is minus 63.30 % (median of minus 61.13 %) while pessimists is 122.95 % (median 19.90 %). Panel B of Table 3 includes the values of the t-statistics and p-values of the parametric pair-sampled and non-parametric Wilcoxon-test. The results reveal that there is a high difference between the two samples.

**Table 3**
Forecast Error (FE) and Absolute Forecast Error (AFE) Categorisation by Pessimistic / Optimistic Forecast

| Panel A: Categorization of Pessimistic/Optimistic Forecast | | | | |
|---|---|---|---|---|
| Trend of forecast | No of IPOs | FE Mean (%) | FE Median (%) | AFE Mean (%) |
| Pessimistic | 8 | 122,95 | 19,90 | |
| Optimistic | 22 | -63,03 | -61,13 | 63,03 |
| All | 30 | -13,44 | -29,91 | 122,95 |
| Panel B: Statistics for Difference in Means and Medians | | | | |
| t-statistics for difference in means | | Wilcoxon test for difference in median | | |
| FE | | FE | | |
| -3,584 (0,009)*** | | -2,521 (0,012)** | | |

FE, Forecast Error = (FPit-APit) / ¦APit¦ ; AFE, Absolute Forecast Error = ¦(FPit-APit)¦ / ¦APit¦. FE = earnings forecast error; AP = actual earnings; FP= earnings forecast as given in the IPO prospectus. Test statistics and p-values (*) indicate the level of significance for the differences in mean (T-Tests) and median (Wilcoxon test); *** Significant at one percent level; **Significant at five percent level.

Table 4 shows that among 30 IPO companies, only 33.34% have their AFEs below a value of 0.2 while 46.66% have AFEs above 0.5. The AFE value from 0.1 to 0.2 has the highest concentration of companies among the Turkish IPOs. Overall, it cannot be interpreted that many of the newly issued companies have reported their forecasted earnings very close to actual earnings.

The study of forecast error shows that 30% of the Turkish forecasts were clustered among ±0.02 % of actual earnings while 16.67% clustered among ±1.0 %. This percentage is not satisfactory, thus implying that additional efforts should be made by the management of future IPOs to improve forecasts of earnings.

**Table 4**
Distribution of Dependent Variable Absolute Forecast Error and Forecast Error

| Distribution of AFE | No of IPOs | Cum Percentage | Distribution of FE | No of IPOs | Cum Percentage |
|---|---|---|---|---|---|
| AFE< 0,1 | 2 | 6,67 | FE< -1,00 | 3 | 10,00 |
| 0,1< AFE = 0,2 | 8 | 26,67 | -0,1< FE = -0,2 | 4 | 13,33 |
| 0,2< AFE = 0,3 | 3 | 10,00 | -0,8< FE = -0,6 | 5 | 16,66 |
| 0,3< AFE = 0,4 | 2 | 6,67 | -0,6< FE = -0,4 | 2 | 6,67 |
| 0,4< AFE = 0,5 | 1 | 3,33 | -0,4< FE = -0,2 | 3 | 10,00 |
| 0,5< AFE = 0,6 | 1 | 3,33 | -0,2< FE = 0 | 5 | 16,67 |
| 0,6< AFE = 0,7 | 3 | 10,00 | 0< FE = 0,2 | 4 | 13,33 |
| 0,7< AFE = 0,8 | 2 | 6,67 | 0,2< FE = 0,4 | 2 | 6,67 |
| 0,8< AFE = 0,9 | - | 0,00 | 0,4< FE = 0,6 | - | 0,00 |
| 0,9< AFE = 1,00 | 4 | 13,33 | 0,6< FE = 0,8 | - | 0,00 |
| 1,00 < AFE | 4 | 13,33 | 0,8< FE = 1,00 | - | 0,00 |
|  |  |  | 1,00< FE | 2 | 6,67 |
| All | 30 | 100,00 |  | 30 | 100,00 |

FE, Forecast Error = (FPit-APit) / ¦APit¦ ; AFE, Absolute Forecast Error = ¦(FPit-APit)¦ / ¦APit¦. FE = earnings forecast error; AP = actual earnings; FP = earnings forecast as given in the IPO prospectus.

## 4.2. Determinants of forecasting accuracy

A firm's ability to forecast its earnings may be theoretically explained by certain firm characteristics. These theoretical explanations appear universal and may apply to both developed capital markets as well as the emerging capital markets, such as Turkey's. This study aims to examine the extent to which the proposed relationships exist between certain firm-related variables and the quality of earnings forecast in the emerging capital market of Turkey. In order to get some insight into the reasons for good forecasting performance, a number of hypotheses were constructed and tested with respect to potential determinants. These hypotheses have been examined in prior studies. Previous researchers have identified many potential determinants of profit forecast accuracy e.g. company size, company age, forecast horizon, financial leverage, underwriter reputation, auditing firm reputation, management ownership, general economic conditions, year of flotation and past profit variability. Seven variables among these were chosen for this study. The remaining factors were rejected due to the lack of adequate data.

In the subsequent titles we provide in detail the seven variables of our multivariate regression model. Summary of all the explanatory variables is also reported in subsequent paragraphs. We will concentrate on previous evidence found in related literature and consider the hypothesis for the case of Turkey. In order to find out the possible determinants of absolute forecast

error (AFE) and to explore their relative relationships, the following conjectures are constructed.

### 4.2.1. Forecast accuracy and company size

Company size is considers as an important variable which may influence the forecast accuracy. There is some evidence in the literature suggesting that it is easier to forecast the larger companies' earnings than their smaller counterparts. It is reported that large firms have more control over their market setting. They enjoy comparative economies of scale making them less susceptible to economic fluctuations (Cox, 1985; Firth and Smith, 1992; Jaggi, 1997; Jelic et al., 1998; Brown et al., 2000; Chen et al., 2001; Dutta and Gingler, 2002; Gounopoulos, 2004). This makes the earnings of larger firms less volatile, more predictible, and more accurate than smaller firms. The association between the forecast accuracy and company size is tested upon the following hypothesis;

**H1:** *The larger the company, the greater the forecast accuracy, meaning the lower the forecast error.*

The hypothesis suggests that there will be a negative association between the forecast error and company size.

Different variables have been used in the literature to proxy the size of the company. Some researchers (Eddy and Seifert, 1992; Firth and Smith, 1992; Mohammed et al., 1994) operationalize size as total assets, whereas Mak (1994) operationalizes size as total shareholders' equity immediately after the issue of the shares.

### 4.2.2. Forecast accuracy and company age

Company age is also considered as an important variable which affects the forecast accuracy. Jelic et al.(1998) insist that the earnings of companies with no prior operating history are likely to be more difficult to forecast, given the fact that historical data is an important input to the process of forecasting. Even if a new company is to rely on the operating history of other companies in the same or a related industry, the available information on the operating history of those companies is likely to be a less reliable predictor of future earnings than one's own operating history (Mak, 1994). According to Chen et al. (2001), older companies may be viewed as being less risky due to the fact that they have more experience to draw on when making forecasts of their earnings. Firth and Smith (1992) and Lee et al. (1993) specify that those companies which have been in existence for a number of years would be in a better position to make predictions about their future performance since they are likely to have a better appreciation of market environment and have comparatively better control over their operations. Similarly, Jaggi (1997) point outs that the younger companies may not be able to fully understand and appreciate the environmental impact on their future performance, and the lack of historical bases may hinder their

capability to make accurate forecasts. The association between the forecast accuracy and company age is tested upon the following hypothesis:

**H2:** *The younger the company, the lower the forecast accuracy, meaning the higher the forecast error.*

The above hypothesis suggests that there will be a negative association between forecast error and the company age.

### 4.2.3. Forecast accuracy and forecast horizon

The forecast horizon has also been recognized as another important potential determinant of forecast accuracy. It has been argued in the literature that the degree of forecast accuracy depends on the time horizon of forecasting meaning that accuracy tends to improve with shorter horizon or forecast error tends to increase with longer horizon (Lee et al., 1993; Firth et al., 1995; Jelic et al., 1998; Brown et al., 2000; Chen et al., 2001). Jaggi (1997) specifies that forecasting conducted with a shorter time period can be expected to be more accurate than those conducted with a longer time period, because longer time horizons are associated with greater uncertainty. Jaggi, moreover, insists that forecasting made closer to the end of the forecasting horizon will have a better set of information on which the forecasts are based.

On the other hand, there is a counter argument that a longer time horizon would provide management with an opportunity to adjust the company's operations and exercise discretion in the maintainance and capital expenditures decisions which would result in bringing the actual results closer to forecasts (Jaggi, 1997: 307). The following hypothesis is employed to test the association between forecast accuracy and time horizon of forecasts:

**H3:** *The shorter the time horizon of forecasts, the greater the accuracy of forecast, meaning the lower the forecast error.*

This hypothesis suggests that there will be a negative association between forecast error and the forecast interval.

### 4.2.4. Forecast accuracy and underwriter reputation

Underwriter reputation is also considered to be another important variable which may influence the forecast accuracy. Investment banks with many offerings over time, can develop a reputational capital for having the ability to price and asses market conditions. Thus, they become reliable for third party information producers and have certification role in the IPO markets (Booth and Smith, 1986; Megginson and Weiss, 1991; Nanda and Yun, 1997; Dunbar, 2000). Since investment banks carry reputational concerns, investors take the reputable investment banks participation as a positive signal in the IPO process. Likewise, issuers who believe they have favorable inside information select high-reputable investment banks to take the firm public. Issuing firms are viewed as effectively leasing the brand

name of an investment bank to certify that the issue price reflects available inside information.

A number of researchers developed models that delineate the owner's incentive to signal through the quality of the investment bank selected for the issue (Titman and Trueman, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994). Their models show that an owner with favorable information about the firm can convey this information to the market through the quality of the investment bank. Investors are able to infer that an entrepreneur who chooses a higher-quality investment bank must have more favorable private information since a choice cannot be mimicked by an entrepreneur with less favorable information. To accomodate this factor as a determinant of forecast accuracy, the following hypothesis is employed:

*H4: The more reputable underwriter, the greater the accuracy of forecast, meaning the lower the forecast error.*

This hypothesis suggests that the relation between the forecast error and the underwriter reputation will be negative.

### 4.2.5. Forecast accuracy and auditor's reputation

Auditors' decisions and actions should be influenced by reputational concerns (McCracken, 2003: 165). Acoording to DeAngelo (1981) reputation arguments suggest that large auditing firms face a greater loss of rents as a result of inaccurate reporting. DeAngelo (1981) also suggests that, the Big Six audit firms are the high quality producers of audits and are likely to be associated with more successful new issues. Palmrose (1988) suggests that auditing firms have an incentive to investigate and report deviations in the application of accounting principles since their reputation capital is reduced by ex post revelation of errors or misstatements. In a similar vein, Beatty and Ritter (1986) argues that auditing firms that have invested more in reputation capital have greater incentives to reduce application errors, thus, the information disclosed in the accounting reports audited by these firms will be more precise. Simunic and Stein (1987) also insist that the Big Six audit firms are the producers of high quality audits and that they have very large investments in reputational capital. It has been argued that if a new issue turns sour, the Big Six auditors would have comparatively more to lose. Therefore, they exercise greater caution to ensure greater accuracy of forecasts contained in IPO prospectuses. Alternatively, the choice of a high quality auditor could be viewed as a signaling mechanism where high quality auditors will be selected by firms with more favorable information. Thus, we hypothesize a negative relationship between forecast error and audit reputation as below:

*H5: The more reputable auditing firm, the greater forecast accuracy, meaning the lower the forecast error.*

### 4.2.6. Forecast accuracy and company's financial leverage

The sixth hypothesis we employed is the relationship between the level of financial leverage and the degree of forecast accuracy. The company's financial leverage may become an important explanatory variable for forecasting accuracy under certain conditions. It has been argued that the net earnings of companies with a comparatively high level of debt are traditionally regarded as being more volatile and at the same time more difficult to forecast (Eddy and Seifert, 1992; Firth and Smith, 1992; Jaggi, 1997). On the basis of these discussions, the following hypothesis is employed to test the relation between forecast accuracy and financial leverage:

**H6:** *The greater the financial leverage, the lower the forecast accuracy, meaning the higher the forecast error.*

This hypothesis suggests that the relation between the forecast error and financial leverage will be positive.

### 4.2.7. Forecast accuracy and retained ownership

The final hypothesis relates to the relationship between the proportion of shares retained by the existing owners of the companies and the degree of forecast accuracy. The proportion of shares retained by the existing owners of the company may reflect forecast integrity, according to Gounopoulos (2004: 14). He points out that a lower proportion may signal owner concern about forecasting accuracy while a higher proportion of shares retained indicates higher confidence and forecasting achievaibility. A higher percentage of proportion of shares of management ownership may signal that the managers-owners are more confident about the future prospects of the company. It further suggests that as a result of this confidence they are likely to commit more resources and attach a greater importance to the earnings forecasts as a signal of the quality of their company (Firth and Liau-Tan, 1997; Jelic et al., 1998). Moreover, insiders have other means to predict profits while outsiders have to rely upon the prospectus forecasting (Chen et al., 2001; Jog and McConomy, 2003). They argue that the larger the number of outside shareholders the greater the problem if the forecasts are not accurate. The following hypothesis is employed to test the association between forecast accuracy and the proportion of retained ownership:

**H7:** *The higher the proportion of retained ownership, the higher the forecast accuracy, meaning the lower the forecast error.*

This hypothesis suggests that the association between forecast error and the proportion of shares retained by pre-issue owners will be negative.

Table 5 summarizes the results of earlier studies with respect to the determinants of forecasting accuracy in IPO prospectuses.

**Table 5**
Determinants of Prospectus Forecast Errors Investigated in Prior Studies

| Study | Country | Size | Auditing Firm Reputation | Investment Bank Reputation | Forecast Horizon | Firm Leverage | Firm Age | Retained Ownership |
|---|---|---|---|---|---|---|---|---|
| Firth & Smith (1992) | New Zeland | (+)*** | (+) | | (+) | (+) | (-) | |
| Jaggi (1997) | Hong Kong | (+) | (-) | | (+) | (-) | (-)** | |
| Jelic et al. (1998) | Malaysia | (+) | (+) | | | (-) | (-)* | (-) |
| Jaggi & Jain (1998) | Hong Kong | (-)*** | | | (+)*** | | | |
| Chen & Firth (1999) | China | (+)** | (-) | (+) | (+) | (-) | (-) | (+) |
| Yau & Chun (1999) | Malaysia | (-) | (+)** | | (+)** | (+) | (-) | |
| Hartnett & Romcke (2000) | Australia | (-) | (-)** | | | | | (+) |
| Cheng & Firth (2000) | Hong Kong | (+) | (-)** | (+)** | (+) | (+) | (-)* | |
| Clarkson (2000) | Canada | (-)*** | (+)** | | (+)** | (+)* | (-)* | |
| Gounopoulos (2004) | Greece | (+) | | (+) | (+) | (-) | (-)** | (-)** |
| Lonkani & Firth (2005) | Thailand | (+)** | | | (+)** | (+) | (-) | |
| Ström (2006) | Sweden | (-) | | | (-) | | (-)* | |
| Jaggi et al. (2006) | Taiwan | (+) | | | (+)*** | | | |
| Chong & Ho (2007) | Singapore | (-) | (-)** | (-)** | (-) | | (-) | (-) |
| Kwag & Small (2007) | U.S. | (+)*** | | | | | | |

Firm size is natural log of the firm's total assets as at before issue year. Auditing firm reputation is a dummy variable taking the value one (1) if the reporting auditor is one of the big eight auditing firms; otherwise coded zero (0). Investment bank reputation is a dummy variable taking value one (1) if the selected underwriter is one of the big six investment banks; otherwise coded zero (0). Forecast horizon is the number of months from the date of prospectus registration to the date of first earnings announcement. Firm leverage is the debt ratio of the firm, computed as the ratio of total liabilities to total assets for pre IPO year. Firm age is the number of years from the date of incorporation to the date of prospectus registration. Management ownership is one minus the number of shares in the prospectus as a percentage of total shares outstanding after the IPO. The signs in the paranthesis with regard to the correlation coefficient of the variables and report the direction of association between the variable (forecast error) and dependent variable. *** The result is significant at the one per cent level, ** The result is significant at the five per cent level. * The result is significant at the ten per cent level.

On the basis of the arguments above the following cross-sectional regression model was constructed to test all the hypothesis. Description of variables used in explaining absolute forecast errors are reported in Table 6.

$$AFE_i = \beta_{0i} + \beta_1 SIZE_i + \beta_2 AFREP_i + \beta_3 IBREP_i + \beta_4 FH_i + \beta_5 LEVER_i + \beta_6 AGE_i + \beta_7 RETAIN_i + \alpha_i$$

**Table 6**
The Regression Model and Summary of Explanatory Variables

| $AFE_i = \beta_{0i} + \beta_1 SIZE_i + \beta_2 AFREP_i + \beta_3 IBREP_i + \beta_4 FH_i + \beta_5 LEVER_i + \beta_6 AGE_i + \beta_7 RETAIN_i + \alpha_i$ | | |
|---|---|---|
| $AFE_i$ | : | Absolute forecast error for company i; Equation 2 is used for AFEi, |
| $\beta_{0i}$ | : | Constant |
| $SIZE_i$ | : | The size for company i as a pre-IPO total assets, |
| $AFREP_i$ | : | The auditing firm reputation at the IPO underwriting coalition; it is a dummy varaiable taking the value of one if the reporting auditor is one of the Big Eight auditing firms, otherwise coded zero. Cankaya and Er (2007)'s auditing firm reputation measures made for the Turkish IPO market is used in the analysis, |
| $IBREP_i$ | : | The underwriter's reputation; it is a dummy variable taking the value of one if the selected underwriter is one of the Big Six investment banks, otherwise coded zero, Bulut (2008)'s underwriter reputation measures made for Turkish IPO market is used in this analysis, |
| $FH_i$ | : | The forecast horizon for company i, |
| $LEV_i$ | : | The financial leverage for company i, |
| $AGE_i$ | : | Age of company i from incorporation to prospectus date, |
| $RETAIN_i$ | : | The proportion of shares retained by pre-issue owners; RETAIN = ALPHA + ln (1- Alpha) as in How and Yeo (2001); where ALPHA means the offer rate at the IPO, |
| $\alpha_i$ | : | Error term. |

## 5. Empirical Results

Descriptive statistics of the major variables are reported in Table 7. These variables are investigated to see whether they carry any effect on forecasting accuracy for the Turkish IPO firms. The average age of the IPOs at the time of listing is about 14 years. The maximum value for age is 50 years and the minimum is 2 years. The forecast horizon varies between 32 and 119 months. Mean forecast horizon for the sample is 81,63 months. The size of the sample companies varies substantially. The biggest company with pre-listing year's assets during the forecast period amounting in 9,78 (around 783 million TL) as logarithmic. On average, the owners of the sample firms retained their ownership after the initial public offering with a

range from 53,91 to 91,89. Mean retained ownership by pre-IPO owners is 74 % after the IPOs. The sample firms carry a median level of 53 % financial leverage just before the IPO. While about 37% of the sample firms are high-reputable investment banks backed-IPOs, 50% of the sample firms are high-reputable auditing firm backed-IPOs.

<div align="center">

**Table 7**
Description Statistics of Continuous and Discrete Independent Variables

</div>

| Variable | Mean | Median | Standart Deviation | Minimum | Maximum | Proportion =1 |
|---|---|---|---|---|---|---|
| AGE (year) | 14,63 | 11,00 | 12,02 | 2,00 | 50,00 | |
| RETAIN (%) | 74,31 | 73,53 | 9,41 | 53,91 | 91,89 | |
| SIZE | 8,16 | 8,17 | 0,91 | 6,69 | 9,78 | |
| IBREP | | | | | | 36,70 |
| AFREP | | | | | | 50,00 |
| FH (month) | 81,63 | 74,00 | 28,36 | 32,00 | 119,00 | |
| LEVER (%) | 53,79 | 51,91 | 26,99 | 2,53 | 90,61 | |

SIZE, natural log of the firm's total assets as at before issue year. AFREP, a dummy variable taking the value one (1) if the reporting auditor is one of the big eight auditing firms; otherwise coded zero (0). IBREP, a dummy variable taking value one (1) if the selected underwriter is one of the big six investment banks; otherwise coded zero (0). FH, the number of months from the date of prospectus registration to the date of first earnings announcement. LEVER, debt ratio of the firm, computed as the ratio of total liabilities to total assets for pre IPO year. AGE, the number of years from the date of incorporation to the date of prospectus registration. RETAIN = ALPHA + ln(1-ALPHA) where ALPHA is one minus the number of shares offered in the prospectus as a percentage of total shares outstanding after the IPO. *** Significant at the one per cent level, **Significant at the five per cent level *Significant at the ten per cent level.

The correlation matrix in Table 8 suggests that there is positive relation between investment bank reputation and firm size at a 10 % significant level. The highest correlation between the independent variables is the one which stands between size-leverage with a positive coefficient of 0,50. These results point out that larger frms employ more reputable investment banks while they use more debt financing. Before proceeding, we should mention that one would expect a correlation between size and age because the majority of large firms have a long history of operation. The correlation coefficient for size-age is positive at 0,25.

Now, we are going now to examine the ability of the various variables to explain simultaneously why some forecasts are more accurate than others. We will focus on testing Hypothesis H1-H7. We will manage it by applying a cross sectional regression analysis. The $R^2$ and F-Statistics have been utilized to test whether the seven independent variables can significantly explain the dependent variable, AFE, of management forecast. The Notion that the higher the $R^2$, the higher the AFE, explains the percentage of the variation by the seven variables. If the F ratio is above the corresponding value the regression as a whole is significant. At the same time t-test with 0.10 significance level was performed to examine which variables are major factors in determining absolute forecast error.

**Table 8**
Pearson Correlation Matrix

|        | AGE   | RETAIN | SIZE    | IBREP  | AFREP  | FH     | LEVER |
|--------|-------|--------|---------|--------|--------|--------|-------|
| AGE    | 1,00  |        |         |        |        |        |       |
| RETAIN | 0,127 | 1,00   |         |        |        |        |       |
| SIZE   | 0,252 | 0,242  | 1,00    |        |        |        |       |
| IBREP  | 0,170 | 0,069  | 0,372*  | 1,00   |        |        |       |
| AFREP  | 0,291 | 0,318  | 0,021   | 0,346  | 1,00   |        |       |
| FH     | 0,321 | -0,302 | -0,160  | 0,213  | 0,059  | 1,00   |       |
| LEVER  | 0,152 | 0,354  | 0,507** | -0,021 | -0,020 | -0,358 | 1,00  |

SIZE, natural log of the firm's total assets as at before issue year. AFREP, a dummy variable taking the value one (1) if the reporting auditor is one of the big eight auditing firms; otherwise coded zero (0). IBREP, a dummy variable taking value one (1) if the selected underwriter is one of the big six investment banks; otherwise coded zero (0). FH, the number of months from the date of prospectus registration to the date of first earnings announcement. LEVER, debt ratio of the firm, computed as the ratio of total liabilities to total assets for pre IPO year. AGE, the number of years from the date of incorporation to the date of prospectus registration. RETAIN = ALPHA + ln(1-ALPHA) where ALPHA is one minus the number of shares offered in the prospectus as a percentage of total shares outstanding after the IPO. *** Significant at the one per cent level, **Significant at the five per cent level *Significant at the ten per cent level.

Table 9 is related with the AFE dependent variable. Common with the findings from other studies, the explanatory power of the model is high with adjusted $R^2$ of 0.30 for the AFE.

The size variable is highly statistically related to the level of forecast accuracy at a 1 percent level, suggesting that smaller firms tend to improve forecast accuracy. The coefficient for the size variable has the same sign from our prediction. Thus, our finding is consistent with the results reported by Jaggi and Jain (1998) and Clarkson (2000) that managers in larger firms present more accurate results than managers in smaller firms. Conversely our results contradict results reported by Firth and Smith (1992), Jaggi and Jain (1998) Clarkson (2000) and Lonkani and Firth (2005) that managers in larger firms tend to be less accurate than managers in smaller firms. The result accepts hypothesis one.

Age coefficient has the expected negative sign, though not significant. This finding is in line with all evidences stating that profits of companies with shorter operating history are intrinsically more difficult to forecast and indeed older firms announce more accurate forecast profits. Our deduction for age is consistent with results reported by Firth and Smith (1992), Chen and Firth (1999) and Lonkani and Firth (2005). Our result indicates greater forecast accuracy for firms with longer operating histories. However, it is statistically insignificant. Gounopoulos (2004) suggested that forecasting the earnings of a brand new company is no harder than forecasting for an existing company with a track record of performance. According to the researcher, generally firms with operating histories of decades outline more stable presence and earnings forecasts prediction. Gounopoulos (2004) found some support for the relation between firm age and absolute forecast error. But our result rejects hypothesis two.

**Table 9**
Cross Sectional Regression Results of AFE

| Variable | Coefficient | Standart Deviation | t statistics | Probability |
|---|---|---|---|---|
| Intercepts | 2,780 | 1,704 | 1,631 | 0,117 |
| AGE | -0,023 | 0,017 | -1,352 | 0,190 |
| RETAIN | -0,055 | 0,021 | -2,608 | 0,016** |
| SIZE | -2,915 | 0,000 | -2,871 | 0,009*** |
| IBREP | -0,675 | 0,438 | -1,543 | 0,137 |
| AFREP | 0,720 | 0,412 | 1,746 | 0,095* |
| FH | 0,015 | 0,008 | 1,907 | 0,070* |
| LEVER | 1,009 | 0,814 | 1,239 | 0,228 |
| $R^2$ (%) | 47,1 | | | |
| Adjusted $R^2$ (%) | 30,2 | | | |
| F-value (p value) | 2,795 (0,031)** | | | |
| N | 30 | | | |

SIZE, natural log of the firm's total assets as at before issue year. AFREP, a dummy variable taking the value one (1) if the reporting auditor is one of the big eight auditing firms; otherwise coded zero (0). IBREP, a dummy variable taking value one (1) if the selected underwriter is one of the big six investment banks; otherwise coded zero (0). FH, the number of months from the date of prospectus registration to the date of first earnings announcement. LEVER, debt ratio of the firm, computed as the ratio of total liabilities to total assets for pre IPO year. AGE, the number of years from the date of incorporation to the date of prospectus registration. RETAIN = ALPHA + ln(1-ALPHA) where ALPHA is one minus the number of shares offered in the prospectus as a percentage of total shares outstanding after the IPO. *** Significant at the one per cent level, **Significant at the five per cent level *Significant at the ten per cent level.

The coefficient for horizon is positive and consistent with our expectations for lower absolute forecast error as the prediction period becomes shorter. Contrarily there is no proof for any significance of the results. The result for the horizon is consistent with results reported by Firth and Smith (1992), Jelic et al (1998) and Gounopoulos (2004) who explain the lack of a significant relationship between forecast error and forecast horizon. The result rejects hypothesis three.

The underwriter variable has the expected negative sign but the coefficient is not statistically significant. The rationale is well described by Brown at al. (2000), that the forecast provided by firms going public with a prestigious underwriter should be more accurate as it is likely that the forecasts are based on information provided by underwriters. In the Turkish case more reputable underwriters seem to be associated with better predictive accuracy. This result is consistent with the finding by Chen et al (2001) Gounopoulos (2004) an Chong and Ho (2007) indicating that reputable underwriters are more accurate than their unreputable counterparts. Our result rejects hypothesis four.

The result with regard to the company's auditor is not in the expected direction for profits and the coefficient is insignificant also. This result does not support hypothesis five, that the IPO forecast accuracy would be higher

if the company is audited by a reputable auditing firm. Our result show that there is no association between the forecast accuracy and the company's auditor.  The results of earlier studies have also shown that there is no association between the forecast accuracy and the company's auditor. Firth and Smith (1992) did not find this association for New Zealand companies. Additionaly, Firth et al. (1995) did not find this association for Singapore companies. On the other hand, Hartnett and Romcke (2000), Cheng and Firth (2000) and Chong and Ho (2007) reported that there is significant inverse relation between company's auditing firm reputation and absolute forecast error.

The coefficient of leverage measured by ratio of total liabilities to total assets for pre-IPO year is positive, consistent with the positive sign hypothesized and not statistically significant. Such a result shows that the leverage control factor proves fruitless in explaining forecast accuracy. Our result is consistent with results reported by Eddy and Seifert (1992), Yau and Chun (1999), Cheng and Firth (2000), Chen et al (2001) and Lonkani and Firth (2005). They found that the higher the financial leverage and the higher the risk faced by the company, the higher the absolute forecast error reported. However, the finding in our study was not statistically significant. So, our result rejects hypothesis six.

The ownership variable is statistically related to the level of forecast accuracy at 5 percent level suggesting that the level of retained ownership by entrepreneurs tends to improve forecast accuracy. The result for the ownership is consistent with results reported by Gounopoulos (2004) that the larger the number of outside shareholders the greater the chance of a problem if the forecasts are inaccurate. The results of earlier studies have also shown that there is a positive relation between management ownership and the forecast error e.g. Chen and Firth (1999) on Chinese companies and Hartnett and Romcke (2000) on Australian companies. The result accepts hypothesis seven.

The results of the regression analysis and the hypothesis used in this study are shown in Table 10. Based on seven determinants of forecasting accuracy, two of seven hypothesis ($H_1$ and $H_7$) are accepted as they are statistically significant at 0,05 level. The rest of the seven hypothesis are not accepted since they are not statistically significant at 0,05 level though two of them ($H_3$ and $H_5$) are statistically significant at 0,1 level.

## 6. Conclusions

The primary objective of this study is to examine the accuracy of earnings forecasts included in the prospectuses of Turkish companies seeking listing on the ISE main board. Our study is the first to investigate the accuracy of IPO earnings forecasts in the Turkish IPO market. The findings of this study provide useful information on bias and accuracy of IPO forecasts as well as on the impact of different company-specific

characteristics on forecasting accuracy. The findings demonstrate that like most IPO forecasts disclosed in most other countries, IPO forecasts disclosed by Turkish companies are generally optimistic. Mostly, Turkish companies' actual earnings have been lower than their forecasted earnings, meaning that managers have been overestimating their earnings forecasts.

**Table 10**
The Hypothesis Used in the Study and Results

|  |  |  |  | t statistic | Result |
|---|---|---|---|---|---|
| $H_1$: | Forecast Error | <-- | Firm Size | -2,871 | Accepted |
| $H_2$: | Forecast Error | <-- | Firm Age | -1,352 | Not accepted |
| $H_3$: | Forecast Error | <-- | Forecast Horizon | 1,907 | Not accepted |
| $H_4$: | Forecast Error | <-- | Investment Bank Reputation | -1,543 | Not accepted |
| $H_5$: | Forecast Error | <-- | Auditing Firm Reputation | 1,746 | Not accepted |
| $H_6$: | Forecast Error | <-- | Firm Leverage | 1,239 | Not accepted |
| $H_7$: | Forecast Error | <-- | Management Ownership | -2,608 | Accepted |

Firm size is natural log of the firm's total assets as at before issue year. Auditing firm reputation is a dummy variable taking the value one (1) if the reporting auditor is one of the big eight auditing firms; otherwise coded zero (0). Investment bank reputation is a dummy variable taking value one (1) if the selected underwriter is one of the big six investment banks; otherwise coded zero (0). Forecast horizon is the number of months from the date of prospectus registration to the date of first earnings announcement. Firm leverage is the debt ratio of the firm, computed as the ratio of total liabilities to total assets for pre IPO year. Firm age is the number of years from the date of incorporation to the date of prospectus registration. Management ownership is one minus the number of shares in the prospectus as a percentage of total shares outstanding after the IPO.

Accuracy is measured for 30 companies out of a total of 33 IPOs during the period of 2002 to 2007 using forecast errors, absolute forecast errors and squared forecast errors. The results indicate that, on average, there are a minus of 13.44% forecast error and 79.01 absolute forecast error. Here the minus sign means that managers have been overestimating forecasts.

The accuracy of the forecasts are tested with a regression analysis by using a number of plausible company specific characteristics such as size, age, forecast interval, gearing, proportion of shares retained by pre-IPO owners and the reputation of both underwriters and auditors. The results reveal that the size and retained ownership are statistically significant, meaning that larger firms and high-retained ownership firms have better forecast accuracy.

On the basis of these findings, we conclude that IPO forecasts disclosed by Turkish companies provide reliable forecast information. Our findings need to be interpreted with caution because the regression model might not have include all relevant variables and thus the omitted variables such as industry, macro economic conditions and profit volatility might have influenced the results of this study.

# References

BEATTY, R.and RITTER J., (1986), "Investment Banking, Reputation and the Underpricing of Initial Public Offerings", *Journal of Financial Economics*, 15: 213-232.

BHASKÂR, K., and MORRIS, R., (1984), "The Accuracy of Brokers' Earnings Forecasts in the UK", *Accounting and Business Research,* 14: 113-124.

BOOTH, J.R., and SMITH, R.L., (1986), "Capital Raising, Underwriting and the Certification Hypothesis", *Journal of Financial Economics*, 15(1-2): 261-281.

BROWN, P., CLARKE, A., HOW, J., and LIM, K., (2000), "The Accuracy of Management Dividend Forecasts in Australia", *Pacific-Basin Finance Journal*, 8(3): 309-331.

BULUT, H.İ., (2008), 'Investment Bank Reputation and the Post-IPO Operating Performance: The Case of the Istanbul Stock Exchange', *Istanbul Stock Exchange Journal* 10(39): 17-40.

ÇANKAYA, F., and ER, B., (2007), "Auditing Firm Reputation, Underpricing and the Post-Issue Operating Performance: A Case of İstanbul Stock Exchange', The Turkish Foundation for Collaboration of Accounting Academician, *The World of Accounting Science,* 9: 51-74.

CARTER, R. and MANASTER, S., (1990), "Initial Public Offerings and Underwriter Reputation", *Journal of Finance*, 45: 1045-1068.

CHAN, A.M.Y., SIT, C.L.K, TONG, M.M.Y., WONG, D.C.K., and CHAN, R.W.Y., (1996), "Possible Factors of Accuracy of Prospectuses Earnings

CHEMMANUR, T.J. and FULGHIERI, P., (1994), "Investment Bank Reputation, Information Production and Financial Intermediation", *Journal of Finance*, 49: 57-79.

Forecasts in Hong Kong", *The International Journal of Accounting*, 31(3): 381-398.

CHEN, G., FIRTH, M., and KRISHNAN, G., (2001), "Earnings Forecast Errors in IPO Prospectuses and Their Associations with Initial Stock Returns". *Journal of Multinational Financial Management*, 11(2): 225-240.

CHEN, G., and FIRTH, M., (1999), 'The Accuracy of Earnings Forecasts and Their Roles and Associations with IPO Firm Valuations", *Journal of International Financial Management and Accounting*, 10(3): 202-226.

CHENG, T., and FIRTH, M., (2000), "An Empirical Analysis of the Bias and Rationality of Earnings Forecasts Published in New Issue Prospectuses", *Journal of Business Finance & Accounting,* 10(3-4): 423-446.

CHONG, B.S., and HO, K.W., (2007), "Lockup and Voluntary Earnings Forecast Disclosure in IPOs", *Financial Management*, 36(3): 63-80.

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

COX, C.T., (1985), "Further Evidence on the Representativeness of Management Earnings Forecasts", *The Accounting Review*, 60(4): 692-701.

DE ANGELO, L., (1981), "Auditor Size and Audit Quality", *Journal of Accounting and Economics,* 3(3): 183-199.

DUNBAR, C., (2000), "Factors Affecting Investment Bank Initial Public Offering Market Share". *Journal of Financial Economics*, 55: 3-41.

DUTTA, S., and GIGLER, F., (2002), "The Effect of Earnings Forecasts on Earnings Management", *Journal of Accounting Research,* 40: 631-655.

EDDY, A., and SEIFERT, B. (1992), "An Examination of Hypothesis Concerning Earnings Forecast Errors", *Quarterly Journal of Business and Economics,* 3(2): 22-37.

FIRTH, M., and SMITH, A., (1992), "The Accuracy of Earnings Forecasts in Initial Public Offerings Prospectuses", *Accounting and Business Research,* 22(87): 239-247.

FIRTH, M. A., KWOK, B. C -H., LIAU-TAN, C-K. and YEO, G. H.-H., (1995), "Accuracy of Earnings Forecasts Contained in IPO Prospectuses", *Accounting and Business Review,* 1(1): 55-83.

FIRTH, M., (1997), "An Analysis of the Stock Market Performance of New Issues in New Zealand", *Pacific-Basin Finance Journal*, 5(1): 63-85.

FIRTH, M, and LIAU-TAN, C,K, (1997), "Signalling Models and the Valuation of New Issues: An Examination of IPOs in Singapore", *Pacific-Basin Finance Journal,* 5: 511-526.

FIRTH, M., (1998), "IPO Earnings Forecasts and Their Role in Signalling Firm Value and Explaining Post-Listing Returns", *Applied Financial Economics,* 8(1): 29-39.

GOUNOPOULOS, D., (2004), "Accuracy of Management Earnings Forecasts in IPO Prospectuses: Evidence from Athens Stock Exchange", http://ssrn.com/abstract =612225.

GRAMLICH, J. D., and SORENSEN, O., (2004), "Voluntary Management Earnings Forecasts and Discretionary Accruals: Evidence from Danish IPOs", *European Accounting Review*, 13(2): 235-259.

HARTNETT, N. and ROMCKE, J., (2000), "The Predictability of Management Forecast Error: A Study of Australian IPO Disclosures", *Multinational Finance Journal*, 4(1-2): 101-132.

HOW, J.C.Y., and YEO, J., (2001), "The Impact of Forecast Disclosure and Accuracy on Equity Pricing: The IPO Perspective", *Journal of Accounting, Auditing and Finance*, 16(4): 401-425.

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.

JAGGI, B., and JAIN, R., (1998), "An Evaluation of Financial Analysts' Earnings Forecasts for Hong Kong Firms", *Journal of International Financial Management and Accounting*, 9(3): 177-200.

JAGGI, B., CHIN, C., LIN, W., and LEE, P., (2006), "Earnings Forecast Disclosure Regulation and Earnings Management: Evidence from Taiwan IPO Firms", *Review of Quantitative Finance and Accounting,* 26(3): 275-299.

JELIC, R., SAADOUNI, B., and BRISTON, R., (1998), "The Accuracy of Earnings Forecast in IPO Prospectuses on the Kuala Lumpur Stock Exchange 1984-1995", *Accounting and Business Research,* 29(1): 57-72.

JOG, V., and MCCONOMY, B.J., (2003), "Voluntary Disclosures of Management Earnings Forecasts in IPO Prospectuses", *Journal of Business, Finance & Accounting,* 30(1-2): 125-167.

KEASEY, K., and MCGUINESS, P., (1991), "Prospectus Earning Forecasts and the Pricing of New Issue on the Unlisted Securities Market", *Accounting and Business Research,* 21(82): 133-145.

KWAG, S.W., and SMALL, K., (2007), "The Impact of Regulation Fair Disclosure on Earnings Management and Analyst Forecast Bias", *Journal of Economics and Finance*, 31(1): 87-98.

LEE, P., TAYLOR, S., YEE, C., and YEE, M., (1993), "Prospectus Earnings Forecasts: Evidence and Explanations", *Australian Accounting Review*, 3: 21-32.

LONKANI, R., FIRTH, M., (2005), "The Accuracy of IPO Earnings Forecasts in Thailand and Their Relationships with Stock Market Valuation", *Accounting and Business Research*, 35(3): 269-286.

MAK, Y.T., (1994), "The Voluntary Review of Earnings Forecasts Disclosed in IPO Prospectuses", *Journal of Accounting and Public* Policy, 13(2): 141-158.

MBUTHIA, E., and WARD, M., (2003), "The Reliability of Pre-Listing Earnings Forecasts on the JSE', *Investment Analysts Journal,* 57: 33-40.

MCCRACKEN S.A., (2003), "Auditors' Strategies to Protect Their Litigation Reputation: A Research Note', *Auditing: A Journal of Research & Theory*, 22(1): 165-179.

MEGGINSON, W. ve WEISS, K., (1991), "Venture Capitalist Certification in Initial Public Offerings', *Journal of Finance*, 46: 879-904.

MOHAMAD, S., NASIR, A., KUING, T.K., and ARIF, M., (1994), "The Accuracy of Earnings Forecasts of Malaysian IPOs", *Capital Markets Review*, 2(2): 46-69.

NANDA, V. and YUN, Y., (1997), "Reputation and Financial Intermediation: An Empirical Investigation of the Impact of IPO Mispricing on Underwriter Market Value", *Journal of Financial Intermediation,* 12: 97-102.

PALMROSE, Z., (1988), "An Analysis of Auditor Litigation and Auditor Service Quality", *The Accounting Review,* 63: 55-73.

PEDWELL, K., WARSAME, H., and NEU, D., (1994), "The Accuracy of Canadian and New Zealand's Earnings Forecasts: A Comparison of Voluntary is Compulsory Disclosures", *Journal of International Accounting, Auditing and Taxation,* 3: 221-236.

SIMUNIC, D.A., STEIN, M., (1987), "Product Differentation in Auditing: Auditor Choice in the Market for Unseasoned New Issues", Monograph Prepared for the Canadian Certified General Accountant Research Foundation.

SIOUGLE, G., (2007), "Earnigs Forecasts Disclosed in SEO Prospectuses: Evidence from an Emerging Market", *Journal of Emerging Market Finance*, 6(3): 249-267.

STROM, N., (2006), "IPO Pricing - Does Prospectus Disclosure Matter?", Working paper - Uppsala University.

TITMAN, S., TRUEMAN, B., (1986), "Information Quality and the Valuation of New Issues", *Journal of Accounting and Economics*, 8(2): 159-172.

YAU, F.S., and CHUN, L.S., (1999), "Earnings Forecast Accuracy and Bias in Initial Public Offerings in Malaysia", *Singapore Management Review*, 21(2): 89-108.

# Özet

## Halka arz izahnamelerinde açıklanan kâr tahminlerinin doğruluğu: Türkiye örneği

Bu çalışmada 2000-2007 döneminde Türkiye'de ilk halka arz olan firmaların yapmış oldukları kâr tahminlerinin doğruluğu araştırılmıştır. Türkiye'deki halka arz firmaları için kâr tahminlerinin açıklanması isteğe bağlı bir durumdur. Bu araştırmada kâr tahminlerinin doğruluğu, tahmin hatası, mutlak tahmin hatası ve düzeltilmiş tahmin hatası ile ölçülmüştür. Firma büyüklüğü, tahmin dönemi uzunluğu, finansal kaldıraç ve yönetici sahiplik düzeyi gibi firmalara ilişkin bir takım özellikler test edilmiştir. Ayrıca yatırım bankası ve denetim firması itibar etkisi de test edilmiştir. Çalışmada elde edilen sonuçlar, diğer birçok ülkede açıklanan tahminlerde olduğu gibi Türkiye'deki firmaların da kârlarını yüksek (ortalama %13,44) tahmin ettiklerini göstermiştir. Çalışmada elde edilen bulgular, Türkiye'deki ilk halka arz firmaları tarafından açıklanan kâr tahminlerinin faydalı bilgiler sağladığı şeklinde değerlendirilebilir.

*Anahtar kelimeler:* Kâr yönetimi, tahmin açıklama, kâr tahminleri, tahmin doğruluğu, tahmin doğruluğunun belirleyicileri, Türkiye'deki ilk halka arzlar.

*JEL sınıflandırması:* C21; G18; G24; G32.