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The ISE Review

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Objectives and Contents

The ISE Review is a journal published quarterly by the Istanbul Stock Exchange (ISE). Theoretical and empirical articles examining primarily the capital markets and securities exchanges as well as economics, money, banking and other financial subjects constitute the scope of this journal. The ISE and global securities market performances and book reviews will also be featuring, on merits, within the coverage of this publication.

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The ISE Review

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GRANGER CAUSALITY BETWEEN STOCK PRICE AND TRADING VOLUME: A STOCK-BASED ANALYSIS IN THE ISE

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M. Sinan TEMURLENK[2]

Abstract

The purpose of this study is to test causal relationships between stock price and trading volume for 9 corporation stock where of the selected from among ISE-30 and companies operating in different sectors in the ISE. The data is based on session's observations approximately 2500 and the period covers 2 January 2003-31 December 2007. Study using Granger causality test; 9 companies whose subject to the application from 7 to the one-way causality from price (return) to trading volume has been determined.

I. Introduction

There are various independent news resources related to securities in the capital markets. analysts who uses different techniques and methods, have benefit from related news sources and carry out evaluations by developing independent and different expectations. Therefore, experts may reach different conclusions on specific securities. The conclusions are reflected to the market as purchase or sale orders and the new values created by the experts using new information,

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result in creation of new prices. Therefore, the new information received by the market is reflected to the market as purchase and sale orders, and creates a non-static balance in the market (Kıyılar, 1997). It might have three types of effect between the price and the trading volume based on the stock or the whole index depending on the special or general characteristic of the information received by the market. It might be thought that the information received by the market will first create an effect on the trading volume of the information and then such effect will be reflected on the price of the stock. However, on the contrary, it is thought that investors will start selling and buying following the decrease and increase in the prices, and that will cause an increase in the trading volume as a secondary effect according to the positive feedback hypothesis. As the third effect, it is thought that there is a bidirectional relation between the price and the volume, and the two variables will act together.

In the studies made about the capital markets; instead of focusing on univariate dynamics of stock prices, more information can be obtained about price-volume relation by studying joint dynamics of stock prices and trading volume. (Gallant et. al., 1992; Yörük, Erdem , Erdem, 2006). Most of the studies carried out to define the dynamic relation between the price and the volume are focused on the existence of a simultaneous relation between the price and the volume. A consensus is reached on the subject that the price and volume relation has a dynamic structure in the recent empirical studies, and a relation of causality is started to be search t on daily stock prices and volume. Granger causality tests started to be used in order to determine the direction of the relation (Chen and Liao, 2005; Bayrakdaroğlu and Nazlıoğlu, 2009).

It can be mentioned about four basic elements that are made in direction of stock markets and make the relations important between price and trading volume which are of considerable significance for investors can be discoursed. These elements are mainly as follows (Gökçe, 2002; Badhani and Suyal, 2005; Bayrakdaroğlu and Nazlıoğlu, 2009):

* The relation between the price and the volume are significant in terms of the internal structure of financial markets. All studies carried out on this subject are based on the information flow in the market, how this flow processes, and how the prices comply with the information reaching the market.

* Once the existence of some relation between the price and the volume in financial market and the direction of this relation are determined; foresights and volatility conjectures will be more efficient.

* The relation between the price and the volume is significant in terms of determining speculative movements in prices (the prices) and obtaining quantitative findings.

* The relation between the price and the volume is significant in terms of having the power to influence the expectations that the markets have and the formation of the market structure to come into being in the future.

The relationship between stock prices and volume can be used as the basis of a trading strategy and as evidence for existence of efficiency or inefficiency of stock markets. (Silvapulle and Choi, 1999; Yörük, Erdem, Erdem, 2006).

II. Literature Survey

When literature is examined, it is seen that the relationships between the stock price and the volume have been subject for many applied studies. In researches performed by Rogalski (1978), Smirlock and Starks (1988) and Jain and John (1988) which are among the primary researches in direction of the world markets; they figured out unidirectional Granger causality relationship from price to transaction volume. In the Hiemstra and Jones (1994), the existence of the relationship between the price and the volume was researched by using the daily data formed in New York Stock Exchange with Granger causality tests, the existence of a bidirectional relationship was determined. Anderson (1996) figured out a positive relationship between the volatility of return and the trade volume by using the daily data in New York Stock Exchange. Chen, Firth and Rui (2001); found a significant positive correlation between trading volume and the absolute value of the stock prices in the research they carried out in share markets of 9 countries that are primarily New York, Tokyo, London, Paris, Toronto, Milano, Amsterdam and Zurich. Hsin et. al. (2003) figured out that stock return volatility was influenced by trading volume in a positive and significantly in their research carried out on stock market of Taiwan. Fan, Groenwold, and Wu (2003) examined the relationship between trading volume

and stock returns for two Chinese A—share markets and ten individual stocks in the energy sector. They reported a strong evidence a return causing volume. Rashid (2007) Karachi (Pakistan) stock exchange the analysis suggests that the linear Granger causality from volume change to stock price change depends on the direction of the stock price movement.

When we look at the studies in direction of ISE; Gökçe (2002) reached the conclusion in his research he carried out by using the daily index values and transaction volume values that price changes and changes in transaction volume were causes in Granger sense, and therefore the direction of the relationship was from price to transaction volume. Yörük, Erdem and Erdem (2006) discovered a bidirectional relationship in nonlinear Granger causality test in their studies they performed on Turkish banking industry; whereas there was a strong relationship from the transaction volume to the price based on linear Granger causality. Baklacı, Kasman (2006) obtained the finding that transaction volume effects the return volatility processes of stock in Turkish stock certificate market in their studies they performed by using the daily data of 25 shares. Bildik and Günay (2008) reached the conclusion that stock were affected positively or negatively when an event happened no matter these stocks were included in index, and at the same time transaction volume and volume volatility were affected by this event significantly. In Akar's research (2008) where he studied the existence of causality relationship between index prices and net foreign transaction volume by using monthly data, as well pointing at bidirectional causality, the results obtained show that there is a statistically stronger causality from index price to foreign transaction volume. In their short-term study they performed on 10 selected banks, Bayrakdaroğlu and Nazlıoğlu (2009) discovered that there was no causality relationship between the price and the volume in general in any banks selected in the nonlinear causality test they performed, whereas they figured out that there were no causality relationships between the price and the volume for 5 banks.

III. Data Set and the Method

With this study, it is aimed to determine whether there is a causality relationship between the price and the volume in stocks trading in ISE certificates transacted

in ISE; and to determine the direction of the relationship if such a relationship exists. For this reason, the period between the dates 02.01.2003 and 31.12.2007 is chosen as test period; and almost 2500 seance observations. Expecting that there stock certificates transaction volume will be high, they were chosen from ISE-30 and companies functioning in different industries in order to provide the feature of representing share market. The survey selected companies; Bandırma Fertilizer Plant Co. (BAGFAS), Enka Construction and Industry Co. (ENKA), Ereğli Iron and Steel Works Stone (EREGL), T. Garanti Bank Co. (GARAN), Petkim Petrochemical Holding Co. (PETKM), Turkcell Contact Services Co. (TCELL), Turkish Airlines (THYAO), Tofaş Turkish Automotive Factory Inc. (TOASO) and Turkish Petroleum Refineries Co. (TUPRS).

Study used data set is provided from ISE. For a number of statistical reasons, it is preferable not to work directly with the price series, so that raw price series are usually converted into series of returns. Moving from this situation compound returns of stock's session closing price following formula with the help calculated (Brooks, 2007).

$$R_t = \% \, 100 * \ln (P_t / P_{t-1})$$

where , R_t denotes the return at time t,
p_t denotes the asset price at time t,
ln denotes the natural logarithm,

A similar transformation the trading volume variable was applied to what return for complying with;

$$TV_t = \% \, 100 * \ln (V_t / V_{t-1})$$

where, TV_t denotes percentage change of trading volume at time t,
V_t denotes trading volume at time t;
ln denotes the natural logarithm,

Causality relationship between the price and the volume and the direction of the relationship are researched using Granger causality analysis in the study. Granger causality analysis tests whether there is a relationship between the prevailing values of a variable, and former values of a variable; and the direction of the relationship if such a relationship exists.

In order to test the Granger causality between two variables as R_t and TV_t, a *VAR* (Vector Autoregressive) model is estimated as shown below:

$$R_t = \alpha_{12} + \sum_{i=1}^{T_{11}} \beta_{11i} R_{t-i} + \sum_{j=1}^{T_{12}} \beta_{12j} TV_{t-j} + \varepsilon_{12t} \tag{1}$$

$$TV_t = \alpha_{22} + \sum_{i=1}^{T_{21}} \beta_{21i} TV_{t-j} + \sum_{j=1}^{T_{22}} \beta_{22j} R_{t-i} + \varepsilon_{12t} \tag{2}$$

where, T selected lag length, α's and β's parameters to be estimated and ε_t are white noise error terms. In order to test whether there is a linear Granger causality from TV_t variable to R_t in Equation (1), null hypothesis is defined as H_0: $\beta_{12j} = 0$ and Wald or chi-square test is applied to this hypothesis. If null hypothesis is rejected, in other words, if at least one of the lagged variable parameters is different from zero, it is concluded that there is Granger causality relationship from TV_t to R_t. The same argument is also applied for Equation (2) to test whether there is Granger causality from R_t variable to TV_t.

IV. Experimental Findings

In an econometric model estimated with time series data, variables must be stationary. An equation estimated with non-stationary time series might be causes spurious regression. Whether a regression reflects a true relationship or not is closely related to stationarity of the variables (Gujarati, 1995). For this reason, in order to be sure that our regressions reflect true relationship in the study, Augmented Dickey-Fuller (*ADF*) and Phillips-Perron (*PP*) unit root tests are applied to the series to determine stationarity of the variables. Table 1 shows *ADF* and *PP* unit root test results. Results of both tests show that

series are stable at level values. Therefore; *VAR* models were first estimated by Ordinary Least Squares (*OLS*) using level of series for Granger causality analysis.

Table 1: Unit Root Test Results

ISE-30 Companies	ADF Unit Root Test		PP Unit Root Test	
	Return	Volume	Return	Volume
BAGFS	-33.13 (1) [0.0000]	-22.42 (10) [0.0000]	-49.94 (3) [0.0001]	-258.93 (82) [0.0001]
ENKAI	-48.67 (0) [0.0001]	-17.32 (18) [0.0000]	-48.66 (10) [0.0001]	-317.66 (96) [0.0001]
EREGL	-49.87 (0) [0.0001]	-21.03 (12) [0.0000]	-49.87 (6) [0.0001]	-282.90 (82) [0.0001]
GARAN	-49.21 (0) [0.0001]	-25.65 (8) [0.0000]	-49.21 (16) [0.0001]	-300.45 (105) [0.0001]
PETKM	-48.36 (0) [0.0000]	-25.75 (8) [0.0000]	-48.36 (15) [0.0001]	-241.29 (166) [0.0000]
TCELL	-50.43 (0) [0.0000]	-19.34 (14) [0.0000]	-50.43 (7) [0.0001]	-434.54 (229) [0.0001]
THYAO	-53.53 (0) [0.0001]	-25.24 (8) [0.0000]	-53.58 (11) [0.0001]	-236.11 (105) [0.0001]
TOASO	-49.35 (0) [0.0001]	-25.45 (8) [0.0000]	-49.38 (12) [0.0001]	-268.50 (93) [0.0001]
TUPRS	-49.94 (0) [0.0001]	-17.90 (18) [0.0000]	-50.15 (17) [0.0001]	-368.33 (189) [0.0000]

Note: Numbers in parenthesis show the lag lengths selected according to Schwarz Information Criteria for *ADF* unit root test, bandwidths determined according to Newey-West using Bartlett kernel for *PP* unit root test, and the values in squared parenthesis show *p*-values of the statistics.

Table 2: Granger Causality Analysis Results Based on OLS

ISE-30 Companies	p	H_0	Test Results
BAGFS	5	Return ≠ > Volume	37.35 [0.0000]
		Return ≠ > Volume	2.78 [0.7340]
ENKAI	7	Return ≠ > Volume	13.62 [0.0584]
		Return ≠ > Volume	2.78 [0.9046]
EREGL	5	Return ≠ > Volume	5.38 [0.3713]
		Return ≠ > Volume	4.42 [0.4904]
GARAN	7	Return ≠ > Volume	12.69 [0.0800]
		Return ≠ > Volume	4.62 [0.7062]
PETKM	9	Return ≠ > Volume	111.24 [0.0000]
		Return ≠ > Volume	6.64 [0.6741]
TCELL	5	Return ≠ > Volume	6.69 [0.2447]
		Return ≠ > Volume	7.73 [0.1719]
THYAO	9	Return ≠ > Volume	99.42 [0.0000]
		Return ≠ > Volume	4.85 [0.8475]
TOASO	5	Return ≠ > Volume	24.08 [0.0002]
		Return ≠ > Volume	4.36 [0.4984]
TUPRS	7	Return ≠ > Volume	17.11 [0.0167]
		Return ≠ > Volume	11.04 [0.1368]

Note: Lag lengths of *VAR(p)* model are determined according to Schwarz Information Criteria. Numbers in squared parenthesis show concerning *p* values and significance.

Secondly; in order to make *VAR* Equation 1 represent the breaks that occurred in the stock price as a result of dividend distributions of companies and paid – unpaid stock distributions, dummy variables are added for the equations in the *VAR* model formed above. The numbers of variables on the right hand side of the Equations (1) and (2) change after the dummy variables were included. *VAR* models formed this way were estimated by Seemingly Unrelated Regression (*SURE*) approach. Table *A*1, in Appendix give the dates of dividend distribution of the companies and paid-unpaid stock certificate distribution.

Table 3: Granger Causality Analysis Results Based on SURE Estimation

ISE-30 Companies	p	H_0	Test Results
BAGFS	5	Return $\neq$ > Volume	37.52 [0.0000]
		Return $\neq$ > Volume	2.80 [0.7308]
ENKAI	7	Return $\neq$ > Volume	2.80 [0.9030]
		Return $\neq$ > Volume	13.70 [0.0567]
EREGL	5	Return $\neq$ > Volume	5.40 [0.3686]
		Return $\neq$ > Volume	4.43 [0.4893]
GARAN	7	Return $\neq$ > Volume	12.74 [0.0787]
		Return $\neq$ > Volume	4.65 [0.7032]
PETKM	9	Return $\neq$ > Volume	112.12 [0.0000]
		Return $\neq$ > Volume	6.70 [0.6687]
TCELL	5	Return $\neq$ > Volume	6.72 [0.2422]
		Return $\neq$ > Volume	7.77 [0.1696]
THYAO	9	Return $\neq$ > Volume	100.21 [0.0000]
		Return $\neq$ > Volume	4.88 [0.8443]
TOASO	5	Return $\neq$ > Volume	24.19 [0.0002]
		Return $\neq$ > Volume	4.37 [0.4970]
TUPRS	7	Return $\neq$ > Volume	17.10 [0.0168]
		Return $\neq$ > Volume	11.16 [0.1317]

Note: Lag lengths of *VAR(p)* model are determined according to Schwarz Information Criteria. Numbers in squared parenthesis show concerning *p* values.

        Table 2 shows the results of Granger Causality Analysis based on the estimated *VAR* model, whereas Table 3 shows the same results based on *VAR* model estimated as Seemingly Unrelated Regression. Tests performed by each of the methods reject the null hypothesis that there is no causality from return to volume at 1% significance level for BAGFS, PETKM, THYAO and TOASO stock certificates, at 5% significance level for TUPRS, and 10% significance level ENKAI and GARAN. It is understood from these results that there is one-direction causality from stock price to transaction volume for BAGFS, PETKM, THYAO, TOASO, TUPRS, ENKAI and GARAN stock certificates. No causality relationships were figured out in all stock certificates from transaction volume to stock price; whereas there is no causality relationship in 2 of 9 companies similarly.

        Meanwhile; when results of Table 2 and Table 3 are compared, it is understood that are added in the model as dummy variables dividend distribution and paid – unpaid stock distribution of companies for the purpose of representing the breaks that occur in return are not considerably effective on results.

V. Conclusion

In this study, 9 companies that are in ISE-30 and functioning in various industries are taken as subject of this analysis, and the causality between the share prices and trading volumes of these companies are examined. In the study covering the period between 02.01.2003 and 31.12.2007, the data are taken as seance observation in order to determine the dynamic relation between the price and the volume. Grander causality test is used as the method in the study. According to the results of Granger Causality Analysis based on the VAR model estimated by both Ordinary Least Squares method and Seemingly Unrelated Regression method; the null hypothesis that there is no causality from return to volume at 1% significance level for BAGFS, PETKM, THYAO and TOASO stock, at 5% significance level for TUPRS, and 10% significance level ENKAI and GARAN is rejected. It is understood from these results that there is one-direction causality from stock return (price) to trading volume for BAGFS, PETKM, THYAO, TOASO, TUPRS, ENKAI and GARAN stock. There are no such a causality relation in 2 of 9 companies. Also no causality relations were figured out in all stock from trading volume to stock price.

Meanwhile; when compare results obtained by Smallest Squares method and Seemingly Unrelated Regression method, it is understood that are added in the model as dummy variables dividend distribution and paid – unpaid stock distribution of companies for the purpose of representing the breaks that occur in return are not considerably effective on results.

These results are closely related to the findings of the study testing the causality relation between the ISE-100 index price and foreign trading volume carried out by Akar (2008). In the research performed by Akar, he has determined a strong causality from index price to foreign trading volume. In this study performed for the shares being effective in index, a causality relation from share return (price) to trading volume is similarly determined. These results give us the opportunity to make 3 kinds of evaluation. First of all, it can be said that is a valid hypothesis in ISE of the positive feedback hypothesis expressed at the introduction part of the study. In other words; all investors, foreign or domestic, follow up the price movements of stock, and they manage their purchases and sells in the direction of these price movements. Secondly, it is the result that the foreign share which is seen to reach 70% in share market or even exceed 70% sometimes has a big role in the formation of both stock price and trading volume. Thirdly; observing foreign investors of domestic investors and transacting after them may be effective in such a result's coming into being.

In direction of the results obtained, it can generally be evaluated that the investors in ISE first follow the price movements, and then make their decisions of purchase and selling.

No causality relation from trading volume to stock price was determined in results. This shows us that, depending on the trading volume, it shows us that determining how the price moves of ISE-30 shares is difficult or it   is impossible to determine.

As all these inferences can be considered for ISE-30 shares; in our opinion, it may be also valid for ISE-50 or even ISE-100, although not for all ISE; because it is not very probable to see manipulative movements in stock with big shares in share market, whereas stock with small shares are open to manipulation. Therefore, it can be estimated that investors will show similar attitudes towards the stock with bigger shares.

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Attachment

Table 1: Dates of Dividend Distribution with Paid–Unpaid Stock Distribution of Companies

ISE-30 Companies	Dates of Dividend Distribution with Paid – Unpaid Stock Distribution of Companies				
BAGFS	30.05.2003	10.09.2004	05.05.2005	31.05.2006	31.05.2007
ENKAI	28.05.2003	12.05.2004	31.05.2005	24.05.2006	24.05.2007
EREGL	-	11.06.2004	30.05.2005	24.05.2006	25.05.2007
GARAN	02.07.2003	27.04.2004	11.07.2005	12.04.2006	24.04.2007
PETKM	-	-	-	-	-
TCELL	-	21.06.2004 /30.07.2004	17.05.2005 /31.05.2005	29.05.2006 /12.06.2006	16.04.2007
THYAO	-	-	-	-	-
TOASO	26.05.2003	-	02.05.2005	17.05.2006	16.05.2007
TUPRS	11.04.2003	20.04.2004	05.05.2005	31.05.2006	04.06.2007

THE ACCURACY OF SALES FORECASTS DISCLOSED IN THE IPO PROSPECTUSES: EVIDENCE FROM ISTANBUL STOCK EXCHANGE

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Abstract

This paper examines the accuracy of sales forecasts disclosed in the prospectuses by the Turkish IPO (Initial Public Offering) companies at the Istanbul Stock Exchange during the period 2002-2007. Their accuracy is measured by forecast errors, absolute forecast errors, and squared forecast errors. A number of company specific characteristics such as company size, company age, auditing firm reputation, investment bank reputation, forecast horizon, financial leverage, retained ownership, and industry membership are tested to see whether these variables make any difference for the accuracy of sales forecasts among the IPO firms. The results of this study show that there are significant differences between the forecasting numbers and realized numbers of Turkish IPO firms. However, these differences are statistically significant only for industry membership.

I. Introduction

Investors need information to evaluate future performance of IPO companies so that they can decide whether to subscribe for the shares offered. In this situation, firms or issuers have to convey information that can be used to value their shares. 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. So 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. Thus, the usefulness of forecast information for investment decisions encouraged several

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researchers to examine the accuracy of IPO forecasts disclosed in different countries. Findings of earlier studies in different countries have provided mixed signals, but mostly optimistic, on the accuracy and reliability of IPO forecasts.

Most companies disclose information in their IPOs on a voluntary basis in countries such as UK, Sweden and Turkey. Forecast disclosure is mandatory in China, Greece, New Zealand, and Singapore. US companies rarely disclose forecasting information in IPOs because the SEC does not require it. Besides, the absence of forecasts in the US IPOs is due to a concern about legal suits if the forecasts prove to be inaccurate.

The prospectus is the main source of information for investors in many countries where IPOs are marketed directly to the general public. For example, Turkey, the focus of this study, does not allow the issuer to discriminate against subscribers in the primary market and most subscribers are small individual investors. 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, a forecast contained in the prospectus of an IPO is potentially more important to investors in countries where IPOs are sold to the general public as is the case in Turkish market.

Lack of information and information asymmetry between company insiders and outside investors are especially more severe in developing economies such as Turkey. Forecasts are one way of reducing information asymmetry between the company insiders and outside potential investors and of becoming more transparent to the outside world. In Turkey, it is a recent phenomenon that forecasts have been included in IPO prospectuses due to the fact that companies started to use corporate governance rules.

We argue that, in Turkey, the forecast published in an offering prospectus is very important not only for Turkish investors but also for international investors. During the recent years, almost eighty percent of the stocks at the ISE (Istanbul Stock Exchange) are owned by international

investors. In addition, this type of direct disclosure is especially important in a developing economy such as Turkey where information asymmetry between company insiders and outside investors is more severe, financial intermediaries and information vendors are relatively sparse, and where investors are rarely professionals.

An obvious concern about a firm's forecasts is their accuracy and bias. 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 used in the study are based on the ones commonly used in the related literature. This paper is organized as follows. A brief review about prior research studies covering international evidence is given in the introduction section. Section 2 gives a short explanation of IPOs and the listing procedures of new stocks on the ISE. Section 3 describes the data and methodology. Then, in subsections, both hypotheses with respect to the relationship between company-specific characteristics and the accuracy of sales forecasts are presented and the empirical results are discussed. Section 6 concludes touching on some shortages of this paper and some recommendations for future researches.

II. Turkish IPO Market

Regulatory framework and Turkish Capital Markets Board (CMB): Financial liberalization attempts during 1980s have promoted the development of capital markets. The Capital Markets Law enacted in 1981 to govern regulations on the issuance of securities instruments and the underlying provisions on IPOs. The CMB is the main regulatory body with responsibility for supervision and regulation of the Turkish securities markets. The CMB's principal function is to foster securities market development in Turkey. It is also responsible for determining the operational principles of the capital markets and providing adequate protection for investors. The CMB supervises and regulates, among

others, public companies, banks and other financial intermediaries, mutual funds, investment corporations, investment consulting firms and rating firms that offer their services to institutions operating in the capital markets.

The company whose shares are going to be offered for sale to the public for the first time needs to register its shares with the Capital Market Board of Turkey and obtain permission for issuing debt and equity securities. This registration is mandatory whether the company's existing shareholders are selling part of their shares to the public or the company is issuing new shares and offering the shares as part of a capital increase program.

The Istanbul Stock Exchange (ISE): The Istanbul Stock Exchange was established in 1986 and it is the only securities exchange in Turkey providing trading in equities, bonds and bills, revenue-sharing certificates, private sector bonds, foreign securities and real estate certificates as well as international securities. It is supervised by the Capital Market Board to ensure proper operation. The ISE requires that a company meet certain earnings ability and minimum shareholding standards as a condition to listing securities on the ISE. The Exchange has shown remarkable growth both in terms of trading volume and number of listed companies.

Turkish Prospectuses: A Turkish prospectus needs to be filed with the CMB for registration, which 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 prospectuses include the base of initial public offering and sale, attainments about the company, the statements to specify the company's financial position, the risks which are the company to be facing and detail information about company's operations.

Underwriters and issuers jointly sign prospectuses. Issuers are primarily responsible for the data included in the prospectuses. However,

underwriters must give a care to 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.

III. Data and Methodology

This paper examines the accuracy of sales forecasts contained in the prospectuses of companies seeking listing on the ISE main board from 2002 to 2007. During the mentioned period, 33 new issues were listed on the Stock Exchange. Among them, 30 (91%) firms disclosed their forecasts in their prospectuses. However, only 24 of them disclosed their sales forecasts. Thus, the sample in the study consists of those remaining 24 firms. In the study, period starts with 2002 because there was no such information concerning the forecasting in the prospectuses before 2002. The prospectuses were collected from the Capital Market Board. The data with respect to determinants of forecasting accuracy such as past financial tables, forecast horizon, firm age, and firm size were taken from the prospectuses. All other related data were extracted from the various publications of the ISE.

The accuracy of sales forecasts disclosed in the prospectuses is tested for the first year ($t = 0$) after the IPO, meaning one operating year after the IPO and the second year ($t + 1$) after the IPO, meaning one operating year after the first operating year following the IPO. Total 23 firms disclosed sales forecasts in their prospectuses for the IPO year.

3.1. Forecast Error Metrics

In this study, the accuracy of sales forecasts disclosed in the Turkish IPO prospectuses 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 errors metrics are forecast error, absolute forecast error, and square forecast error. Forecast error is defined as the difference between the actual sales and the forecast sales and then divided by absolute value of the actual sales. Thus, the forecast error is calculated as follows:

$$FE_{it} = \left(AS_{it} - FS_{it}\right)/\left|AS_{it}\right| \tag{1}$$

Where:

FE$_{it}$: Forecast error of company i,

AS$_{it}$: Actual sales of company i for the period t,

FS$_{it}$: Forecast sales of company i for the period t

The mean forecast error is a measure of bias in a forecast. It examines whether company management systematically overestimates or underestimates sales for the company. The signed forecast error shows that whether a company is optimistic or pessimistic about its future sales. A positive mean value (FE>0) for the forecast error implies that, on average, IPO companies have a pessimistic bias indicating firms underforecast. On the other hand, a negative mean value (FE < 0) for the forecast error implies an optimistic bias indicating firms overforecast (Jaggi et al., 2006).

The absolute forecast error indicates the absolute value of the forecast error. Brown et al (2000) insist that forecast error implies bias while absolute forecast error implies the accuracy level. According to Chen and Firth (1998) the mean absolute forecast error indicates the overall level of accuracy. The mean absolute forecast error provides an indication of how close the forecasts were to actual sales in absolute terms (Jelic et al., 198). The absolute forecast error is given by:

$$FE_{it} = \left|\left(AS_{it} - FS_{it}\right)\right|/\left|AS_{it}\right| \tag{2}$$

Where:

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

AS$_{it}$: Actual sales of the company i for the period t,

FS$_{it}$: Forecast sales of the company i for the period t

Combining equation 1 and 2, the absolute forecast error becomes the absolute value of forecast error as following:

$$AFE_{it} = |FE_{it}| \qquad (3)$$

Some researchers (Bhaskar and Morris, 1984; Firth and Smith, 1992; Gounopoulos, 2004) use squared forecast error as a third error metric. This error metric is measured using the square of the forecast error. Bhaskar and Morris specifies that 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. According to Firth and Smith (1992), in a similar vain, squared forecast error models better the loss to investors due to an erroneous forecast. The squared forecast error is estimated as shown below:

$$SQFE_{it} = \left[\left(AS_{it} - FS_{it} \right) / |AS_{it}| \right]^{2} \qquad (4)$$

Where:
SQFE$_{it}$: Squared forecast error,
AS$_{it}$: Actual sales of company i for the period t,
FS$_{it}$: Forecasting sales of company i for the period t

In this study, three forecast error metrics are used namely forecast error, absolute forecast error, and squared forecast error. Table 1 shows the results of the three forecast error metrics measures. Panel A includes the average forecasts error for the first year (t = 0) after the IPO and the second year (t + 1) after the IPO which are -25.74 % and 12.87 % respectively. These results show underestimation for the first year and overestimation for the second year for sales forecasts. The average absolute forecasts error is found 42.15 % for the first year and 35.50 % for the second year as shown in the Panel A of the table. Squared forecast error measures are 114.86 % and 39.18 % for the first year and the second year respectively.

Among the firms which disclosed sales forecasts in their prospectuses, 9 (37 %) firms overestimated sales forecasts while 15 (63 %) firms underestimated sales forecasts for the first year (t = 0) after the IPO year. For the second year (t + 1) after the IPO, 10 (43 %) firms made overestimation while 13 (57 %) firms made underestimation. The difference between average sales forecasts of the firms which made overestimation and underestimation is significant at the one percent level as indicated by t value of 3.549 and p value of 0.002.

Table 1: Descriptive Statistics of IPO Sales Forecast Accuracy Measures

Panel A. Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum	Highest Negative	Highest Positive
Forecast Error for the Year (t= 0)						
FE (%)	-25,74	106,48	-476,38	70,74	-476,38	70,74
AFE (%)	42,15	100,86	0,31	476,38	-	476,38
SQFE (%)	114,86	482,19	0,00	2269,41	-	2269,41
Forecast Error for the Year (t+ 1)						
FE (%)	-1,04	62,62	-60,73	243,62	-60,73	243,62
AFE (%)	19,45	52,71	0,01	243,62	-	243,62
SQFE (%)	3,78	123,67	0,00	593,52	-	593,52

Panel B. Optimistic and Pessimistic Sales Forecasts

	Optimistic forecasts	Pessimistic Forecasts	t statistic (p-value)	All Forecasts
Forecast Error for the Year (t=0)				
FE (%) Mean	23,71	-51,83	1,837 (0,080)c	-25,74
FE (%) Median	15,72	-16,57		-3,52
Sample	9	15		24
Forecast Error for the Year (t+ 1)				
FE (%) Mean	55,63	-20,02	3,549 (0,002)a	12,87
FE (%) Median	24,30	-15,82		-1,04
Sample	10	13		23

[a] Significant at the 0.01 level
[b] Significant at the 0.05 level
[c] Significant at the 0.10 level

3.2. Determinants of Forecasting Accuracy

A firm's ability to forecast its sales may be theoretically explained by certain firm characteristics. These theoretical explanations appear universal and may apply to developed capital markets as well as the emerging capital markets. This study aims to examine the extent to which the proposed relationships exist between certain firm-related characteristics and the quality of sales 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 for different markets in the prior studies. Previous researchers have identified many potential determinants of sales forecast accuracy. In this study; company size, company age, auditing firm reputation, investment bank reputation, forecast horizon, financial leverage, management ownership, and operational sector were chosen as potential determinants of sales forecasts for Turkish Market. A summary statistics of mentioned determinants are given in the Table 2.

Table 2: Descriptive Statistics of Dependent Variables

Variables; (t = 0)	Mean	Standard Deviation	Minimum	Maximum
Firma Age (years)	16,00	12,6868	2,00	50,00
Ownership Retained (%)	31,11	8,7142	16,93	50,71
Firm Size (log)	8,24	0,6648	7,15	9,40
Forecasting Horizon (months)	86,21	26,7468	44,00	117,00
Firm Financial Leverage (%)	40,28	44,77	1,23	215,60
Variables; (t + 1)	Mean	Standard Deviation	Minimum	Maximum
Firm Age (years)	16,22	12,9262	2,00	50,00
Ownership Retained (%)	31,30	8,8623	16,93	50,71
Firm Size (log)	8,26	0,6706	7,15	9,40
Forecasting Horizon (months)	86,95	27,0899	44,00	117,00
Firm Financial Leverage (%)	41,97	44,97	3,35	215,60

3.2.1. Company Size and the Accuracy of Sales Forecasts

Company size is considered 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' sales than their smaller counterparts. Hagerman and Ruland (1979) insisted that larger firms have more internal and external resources to make better forecasting. In a similar vain, Eddy and Seifert (1993) and Mark (1994) argued that larger firms make better forecasting due to the fact that larger firms are able to get advanced computer-related products and more sophisticated forecasting instruments easily. It is reported that larger firms have more control over their market setting, enjoy comparative economies scale making them less susceptible to economic fluctuations (Firt and Smith, 1992; Brown et al., 2000; Dutta and Gingler, 2002). This makes the sales of larger firms less volatile, more predictable, and more accurate than smaller firms. Additionally, Jelic et al. (1998) argued that small firms have less fluctuating sales numbers and this gives less opportunity to management to make accurate forecasting. Foster et al. (1984) and Bernard and Thomas (1990) insisted that sales of small firms are less forecastable and there is a reverse relation between company size and changes of sales after the IPO.

Different variables have been used in the literature as proxy to the size of the company. Some researchers (Eddy and Seifert, 1992; Firth and Smith, 1992; Mohammed et al., 1994; Jelic et al., 1998) operationalize size as total assets, whereas Jelic et al (1998) operationalizes size as market value. Mak (1994) used total shareholders' equity immediate after the issue of the shares. Jelic et al (1998) and Gounopoulos (2004) measured size by turnover achieved. In this study, size is taken as the logarithmic values of total assets. The Association between the company size and the accuracy of sales forecast is tested upon the following hypothesis:

H1: There are significant differences between the accuracy of the sales forecasts made by large firms and small firms.

To test this hypothesis, we split the sample into two groups based on the median alpha. Alpha is the logarithmic value of the total assets of firms before

the IPO (See the Table 2). Henceforth, the above median alpha subsample will be referred to as the larger group and the below median alpha subsample as the smaller group. The findings for the first year (t = 0) after the IPO and the second year (t + 1) after the IPO are shown in the Table 3. There are positive relations but statistically insignificant for each of the metrics employed in the study between the accuracy of sales forecasts made by larger and smaller firms.

Table 3: Firm Size and the Accuracy of Sales Forecasts

	Size	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t = 0)							
Forecast Error	Larger	7	0,0798	0,2359	-0,965	22	0,345
	Smaller	17	-0,3647	1,1945			
Absolute Forecast Error	Larger	7	0,1448	0,1966	0,869	22	0,394
	Smaller	17	0,5232	1,1303			
Squared Forecast Error	Larger	7	0,0541	0,1197	0,678	22	0,505
	Smaller	17	1,4761	5,5782			
	Size	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t + 1)							
Forecast Error	Larger	7	-0,0697	02277	1,005	21	0,326
	Smaller	16	0,2155	0,7267			
Mutlak Tahmin Hatası	Larger	7	0,1933	0,1180	0,972	21	0,342
	Smaller	16	0,4258	0,6199			
Squared Forecast Error	Larger	7	0,0493	0,0522	0,874	21	0,392
	Smaller	16	0,5416	1,4709			

3.2.2. Company Age and the Accuracy of Sales Forecast

Company age is also considered an important variable which affects the forecast accuracy. 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. Jaggi (1997) points out 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. 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 are very important input to the process of forecasting. Even if a new company is to rely on the operating history of the other companies in the same industry or 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). Company age is taken as the number of years it has been in business in this study. On the basis of these discussions, the following hypothesis is employed to test the relation between the IPO company age and the sales forecast accuracy:

H2: There are significant differences among the accuracy of sales forecasts of companies with respect to the company age

To test the relation between company age and forecast accuracy, we split the sample into two groups based on the median firm age. Henceforth, the above median firm age subsample will be referred to as older-firm group and the below median firm age subsample as the younger-firm group. Older firms indicated less forecasting error for each of the three metrics in comparison to younger firms as displayed in the Table 4. These findings are consistent with the findings and hypotheses in the literature. However, the differences reached in this study are not significant.

Table 4: Company Age and the Accuracy of Sales Forecasts

	Existence	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t = 0)							
Forecast Error	Old Firm	9	0,0159	0,2215	-0,926	22	0,364
	New Firm	15	-0,3856	1,2775			
Absolute Forecast Error	Old Firm	9	0,1266	0,1770	1,134	22	0,269
	New Firm	15	0,5846	1,1937			
Squared Forecast Error	Old Firm	9	0,0439	0,1059	0,831	22	0,415
	New Firm	15	1,6718	5,8266			
	Existence	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t + 1)							
Forecast Error	Old Firm	9	-0,1489	0,3541	1,788	21	0,088
	New Firm	14	0,3072	0,7064			
Absolute Forecast Error	Old Firm	9	0,3003	0,2211	0,392	21	0,699
	New Firm	14	0,3903	0,6608			
Squared Forecast Error	Old Firm	9	0,1336	0,1492	0,796	21	0,435
	New Firm	14	0,5577	1,5808			

3.2.3. Auditing Firm Reputation and the Accuracy of Sales Forecasts

DeAngelo (1981)'s reputation argument suggests that large auditing firms face a greater loss of rents as a result of inaccurate reporting. DeAngelo also suggested that, the Big Six audit firms were the high quality producers of audits and were likely to be associated with more successful new issues. Titman and Trueman (1986) insisted that 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. Alternatively, according to Smunic and Stein (1987) the Big Six audit firms were the producers of high quality audits and that they had very large investments in reputational capital. They argued that if a new issue turns sour, the Big Six auditing firms would have had comparatively more to lose. Therefore, they exercise greater caution to ensure greater accuracy of forecasts contained in the IPO prospectuses. Davidson and Neu (1993) found positive and significant relations between forecasting accuracy and auditing firm reputation. On the basis of these discussions, the following hypothesis is employed to test the relation between the forecast accuracy and auditing firm reputation for Turkish IPOs:

H3: There are significant differences between the accuracy of the sales forecasts of firms audited by high reputable auditing firms and low reputable auditing firms.

To test this hypothesis, we split the sample into two groups based on the reputation of auditing firm reputation they employed for auditing. Taken asset values into consideration, the largest four auditing firms[1] are taken as high-reputable. Henceforth, the subsample which is audited by high-reputable auditing firms will be referred to as the high-reputable group and the subsample which is audited by less-reputable auditing firm as the low-reputable group. The results for the first year (t = 0) after the IPO and the second year (t + 1) after the IPO are reported in Table 4. The results do not indicate any significant differences between the accuracy of sales forecasts for each of metrics we used in this study for the first year after the IPO and the second year after the IPO.

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[1] Price Waterhouse Coopers, Ernst&Young, Deloitte Touche Tohmatsu, KPMG

Table 5: Auditing Firm Reputation and the Accuracy of Sales Forecasts

	Auditing Firm Reputation	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t = 0)							
Forecast Error	High Reputable	12	0,1106	0,2970	-1,722	22	0,099
	Low Reputable	12	-0,5807	1,3588			
Absolute Forecast Error	High Reputable	12	0,2190	0,2214	0,985	22	0,335
	Low Reputable	12	0,6068	1,3463			
Squared Forecast Error	High Reputable	12	0,0931	0,1579	1,029	22	0,315
	Low Reputable	12	2,0296	6,5193			
	Auditing Firm Reputation	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t + 1)							
Forecast Error	High Reputable	11	-0,0837	0,2107	1,613	21	0,122
	Low Reputable	12	0,3235	0,8110			
Absolute Forecast Error	High Reputable	11	0,1822	0,1249	1,554	21	0,135
	Low Reputable	12	0,5135	0,6958			
Squared Forecast Error	High Reputable	11	0,0474	0,0477	1,298	21	0,208
	Low Reputable	12	0,7075	1,6822			

3.2.4. Investment Bank Reputation and the Accuracy of Sales Forecast

Investment bank reputation is also considered to be another important variable which may influence the forecast accuracy. Having many offerings over time, investment banks can develop a reputational capital for having the ability to assess market conditions. Thus, they become reliable third party information producers and mitigate the information asymmetry problem between the issuing firm and outside investors (Booth and Smith, 1986; Megginson and Weiss, 1991; Nanda and Yun, 1997; Dunbar, 2000). Besides, issuers who believe they have favorable information select high-reputable investment banks to take the firm public (Titman and Trueman, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994). Thus, an owner with favorable information about his firm can convey this information to the market through the quality of the investment bank. On the other hand, an owner who chooses a high-reputable investment bank must have more favorable private information since such a choice cannot be profitably mimicked by an owner with less favorable information.

To accommodate this factor as a determinant of forecast accuracy, the following hypothesis is employed:

H4: There are significant differences between the accuracy of the sales forecasts of firms taken public by high reputable investment banks and low reputable investment banks.

To test this hypothesis, we split the sample into two groups as is done in Bulut (2008). Determining if the underwriter of an IPO is of high-reputable or low-reputable, IPOs are sorted by the market share of the underwriter based on activity level of the dollar amount of underwritngs. An IPO with high-reputation underwriter is then defined as one where the IPO's underwriter has a market share greater than the median observation. By definition, the remainder of the IPOs are handled by low-reputation underwriters.

As indicated in the Table 5, the IPO firms which are taken public by high-reputable investment banks, in comparison to the IPO firms which taken public by low-reputable investment banks, made less forecasting error for each of the metrics. However, the accuracy of sales forecasts differences are not significant between these two group IPOs.

Table 6: Investment Bank Reputation and the Accuracy of Sales Forecasts

For the Year (t = 0)

	Investment Bank Reputation	Sample	Mean	Standard Deviation	t statistic	df	P-value
Forecast Error	High Reputable	10	0,0202	0,2421	-1,033	22	0,313
	Low Reputable	14	-0,4173	1,3157			
Absolute Forecast Error	High Reputable	10	0,1679	0,1665	1,054	22	0,303
	Low Reputable	14	0,5878	1,2436			
Squared Forecast Error	High Reputable	10	0,0531	0,0993	0,900	22	0,378
	Low Reputable	14	1,7815	6,0305			

For the Year (t + 1)

	Investment Bank Reputation	Sample	Mean	Standard Deviation	t statistic	df	P-value
Forecast Error	High Reputable	10	-0,0157	0,2918	0,969	21	0,344
	Low Reputable	13	0,2398	0,7903			
Absolute Forecast Error	High Reputable	10	0,2102	0,1906	1,165	21	0,257
	Low Reputable	13	0,4664	0,6716			
Squared Forecast Error	High Reputable	10	0,0769	0,1197	1,075	21	0,295
	Low Reputable	13	0,6340	1,6270			

3.2.5. Forecasting Horizon and the Accuracy of Sales Forecasts

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; Pedwell et al., 1994; Firth et al., 1995; Jelic et al., 1998; Brown et al., 2000; Chen et al., 2001). They thought so because longer time horizons are associated with greater uncertainty. 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 maintenance and capital expenditures decisions which would result in bringing the actual results closer to forecasts (Jaggi, 1997).

Dev and Webb (1972) for England and Mak (1989) for New Zealand found positive and significant relations between the accuracy of forecasts and the time horizon of the forecasts. On the other hand, Firth and Smith (1992) for New Zealand and Jelic et al (1998) for the Malaysian market did not reach any relation. Similarly, Mohammed et al (1994) for Malaysian market and Chan et al (1996) for Hong Kong market did not find any significant relations between the accuracy of forecasts and the time horizon of forecasts. Thus, to reach a certain conclusion from the literature whether the time horizon of forecasts carry an effect on forecast accuracy is not obvious.

In this study, time horizon is taken as the number of months between preparation date of the prospectuses and the end of the forecasting period. The association between the forecast accuracy and time horizon of forecast is tested upon the following hypothesis:

H5: There are significant differences among the accuracy of sales forecasts of IPO firms with respect to time horizon of forecast

To test the relation between the accuracy of sales forecast and the time horizon of the forecast, we split the sample into two groups based on the median alpha. Alpha is the number of months of forecasting. Henceforth, the above

median alpha subsample will be referred to as the longer-time horizon group and the below median alpha subsample as the shorter-time horizon group. In the table 6, Companies which made sales forecasts for the shorter time period, in comparison to companies which made sales forecasts for the longer time horizon, displayed less forecasting error as expected. However, differences are not significant.

Table 7: Forecasting Horizon and the Accuracy of Sales Forecasts

	Forecasting Horizon	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t = 0)							
Forecast Error	Shorter	13	0,0095	0,2774	1,289	22	0,211
	Longer	11	-0,5241	1,4672			
Absolute Forecast Error	Shorter	13	0,1983	0,18554	-1,196	22	0,244
	Longer	11	0,6665	1,4022			
Squared Forecast Error	Shorter	13	0,0711	0,1341	-1,150	22	0,262
	Longer	11	2,2317	6,7989			
	Forecasting Horizon	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t + 1)							
Forecast Error	Shorter	12	0,0392	0,2675	-0,708	21	0,487
	Longer	11	0,2264	0,8742			
Absolute Forecast Error	Shorter	12	0,1877	0,1865	-1,652	21	0,113
	Longer	11	0,5376	0,7089			
Squared Forecast Error	Shorter	12	0,0671	0,1312	-1,338	21	0,195
	Longer	11	0,7460	1,7554			

3.2.6. Financial Leverage and the Accuracy of Sales Forecast

The company's financial leverage may become an important explanatory variable for forecasting accuracy under certain conditions. It has been argued that sales 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). Eddy and Seifert (1992) argued that one of the risk sources is the financial leverage level and the uncertainty with respect to the future sales and earnings will be high with the companies with high level of leverage. Mohammed et al. (1994) and Cheng and Firth (2000) insisted that the higher the leverage the more difficult to estimate the earnings and sales. Firth and Smith (1992), Chan et al. (1996) and Jelic et al. (1998) hypothesized that there is a positive relation between the forecast error and the leverage level. According to Jelic et al. (1998) agency theory implies that monitoring costs are high with the companies with high leverage. In this study, financial leverage is taken as the ratio of total liabilities to total assets. The following hypothesis is employed to test the association between forecast accuracy and financial leverage.

H6: There are significant differences among the accuracy of sales forecasts of firms with respect to the level of financial leverage.

To test the relation between the accuracy of sales forecasts disclosed in the IPO prospectuses and the pre-IPO level of financial leverage, we split the sample into two groups based on the median financial leverage. Henceforth, the above median financial leverage subsample will be referred to as the high-leverage group and the below median financial leverage subsample as the low-leverage group. Firms with high level of financial leverage displayed less forecasting error for each of the metrics in comparison to the firms with low-level of financial leverage (Table 7). These findings are inconsistent with the evidences in the literature. However, these findings are consistent with the evidences reached by Jelic et al. (1998) for the Malya and Chen and Firth (1999) for the Chinese market.

Table 8: Financial Leverage and the Accuracy of Sales Forecasts

For the Year (t = 0)	Leverage Level	Sample	Mean	Standard Deviation	t statistic	df	P-value
Forecast Error	High Leverage	8	-0,0376	0,1304			
	Low Leverage	16	-0,3338	1,2532	-0,659	22	0,516
Absolute Forecast Error	High Leverage	8	0,1081	0,0726			
	Low Leverage	16	0,5653	1,1613	1,100	22	0,283
Squared Forecast Error	High Leverage	8	0,0163	0,0162			
	Low Leverage	16	1,5839	5,6402	0,777	22	0,445

For the Year (t+1)	Leverage Level	Sample	Mean	Standard Deviation	t statistic	df	P-value
Forecast Error	High Leverage	8	-0,0117	0,1413			
	Low Leverage	15	0,2036	0,7676	0,778	21	0,445
Absolute Forecast Error	High Leverage	8	0,1219	0,0559			
	Low Leverage	15	0,4794	0,6224	1,603	21	0,124
Squared Forecast Error	High Leverage	8	0,0176	0,0147			
	Low Leverage	15	0,5913	1,5102	1,063	21	0,300

3.2.7. Retained Ownership and the Accuracy of Sales Forecast

When a firm makes the transition from private to public ownership, ownership structure of the firm may change dramatically. The reduction in management ownership that occurs when a firm goes public is likely to lead to the agency problem described in Jensen and Meckling (1976). As a result of the heightened conflict of interest between initial owners and shareholders, the performance of the firm could suffer as managers have incentives to increase perquisite consumption. The agency theory hypothesis (Jensen and Meckling, 1976) leads us to expect relatively superior operating performance from firms with higher ownership retained by entrepreneurs in comparison to firms with lower ownership retained.

The proportion of shares retained at the IPO by the existing owners of the company may reflect forecast integrity (Gounopoulos, 2004). He points out that a lower proportion may signal owner concern about forecasting accuracy while a high level of the proportion of shares retained indicates higher confidence and forecasting achievability. A higher percentage of proportion of shares of management ownership may signal that the manager-owners are more confident about the future prospects of the company, and 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).

The following hypothesis is employed to test the association between forecast accuracy and the proportion of retained ownership after the IPO:

H7: There are significant differences among the accuracy of sales forecasts of firms with respect to the retained ownership after the IPO.

To test the relation between the accuracy of sales forecasts disclosed in the IPO prospectuses and retained ownership at the IPO, we split the sample into two groups based on the median alpha which is the fraction of the firm retained by the pre-issue shareholders after the IPO. Henceforth, the above median alpha subsample will be referred to as the high-ownership group and the below median alpha subsample as the low-ownership group. Low-ownership firms

show less forecasting error for each of the three metrics compared to high-ownership group as displayed in the Table 9. These findings are inconsistent with Jensen and Meckling (1976)'s agency hypothesis. According to agency theory, it is expected that high-ownership firms should make less forecasts error in comparison to low-ownership group. This analysis, in this study, indicates a relationship inconsistent with agency theory; however, findings are not significant.

Table 9: Retained Ownership and the Accuracy of Sales Forecasts

	Ownership Level	Sample	Median	Standard Deviation	t statistic	df	P-value
For the Year (t = 0)							
Forecast Error	High Ownership	14	-0,4188	1,3049	1,041	22	0,309
	Low Ownership	10	0,0222	0,3118			
Absolute Forecast Error	High Ownership	14	0,5525	1,2502	-0,834	22	0,413
	Low Ownership	10	0,2174	0,2127			
Squared Forecast Error	High Ownership	14	1,7566	6,0373	-0,868	22	0,395
	Low Ownership	10	0,0880	0,1513			

	Ownership Level	Sample	Median	Standard Deviation	t statistic	df	P-value
For the Year (t + 1)							
Forecast Error	High Ownership	14	0,1390	0,7284	-0,096	21	0,925
	Low Ownership	9	0,1127	0,4647			
Absolute Forecast Error	High Ownership	14	0,2952	0,6191	-0,447	21	0,659
	Low Ownership	9	0,2926	0,3659			
Squared Forecast Error	Low Ownership	14	0,5120	1,5663	-0,573	21	0,573
	Düşük Sahiplik	9	0,2047	0,3939			

3.2.7. Industry Membership and the Accuracy of Sales Forecast

Industry membership may have an effect on the level of forecasting accuracy. This is because each industry faces competition and complexity that may make it easier for firm in some industries to make better forecast (Gounopoulos, 2004). Some empirical evidences suggest that industry membership is related to forecast accuracy (Dew and Webb, 1972; Porter, 1982; Mak, 1989; Jelic et al., 1998). They suggested that forecasting may be easier for some industries due to the fact that their profits are likely to be less sensitive to economic cycles. However, empirical evidences on whether differences exist in forecasting errors across industries have been mixed. Chen et al (2001) report negative sign for industry, which conflicts with the hypothesis for positive relationship. Tests of industrial classification factors have always been problematic because of the lack of a good theoretical basis and the often rather crude definitions of industries (Jelic et al., 1998).

For the relationship between industry membership and the accuracy of sales forecast in the Turkish IPO market, the following hypothesis is employed:

H8: There are significant differences among the accuracy of sales forecasts of firms with respect to the industry classification.

To test the relationship between industry membership and the accuracy of sales forecast, industrial classification is reduced into two groups as industrial and other categories due to the fact that the small number of Turkish firms within some industry groups precludes the mentioned analysis. There are statistically significant differences for the first year ($t = 0$) after the IPO among the accuracy of sales forecasts of industrial firms and non-industrial firms as depicted in the Table 10. In general, this kind of evidence is expected for the industrial firms in comparison to non-industrial firms. However, this result reached for this analysis is significant to explain the differences among the accuracy of sales forecasts of industrial and non-industrial firms.

Table 10: Industry Membership and the Accuracy of Sales Forecasts

	Industry Membership	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t = 0)							
Forecast Error	Industrial Firms	7	-0,7818	1,7609	1,751	22	0,094
	Non-industrial	17	-0,0099	0,4022			
Absolute Forecast Error	Industrial Firms	7	0,7940	1,75449	-1,258	22	0,221
	Non-industrial	17	0,2559	0,3037			
Squared Forecast Error	Industrial Firms	7	3,2690	8,56573	-1,548	22	0,136
	Non-industrial	17	0,1523	0,3441			
	Industry Membership	Sample	Mean	Standard Deviation	t statistic	df	P-value
For the Year (t + 1)							
Forecast Error	Industrial Firms	7	0,6211	0,9529	-2,877	21	0,009[a]
	Non-industrial	16	-0,0867	0,2232			
Absolute Forecast Error	Industrial Firms	7	0,7836	0,8005	-3,017	21	0,007[a]
	Non-industrial	16	0,1676	0,1669			
Squared Forecast Error	Industrial Firms	7	1,1634	2,1418	-2,133	21	0,045[b]
	Non-industrial	16	0,0542	0,0949			

[a] Significant at the 0.01 level; [b] Significant at the 0.05 level

IV. Conclusion

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. So forecasts disclosed in prospectuses for the IPOs provide useful information for evaluating the company's future performance. A forecast contained in the prospectus of an IPO is potentially more important to investors in countries where IPOs are sold to the general public as is the case in Turkish market. Besides, this type of direct disclosure is especially important in a developing economy such as Turkey where information asymmetry between company insiders and outside investors is more severe, financial intermediaries and information vendors are relatively sparse, and where investors are rarely professionals.

In view of the usefulness of IPO forecasts, investors would be interested to know about the reliability of these forecasts. The primary objective of this study is to examine the accuracy of sales forecasts included in the prospectuses of Turkish companies seeking listing on the ISE main board. The findings of this study provide useful information on the accuracy of IPO forecasts as well as the impact of different company-specific characteristics on forecasting accuracy. The accuracy of the forecasts are tested by using a number of plausible company specific characteristics such as company size, company age, auditing firm reputation, investment bank reputation, forecast horizon, financial leverage, retained ownership, and industry membership.

Accuracy is measured by commonly used forecasting metrics in the literature such as forecast errors, absolute forecast errors and squared forecast errors. The results indicate that, on average, there are a minus of 25.74% sales forecast error for the first year (t = 0) after the IPO and 12.87% sales forecast error for the second year (t + 1) following the IPO. Thus, managers overestimated the sales for the first year (t = 0) after the IPO and underestimated the sales for the second year (t + 1) following the IPO. The findings demonstrate that like most IPO forecasts disclosed in most other countries, IPO forecasts disclosed by Turkish companies are generally optimistic. The results reveal that only the hypothesis which explains a positive relationship between industry membership and the accuracy of sales forecast is accepted, meaning that industrial firms have better sales forecasts. Other hypotheses are rejected as depicted in the Table 11.

Our findings need to be interpreted with caution due to the small number of the sample. However, it is expected that the sample will increase to such a level that more reliable tests will be possible for the Turkish IPO market in the future works about the accuracy of forecasting.

Table 11. The Hypotheses and the Results

	Hypotheses	t statistic	Result
For the Year (t = 0)	H1: Forecast Error <-- Company Size	-0,965	Reject
	H2: Forecast Error <-- Company Age	-0,926	Reject
	H3: Forecast Error <-- Auditing Firm Reputation	-1,722	Reject
	H4: Forecast Error <-- Investment Bank Reputation	-1,033	Reject
	H5: Forecast Error <-- Forecasting Horizon	1,289	Reject
	H6: Forecast Error <-- Leverage Level	-0,659	Reject
	H7: Forecast Error <-- Retained Ownership	1,041	Reject
	H8: Forecast Error <-- Industry Membership	1,751	Reject
For the Year (t = +1)	H1: Forecast Error <-- Company Size	1,005	Reject
	H2: Forecast Error <-- Company Age	1,788	Reject
	H3: Forecast Error <-- Auditing Firm Reputation	1,613	Reject
	H4: Forecast Error <-- Investment Bank Reputation	0,969	Reject
	H5: Forecast Error <-- Forecasting Horizon	-0,708	Reject
	H6: Forecast Error <-- Leverage Level	0,788	Reject
	H7: Forecast Error <-- Retained Ownership	-0,096	Reject
	H8: Forecast Error <-- Industry Membership	-2,877	Accept

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AFTERMARKET PERFORMANCES OF BOOK BUILDING AND FIXED PRICE OFFERINGS ON THE ISTANBUL STOCK EXCHANGE

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Abstract

The objective of this study is to compare fixed price and book building IPOs in terms of aftermarket performances. On a sample of 28 IPOs (15 book build and 13 fixed price) from 2004 to 2007, it is found that book built IPOs outperform fixed price IPOs, on the contrary to most of the studies indicating that fixed price offerings are more under priced due to the greater uncertainty. This study lists 4 possible reasons for this discrepancy: i) issuing firms' and underwriters' fear of under subscription, ii) decrease in the quality of IPOing firms with fixed price offering, iii) increased press coverage and increased and more favorable research coverage in book building offerings, iv) the possibility of informed investors' misrepresenting their information in order to get more profit by trading in the aftermarket.

I. Introduction

IPO under pricing is a well-documented phenomenon in the financial literature. Numerous studies which have examined the performance of Initial Public Offerings (IPOs) have documented the existence of short-run excess returns in almost all stock markets. Most of the theoretical researches have concentrated on the reasons of the short term IPO under pricing. In spite of the abundance of theories attempting to explain the abnormal price behavior of newly issued stocks a lot of unanswered questions have remained.

In the last decades, studies have focused on the comparison of the different IPO mechanisms in terms of the under pricing level they lead to. Book-building and fixed price, which are most commonly used IPO mechanisms, have been at the center of the literature comparing IPO methods. In the literature

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there is a consensus that both IPO mechanisms require under pricing. However, most of the literature analyzing and comparing book building and fixed price methods suggested that book building mechanism would require lower under pricing on average.

In this study, aftermarket performances of Turkish IPOs conducted from 2004 to 2007 are analyzed and fixed price and book building methods are compared in terms of aftermarket abnormal returns. According to the analysis, on the contrary to most of the studies, book building IPOs in Turkey outperforms fixed price offerings in the aftermarket.

The organization of this paper is as follows: In Section 2, there is a review of the literature comparing different IPO mechanisms in terms of underpricing levels. Section 3 provides information on IPO mechanism used in Turkish IPOs. Section 4 contains description of data and methodology used in the study. Empirical study and results are summarized in Section 5. In Section 6 the results are discussed and Section 7 concludes the paper.

II. Literature Review

Most of the literature analyzing and comparing book building and fixed price methods suggested that book building on average would require lower under pricing (Benveniste and Wilhelm 1990, Spatt and Srivastava 1991, Loughran, Ritter and Rydqvist 1994, Aorsio, Giudici and Paleari 2000, Pandey 2004).

Benveniste and Spindt (1988, 1989) show that investment banks use the declarations of interest from institutional investors to determine the price and allocation of new issues. Under pricing is necessary to induce investors to reveal their information. However, if shares are repeatedly allocated to same investors underwriters can reduce under pricing.

Chowdhry and Sherman (1996) point out that two features of public offers tend to lead greater under pricing, relative to the book building method: i) the need to set the price farther in advance (increasing the risk that an offer will fail due to information leakage) and ii) the common requirement that investors pay in advance for their entire order, with the issuer typically allowed to keep the interest on these funds (there is a recent trend towards requiring only partial installment payments that will mitigate this effect).

Leite (1999) presents a model showing that the use of book building allows more accurate pricing, this repairing the adverse selection problem facing less informed investors and hence reducing the need for underpricing.

Ljungqvist, Jenkinson and Wilhelm (2000) analyze both direct and indirect costs (associated with under pricing) using a unique dataset containing information on 2,051 initial public offerings in 61 non-U.S. markets during the period 1992-1999. They find that direct costs of book building are typically twice as large as direct costs for fixed-price offers. However, book building leads to substantially less under pricing.

Sherman (2000) shows that the use of fixed price even for one tranche of a hybrid offering, where book building is used to determine the price, can result in higher under pricing than with pure book building.

Arosio, Giudici and Paleari (2000) present an empirical study conducted on a unique survey of 163 IPOs on the Milan Stock Exchange between 1985 and 1999. They distinguish between fixed price offers and open-price offers with book building and find different under pricing levels and different statistically significant determinants. They find lower under pricing in IPOs with book building.

On the other hand, Busaba and Chang (2001, 2002) find that both the book building and the fixed price IPO selling methods require more under pricing when aftermarket trading by informed investors is considered. According to them, book building becomes especially costly, since the potential for profit in the aftermarket adversely affects investors' bidding behavior in the pre-market. Unless the underwriter building a book can target a small enough subset of the informed investors, a fixed price strategy that allocates the issue to retail investors produces higher proceeds on average, contrary to the conventional wisdom in the literature.

Pandey (2004) analyze 84 Indian IPOs (20 book build and 64 fixed price) between 1999 and 2003 and find that the fixed price offerings are used by issuers offering large proportion of their capital by raising a small amount of money whereas book building is opted for by issuers offering small proportion of their stocks and mobilizing larger sums of money. They also argue that, fixed price offerings result in higher initial returns compared to that of book building offerings.

Based on a sample of 15 European countries and European IPOs over the period from 1995 to 2004, Gajewski and Gresse (2006) compare the average underpricing and liquidity of book built and non book built IPOs. They show that book built IPOs are less under priced than fixed price and auctioned IPOs but less liquid. In their analysis, mean under pricing in book built IPOs is found as 3.39%, whereas this return for the non book built IPOs is 9.64%.

On the other hand, Jovanovic and Szentes (2007) argues that under pricing arises not because of the need to elicit information from the buyers, but because of the underwriter's use his private information to capture the rents for himself and for his favored clients. The threat to cut the allocation to investors who reveal weak interest is the punishment to cheating investors.

Research on IPOs in the Istanbul Stock Exchange focused mainly on initial under pricing whereas the number of the studies comparing different IPO methods are limited.

Kıymaz (1996) and Kıymaz (1996b) investigated the performances of Turkish financials and industrials IPOs respectively in the period of 1990-1995. Kiymaz (1996a) reports an initial market adjusted abnormal returns of 15.3% for financial IPOs. When the after-market returns following the initial trading day are investigated, the positive initial trading day returns are mostly replaced by negative returns. For all financials, the cumulative abnormal returns (excluding initial day returns) at the end of fifth month are -9.3 %. Kiymaz (1996b) reports an initial market adjusted returns of 12.2% for industrial IPOs. In the aftermarket period of five month, for all industrials, the cumulative abnormal returns are -2.5%.

Özer (1999) investigates the aftermarket performances of 89 IPOs conducted between 1989 and 1994 on ISE and reports statistically significant positive abnormal returns at the first three trading days. However, after the 3rd trading day, the returns of the IPO are not statistically significant from market return.

Kıymaz (2000) shows that 163 Turkish IPOs between 1990 and 1996 provided an average abnormal return of %13.1 at the first trading day. He states the factors affecting underpricing as firm size, market trend during IPO and ownership structure.

Durukan (2002) analyzes a sample consisting of 173 IPO between 1990 and 1997 and finds 14.61% average first day return.

In their study investigating the Turkish IPOs during 1992-2000 period, Aktas, Aydogan, and Karan (2003) estimate initial under pricing in the Istanbul Stock Exchange as 9.17%.

Teker and Ekit (2003) examines the performance of 34 IPOs conducted in Istanbul Stock Exchange during the year of 2000. They found the total cumulative abnormal return on the initial two trading days as 11.02% whereas abnormal returns for whole 30 day event window are statistically insignificant and negative.

Küçükkocaoğlu (2008) compare the three different IPO methods (book building, fixed price offer and sale through the stock exchange) available in the Istanbul Stock Exchange, using 1993 – 2005 firm and issue data. Their empirical analysis reveals significant first day under pricing of 7.01% in fixed price offer, 11.47% in book building mechanism, and 15.68% in sale through stock exchange method. They also show that fixed price offers can better control the impact of market information on under pricing than sale through the stock exchange method.

Ünlü and Ersoy (2008) investigate the existence of underpricing and the factors influencing aftermarket performance for the IPOs conducted between 1995 and 2008 on ISE. They argue that IPOing firms older than 20 years and going public through fixed price offering are more underpriced. They find first day average abnormal returns for fixed price and book building offerings as 7.2% and 2.2%, respectively.

III. Historical Background and IPO Mechanisms

The book building approach long used by U.S. has become one of the strongest trends in IPO methods during the 90s before when fixed price methods were predominant outside the U.S. By July 1999 Ljungqvist, Jenkinson and Wilhelm (2000) estimate that 80% of non-U.S. offerings were brought to market using book building methods or some hybrids. It has been suggested that the decline of fixed-price offerings is related to the wave of privatization of state-owned firms many of which were too large to sell in the local market. As a result of this, the

world became more familiar with the U.S. issue method, book building, in order to benefit from international funds. (Sherman, 2002). After the underwriting scandals in the U.S. since the economic crisis of 2000, it has been thought that book building mechanism used to price initial public offerings would be under attack. However, both in the U.S. and globally, the reality is surprisingly the opposite. (Degeorge, Derrien and Womack 2007) On the other hand, fixed price offering remains also popular because it is an efficient, low cost way to distribute shares to retail investors. Moreover, fixed price offerings avoid the high fixed cost of road shows (Ljungqvist, Jenkinson and Wilhelm, 2000).

In Turkey, book building method was popular in mid-90s but has not been used between 1995 and 2004. In 2004 a new method (fixed price-book building hybrid) has been introduced and it has become predominant offering method since 2007. Today, there are three IPO methods available in Turkish Equity Markets: Sale through the stock exchange, fixed price offering and book building (including book-building/fixed price hybrids) methods.

3.1. Sale through the Stock Exchange

The shares can be issued with this method after the approval of the Capital Markets Board of Turkey (CMBT). In this method, a share price is determined with the CMBT and announced at the time of registration. Shares are sold at the primary market of Istanbul Stock Exchange (ISE) by an intermediary institution from this predetermined price. Investors who buy the shares at the primary market must wait until trading of shares at the secondary market in order to sell their shares. The shares can be sold after completion of the required documentation at least 20 days prior to the offering. The price selected at the time of registration is set as the opening price. From then on, the price of the shares moves within the band determined by the daily limits (+/- 21%) set by the ISE. (Küçükkocaoğlu, 2008)

3.2. Fixed Price Offerings

Under this mechanism, the firm and its lead manager set the offer price before the sale of shares. This price results from a negotiation between the firm and its underwriter. Orders are taken from investors and shares are randomly rationed

or prorated among all the bidders if the demand exceeds the quantity of shares for sale. It is an efficient, low cost way to distribute shares to retail investors.

3.3. Book-building and Book-building/Fixed Price Hybrids

Book building is an initial public offering process which includes discovery of price and investors' interests. At the beginning of book building the book-runner sets an indicative price range. Book building period ('road show') generally lasts for one to two weeks, during which a book runner collects bids from investors, either directly or via other members of the underwriting syndicate. The bids specify an amount in shares or money. Non binding bids are collected from investors at various prices, which are above or equal to the floor price. Starting from the highest-price bid, the bids are transformed into a table showing cumulative bid amounts at each price level. The price level at which the cumulative amount exceeds the amount of shares offered is set as the selling price.

Two types of book building procedures are available: one is pure book building which is equivalent to the American procedure. The other is a hybrid book building which is a mixture of book building and fixed-price mechanisms. In this method the price and allocation rules are the same as in the book building, except for a fraction of the shares which are reserved for retail investors, are sold via a fixed-price procedure, at the price chosen in the book building part of the offering. In the rest of this study, those two procedures are not separated since they are similar in terms of price setting.

Book building and fixed price offerings differ from each other in terms of their price determination mechanism. In fixed price offerings, where the price is discovered in the aftermarket, the offering of stocks is made without discovering the demand from investors. On the other hand, demand for the shares and valuation of the investors are discovered before the offering in case of book building which involves road shows and one-to-one meetings with potential investors. This information is then used to determine the size, price, and allocation of the offering.

Gajewski and Gresse (2006) lists for each mechanism, its main characteristics in terms of pricing and allocation rules as shown in Table 3.1.

Table 3.1. Pricing and Allocation Rules by IPO Mechanism

	Book building	Fixed price offer
Offering Price	Price range	Fixed price
Order Types	Limit orders	Market orders
Organizer	Lead Manager	Lead manager or the exchange
Actual issue price	At the discretion of the lead manager	Offering price
Orders filled	Discretionary	All
Allocation	Discretionary	Proportional

Source: Gajewski, J-F., C. Gresse, 2006, "A Survey of the European IPO Market", ECMI Paper, No.2/August 2006

45 IPOs have been conducted between 2004 and 2007 on Istanbul Stock Exchange. Fixed price method has been used in 15 of these IPOs. 16 IPOs have used book building method and 14 IPOs have been conducted through sale at stock exchange. Book building mechanism used during 2004-2007 period is a mixture of fixed price and book building where the price is determined according to the U.S. book building procedure and bids are collected from retail investors at a fixed price.

IV. Data and Methodology

The purpose of this study is to compare after market performances of book-built and fixed price IPOs from 2004 to 2007.

45 IPOs have been conducted between 2004 and 2007 in Turkish equity markets. Of these 45 issues, 15 firms went public through a fixed price offering, 16 firms used book building method and 14 firms used sale at stock exchange method. Total proceeds from fixed price offerings have been about TL 387 million, whereas total proceeds from book building IPOs have been about TL 8.2 billion. Furthermore, it has been found that biggest part of the shares have been sold to foreign institutional investors in book building offerings. On the other hand, in fixed price offerings, average allotment to foreign institutional investors is about 20%. This ratio for the book building IPOs is about 65%. (Statistical summary of the IPOs is presented at Appendix 1)

One IPO (MRTGG) has been excluded from the analyses due to the speculative price movements in the aftermarket and 1 IPO (OYAYO) has been excluded since it is an investment trust operating by buying other financial assets. Moreover, 1 IPO (SAGYO) is considered to be outlier and risky in terms of speculative attacks because of its small cap, small number of investors and relatively high free float. As a result, 13 fixed price and 15 book building IPOs remain to be used in the comparison analysis.

These 28 IPOs have been analyzed in terms of price stabilization activities, since these activities conducted by intermediary agencies may have significant effect on aftermarket performances of the issues. Price stabilization activities under Turkish Law and the analysis for this study are presented in section 4.1.

The offering data was obtained from ISE website (www.imkb.gov.tr) which gives detailed information on all initial public offerings in Turkey.

Aftermarket price statistics have been drawn from HisseXL which is an integrated software for institutional users of financial information about security markets and analysis tools for processing such information developed by Rasyonet, a private solution provider to brokerage houses, commercial banks and portfolio management firms operating in capital markets.

Aftermarket performances of IPOs are analyzed considering how an IPO performed in comparison to market. Market is determined as ISE-100 index and market adjusted returns are calculated using geometric excess return formula.

Return of stock i for the closing of nth day is defined as the percentage change between offering price and closing price at the nth day. Therefore, return for stock i as of the end of the nth trading day is calculated as follows:

(i) $R_i(n): (P_i(n) - P_i(0)) / P_i(0)$

where;

$R_i(n)$: Total return of stock i as of the closing of nth day of trading
$P_i(n)$: Closing price of stock i at the nth day
$P_i(0)$: Initial price of stock i.

Change in the ISE-100 index from the beginning of the first trading day till the end of the nth trading day of stock i is calculated in a similar way:

(ii) $R_{m, i}(n)$: $(CISE_i(n) - CISE_i(0)) / CISE_i(0)$

where;
$R_{m, i}(n)$: Market return in the first n trading days of stock i
$CISE_i(n)$: Closing level of ISE-100 index at the end of nth day of trading for i
$CISE_i(0)$: Closing level of ISE-100 index on the day before the trading of i.

Market adjusted return of stock i, as of the end of the nth trading day, $MAR_i(n)$, is calculated with geometric relative return formula which is defined in the following way:

(iii) $MAR_i(n)$: $[(1+R_i(n)) / (1+R_{m, i}(n))] - 1$

For example, calculation of the market adjusted return of stock i, for the end of the 10th trading day is formulated as follows:

$MAR_i(10) = [(1+R_i(10)) / (1+R_{m, i}(10))] - 1$

Market adjusted returns for 13 fixed price and 15 book-building IPOs and average excess returns for fixed price and book-building methodologies are calculated for the 1st, 5th, 10th, 30th, 60th and 90th days of trading.

Then, t-test is applied to determine the significance of the difference between the average returns of fixed price and book-building offerings at the 90% confidence interval.

4.1. Over Allotment Option and Price Stabilization Activities in Istanbul Stock Exchange

Price stabilization mechanism is a tool to reduce a new issue's price volatility in the aftermarket. This mechanism involves a stabilizing manager (typically, the lead manager of an IPO) buying or agreeing to buy the relevant securities in

order to stabilize or maintain the market price of a security. It is a complex and sophisticated process used by the lead manager of an IPO to ensure the success of the securities issue. The introduction of a price stabilization mechanism would enhance confidence in the market for new issues of shares and thereby facilitate corporate fundraising.

Companies that want to venture out and start selling their shares to the public have ways to stabilize their initial share prices. Most popular one of these ways is through a legal mechanism called the green shoe option. A green shoe option, also known by its legal title as an "over-allotment option", gives underwriters the right to sell additional shares in a registered securities offering if demand for the securities is in excess of the original amount offered thereby taking a short position prior to the offering. This short position can be covered by exercising the overallotment option and/or by short covering in the aftermarket. Green shoe options typically allow underwriters to sell up to 15% more shares than the original number set by the issuer.

In Turkey, the regulations regarding the initial public offering process are determined by Capital Markets Board Communiqué, Serial I No: 26 and aftermarket price stabilization activities are regulated by Subject 21/A added to the Communiqué on December 17th, 2003. 21st Subject of the Communiqué is about over-allotment option which is defined as the right to sell additional shares in an offering if demand for the securities is in excess of the original amount offered. The Green Shoe can vary in size up to 15% of the original number of shares offered. Post-IPO stabilization mechanism shall be available for the period disclosed by the company in the prospectus, which shall not exceed 30 days from the date when trading permission was given by ISE. A single intermediary, the stabilizing manager, must have been appointed to conduct the stabilizing action. Aftermarket price supporting activities should satisfy the following conditions:

- The prospectus must state that the securities of the issuer may be subject to stabilizing action and must specify the maximum period during which stabilizing action may be taken.

• Price supporting activities are permitted if the price of a new issue falls below the offering price. Therefore, purchasing orders given by the stabilization manager cannot be above the offering price. During the stabilization period, if the price of the stock falls below the offering price, stabilizing manager can purchase shares in the market. Once shares are purchased by the stabilizing manager, they cannot be sold below the offering price until the end of the stabilization period.

• If the price stabilizing mechanism is utilized, an announcement must be made to the exchange and the stabilizing manager must disclose its stabilizing activities during and after the stabilizing period.

• While conducting stabilization activities, the stabilizing manager should pay attention to not disturbing the ordinary working of the market.

Price stabilization activities and the overallotment, or green shoe, option has become very popular in the Turkish IPO market since its introduction in 2003 and is nowadays an important tool to stabilize IPOs or to issue additional shares in the case of excess demand.

Prospective price stabilization activities may have effects on aftermarket performances of new issues. Küçükkocaoğlu and Alagöz (2006) analyze the efficiency of price stabilization activities in Istanbul Stock Exchange on a sample of twenty IPOs conducted between 17.12.2003 and 31.12.2005. They find out that IPOs for which price stabilization transactions have not occurred in the aftermarket have higher first day average returns compared to that of IPOs for which price stabilization activities have been conducted. (2.56% and 6.76%, respectively). They state two possible reasons for this discrepancy: i) price stabilization prevent under pricing, ii) higher offering prices are determined for issues for which stabilization activities are planned. Both of these arguments are consistent with the international literature.

In this study, our sample consisting of 13 fixed price and 15 book building IPOs is analyzed in terms of price stabilization activities. According to the prospectuses, price stabilization activities have been planned for 8 of 13

fixed price IPOs and 6 of these 8 IPOs have been subject to stabilization action since aftermarket prices have fallen below the offering price. On the other hand, price stabilization activities have been planned in all of the 15 book building IPOs, however, stabilization transactions have occurred in the aftermarket for only 7 of these IPOs. Information on our sample is given in Appendix 3.

There is no doubt that, the existence of price stabilization activities in the aftermarket may influence our findings in this study. However, the purpose of this study is comparing aftermarket performances of fixed price and book-building IPOs. Since price stabilization activities exist for both methodologies (for 6 of 13 (46.1 percent of) fixed price IPOs vs. for 7 of 15 (46.7 percent of) book-building IPOs), we think that the effects of these activities on average returns of book-building and fixed price IPOs would be in the same direction. Therefore, we assume the effects of price stabilization activities as negligible for this study.

On the other hand, in our sample, number of book-building IPOs including prospective price stabilization activities is higher than that of fixed price IPOs. The effects of this situation on our conclusion may be more serious because, as stated in the literature, planning of price stabilization may prevent under pricing due to the fact that stabilization mechanism would enhance confidence of investors. However, considering our sample, although the number of book-building IPOs which may be subject to price stabilization activities is higher than that of fixed price IPOs (price stabilization activities have been planned in 15 of 15 book building IPOs vs. 8 of 13 fixed price IPOs), book building IPOs perform better in the aftermarket. Therefore, the possibility of price stabilization is also not considered as a factor which may change the results.

V. Empirical Study and Results

Aftermarket performances of IPOs are examined for the next 90 days after the first trading day and it has been found that book building offerings provide with better returns on average than fixed price IPOs. For 13 fixed price and 15 book building IPOs, first day average returns are found as 2.43% and 10.31%, respectively. Average market adjusted returns of fixed price and book building offerings for the first 90 trading days are shown at the Graph 5.1.

Graph 5.1. Average Market Adjusted Returns for the Selected Days
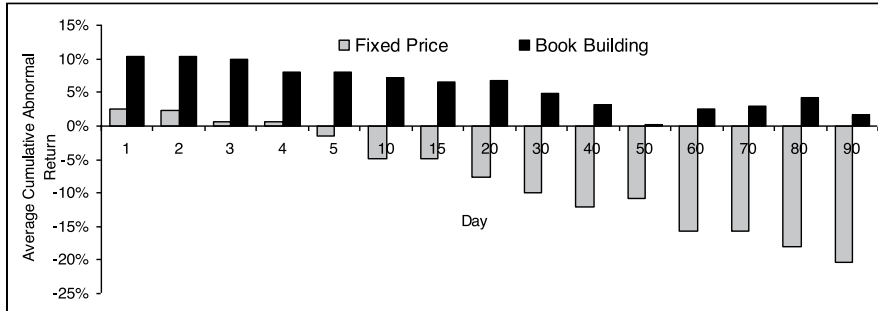
Note: As shown on the graph, fixed price offerings generate negative abnormal returns after the 5th day of the IPO.

1, 5, 10, 30, 60 and 90-day market adjusted returns are chosen for comparison. These returns and their standard deviations are calculated. Table 5.1. summarizes aftermarket relative returns for the selected days.

Table 5.1.   Average Market Adjusted Returns for the Selected Days

	Fixed Price	Book building
# of IPOs	13	15
1 day market adjusted	2.43%	10.31%
Std. Dev. of Returns	1.49%	0.78%
5 day market adjusted return	-1.53%	8.00%
Std. Dev. of Returns	3.49%	2.53%
10 day market adjusted return	-4.80%	7.11%
Std. Dev. of Returns	4.42%	3.25%
30 day market adjusted return	-9.92%	4.89%
Std. Dev. of Returns	6.86%	2.83%
60 day market adjusted return	-15.67%	2.07%
Std. Dev. of Returns	7.27%	3.83%
90 day market adjusted return	-20.43%	1.69%
Std. Dev. of Returns	6.99%	6.64%

T-test is used to analyze the significance of the differences between the average returns at the 90% confidence interval and we have found that book building IPOs generate significantly higher returns compared to fixed price IPOs. Statistical summary at the 90% confidence interval is summarized in Table 5.2.

Table 5.2. Statistics of Comparison of Differences Between Mean Returns for the Selected Days

	1st Day	5th Day	10th Day	30th Day	60th Day	90th Day
t Stat	-1.93	-1.44	-1.60	-1.75	-1.97	-2.23
P(T<=t) one tail	0.03	0.08	0.06	0.05	0.03	0.02
t Critical one tail	1.32	1.32	1.32	1.33	1.32	1.32
P(T<=t) two tail	0.07	0.16	0.12	0.10	0.06	0.03
t Critical two tail	1.72	1.71	1.71	1.72	1.72	1.71

Table 5.3. Statistical Summary for the Differences Between Means (at 10% Significance Level)

1st day	Significant
5th day	Insignificant
10th day	Insignificant
30th day	Significant
60th day	Significant
90th day	Significant

VI. Discussion

IPOs conducted in Turkish equity markets indicate significant first day abnormal returns according to several empirical analyses. Kıymaz (2000) shows that Turkish IPOs between 1990 and 1996 provided an average abnormal return

of %13.1 at the first trading day. Aktas, Aydogan, and Karan (2003) estimate initial under pricing as 9.17% in the period 1992-2000. In his empirical analysis comparing the IPO methods used on ISE, Küçükkocaoğlu (2006) indicates significant first day under pricing of 7.13% for fixed price offers and 10.61% in book building mechanism for the IPOs between 1993 and 2005 in the Turkish equity market.

In this study, it has been found that book building IPOs have outperformed fixed price offerings between 2004 and 2007. First day average return for book building issues is calculated as 10.3%, whereas first day average return for fixed price offerings is 2.4%. Variances of the returns in book building offerings are lower than those of fixed price offerings. Additionally, issue size of book built offers are found to be significantly larger in Turkish IPOs.

This findings is on the contrary to the literature comparing book building and fixed price methods in terms of under pricing levels they lead to. In the literature, most of the studies suggested that book building on an average would require lower under pricing. (Benveniste and Wilhelm 1990, Spatt and Srivastava 1991, Loughran, Ritter and Rydqvist 1994, Chowdhry and Sherman 1996, Benveniste and Busaba 1997, Ritter 1998, Sherman 2002, Ljungqvist, Jenkinson and Wilhelm 2000, Arosio, Giudici and Paleari 2000, Pandey 2004, Gajewski and Gresse 2006). Morevover, smaller issues are expected to be more under priced which is not the case of our study. In the literature, both Ritter (1984) and Brav and Gompers (1987) suggest that due to higher uncertainty new issues of smaller firms may have bigger discount.

If fixed price mechanism requires lower underpricing why do the firms and underwriters in Turkey choose book building mechanism in spite of its difficulties and high direct and indirect costs compared to those of fixed price?

The fear of IPO failure may explain this question. Dunbar (1999) shows that IPO withdrawals have a negative effect on market share of an established investment bank, whereas one year abnormal stock performance has a positive effect on investment bank's market share. In this case, it can be true to say that underwriters prefer under pricing to under subscription. In Turkish IPO market, 2004-2007 period has been a switching period in terms

of price setting mechanisms. Book building which was unpopular before 2004, although it was used in mid 90s, became the dominant method in price setting in 2007. One of the most important factors which triggered this switch has been the increase in the share of the foreign institutional investors who have a tendency to claim more information about an IPOing firm before participation decision. Furthermore, in this period, book building mechanism was used especially for larger issues because of the fact that larger issues are exposed to higher risk of under subscription and book building mechanism minimizes this risk since it gives the underwriter and issuing firm the opportunity to measure investors' appetite before the offering. It can be argued that one of the most important reasons for more under priced book building issues is IPOing firms' and underwriters' fear of under subscription which may be thought as more insignificant for a small issue.

Secondly, between 2004 and 2007 most of the high quality firms have chosen book building mechanism whereas most of the firms choosing fixed price mechanism were less promising. This may lead to lower after market returns for fixed price offerings. In their study comparing auctions and book building in terms of under pricing, Jovanovic and Szentes (2007) indicate that auctions are minimal or nonexistent because the worst firms would choose the auction mechanism, and that this adverse selection may eliminate auctions altogether while explaining the increasing popularity of book building although under pricing is far higher when the book building mechanism is used than when the company is simply auctioned of. Even though this finding is derived from a study comparing auction and book building method, a similar trend in Turkish IPO methodologies is observed between fixed price and book building offerings.

Another reason for superior after market performance in book built IPOs may be more favorable research coverage. Degeorge, Derrien and Womack (2004) find empirical evidence that underwriters employing book building implicitly commit to providing more favorable coverage to the companies they take public in the aftermarket. They find that analyst affiliated with the lead underwriter of the offering issue more (and more favorable) recommendations for recent book built IPOs than for auctioned offerings. They

also find that these analysts provide positive recommendations, what they call 'booster shots', following poor stock market performance to book built IPOs. In addition to analyst coverage, they find that book built IPOs receive more press coverage after the IPO. They interpret this result as evidence that book building underwriters use their resources to influence the press in order to advertise their offerings. Rajan and Servaes (1997) find that the intensity of analyst coverage is positively correlated with the degree of initial return. Taking all of these into consideration, it is true to say that issuers may be willing to pay higher direct and indirect costs of book building in exchange for increased press coverage and for increased and more favorable research coverage.

Lastly, aftermarket trading of informed investors may be another reason for better after market performance of book building IPOs in Turkey. Busaba and Chang (2002) point out that if informed investors are allowed to trade their information in the aftermarket, book building method may result in more under priced IPOs compared to fixed price method. Busaba and Chang (2001, 2002) found that a fixed price method that allocates all shares to retail investors requires less under pricing on average than running a book building mechanism in which all informed investors are treated equally. Informed investors' misrepresenting of their information may result in lower pricing of a firm's shares. However, such investors take the risk of exclusion from forthcoming IPOs. In developed markets, where too many IPOs are conducted in each year, informed investors would prefer to develop a long-term relationship with underwriter in order to get the utmost enjoyment out of continuous returns by participating in each IPO. However, it can be argued that in less developed markets, where limited number of book built IPOs take place each year, the possibility of informed investors' misrepresenting their information increases, since they may prefer to get more return in the aftermarket rather than investing for the forthcoming IPOs.

VII. Conclusion

This study documents comparison of aftermarket performances of book building and fixed price offerings. Two offering methods are compared in terms of their aftermarket performance. 13 fixed price and 15 book building IPOs between

2004 and 2007 have been analyzed and it has been found that fixed price offerings in this period are characterized by lower first day abnormal returns with greater uncertainty compared to book built IPOs. Since this finding is not in line with the literature arguing that book building issues require less under pricing, we discussed the possible reasons behind this discrepancy between international literature and our findings. Lastly 4 possible reasons for this discrepancy have been stated as follows: i) issuing firms' and underwriters' fear of under subscription, ii) after the introduction of book building mechanism, decrease in the quality of IPOing firms with fixed price offering, iii) increased press coverage and increased and more favorable research coverage in book building offerings, iv) the possibility of informed investors' misrepresenting of their information in order to get more profit trading in the aftermarket. In this study, these arguments have been supported with the findings of several researchers, however further research and empirical analysis on IPOs in the ISE is needed in order to analyze the effects of each argument.

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Appendices

Table 1: Information on the IPOs Conducted Between 2004 and 2007

	Company	Ticker	Total Proceeds mr ′TL	Ratio (%)	Value mr ′TL	Trading Date	No. of Investor	IPO Method
1	Fenerbahçe Sportif Hizmetler San. ve Tic. A.Ş.	FENER	39.4	15.0	262.5	20.02.2004	35,112	FP
2	İnfo Menkul Kıymetler Yatırım Ortaklığı A.Ş.	INFYO	3.4	99.1	3.5	04.03.2004		STSE
3	Desa Deri Sanayi ve Ticaret A.Ş.	DESA	21.3	30.0	71.1	06.05.2004	11,835	FP
4	Burçelik Vana Sanayi ve Ticaret A.Ş.	BURVA	4.1	38.3	10.6	17.05.2004	3,937	FP
5	Türk Traktör ve Ziraat Makineleri A.Ş.	TTRAK	94.0	25.0	376.0	11.06.2004	12,052	FP
6	Doğuş Otomotiv Servis ve Ticaret A.Ş.	DOAS	256.2	34.5	742.5	17.06.2004	23,909	BB
7	İndeks Bilgisayar Sistemleri Mühendislik Sanayi ve Ticaret A.Ş.	INDES	12.2	15.3	79.2	24.06.2004	1,329	FP
8	Şeker Finansal Kiralama A.Ş.	SEKFK	4.0	15.0	26.4	23.07.2004	673	FP
9	PLASTİKKART Akıllı Kart İletişim Sistemleri Sanayi ve Ticaret A.Ş.	PKART	12.8	28.6	44.8	19.08.2004		STSE
10	Denizbank A.Ş.	DENIZ	208.4	25.0	833.8	01.10.2004	20,797	BB
11	AFM Uluslararası Film Prodüksiyon Ticaret ve Sanayi A.Ş.	AFMAS	26.0	35.0	74.3	19.10.2004	824	FP
12	İş Girişim Sermayesi Yatırım Ortaklığı A.Ş.	ISGSY	32.2	37.7	85.5	22.10.2004	5,363	FP
13	Trabzonspor Sportif Yatırım ve Ticaret A.Ş.	TSPOR	32.8	25.0	131.3	15.04.2005	9,804	FP
14	Akmerkez Gayrimenkul Yatırım Ortaklığı A.Ş.	AKMGY	268.5	49.0	548.0	15.04.2005	1,160	BB
15	İnfotrend B Tipi Menkul Kıymetler Yatırım Ortaklığı A.Ş.	IBTYO	5.6	99.4	5.6	09.05.2005	441	STSE
16	Evg Yatırım Ortaklığı A.Ş.	EVNYO	2.8	99.0	2.9	11.07.2005	442	STSE
17	Bim Birleşik Mağazalar A.Ş.	BIMAS	290.2	43.1	672.9	15.07.2005	2,465	BB
18	Anel Telekomünikasyon Elektronik Sistemleri San. ve Tic. A.Ş.	ANELT	33.7	40.9	82.3	13.09.2005	619	STSE
19	Hedef Menkul Kıymetler Yatırım Ortaklığı A.Ş	HDFYO	1.4	50.0	2.8	06.10.2005	668	STSE
20	Türkiye Vakıflar Bankası T.A.O.	VAKBN	1,723.3	25.2	6,843.9	18.11.2005	34,171	BB
21	Mert Gıda Giyim San.ve Tic. A.Ş.	MRTGG	3.8	25.0	15.0	16.12.2005	274	FP
22	Reysaş Taşımacılık ve Lojistik Ticaret A.Ş.	RYSAS	69.0	34.5	200.0	10.02.2006	8,042	FP
23	Datagate Bilgisayar Malzemeleri Ticaret A.Ş.	DGATE	7.0	30.3	23.1	10.02.2006	1,368	FP
24	Vestel Beyaz Eşya San. ve Tic. A.Ş.	VESBE	191.4	31.5	607.5	21.04.2006	17,119	BB
25	Selçuk Ecza Deposu Ticaret ve Sanayi A.Ş.	SELEC	240.7	20.0	1,203.1	26.04.2006	16,200	BB
26	Asya Katılım Bankası A.Ş.	ASYAB	241.5	23.0	1,050.0	12.05.2006	37,777	BB
27	Coca-Cola İçecek A.Ş.	CCOLA	419.5	23.2	1,809.6	12.05.2006	17,621	BB
28	Başkent Menkul Kıymetler Yatırım Ortaklığı	BSKYO	1.4	50.0	2.8	26.05.2006	449	STSE
29	Metro Menkul Kıymetler Y.O.	METYO	2.8	90.0	3.1	02.06.2006	387	STSE
30	Taksim Yatırım Ortaklığı A.Ş.	TKSYO	3.2	98.6	3.2	02.06.2006	387	STSE
31	Armada Bilgisayar Sistemleri Sanayi ve Ticaret A.Ş.	ARMDA	9.0	30.0	30.0	15.06.2006	751	FP
32	Silverline Endüstri ve Ticaret A.Ş.	SILVR	20.0	36.8	54.4	23.06.2006	483	STSE
33	Euro Menkul Kıymetler Yatırım Ortaklığı A.Ş.	EMBYO	3.5	99.0	3.6	26.06.2006	261	STSE
34	Tacirler yatırım Ortaklığı A.Ş.	TCRYO	4.5	85.0	5.3	10.07.2006	769	STSE
35	Karel Elektronik Sanayi ve Ticaret A.Ş.	KAREL	24.6	31.0	79.4	20.10.2006	4,527	FP
36	Marbaş B Tipi Menkul Kıymetler Yatırım Ortaklığı A.Ş.	MRBYO	1.5	51.0	3.0	08.12.2006	362	STSE
37	TAV Havalimanları Holding A.Ş.	TAVHL	445.6	18.4	2,421.9	23.02.2007	18,737	BB
38	Sağlam Gayrimenkul Yatırım Ortaklığı A.Ş.	SAGYO	7.7	50.0	15.4	02.03.2007	427	FP
39	Oyak Yatırım Ortaklığı A.Ş.	OYAYO	11.0	100.0	11.0	04.05.2007	1,730	BB
40	Merkez B Tipi Men.Kıy.Yat.Ort.	MZBYO	3.3	98.8	3.3	04.05.2007	703	STSE
41	Türkiye Halk Bankası A.Ş.	HALKB	2,476.1	25.0	9,912.3	10.05.2007	50,693	BB
42	İş Yatırım Menkul Değerler A.Ş. hk.	ISMEN	99.4	29.7	334.2	18.05.2007	19,250	BB
43	Sinpaş Gayrimenkul Yatırım Ortaklığı A.Ş.	SNGYO	510.1	49.0	1,041.0	22.06.2007	3,912	BB
44	Albaraka Türk Katılım Bankası A.Ş.	ALBRK	227.3	20.6	1,105.1	29.06.2007	23,872	BB
45	Tekfen Holding A.Ş.	TKFEN	583.6	34.5	1,691.6	23.11.2007	16,193	BB

Source: IMKB (Istanbul Stock Exchange)

Table 2: Market Adjusted Returns

	Ticker	Trading Date	IPO Method	1	5	10	30	60	90
1	FENER	20.02.2004	FP	18.5%	28.5%	20.5%	0.0%	27.1%	5.1%
2	DESA	06.05.2004	FP	15.7%	6.6%	12.9%	-11.6%	-19.4%	-21.5%
3	BURVA	17.05.2004	FP	-5.7%	-18.8%	-21.0%	-27.8%	-29.9%	-33.0%
4	TTRAK	11.06.2004	FP	-3.7%	-15.8%	-18.4%	-25.4%	-26.7%	-32.7%
5	INDES	24.06.2004	FP	-1.0%	-8.5%	-12.7%	-20.5%	-28.1%	-32.8%
6	SEKFK	23.07.2004	FP	-5.0%	-10.2%	-18.1%	-14.8%	-24.8%	-32.8%
7	AFMAS	19.10.2004	FP	-18.7%	-15.6%	-23.7%	-32.8%	-44.7%	-49.6%
8	ISGSY	22.10.2004	FP	1.4%	-2.5%	-4.4%	-8.3%	-22.7%	-26.4%
9	TSPOR	15.04.2005	FP	0.9%	-4.3%	-9.4%	-12.1%	-27.8%	-29.7%
10	RYSAS	10.02.2006	FP	19.2%	16.7%	24.4%	35.0%	35.8%	51.6%
11	DGATE	10.02.2006	FP	19.9%	36.7%	32.7%	48.6%	24.2%	0.0%
12	ARMDA	15.06.2006	FP	-8.7%	-25.0%	-36.6%	-48.2%	-47.6%	-43.8%
13	KAREL	20.10.2006	FP	-1.4%	-7.7%	-8.6%	-11.0%	-19.1%	-19.8%
14	HALKB	10.05.2007	BB	11.4%	8.3%	2.0%	0.0%	-4.4%	-2.4%
15	ISMEN	18.05.2007	BB	13.8%	3.4%	0.9%	-2.8%	-8.9%	-21.0%
16	ALBRK	29.06.2007	BB	18.6%	11.2%	14.8%	17.2%	9.7%	7.9%
17	TKFEN	23.11.2007	BB	5.0%	2.5%	-2.2%	23.0%	31.7%	57.6%
18	DOAS	17.06.2004	BB	-3.3%	-11.9%	-14.7%	-26.1%	-37.3%	-44.1%
19	DENIZ	01.10.2004	BB	8.3%	3.5%	-2.8%	-3.3%	-2.6%	3.1%
20	BIMAS	15.07.2005	BB	6.5%	4.4%	3.2%	1.5%	8.2%	-3.5%
21	VAKBN	18.11.2005	BB	10.5%	6.6%	13.0%	17.6%	25.5%	14.4%
22	VESBE	21.04.2006	BB	-2.7%	-7.2%	-13.9%	-18.7%	-34.8%	-29.3%
23	SELEC	26.04.2006	BB	23.1%	27.9%	36.0%	28.2%	21.3%	14.8%
24	ASYAB	12.05.2006	BB	26.8%	52.5%	48.2%	16.9%	23.0%	39.1%
25	CCOLA	12.05.2006	BB	15.6%	17.1%	23.4%	22.8%	16.7%	13.5%
26	TAVHL	23.02.2007	BB	10.6%	9.6%	9.0%	15.1%	15.1%	7.0%
27	SNGYO	22.06.2007	BB	-1.4%	-9.7%	-14.5%	-17.6%	-14.0%	-15.9%
28	AKMGY	15.04.2005	BB	11.9%	1.8%	4.3%	-0.3%	-11.9%	-15.9%

FP: Fixed Price
BB: Book building

Table 3: Information on Over Allotment Option and Price Stabilization Activities

	Ticker	IPO Mechanism	Over Allotment Option*	Price Stabilization Activities*	Post-IPO Price Stabilization Activities**
1	FENER	FP	Yes	Planned	-
2	DESA	FP	Yes	Planned	Conducted
3	BURVA	FP	-	-	-
4	TTRAK	FP	-	Planned	Conducted
5	INDES	FP	Yes	Planned	Conducted
6	SEKFK	FP	-	-	-
7	AFMAS	FP	-	-	-
8	ISGSY	FP	Yes	Planned	Conducted
9	TSPOR	FP	-	Planned	Conducted
10	RYSAS	FP	Yes	Planned	-
11	DGATE	FP	-	-	-
12	ARMDA	FP	-	-	-
13	KAREL	FP	Yes	Planned	Conducted
14	HALKB	BB	Yes	Planned	-
15	ISMEN	BB	Yes	Planned	-
16	ALBRK	BB	Yes	Planned	-
17	TKFEN	BB	Yes	Planned	-
18	DOAS	BB	Yes	Planned	Conducted
19	DENIZ	BB	Yes	Planned	Conducted
20	BIMAS	BB	Yes	Planned	-
21	VAKBN	BB	Yes	Planned	Conducted
22	VESBE	BB	Yes	Planned	Conducted
23	SELEC	BB	Yes	Planned	-
24	ASYAB	BB	Yes	Planned	Conducted
25	CCOLA	BB	Yes	Planned	-
26	TAVHL	BB	Yes	Planned	Conducted
27	SNGYO	BB	-	Planned	Conducted
28	AKMGY	BB	Yes	Planned	-

*: IPO Prospectuses
**: Company disclosures

GLOBAL CAPITAL MARKETS

The global economy has begun to enter recovery, however, the stabilization is uneven and the recovery is expected to be slow. The advanced economies, hit particularly hard by financial crisis and the decline in world trade, are showing signs of stabilization. Financial conditions have improved more than expected and recent data suggest that the rate of decline in economic activity is moderating, although to varying degrees among regions. Despite these signs, the global recession is not over, and the recovery is still expected to be slow. Global activity is forecast to contract by 1.4 percent in 2009 and to expand by 2.5 percent in 2010, which is 0.6 percentage point higher than envisaged in the April 2009 WEO. In the US, the industrial production may be close to bottoming out and business and consumer confidence has improved.

In the Euro area, consumer and business survey indicators have been recovering but data on real activity show few signs of stabilization and thus activity is projected to strenghten slowly.

In Asia recent developments point to a strenghtening of domestic demand and exports, led by a rapid rebouns in China where growth accelerated to an annual rate of 7.1 percent in the first half of the year.

The performances of some developed stock markets with respect to indices indicated that DJIA, FTSE-100, Nikkei-225 and DAX changed by –3.1%, 12.2%, 5.2% and 3.7%, respectively, at July 1st, 2009 in comparison with the December 31, 2008. When US $ based returns of some emerging markets are compared in the same period, the best performer markets were: China (74.9 %), Brazil (65.8 %), Indonesia (62.6 %), Chile (56.1 %) and Russia (54.8 %). In the same period, the lowest return markets were: Poland (8.0 %), Czech Rep. (11.2 %), and Mexico (15.9 %). The performances of emerging markets with respect to P/E ratios as of end of December 2008 indicated that the highest rates were obtained in Chile (11.5), Jordan (10.9), Czech Rep. (10.5) and India (8.6) and the lowest rates in Mexico (0.3), Pakistan (3.0), Turkey (3.2) and Argentina (3.4).

Market Capitalization (USD Million, 1986-2008)

	Global	Developed Markets	Emerging Markets	ISE
1986	6,514,199	6,275,582	238,617	938
1987	7,830,778	7,511,072	319,706	3,125
1988	9,728,493	9,245,358	483,135	1,128
1989	11,712,673	10,967,395	745,278	6,756
1990	9,398,391	8,784,770	613,621	18,737
1991	11,342,089	10,434,218	907,871	15,564
1992	10,923,343	9,923,024	1,000,319	9,922
1993	14,016,023	12,327,242	1,688,781	37,824
1994	15,124,051	13,210,778	1,913,273	21,785
1995	17,788,071	15,859,021	1,929,050	20,782
1996	20,412,135	17,982,088	2,272,184	30,797
1997	23,087,006	20,923,911	2,163,095	61,348
1998	26,964,463	25,065,373	1,899,090	33,473
1999	36,030,810	32,956,939	3,073,871	112,276
2000	32,260,433	29,520,707	2,691,452	69,659
2001	27,818,618	25,246,554	2,572,064	47,689
2002	23,391,914	20,955,876	2,436,038	33,958
2003	31,947,703	28,290,981	3,656,722	68,379
2004	38,904,018	34,173,600	4,730,418	98,299
2005	43,642,048	36,538,248	7,103,800	161,537
2006	54,194,991	43,736,409	10,458,582	162,399
2007	64,563,414	46,300,864	18,262,550	286,572
2008	35,811,160	26,533,854	9,277,306	117,930

Source: Standard & Poor's Global Stock Markets Factbook, 2009.

Comparison of Average Market Capitalization Per Company (USD Million, June 2009)
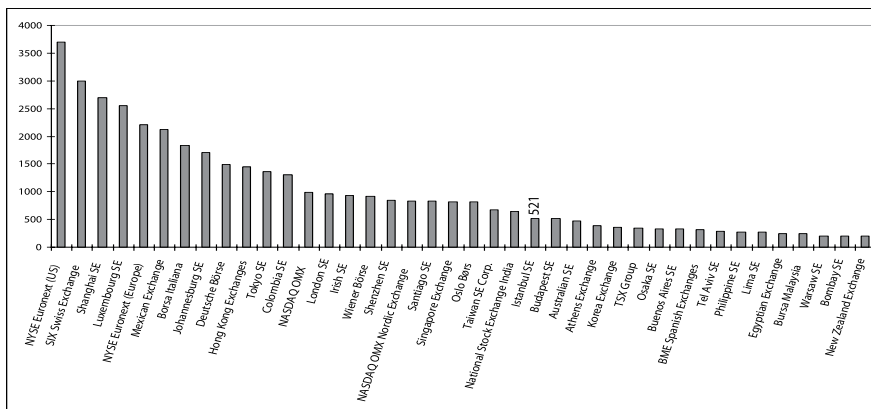
Source: FIBV, Monthly Statistics, June 2009.

Worldwide Share of Emerging Capital Markets
(1986-2008)
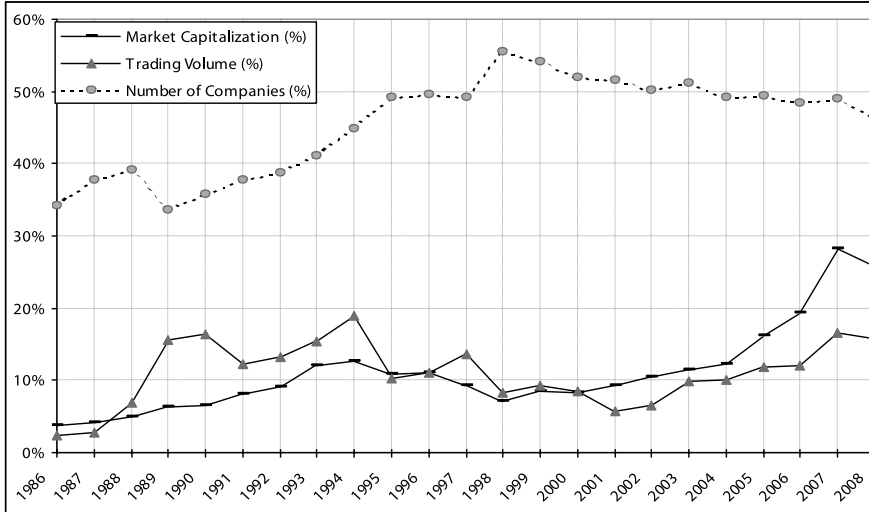
Source: Standard & Poor's Global Stock Markets Factbook, 2009.

Share of ISE's Market Capitalization in World Markets
(1986-2008)
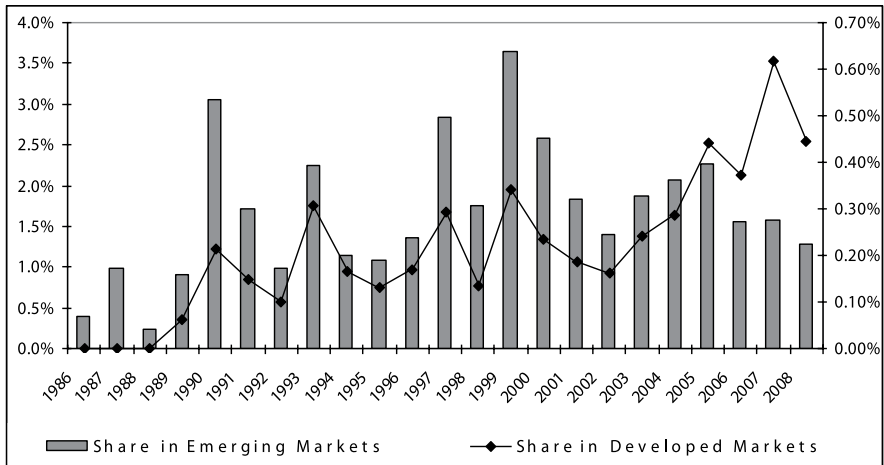
Source: Standard & Poor's Global Stock Markets Factbook, 2009.

Piyasa Main Indicators of Capital Markets (June 2009)

Market	Monthly Turnover Velocity (June 2009) (%)	Market	Value of Share Trading (millions, US$) Up to Year Total (2009/1-2009/6)	Market	Market Cap. of Share of Domestic Companies (millions US$) June 2009
1 NASDAQ OMX	1030.9%	NASDAQ OMX	14,722,742	NYSE Euronext (US)	9,863,640.9
2 Shenzhen SE	434.2%	NYSE Euronext (US)	9,528,246	Tokyo SE	3,203,510.3
3 Korea Exchange	251.9%	Shanghai SE	2,136,688	NASDAQ OMX	2,590,156.8
4 Shanghai SE	232.3%	Tokyo SE	1,977,035	Shanghai SE	2,329,302.9
5 Istanbul SE	216.9%	London SE	1,803,766	London SE	2,197,600.6
6 Taiwan SE Corp.	210.6%	Deutsche Börse	1,271,454	NYSE Euronext (Avrupa)	2,196,994.0
7 NYSE Euronext (US)	169.4%	Shenzhen SE	1,105,019	Hong Kong Exchanges	1,825,470.5
8 Borsa Italiana	167.3%	NYSE Euronext (Europe)	896,321	TSX Group	1,280,532.5
9 Deutsche Börse	158.2%	Korea Exchange	750,430	BME Spanish Exchanges	1,083,685.8
10 Tokyo SE	155.5%	BME Spanish Excha	731,155	Deutsche Börse	1,083,094.4
11 BME Spanish Exchan	153.8%	Hong Kong Exchanges	680,379	Bombay SE	991,532.2
12 Oslo Børs	146.2%	TSX Group	602,408	National Stock Exchange India	925,288.7
13 Egyptian Exchange	142.9%	Taiwan SE Corp.	420,066	Australian SE	888,067.7
14 National Stock Ex India	130.5%	Borsa Italiana	419,361	SIX Swiss Exchange	845,758.6
15 Budapest SE	128.2%	SIX Swiss Exchange	400,362	NASDAQ OMX Nordic E	652,455.4
16 Australian SE	124.9%	NASDAQ OMX Nordic Exchange	378,752	Korea Exchange	621,764.0
17 London SE	124.0%	Australian SE	369,151	Shenzhen SE	619,854.0
18 Hong Kong Exchanges	105.6%	National Stock Exchange India	343,249	Johannesburg SE	608,045.6
19 Osaka SE	105.4%	Johannesburg SE	147,886	Borsa Italiana	531,863.1
20 TSX Group	103.6%	Istanbul SE	124,072	Taiwan SE Corp.	494,196.0

21	NASDAQ OMX Nordic Exchange	102.8%	Bombay SE	117,138	Singapore Exchange	367,986.7
22	SIX Swiss Exchange	87.4%	Oslo Børs	113,077	Mexican Exchange	265,066.0
23	Irish SE	84.5%	Singapore Exchange	108,850	Bursa Malaysia	230,711.8
24	NYSE Euronext (Europe)	83.5%	Osaka SE	76,747	Santiago SE	195,260.4
25	Singapore Exchange	78.0%	Bursa Malaysia	39,240	Tel Aviv SE	175,780.5
26	Athens Exchange	62.8%	Mexican Exchange	35,573	Istanbul SE	164,675.2
27	Johannesburg SE	60.1%	Tel Aviv SE	35,132	Oslo Børs	159,058.6
28	Tel Aviv SE	58.0%	Egyptian Exchange	30,264	Osaka SE	147,906.2
29	Warsaw SE	54.3%	Athens Exchange	27,668	Colombia SE	111,100.3
30	Wiener Börse	52.3%	Warsaw SE	22,471	Athens Exchange	109,661.5
31	Bursa Malaysia	52.2%	Wiener Börse	21,505	Warsaw SE	92,591.0
32	New Zealand Exchange	42.0%	Santiago SE	18,932	Wiener Börse	90,585.9
33	Bombay SE	40.2%	Irish SE	16,478	Egyptian Exchange	82,882.4
34	Mexican Exchange	25.4%	Budapest SE	10,865	Luxembourg SE	81,515.3
35	Colombo SE	25.1%	Philippine SE	8,156	Philippine SE	67,756.7
36	Philippine SE	23.1%	Colombia SE	6,684	Tehran SE	53,667.5
37	Santiago SE	22.6%	New Zealand Excha	6,315	Irish SE	52,954.2
38	Cyprus SE	22.3%	Tehran SE	2,500	Lima SE	52,204.3
39	Ljubljana SE	19.5%	Lima SE	1,713	Buenos Aires SE	34,287.7
40	Colombia SE	15.3%	Buenos Aires SE	1,357	New Zealand Exchange	28,313.8
41	Tehran SE	11.7%	Cyprus SE	918	Budapest SE	21,330.0
42	Mauritius SE	8.3%	Ljubljana SE	510	Ljubljana SE	12,927.1
43	Lima SE	4.8%	Colombo SE	431	Cyprus SE	9,222.4
44	Buenos Aires SE	4.5%	Luxembourg SE	177	Colombo SE	6,747.3
45	Bermuda SE	3.5%	Mauritius SE	157	Mauritius SE	5,420.9

Source: FIBV, Monthly Statistics, June 2009.

Trading Volume (USD millions, 1986-2008)

	Global	Developed	Emerging	ISE	Emerging/ Global (%)	ISE/Emerging (%)
1986	3,573,570	3,490,718	82,852	13	2.32	0.02
1987	5,846,864	5,682,143	164,721	118	2.82	0.07
1988	5,997,321	5,588,694	408,627	115	6.81	0.03
1989	7,467,997	6,298,778	1,169,219	773	15.66	0.07
1990	5,514,706	4,614,786	899,920	5,854	16.32	0.65
1991	5,019,596	4,403,631	615,965	8,502	12.27	1.38
1992	4,782,850	4,151,662	631,188	8,567	13.20	1.36
1993	7,194,675	6,090,929	1,103,746	21,770	15.34	1.97
1994	8,821,845	7,156,704	1,665,141	23,203	18.88	1.39
1995	10,218,748	9,176,451	1,042,297	52,357	10.20	5.02
1996	13,616,070	12,105,541	1,510,529	37,737	11.09	2.50
1997	19,484,814	16,818,167	2,666,647	59,105	13.69	2.18
1998	22,874,320	20,917,462	1,909,510	68,646	8.55	3.60
1999	31,021,065	28,154,198	2,866,867	81,277	9.24	2.86
2000	47,869,886	43,817,893	4,051,905	179,209	8.46	4.42
2001	42,076,862	39,676,018	2,400,844	77,937	5.71	3.25
2002	38,645,472	36,098,731	2,546,742	70,667	6.59	2.77
2003	29,639,297	26,743,153	2,896,144	99,611	9.77	3.44
2004	39,309,589	35,341,782	3,967,806	147,426	10.09	3.72
2005	47,319,584	41,715,492	5,604,092	201,258	11.84	3.59
2006	67,912,153	59,685,209	8,226,944	227,615	12.11	2.77
2007	98,816,305	82,455,174	16,361,131	302,402	16.55	1.85
2008	80,516,822	67,795,950	12,720,872	239,713	15.80	1.88

Source: Standard & Poor's Global Stock Markets Factbook, 2009.

Number of Trading Companies (1986-2008)

	Global	Developed Markets	Emerging Markets	ISE	Emerging/ Global (%)	ISE/Emerging (%)
1986	28,173	18,555	9,618	80	34.14	0.83
1987	29,278	18,265	11,013	82	37.62	0.74
1988	29,270	17,805	11,465	79	39.17	0.69
1989	25,925	17,216	8,709	76	33.59	0.87
1990	25,424	16,323	9,101	110	35.80	1.21
1991	26,093	16,239	9,854	134	37.76	1.36
1992	27,706	16,976	10,730	145	38.73	1.35
1993	28,895	17,012	11,883	160	41.12	1.35
1994	33,473	18,505	14,968	176	44.72	1.18
1995	36,602	18,648	17,954	205	49.05	1.14
1996	40,191	20,242	19,949	228	49.64	1.14
1997	40,880	20,805	20,075	258	49.11	1.29
1998	47,465	21,111	26,354	277	55.52	1.05
1999	48,557	22,277	26,280	285	54.12	1.08
2000	49,933	23,996	25,937	315	51.94	1.21
2001	48,220	23,340	24,880	310	51.60	1.25
2002	48,375	24,099	24,276	288	50.18	1.19
2003	49,855	24,414	25,441	284	51.03	1.12
2004	48,806	24,824	23,982	296	49.14	1.23
2005	49,946	25,337	24,609	302	49.27	1.23
2006	50,212	25,954	24,258	314	48.31	1.29
2007	51,322	26,251	25,071	319	48.85	1.27
2008	49,138	26,375	22,763	284	46.32	1.25

Source: Standard & Poor's Global Stock Markets Factbook, 2009.

Comparison of P/E Ratios Performances
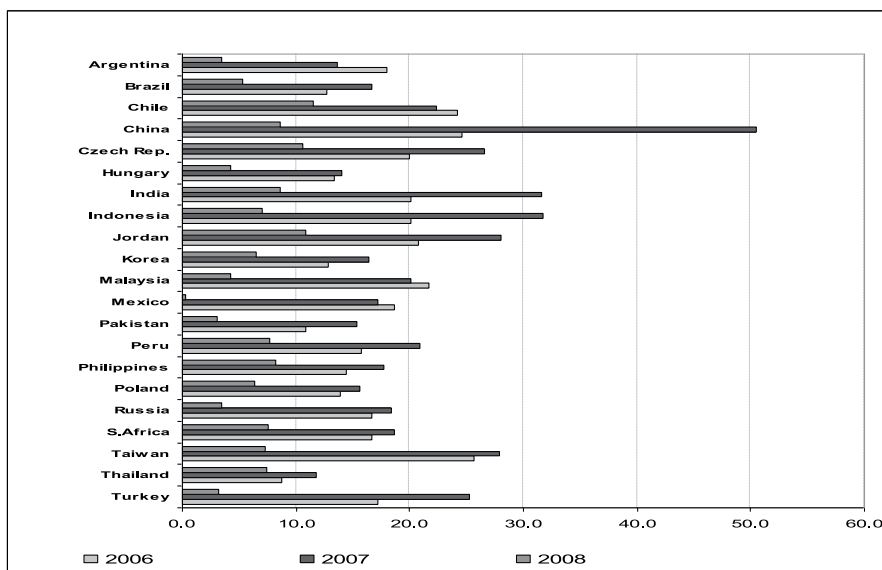
Source: IFC Factbook 2001. Standard & Poor's, Global Stock Markets Factbook, 2009.

Price-Earnings Ratios in Emerging Markets

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Argentina	39.4	-889.9	32.6	-1.4	21.1	27.7	11.1	18.0	13.6	3.4
Brazil	23.5	11.5	8.8	13.5	10.0	10.6	10.7	12.7	16.6	5.3
Chile	35.0	24.9	16.2	16.3	24.8	17.2	15.7	24.2	22.3	11.5
China	47.8	50.0	22.2	21.6	28.6	19.1	13.9	24.6	50.5	8.6
Czech Rep.	-14.9	-16.4	5.8	11.2	10.8	25.0	21.1	20.0	26.5	10.5
Hungary	18.1	14.3	13.4	14.6	12.3	16.6	13.5	13.4	14.0	4.2
India	25.5	16.8	12.8	15.0	20.9	18.1	19.4	20.1	31.6	8.6
Indonesia	-7.4	-5.4	-7.7	22.0	39.5	13.3	12.6	20.1	31.7	7.0
Jordan	14.1	13.9	18.8	11.4	20.7	30.4	6.2	20.8	28.0	10.9
Korea	-33.5	17.7	28.7	21.6	30.2	13.5	20.8	12.8	16.4	6.4
Malaysia	-18.0	91.5	50.6	21.3	30.1	22.4	15	21.7	20.1	4.2
Mexico	14.1	13.0	13.7	15.4	17.6	15.9	14.2	18.6	17.2	0.3
Pakistan	13.2	-117.4	7.5	10.0	9.5	9.9	13.1	10.8	15.3	3.0
Peru	25.7	11.6	21.3	12.8	13.7	10.7	12.0	15.7	20.9	7.7
Philippines	22.2	26.2	45.9	21.8	21.1	14.6	15.7	14.4	17.7	8.2
Poland	22.0	19.4	6.1	88.6	-353.0	39.9	11.7	13.9	15.6	6.4
Russia	-71.2	3.8	5.6	12.4	19.9	10.8	24.1	16.6	18.4	3.4
S.Africa	17.4	10.7	11.7	10.1	11.5	16.2	12.8	16.6	18.7	7.5
Taiwan	52.5	13.9	29.4	20.0	55.7	21.2	21.9	25.6	27.9	7.2
Thailand	-12.2	-6.9	163.8	16.4	16.6	12.8	10.0	8.7	11.7	7.5
Turkey	34.6	15.4	72.5	37.9	14.9	12.5	16.2	17.2	25.2	3.2

Source : IFC Factbook, 2004; Standard & Poor's, Global Stock Markets Factbook, 2009.
Note   : Figures are taken from S&P/IFCI Index Profile.

Comparison of Market Returns in USD
(31/12/2008-01/07/2009)

Country	Value
China	74.9
Brazil	65.8
Indonesia	62.6
Chile	56.1
Russia	54.8
India	54.4
Taiwan	43.5
Israel	40.9
Colombia	40.6
Turkey	40.4
Venezuela	36.6
Thailand	35.6
Argentina	35.6
Singapore	33.3
Hong Kong	27.7
Greece	27.3
Hungary	26.4
S.Africa	26.1
S. Korea	24.7
Egypt	22.2
Malaysia	21.0
Pakistan	18.8
Saudi Arabia	16.6
Mexico	15.9
Czech Rep.	11.2
Poland	8.0
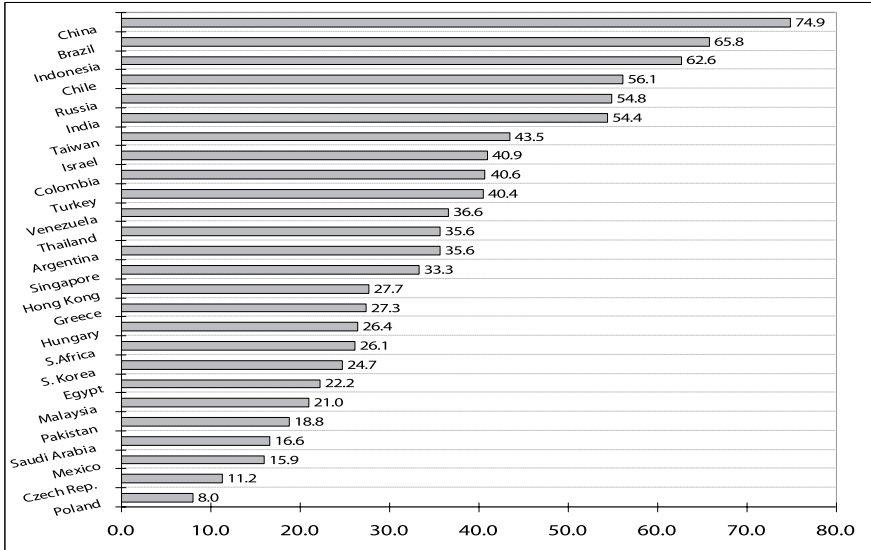
Kaynak: The Economist, July 4th 2009.

Market Value/Book Value Ratios

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Argentina	1.5	0.9	0.6	0.8	2.0	2.2	2.5	4.1	3.2	0.8
Brazil	1.6	1.4	1.2	1.3	1.8	1.9	2.2	2.7	3.3	1.0
Chile	1.7	1.4	1.4	1.3	1.9	0.6	1.9	2.4	2.5	1.4
China	3.0	3.6	2.3	1.9	2.6	2.0	1.8	3.1	6.3	1.9
Czech Rep.	0.9	1.0	0.8	0.8	1.0	1.6	2.4	2.4	3.1	2.0
Hungary	3.6	2.4	1.8	1.8	2.0	2.8	3.1	3.1	3.2	0.9
India	3.3	2.6	1.9	2.0	3.5	3.3	5.2	4.9	7.9	1.7
Indonesia	3.0	1.7	1.7	1.0	1.6	2.8	2.5	3.4	5.6	1.6
Jordan	1.5	1.2	1.5	1.3	2.1	3.0	2.2	3.3	4.4	1.3
Korea	2.0	0.8	1.2	1.1	1.6	1.3	2.0	1.7	2.2	0.8
Malaysia	1.9	1.5	1.2	1.3	1.7	1.9	1.7	2.1	2.5	0.7
Mexico	2.2	1.7	1.7	1.5	2.0	2.5	2.9	3.8	3.6	1.0
Pakistan	1.4	1.4	0.9	1.9	2.3	2.6	3.5	3.2	4.7	0.8
Peru	1.5	1.1	1.4	1.2	1.8	1.6	2.2	3.5	6.0	2.7
Philippines	1.4	1.0	0.9	0.8	1.1	1.4	1.7	1.9	2.8	1.3
Poland	2.0	2.2	1.4	1.3	1.8	2.0	2.5	2.5	2.8	1.1
Russia	1.2	0.6	1.1	0.9	1.2	1.2	2.2	2.5	2.8	0.1
S.Africa	2.7	2.1	2.1	1.9	2.1	2.5	3.0	3.8	4.4	1.6
Taiwan	3.4	1.7	2.1	1.6	2.2	1.9	1.9	2.4	2.6	1.0
Thailand	2.1	1.3	1.3	1.5	2.8	2.0	2.1	1.9	2.5	1.0
Turkey	8.9	3.1	3.8	2.8	2.6	1.7	2.1	2.0	2.8	0.7

Source: IFC Factbook, 2004; Standard & Poor's, Global Stock Markets Factbook, 2009.

Note   : Figures are taken from S&P/IFCI Index Profile.

Value of Bond Trading
(Million USD Jan. 2009-June 2009)

Exchange	Value
London SE	4,403,639
BME Spanish Exchanges	4,354,910
NASDAQ OMX Nordic Exchange	896,870
Colombia SE	438,925
Istanbul SE	202,460
Korea Exchange	197,716
Borsa Italiana	160,388
Tel Aviv SE	124,884
Oslo Børs	104,045
Santiago SE	99,140
Deutsche Börse	81,292
SIX Swiss Exchange	80,781
National Stock Exchange India	54,345
Irish SE	42,524
Shanghai SE	28,487
NYSE Euronext (Europe)	15,594
Buenos Aires SE	9,450
Shenzhen SE	5,543
Singapore Exchange	4,468
Bombay SE	3,952
Egyptian Exchange	3,692
Tokyo SE	2,147
TSX Group	1,302
Budapest SE	830
Wiener Börse	564
Lima SE	442
New Zealand Exchange	340
Malta SE	296
Warsaw SE	236
Australian SE	215
Ljubljana SE	130
Bursa Malaysia	127
Mexican Exchange	116
Luxembourg SE	24
Cyprus SE	8
Athens Exchange	3

Source: FIBV, Monthly Statistics, June 2009.

Foreign Investments as a Percentage of Market Capitalization in Turkey (1986-2006)
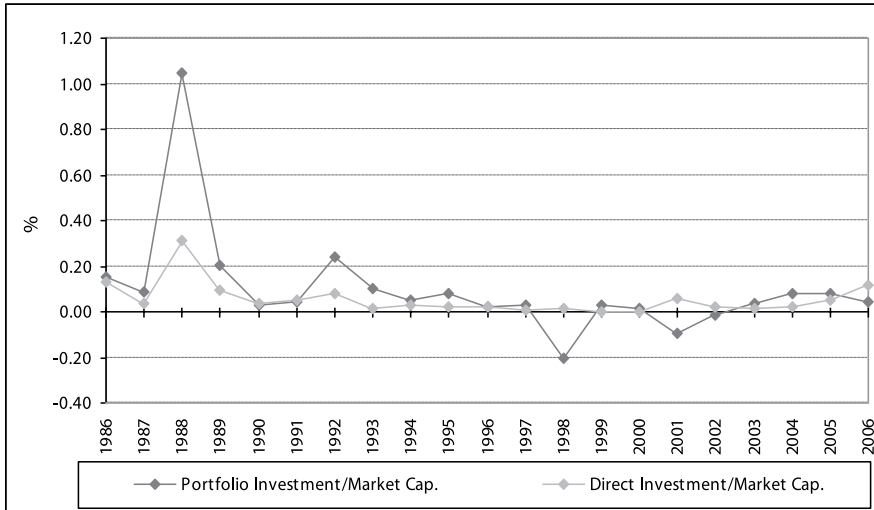
Source: ISE Data. CBTR Databank.

Foreigners' Share in the Trading Volume of the ISE (Jan. 1998-June 2009)
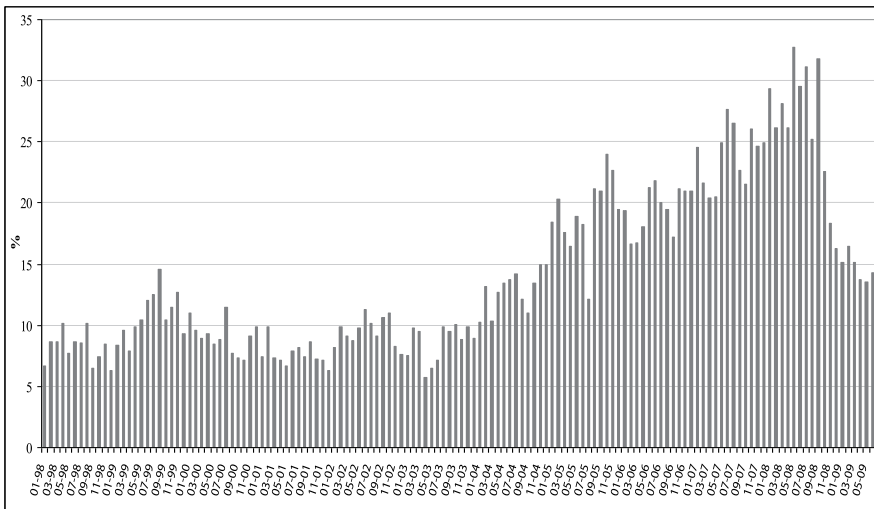
Source: ISE Data.

Price Correlations of the ISE
(Sep. 2003- Sep. 2008)
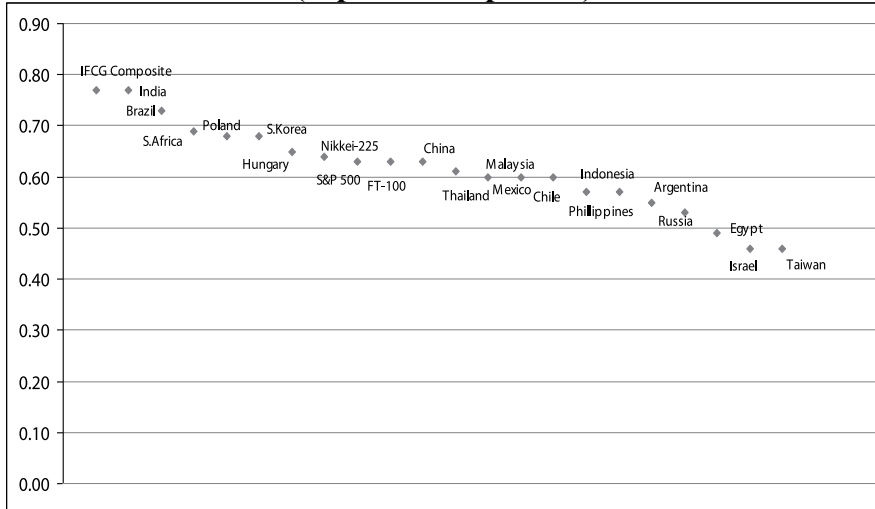
Source: Standard & Poor's, Emerging Stock Markets Review, September 2008.
Notes : The correlation coefficient is between -1 and +1. If it is zero. for the given period. it is
implied that there is no relation between two serious of returns.

Comparison of Market Indices
(31 Jan. 2004=100)

Source: Bloomberg

ISE
Market Indicators

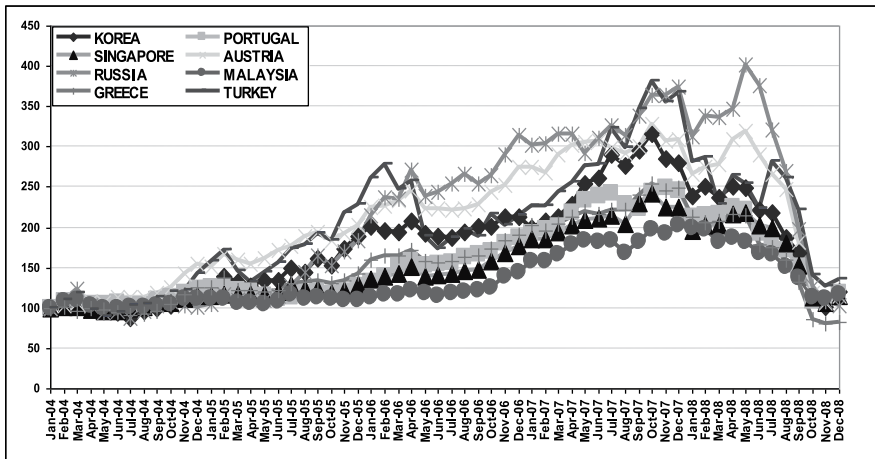|	Number of Companies	Traded Value				Market Value		Dividend Yield	P/E Ratios		
		Total		Daily Average							
		TL Million	US$ Million	TL Million	US$ Million	Milyon TL	Milyon ABD$	(%)	TL(1)	TL(2)	US$
1986	80	0.01	13	---	---	0.71	938	9,15	5,07	---	---
1987	82	0.10	118	---	---	3	3.125	2,82	15,86	---	---
1988	79	0.15	115	---	---	2	1.128	10,48	4,97		---
1989	76	2	773	0.01	3	16	6.756	3,44	15,74	---	---
1990	110	15	5.854	0.06	24	55	18.737	2,62	23,97	---	---
1991	134	35	8.502	0.14	34	79	15.564	3,95	15,88	---	---
1992	145	56	8.567	0.22	34	85	9.922	6,43	11,39	---	---
1993	160	255	21.770	1	88	546	37.824	1,65	25,75	20,72	14,86
1994	176	651	23.203	3	92	836	21.785	2,78	24,83	16,70	10,97
1995	205	2.374	52.357	9	209	1.265	20.782	3,56	9,23	7,67	5,48
1996	228	3.031	37.737	12	153	3.275	30.797	2,87	12,15	10,86	7,72
1997	258	9.049	58.104	36	231	12.654	61.879	1,56	24,39	19,45	13,28
1998	277	18.030	70.396	73	284	10.612	33.975	3,37	8,84	8,11	6,36
1999	285	36.877	84.034	156	356	61.137	114.271	0,72	37,52	34,08	24,95
2000	315	111.165	181.934	452	740	46.692	69.507	1,29	16,82	16,11	14,05
2001	310	93.119	80.400	375	324	68.603	47.689	0,95	108,33	824,42	411,64
2002	288	106.302	70.756	422	281	56.370	34.402	1,20	195,92	26,98	23,78
2003	285	146.645	100.165	596	407	96.073	69.003	0,94	14,54	12,29	13,19
2004	297	208.423	147.755	837	593	132.556	98.073	1,37	14,18	13,27	13,96
2005	304	269.931	201.763	1.063	794	218.318	162.814	1,71	17,19	19,38	19,33
2006	316	325.131	229.642	1.301	919	230.038	163.775	2,10	22,02	14,86	15,32
2007	319	387.777	300.842	1.539	1.194	335.948	289.986	1,90	12,16	11,97	13,48
2008	317	332.615	261.281	1.325	1.041	182.025	119.696	4,93	5,55	5,76	4,63
2009	320	204.365	128.787	1.635	1.030	252.974	166.037	2,17	11,51	12,38	10,26
2009/Ç1	319	69.916	42.501	1.110	675	183.809	110.263	3,58	7,28	7,47	5,50
2009/Ç2	320	134.449	86.286	2.169	1.392	252.974	166.037	2,17	11,51	12,38	10,26

Q: Quarter

Note: Between 1986-1992. the price earnings ratios were calculated on the basis of the companies'
previous year-end net profits. As from 1993.

YTL(1) = Total Market Capitalization / Sum of Last two six-month profits

YTL(2) = Total Market Capitalization / Sum of Last four three-month profits.

US$ = US$ based Total Market Capitalization / Sum of Last four US$ based three-month profits.

- Companies which are temporarily de-listed and will be traded off the Exchange under the decision of
ISE's Executive Council are not included in the calculations.

- ETF's data are taken into account only in the calculation of Traded Value.

Closing Values of the ISE Price Indices

TL Based

	NATIONAL-100 (Jan. 1986=1)	CORPORATE GOVERNANCE (Aug.29.2007= 48.082.17)	NATIONAL-INDUSTRIALS (Dec. 31.90=33)	NATIONAL-SERVICES (Dec. 27.96=1046)	NATIONAL-FINANCIALS (Dec. 31.90=33)	NATIONAL-TECHNOLOGY (Jun. 30.2000 =14.466.12)	INVESTMENT TRUSTS (Dec 27. 1996=976)	SECOND NATIONAL (Dec 27. 1996=976)	NEW ECONOMY (Sept 02.2004 =20525.92)
1986	1,71	---	---	---	---	---	---	---	---
1987	6,73	---	---	---	---	---	---	---	---
1988	3,74	---	---	---	---	---	---	---	---
1989	22,18	---	---	---	---	---	---	---	---
1990	32,56	---	---	---	---	---	---	---	---
1991	43,69	---	49,63	---	33,55	---	---	---	---
1992	40,04	---	49,15	---	24,34	---	---	---	---
1993	206,83	---	222,88	---	191,90	---	---	---	---
1994	272,57	---	304,74	---	229,64	---	---	---	---
1995	400,25	---	462,47	---	300,04	---	---	---	---
1996	975,89	---	1.045,91	---	914,47	---	---	---	---
1997	3.451,--	---	2.660,--	3.593,--	4.522,--	---	2.934,--	2.761,--	---
1998	2.597,91	---	1.943,67	3.697,10	3.269,58	---	1.579,24	5.390,43	---
1999	15.208,78	---	9.945,75	13.194,40	21.180,77	---	6.812,65	13.450,36	---
2000	9.437,21	---	6.954,99	7.224,01	12.837,92	10.586,58	6.219,00	15.718,65	---
2001	13.782,76	---	11.413,44	9.261,82	18.234,65	9.236,16	7.943,60	20.664,11	---
2002	10.369,92	---	9.888,71	6.897,30	12.902,34	7.260,84	5.452,10	28.305,78	---
2003	18.625,02	---	16.299,23	9.923,02	25.594,77	8.368,72	10.897,76	32.521,26	---
2004	24.971,68	---	20.885,47	13.914,12	35.487,77	7.539,16	17.114,91	23.415,86	39.240,73
2005	39.777,70	---	31.140,59	18.085,71	62.800,64	13.669,97	23.037,86	28.474,96	29.820,90
2006	39.117,46	---	30.896,67	22.211,77	60.168,41	10.341,85	16.910,76	23.969,99	20.395,84
2007	55.538,13	55.406,17	40.567,17	34.204,74	83.822,29	10.490,51	16.428,59	27.283,78	32.879,36
2008	26.864.07	21.974.49	19.781.26	22.169.30	38.054.32	4.858.62	8.655.55	8.645.09	14.889.37
2009	36.949,20	28.985,35	27.972,17	27.652,64	54.609,09	7.054,04	12.025,90	17.503,77	25.625,99
2009/Ç1	25.764,83	20.760,86	20.297,09	22.484,07	35.651,63	4.658,53	10.022,26	11.168,24	16.479,36
2009/Ç2	36.949,20	28.985,35	27.972,17	27.652,64	54.609,09	7.054,04	12.025,90	17.503,77	25.625,99

US $ Based / Euro Based

	NATIONAL-100 (Jan. 1986=100)	CORPORATE GOVERNANCE (Aug.29.2007= 2.114.37)	NATIONAL-INDUSTRIALS (Dec. 31.90=643)	NATIONAL-SERVICES (Dec. 27.96 =572)	NATIONAL-FINANCIALS (Dec.31.90= 643)	NATIONAL-TECHNOLOGY (Jun. 30.2000 =1.360.92)	INVESTMENT TRUSTS (Dec 27. 96=534)	SECOND NATIONAL (Dec 27.96=534)	NEW ECONOMY (Sept 02. 2004 =796.46)	NATIONAL-100 (Dec.31.98= 484)
1986	131,53	---	---	---	---	---	---	---	---	---
1987	384,57	---	---	---	---	---	---	---	---	---
1988	119,82	---	---	---	---	---	---	---	---	---
1989	560,57	---	---	---	---	---	---	---	---	---
1990	642,63	---	---	---	---	---	---	---	---	---
1991	501,50	---	569,63	---	385,14	---	---	---	---	---
1992	272,61	---	334,59	---	165,68	---	---	---	---	---
1993	833,28	---	897,96	---	773,13	---	---	---	---	---
1994	413,27	---	462,03	---	348,18	---	---	---	---	---
1995	382,62	---	442,11	---	286,83	---	---	---	---	---
1996	534,01	---	572,33	---	500,40	---	---	---	---	---
1997	982,--	---	757,--	1.022,--	1.287,--	---	835,--	786,--	---	---
1998	484,01	---	362,12	688,79	609,14	---	294,22	1.004,27	---	---
1999	1.654,17	---	1.081,74	1.435,08	2.303,71	---	740,97	1.462,92	---	1.912,46
2000	817,49	---	602,47	625,78	1.112,08	917,06	538,72	1.361,62	---	1.045,57
2001	557,52	---	461,68	374,65	737,61	373,61	321,33	835,88	---	741,24
2002	368,26	---	351,17	244,94	458,20	257,85	193,62	1.005,21	---	411,72
2003	778,43	---	681,22	414,73	1.069,73	349,77	455,47	1.359,22	---	723,25
2004	1.075,12	---	899,19	599,05	1.527,87	324,59	736,86	1.008,13	1.689,45	924,87
2005	1.726,23	---	1.351,41	784,87	2.725,36	593,24	999,77	1.235,73	1.294,14	1.710,04
2006	1.620,59	---	1.280,01	920,21	2.492,71	428,45	700,59	993,05	844,98	1.441,89
2007	2.789,66	2.783,03	2.037,67	1.718,09	4.210,36	526,93	825,20	1.370,45	1.651,52	2.221,77
2008	1.027.98	840.87	756.95	848.33	1.456.18	185.92	331.21	330.81	569.76	859.46
2009	1.411,20	1.107,04	1.068,34	1.056,14	2.085,69	269,42	459,31	668,52	978,74	1.171,62
2009/Ç1	899,39	724,71	708,52	784,87	1.244,51	162,62	349,85	389,86	575,26	793,40
2009/Ç2	1.411,20	1.107,04	1.068,34	1.056,14	2.085,69	269,42	459,31	668,52	978,74	1.171,62

Q: Quarter

BONS AND BILLS MARKET

Traded Value

Outright Purchases and Sales Market

	Total		Daily Average	
	TL Million	US $ Million	TL Million	US $ Million
1991	1	312	0.01	2
1992	18	2.406	0.07	10
1993	123	10.728	0.50	44
1994	270	8.832	1	35
1995	740	16.509	3	66
1996	2.711	32.737	11	130
1997	5.504	35.472	22	141
1998	17.996	68.399	72	274
1999	35.430	83.842	143	338
2000	166.336	262.941	663	1.048
2001	39.777	37.297	158	149
2002	102.095	67.256	404	266
2003	213.098	144.422	852	578
2004	372.670	262.596	1.479	1.042
2005	480.723	359.371	1.893	1.415
2006	381.772	270.183	1.521	1.076
2007	363.949	278.873	1.444	1.107
2008	300.995	239.367	1.199	954
2009	215.939	134.586	1.728	1.077
2009/Ç1	110.905	67.259	1.760	1.068
2009/Ç2	105.034	67.327	1.694	1.086

Repo-Reverse Repo Market

Repo-Reverse Repo Market

	Total		Daily Average	
	TL Million	US $ Million	TL Million	US $ Million
1993	59	4.794	0.28	22
1994	757	23.704	3	94
1995	5.782	123.254	23	489
1996	18.340	221.405	73	879
1997	58.192	374.384	231	1.486
1998	97.278	372.201	389	1.489
1999	250.724	589.267	1.011	2.376
2000	554.121	886.732	2.208	3.533
2001	696.339	627.244	2.774	2.499
2002	736.426	480.725	2.911	1.900
2003	1.040.533	701.545	4.162	2.806
2004	1.551.410	1.090.477	6.156	4.327
2005	1.859.714	1.387.221	7.322	5.461
2006	2.538.802	1.770.337	10.115	7.053
2007	2.571.169	1.993.283	5.102	3.955
2008	2.935.317	2.274.077	11.694	9.060
2009	1.540.945	958.586	12.328	7.669
2009/Ç1	758.127	457.606	12.034	7.264
2009/Ç2	782.818	500.980	12.626	8.080

Q: Quarter

ISE GDS Price Indices (January 02, 2001=100)

TL Based

	3 Months (91 Days)	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)	General
2001	102,87	101,49	97,37	91,61	85,16	101,49
2002	105,69	106,91	104,87	100,57	95,00	104,62
2003	110,42	118,04	123,22	126,33	127,63	121,77
2004	112,03	121,24	127,86	132,22	134,48	122,70
2005	113,14	123,96	132,67	139,50	144,47	129,14
2006	111,97	121,14	127,77	132,16	134,48	121,17
2007	112,67	122,83	130,72	136,58	140,49	128,23
2008	112,56	122,69	130,63	136,65	140,81	128,03
2009	114,34	126,29	135,94	143,46	148,82	134,57
2009/Ç1	113,82	125,10	133,95	140,58	145,01	129,68
2009/Ç2	114,34	126,29	135,94	143,46	148,82	134,57

ISE GDS Performance Indices (January 02, 2001=100)

TL Based

	3 Months (91 Days)	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)
2001	195,18	179,24	190,48	159,05	150,00
2002	314,24	305,57	347,66	276,59	255,90
2003	450,50	457,60	558,19	438,13	464,98
2004	555,45	574,60	712,26	552,85	610,42
2005	644,37	670,54	839,82	665,76	735,10
2006	751,03	771,08	956,21	760,07	829,61
2007	887,85	916,30	1.146,36	917,23	1.008,52
2008	1.047,38	1.083,04	1.369,76	1.070,37	1.241,27
2009	1.118,66	1.169,40	1.484,42	1.188,46	1.360,84
2009/Ç1	1.088,26	1.137,62	1.423,23	1.139,46	1.314,37
2009/Ç2	1.118,66	1.169,40	1.484,42	1.188,46	1.360,84

ISE GDS Portfolio Performance Indices (December 31, 2003=100)

TL Based

	Equal Weighted Indices			Market Value Weighted Indices			
	EQ 180-	EQ 180+	EQ COMPOSITE	MV 180-	MV 180+	MV COMPOSITE	REPO
2004	125,81	130,40	128,11	125,91	130,25	128,09	118,86
2005	147,29	160,29	153,55	147,51	160,36	154,25	133,63
2006	171,02	180,05	175,39	170,84	179,00	174,82	152,90
2007	203,09	221,63	211,76	202,27	221,13	212,42	177,00
2008	240,13	264,15	251,95	239,21	263,57	252,36	203,07
2009	258,41	295,66	276,29	257,07	295,11	277,75	212,66
2009/Ç1	250,64	281,08	265,58	249,37	280,55	266,43	208,40
2009/Ç2	258,41	295,66	276,29	257,07	295,11	277,75	212,66

Q: Quarter

GDS: Government Debt Securities

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