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**UNDERPRICING OF INITIAL PUBLIC OFFERINGS
LISTED ON
THE ISTANBUL STOCK EXCHANGE (ISE)**

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Yüksek Lisans Tezi olarak sunduğum “**Underpricing of Initial Public Offerings Listed On The Istanbul Stock Exchange (ISE)**” adlı çalışmanın, tarafımdan, bilimsel ahlak ve geleneklere aykırı düşecek bir yardıma başvurmaksızın yazıldığını ve yararlandığım eserlerin bibliyografyada gösterilenlerden oluştuğunu, bunlara atıf yapılarak yararlanılmış olduğunu belirtir ve bunu onurumla doğrularım.

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ABSTRACT
Master Thesis
Underpricing of Initial Public Offerings
Listed On The
Istanbul Stock Exchange (ISE)
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This paper aims to provide additional international evidence on the Initial Public Offerings (IPOs), using data from the Turkish Stock Exchange Market. In this study the initial and after-market returns for the Turkish IPOs is investigated for the period 1996-2006.

The analysis show that the mean underpricing for all firms is 9.5%, while those for Financial, Manufacturing, Transportation, Communication and Storage, Technology, Wholesale and Retail Trade, Hotels and Restaurants, and Education, Health, Sports and Other Social Services sectors are 11.9%, 9.1%, 20.6%, 10.3%, 3.3%, and 0.9%, respectively. All underpricing levels are statistically significant at the conventional levels except for the Wholesale and Retail Trade, Hotels and Restaurants, and Education, Health, Sports and Other Social Services sectors. As for the sub-sectors, the highest underpricing is observed in Manufacture of Non-Metallic Mineral Products (21.2%) followed by Manufacture of Fabricated Metal, Products, Machinery and Equipment (18.5%).

In investigation of the factors influencing the initial performance, control variables such as the percentage change in ISE-100 index during last 15 days before the first trading day, gross proceeds, size of issuer, the operating history

of the firm before going to public, the reputation of underwriter, privatization, institutional ownership, method of going public, sale method of new issues, self-offered IPOs are employed. The regression results indicate that self-issued offerings, the percentage change in ISE-100 index during last 15 days before the first trading day and privatization have statistically significant impact on the underpricing.

Key Words: 1) underpricing 2) IPO 3) Turkey 4) emerging market

ÖZET
Yüksek Lisans Tezi
İstanbul Menkul Kıymetler Borsası'nda (İMKB)
Uygulanan Halka Arz'daki Düşük Fiyatlandırma
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İngilizce Finansman Programı

Bu çalışma, 1996-2006 yılında halka arz edilen Türk hisse senetlerinin ilk gün ve sonrasındaki market getirilerini analiz ederek uluslararası literatüre ve Türk Hisse Senedi Piyasası'na yönelik daha önceki araştırmalara katkısı amaçlamıştır.

Analiz sonucunda tüm firmalar için ortalama % 9,5 düşük fiyatlandırma tespit edilmiştir. Sektörel kırılımda ise Mali Sektör, İmalat Sektörü, Ulaştırma, Haberleşme ve Depolama Sektörü, Teknoloji Sektörü, Toptan ve Parekende Ticaret, Otel ve Lokantalar Sektörü, Eğitim, Sağlık, Spor ve Diğer Sosyal Hizmetler Sektöründe sırasıyla %11,9, %9,1, %20,6, %10,3%, %3,3 ve %0,9 düşük fiyatlandırma gözlemlenmiştir. Toptan ve Parekende Ticaret, Otel ve Lokantalar Sektörü, Eğitim, Sağlık, Spor ve Diğer Sosyal Hizmetler Sektörü hariç, diğer ana sektörlerde tespit edilen düşük fiyatlandırmalar istatistiki olarak anlamlı bulunmuştur. Alt sektör kırılımda ise, en yüksek düşük fiyatlandırma % 21,2 ile Taş ve Toprağa Dayalı İmalat Sektörü'nde ve ikinci olarak % 18,5 ile Metal Eşya, Makine ve Gereç Yapım Sektörü'nde gözlemlenmiştir.

İlk gün performansını etkileyen faktörlerin tespiti için ilk işlem günündeki ve ilk işlem gününden 15 gün önceki İMKB-Ulusal 100 Endeks getirisinin yüzdesel değişimi, halka arzı gerçekleştiren şirketin varlık büyüklüğü, halka arz sonucunda elde edilen hasılat, özelleştirme, halka arz yöntemi, satış

yöntemi, halka arzını kendi üstlenen şirket ve halka arza aracılık eden kuruluşun itibarı, şirketin halka arza kadar olan faaliyet yaşı değişkenleri kullanılmıştır. Bu değişkenler arasından halka arzını kendi üstlenen şirket, ilk işlem günündeki ve ilk işlem gününden 15 gün önceki IMKB-Ulusal 100 Endeks getirisinin yüzdesel değişimi ve özelleştirme istatistiki olarak anlamlı bulunmuştur.

Anahtar Kelimeler: 1) düşük fiyatlandırma 2) ilk halka arz 3) Türkiye 4) gelişmekte olan ülkeler

**UNDERPRICING OF INITIAL PUBLIC OFFERINGS
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INTRODUCTION

Initial Public Offering is a process by which a firm sells equity to the public for the first time. In IPO process investors, underwriters and issuing firms have different expectations. Underwriters act as a bridge between issuer and investors and want to build reputation. Firms, which go public offering, want to get the highest issue price to increase cash flow generated from public offering. Investors, however, want to purchase underpriced shares at a discounted price to maximize his or her gain. These underpriced shares have long been an issue of interest in the finance literature and many studies investigate the underpricing of IPOs both theoretically and empirically.

Most empirical studies have been done for the developed markets, such as Italia (Cassia, 2004), France (Chahine, 2005), Australia (Dimovski and Brooks, 2003), the UK (Coakley, Hadass and Wood (2005) and Germany (Schertler, 2002). The results of these papers indicate that underpricing is in common in these markets. A few studies have investigated IPO market in emerging markets, such as Tunisia (Naceur, 1998), Hungary (Schindele and Perotti, 2000), China (Chan, Wang and Wei, 2002). The findings of these papers support the existence of underpricing as for developed markets.

As for the Turkish case, a couple of papers have investigated underpricing in the Turkish IPO market. Kiyamaz (2000) for the period 1990-1996 and Durukan (2002) for the period 1990-1997 found evidence of underpricing in the Turkish Market.

This thesis aims to extend the international literature on initial public offerings (IPOs) by examining the IPOs issued in Istanbul Stock Exchange Market for the period 1996-2006. The contribution of this thesis is two-fold: The initial and immediate after market performances of IPOs are analyzed for the sample period. Secondly, we try to investigate the determinants of the initial performances of IPOs, using some control variables that are widely used in the IPO literature. Furthermore,

in this thesis, we also examine the impact of some control variables that have not been used before in the previous studies on the Turkish IPO market on underpricing.

The remainder of this paper is structured as follows: Chapter I provides information about IPOs and underpricing in the literature. Benefits and costs of public offering are outlined in Chapter II. Chapter III provides information about the ISE. Data and methodology are explained in Chapter IV. Chapter V reports the empirical results. Chapter IV draws the conclusion.

CHAPTER I

INITIAL PUBLIC OFFERING & UNDERPRICING IN THE LITERATURE

1.1. WHAT IS INITIAL PUBLIC OFFERING AND UNDERPRICING ?

Initial Public Offering is a process by which a firm sells equity to the public for the first time. By this way a company becomes a public concern. In IPO pricing , investors and issuing firms have different expectations. Issuing firms want to get highest issue price to increase cash flow generated from public offering. However, investors want to purchase shares at a discounted price to maximize his or her gain. This discounted price denotes underpricing.

Underpricing is the positive spread between the opening price on the first trading day and the offer price, scaled by the offer price. If this spread is equal to zero, the firm's shares are called fully-priced. If the spread has a negative sign, the firm's shares are called overpriced.

1.2. LITERATURE SURVEY

Many studies investigate the explanations of underpricing of IPOs both theoretically and empirically in finance literature. Underpricing seems to be a common characteristic of most international markets. Ritter and Welch (2002) categorized the explanations of this anomaly of the financial markets on the basis of whether asymmetric or symmetric information is assumed. The former can in turn be classified into rational theories, in which IPO issuers are more informed than investors, and into theories in which investors are more informed than the issuer. Rock (1986), however, categorized investors into two types: informed and uninformed. Informed investors will only attempt to buy underpriced shares. Uninformed investors cannot discriminate between issues. Benveniste and Spindt (1989) developed the information gathering theory and stated that underpricing is a means to induce informed investors to reveal private information about the demand

for shares in the pre-selling phase, thus allowing the intermediaries to better evaluate the offering.

Jegadeesh et al. (1993) and Spiess and Pettway (1997) showed that underpricing might also generate useful information advantages for future offerings, market feedback hypothesis. Allen and Faulhaber (1989), however, showed that the firm's managers as the informed party and interpreted the underpricing as a signal of a firm's superior quality, signaling hypothesis.

Most empirical studies on underpricing of IPOs in the literature have been done for developed markets. Relatively few empirical studies have investigated this issue for emerging markets. Cassia et al. (2004) examined the first-day return of 182 IPOs listed on the Italian Stock Exchange from 1985 to 2001. Their findings indicate a significantly mean positive underpricing (21.87%) and highlight that on the main board of the Italian Exchange IPO underpricing decreased in the late 1990s. They claim that such a pattern can be accounted for by two determinants: (i) the evolution of pricing strategies, from fixed-price IPOs to book building, (ii) the segmentation of the Italian Exchange with the birth of a new board for high-growth and technology firms (Nuovo Mercato). Their results further suggest that IPOs are intentionally underpriced: both public and private information available at the IPO is only partially incorporated in pricing the shares.

Alvarez and Gonzalez (2005) analyzed Spanish Initial Public Offerings to provide additional evidence on the long-run performance of IPOs and its relationship with initial underpricing. Their results reveal the existence of negative long-run abnormal stock returns. Long-run performance presents a positive relationship with underpricing and the volume of funds obtained in seasoned offerings.

Kirkulak and Davis (2005) developed a new method for measuring underwriter reputation and apply it to the Japanese IPO market using data from 1998 to 2002. Their findings indicate that the relationship between underwriter reputation

and underpricing depends on where the IPO is priced, reflecting the level of demand for the issue. When there is high (low) demand there is a positive (negative) and significant relationship between underwriter reputation and the level of underpricing.

Hill (2006) used unique data relating to shareholdings of firms listing on the London Stock Exchange, and provided compelling evidence that IPO underpricing does not arise from efforts to determine the ownership structure of the post IPO firm. It is suggested that research is directed elsewhere to find an answer to the underpricing phenomenon, and for means other than IPO underpricing to affect post IPO ownership structure.

Chahine (2005) investigated the relationship between underpricing and investor interest level prior to and after the IPO date in France. The empirical results show a significant 3-day buy-and-hold abnormal return of 19.15%. It is positively related to the share demand-to-offer ratio in the pre-market period and to trading volume in the aftermarket.

Tykvová and Walz (2007) examined the influence of different types of VCs on the performance of their portfolio firms around and after IPO in Germany. Their empirical results suggest that market participants did not correctly assess the role played by the different types of VCs. Firms backed by independent, international and reputable VCs outperform other IPOs, and their share prices fluctuate less than those of their counterparts.

Schertler (2002) compared 138 firms listed from 1997 to 2000 in Neuer Markt (German Stock Market) and 256 firms listed from 1996 to 2000 in Nouveau Marche (French Stock Market) to determine if underpricing occurs or not. In Neuer Markt underpricing on the first trading day is found about 50%, while 14% in Nouveau Marche. To determine the factors influencing underpricing and the difference in underpricing rate between two markets age of firms in years, the number of employees, the aftermarket standard deviation of log returns from day 2

to day 16, gross proceeds in million euros, number of shares sold by the old shareholders, stock market performance, underwriter reputation are used as variables. It is found that the stock market performance has a positive significant impact on underpricing in both markets. Moreover, underwriter reputation lowers the underpricing of firms in the sample of the Neuer Markt, while underwriter reputation does not effect the underpricing of firms in the sample of Nouveau Marche. If the effects of the factors listed above are examined in each market separately, stock market performance and firms' gross proceeds have a statistically significant impact on underpricing in Nouveau Marche while underpricing in Neuer Markt can be explained by stock market performance, underwriter reputation and standard deviation of log return.

Unlu et al. (2004) investigated the changing nature of initial public offering (IPO) underpricing, using a sample of 513 IPOs launched in the UK from 1993 to 2001. Results show that the mean UK underpricing is initially less than that in the USA, reverses itself in the mid-1990s, returns to a lower level during the bubble period, but exceeds US underpricing for the last years of the sample. A growing amount of money left-on-the-table by UK underwriters is also observed. The analysis of IPO characteristics shows the simultaneous presence of changing composition and incentive realignment effects in the UK IPO market. These effects are most evident during the technology/internet equity bubble, which spans the last two subperiods of this study.

Drobetz, Kammermann, Wälchli (2003) examined the underpricing and long-term performance of Swiss IPOs from 1983 to 2000. They find the average market adjusted initial return 34.97%. They also report evidence for lower initial returns under increased competition among investment banks, and more accurate pricing when book-building is used. They have reported that find a strong continuous underperformance of Swiss IPOs in the aftermarket does not exist.

Franzke (2003) tried to explore relationship between underpricing and underwriter reputation by investigating 160 non-venture backed, 79 venture-backed

and 61 bridge financed companies going public which are listed from March 1997 to March 2002 on Germany's Neuer market. Less underpricing is expected in companies supported by a prestigious venture capitalist (VC) and/or underwritten by a top bank but contrary to this fact this study show that VC backed IPOs are more underpriced than non VC-backed IPOs.

Chambers and Dimson (2006) analyzed British IPOs from World War 1 to 1986 to determine whether legal, regulatory, disclosure and underwriting pressures reduce underpricing. They found that underpricing became higher in the second half of the 20th century than in the interwar years, a rise that cannot be attributed to IPO composition or issue method.

Coakley, Hadass and Wood (2005) analyzed the nature and causes of short run underpricing for a unique sample of 591 IPOs issued on the London Stock Exchange for the period 1985-2003. They found significant differences between the 1998-2000 bubble years and the rest of the sample. Venture capitalists and reputable underwriters played a certification role in the latter period but not during the bubble years. These years featured significant increases in underpricing, money left on the table, and a decline in operating quality. The combination of venture capitalists and prestigious underwriters were increasingly associated with the highest underpricing during 1998-2000.

Dimovski and Brooks (2003) tried to explore the financial characteristics of Australian initial public offerings (IPOs) for the period 1994–1999. Their results indicate that those IPOs are underpriced at the time of listing and underperform the market in the first year following their listing.

Choi and Nam (1998) investigated the determinants of short-run performance of privatization IPOs, using a sample of 185 privatization IPOs from 30 countries over the period from 1981 to 1997. Their study indicates that there is a general tendency for privatizations to be underpriced to a greater degree than the initial public offerings of privately-owned enterprises. The degree of underpricing at the

initial public offering is positively related to the stake sold at initial public offerings and to the degree of uncertainty in ex ante value of newly-privatized firms. Contrary to the result of Choi and Nam (1998), Steen, Kalev and Turpie (1999) find for Australian Market private sector IPOs are more underpriced than privatization IPOs. The difference in the underpricing between these studies due to the characteristics of Australian Privatization IPOs. These characteristics include the tender process adopted, the extensive marketing employed and the dominant position of many of the issuers.

Kooli and Suret (2001) examined common share IPOs, Unit and Junior Stock IPOs for the period 1991-1998. The results show the evidence of underpricing. However, the degree of underpricing depends on the type of the issue. Unit IPOs and Junior Capital Pool IPOs are more underpriced than common shares IPOs. They also figure out IPO market in Canada is good only for large offerings. They find that the underpricing is significantly related to the size and the period of the issue and to whether the IPO is a Junior Capital Pool or not. On the other hand, the prestige of the underwriter is positively related to the underpricing but this relationship is not significant.

Boulton, Smart and Zutter (2006) examined a sample of more than 4,600 IPOs across 24 countries for the period 2000-2004. They find that firm- and deal-specific characteristics widely used in IPO single-country underpricing studies such as offer size, underwriter reputation, and industry can explain variation in an international cross section of initial returns. More importantly, they also found that country-level measures of earnings quality and governance characteristics explain differences in the international cross section of IPO underpricing and their study reveal that underpricing is generally higher in countries with corporate governance systems that strengthen the position of investors relative to insiders.

Miloud (2007) analyzed the relationship between the level of underpricing of an initial public offering, its property structure after the process of allocating the capital and its ex-post level of liquidity by a sample of 277 IPOs in the Euro NM

market and 277 equivalent operations in the Nasdaq. They show that the underpricing level is positively correlated to the part of the capital retained by the original shareholders. If the company IPO is underpriced, it is very likely because the founder shareholders have proffered to retain an important part of the capital in order to maintain the control on the company. The property structure can explain the variation in the level of the liquidity. The liquidity of a company with an undervalued offer is higher than that of an underpriced company. In fact the companies with underpriced issues are characterized by a low average of price variants and a higher transaction turnover than that of the overpriced IPO.

Kim and Weisbach (2005) considered the question of whether raising capital is an important reason why firms go public. Using a sample of 16,958 initial public offerings from 38 countries between 1990 and 2003, their results suggest that the sale of primary shares is correlated with a number of factors associated with the firm's demand for capital. In particular, issuance of primary shares is correlated with higher increases of investment, higher repayment of debt and increases in cash, and more subsequent capital rising through seasoned equity offers. Since 79% of all capital raised through IPOs in their sample is from the sale of primary shares, they conclude that capital-raising is an important motive in the going-public decision.

Kenourgios (2002) examined initial performance and short-run underpricing of 169 IPOs listed on the Athens Stock Exchange over the period 1997-2002. The results provide evidence of significant underpricing. Furthermore, the cross sectional analysis on the determinants of the IPOs shows that both the underwriters' prestige and the times of oversubscription significantly affect the underpricing level of the IPOs over the most important and "hot" period for the Greek emerging stock market since its establishment, in terms of growth rates, acceleration of the going public process and volatility of market and stock returns.

Celis and Maturana (1998) studied short- and long-run Initial Public Offering (IPO) performance in Chile. Using both a market index and sector indices as benchmarks, IPO sample shows significant short-run Cumulative Abnormal Return

(CAR) of 4.8% and an insignificant CAR up to 4 years after the initial date. While the proceeds collected are negatively related to short-run underpricing, the quality of the underwriter shows a positive relationship to the same variable. The regulatory environment and the strength of institutional investors seem to play an important role in determining short-run underpricing in Chile. Timing evidence shows a puzzling negative relation between the market's P/E ratio and the number of companies going public.

Naceur (1998) studied 12 firms of 17 going-public firms between 1992 and 1997 in Tunisian Market. This study confirms underpricing by finding of positive after market return as 11.04%. Advised solutions to reduce underpricing stated as dealing with mechanisms by which companies initially offer shares of common stock to institutional and individual investors and the allocation procedures of new issues.

Schindele, Perotti (2000) investigated the determinants of underpricing at the initial public offering market in 1990-1998, the period of transition from socialist to market economy and immaturity of the domestic capital. They find that political issues played a significant role in the process. In the analysis of IPOs, it is found that greater discount at privatization IPOs than private issues, and a positive relation between underpricing and the proportion of shares offered for compensation coupons.

Chan, Wang, Wei (2002) investigated performance of 570 A-share IPOs issued in China between January 1993 and December 1998 and 39 B-share IPOs issued between January 1995 and December 1998. Their results indicate that the average underpricing for A shares is found 178 % and 11.6 % for B shares on the first trading day. They found that the underpricing of A share IPO's is positively related to the number of days between the offering and the listing and the number of stock investors in the province from which the IPO comes and negatively related to the number of shares being issued. But none of the factors for explaining

underpricing of A-shares have explanatory power on B-shares. In this study price to book ratio and relative price-earning multiple are positively effect underpricing.

Chen, Firth and Kim (2003) examined underpricing in 701 A-shares IPO's and 117 B-shares listed in the period 1990-1997 in China. They found that the median initial return on A-share IPOs is 145% while the median underpricing of B-shares is 10%. Listing lag and future equity offerings are found as major factors explaining underpricing of B-shares and A shares. Addition to these factors, ownership structure of the firm is found to be a significant factor for underpricing in A shares. This study also reveals that underpricing is a positive function of the relative price to book ratio.

Venkatesh and Neupane (2005) examined unique set of IPOs data in Thailand post Asian Financial crises to identify the relationship between initial market adjusted underpricing and the ownership concentration. They found that a weak but a negative relationship exists between the two and therefore to certain extent refuting the signaling hypothesis of high ownership and high underpricing.

Nasr and Sohail (2007) studied the short-run and long-run performance of 50 IPOs listed on Karachi Stock Exchange from 2000 to 2006. They find that the average under-pricing is 35.66%; and that the average market-adjusted cumulative abnormal return and buy-and-hold abnormal return over the one year after listing are -19.67% & -38.10% by using market adjusted model and are -53.30% & -65.73% by using capital asset pricing model, respectively, which are negative and significant at the 5% and 1% levels respectively. Their study reveal that the level of under-pricing is determined by ex-ante uncertainty, offer size, market capitalization and oversubscription variables while a little power of explaining the underpricing by percentage of shares offered, price earning ratio, secondary issue and market volatility variables.

There are a few studies investigating underpricing in the Turkish IPO market. Guner, Onder and Rhoades (1999) examined the effect of underwriter reputation on

the initial-day IPO returns in Istanbul Stock Exchange during the period from January, 1993 to June, 1999. The results from the traditional model indicate that underwriter reputation does not affect the initial day IPO returns. However, after controlling for factors that are important in determining the price of an IPO in an emerging market, a complex relationship between underwriter reputation measures and IPO returns is documented. Results indicate that it is not appropriate to extend the findings in the US to other markets without taking into account the unique characteristics of these markets.

Kiymaz (2000) analyzed 163 firms listed and traded on the Istanbul Stock Exchange (ISE) during 1990-1996. The average market adjusted underpricing on the first trading day is found 13.6% for all sample, 12.2% for industrials, 15.3% for financials and 18.5% for others. Size of issuer, rising stock market between the date of public offering and first trading day and self-issued offerings are highlighted as strong significant factors influencing the initial performance of Turkish IPOs. In addition to these factors, institutional ownership is determined as a weak factor.

Durukan (2002) investigated IPO performance of 173 firms listed from 1990 to 1997 in Istanbul Stock Exchange. She found that underpricing on the first trading day is about 14.61%. Firm size, gross proceeds, methods of IPO, age of firm and debt level in the firm capital structure in the year prior to IPO are found as factors influencing the IPO returns in the short run. Firm size and portion of shares are listed as significant variable in long-run returns.

Ekit and Teker (2003) examined the performance of all IPOs in Istanbul Stock Exchange during the year of 2000. The study employs standard event study methodology for 34 IPOs over a 30 day event window. Their empirical findings support that the first two days of IPOs generally provide positive abnormal returns.

Kucukkocaoglu (2005) examined the relationship between underwriting procedures and first day underpricing in Turkey using 217 firms in the 1993-2005 period. It is found that with a mean of 15.68% underpricing exists in sale through

the stock exchange, with a mean of 11.47% in book building and fixed price offers with a mean of 7.01 %.

CHAPTER II

BENEFITS AND COSTS OF PUBLIC OFFERING

In IPO pricing, investors, underwriters and issuing firms have different expectations. Firms, which go public offering, want to get the highest issue price to increase cash flow generated from public offering. Investors, however, want to purchase underpriced shares at a discounted price to maximize his or her gain. Underwriters act as a bridge between issuer and investors and want to build reputation. Below, we briefly discuss the benefits and costs of IPO for issuer firms.

2.1. BENEFITS OF PUBLIC OFFERING

- ***Access to Capital***

If a company needs to raise capital, it can choose public offering by selling its shares. This way will cost less than other financing operations and by this way company will use a long-term source. An initial equity offering can bring immediate proceeds to a company. These funds may be used for a variety of purposes including; growth and expansion, to pay debt, marketing, etc.

Once public offering is realized, a company's financing alternatives are increased. A publicly traded company can return to the public for additional capital with convertible bond issue or secondary equity offering. A public status can also provide favorable terms for alternative financing from public and private investors.

- ***Liquidity***

By going public, firms create a market for their shares in which buyers and sellers participate with transparency. In general, share in a public company is much more liquid than share in a private enterprise. Liquidity is created both for the investors and owners. A publicly traded company may raise more capital through additional stock offerings if sufficient investor interest exists.

- ***Institutionalization***

The main characteristic of companies in Turkey is being family-owned companies. The main risk of these kind of companies is that operating period is limited by owner's lifetime.

Before issuing shares for public trade, companies must complete procedures of the Istanbul Stock Exchange and Capital Markets Board of Turkey. After initial public offerings, financial statements of companies must be audited by independent audit companies. Also, they have to inform shareholders and public regularly and they are dependent on continuous audit of the Capital Markets Board of Turkey and Istanbul Stock Exchange. Through these regulations, firms take a big step in institutionalization and adopting modernized management techniques.

- ***Future Capital***

Companies in developing countries need capital to compete with global competitors, to make investments and to grow. Going public is one way to raise capital. Once going public is realized, firms can go public by secondary offering if capital is needed again. The importance of having publicly traded shares and being a company in Stock Exchange Market is gradually understood.

- ***Publicity Opportunity in Domestic and Foreign Markets***

In Turkey as in other countries, publicly traded companies continue to keep shareholders informed about the company's business operations, financial condition, and management. This regulation also creates opportunity for companies to present their goods and services in local and external markets. This publicity can attract the attention of potential partners or merger candidates stated in domestic country or foreign countries.

2.2. COSTS OF PUBLIC OFFERING

The costs that issuer face in initial public offering can be categorized as direct and indirect costs.

2.2.1. Direct Costs

- ***Fee of Underwriters***

This fee mostly depends on volume of IPOs, type of underwriter's service, total amount of IPO and if exists other consortium underwriters' fees must be paid. The fee is mentioned on the agreement between underwriter and issuer.

- ***Fee of Capital Market Board of Turkey***

The Capital Market Board of Turkey takes registration fee amounted 0.2% of issue price of shares that will be registered and sold.

- ***Fees of Istanbul Stock Exchange***

ISE takes initial listing fee amounted 0.1% of nominal capital and also charges 0.1% of nominal amounts of shares but this amount is set as between TRY 1.000 and TRY 10.000.

- ***Other costs***

Addition to these costs, also independent audit service expenses for financial statements, advertisement expenses for publicity can be listed.

2.2.2. Indirect Costs

Indirect costs can be explained as management time and effort before, after and during going public.

CHAPTER III THE ISTANBUL STOCK EXCHANGE (ISE)

3.1. HISTORY OF THE ISE

The only stock exchange in Turkey, the ISE established on 26 December 1985 but began its operations on 3 January 1986. In fact, the origin of an organized securities market in Turkey has its roots in the second half of the nineteenth century. It was Dersaadet Securities Exchange established in 1866.

The early phase of the 1980's saw a marked improvement in the Turkish capital markets, both in regard to the legislative framework and the institutions required to set the stage for sound capital movements. In 1981, the "Capital Market Law" was enacted. One year later, the main regulatory body responsible for the supervision and regulation of the Turkish securities market, the Capital Market Board based in Ankara, was established.

A new decree was issued in October 1983 foreseeing the setting up of currency exchanges in Turkey. In October 1984, the "Regulations for the Establishment and Functions of Securities Exchanges" was published in the Official Gazette. The regulations concerning operational procedures were approved in the

subsequent extraordinary meetings of the General Assembly and the Istanbul Stock Exchange was formally inaugurated at the end of 1985. Today, the number of companies traded on the Istanbul Stock Exchange has increased from 80 in 1985 to 316 in 2006.

There are four different markets at the ISE. These are National Market, Second National Market, New Economy Market, and Watch-List Companies Market. At the end of 2006, 290 firms are listed in National Market, 15 firms in Second National Market, 3 firms in New Economy Market, 8 firms in Watch-List Companies Market. The total market value of the firms traded has increased from US\$ 938 million at the end of 1986, to US\$ 163.775 billion at the end of 2006. Total trading value has increased US\$ 13 million to US\$ 229.642 billion.

3.2. LISTING REQUIREMENTS IN THE ISTANBUL STOCK EXCHANGE

- Its latest annual and quarterly financial statements must have been independently audited and for group companies, consolidated financial statements must have been prepared; in the case of audit reports involving qualified opinion, the consequences of the events leading to such opinion must be reflected in the financial statements and explained in footnotes.
- At least three calendar years must have elapsed since its corporation (two years if the free float rate is at least 25%).
- It must have earned profits before tax in the last two consecutive years (in the previous year if its free-float rate is at least 25%).
- Its paid-in or issued capital must be minimum TL 1.250 billion (this amount may be increased by the Executive Council in consideration of the revaluation rate announced annually).

- Its free-float rate must be:

15% if its capital is up to TL 750 billion,

10% if its capital is within range of TL 750 billion and TL 1.5 trillion,

5% if its capital is more than TL 1.5 trillion.

Nevertheless, companies that initially offer their shares representing less than 15% of their capital to the public must have the balance of the shares registered with the Capital Market Board by the end of the third year following the date of initial public offering. In the calculation of the said rate, the nominal capital as of the date when such rate is increased to 15% is taken into consideration.

- The Executive Council must have had the corporation's financial situation examined and accepted its ability to continue as a going concern.
- The statement required by the Exchange must be submitted to the ISE Chairman's Office after being printed on the corporation's letterhead, signed by two signatories with first degree authority and attested by the notary.
- Its articles of incorporation must not include any provisions limiting the transfer and trading of the securities or preventing the shareholders from exercising their rights.
- Material legal disputes which may affect the corporation's manufacturing activities must have been settled or about to be settled.
- For reasons other than acceptable to the Exchange, the corporation must not have suspended its manufacturing activities for more than a quarter within the previous year, not applied for liquidation of its assets or entered into

composition or any other arrangement with its creditors, and not have faced similar situations envisaged by the Exchange.

- Its securities must comply with the criteria envisaged by the ISE management in terms of the current and potential trading volume.

Table 1 provides figures showing the developments of ISE in last twenty years. As seen in Table 1, the number of listed companies, trading volume and traded value has increased significantly from 1986 to 2006.

Table 1: Developments in ISE from 1986 to 2006

Years	Number of Firms	Traded Value (Million \$)	Traded Number of Stocks (Thousand)	Market Value of Firms (Million \$)
1986	80	13	3	938
1987	82	118	15	3.125
1988	79	115	32	1.128
1989	76	773	238	6.756
1990	110	5.854	1.537	18.737
1991	134	8.502	4.531	15.564
1992	145	8.567	10.285	9.922
1993	160	21.770	35.249	37.824
1994	176	23.203	100.062	21.785
1995	205	52.357	306.254	20.782
1996	228	37.737	390.924	30.797
1997	258	58.104	919.784	61.879
1998	277	70.396	2.242.531	33.975
1999	285	84.034	5.823.858	114.271
2000	315	181.934	11.075.685	69.507
2001	310	80.400	23.938.149	47.689
2002	288	70.756	33.933.251	34.402
2003	285	100.165	59.099.780	69.003
2004	297	147.755	69.614.651	98.073
2005	304	201.763	81.099.503	162.814
2006	316	229.642	91.634.552	163.775

Source: ISE

3.3. METHODS OF SALE IN THE ISE

The Turkish IPO market gives issuers and underwriters a choice of four different IPO selling mechanisms. Accordingly, firms may offer their shares to the public through one of the following four methods of sale. These are Fixed-Price Offering, Book Building Method, Sale through the Stock Exchange and Best Effort.

- ***Fixed-Price Offering***

In this method, investors know fixed price of security which will be offered to the public. Bid collection period is set as 2 days after the announcement of prospectus is realized in the ISE.

- ***Book Building Method***

In a book building method, price at which securities will be offered is not known in advance to the investor. Only an indicative price range is known and bids above this minimum price are collected.

- ***Sale through the Stock Exchange***

According to Istanbul Stock Exchange regulatory framework, firms must be apply at least 20 days before the initial public offering and the application must be accepted by the Istanbul Stock Exchange Board and must be announced.

- ***Best Effort***

In best effort, underwriter agrees to use all efforts to sell as much of an issue as possible. The underwriter does not guarantee that the issuing firm will receive a set amount of money. Best effort agreements are used mainly for securities with higher risk.

CHAPTER IV

DATA AND METHODOLOGY

4.1. DATA

The sample consists of 132 IPOs launched in Turkey from January 1, 1996 to December 31, 2006. The data obtained from the ISE and website of IBS Real Trade. Total number of IPOs realized in the sample period is 152. Twenty firms omitted from the sample due to incomplete information, bankrupted firms and firms which are transferred to the Saving Deposits Insurance Fund. Table 2 reports the distribution of the sample IPOs by year. The number of IPOs fluctuates during the sample period. The impact of financial crisis of 2001 on IPOs is clear.

Table 2: Distribution of the sample IPOs by year (1996-2006)

Year	Total Number of IPOs	Merged Acquired	Others	Number of IPOs included	% of IPOs included
1996	27	1	5	21	77,78
1997	29	1	4	24	82,76
1998	20	1	1	18	90,00
1999	10			10	100,00
2000	35		2	33	94,29
2001	1			1	100,00
2002	4		1	3	75,00
2003	2			2	100,00
2004	12		3	9	75,00
2005	8			8	100,00
2006	4		1	3	75,00
Total	152	3	17	132	86,84

Source: ISE

Table 3 reports division of IPOs among sectors and sub-sectors during the sample period. The sectors and sub-sectors, which cover one firm were eliminated for accurate calculation. The eliminated sub-sectors are entertainment services, medical and other health services and communication. The eliminated sector is mining. Hence, total number of IPOs used is 128. The highest number of IPOs is

observed in manufacturing sector with 55 IPOs, followed by 48 IPOs in financial sector.

Table 3: Division of IPOs by sectors and subsectors

SECTORS	NUMBER OF FIRMS	% of sectors
<i>Education, Health, Sports and Other Social Services</i>	4	3
Sports services	4	
<i>Electricity, Gas and Water</i>	4	3
<i>Financial Institutions</i>	48	38
Banks and special finance corporations	5	
Insurance companies	2	
Financial leasing and factoring	4	
Holding and investment companies	8	
Real estate investment trusts	10	
Investment trusts	19	
<i>Manufacturing Industry</i>	55	43
Manufacture of fabricated metal products, machinery and equipment	9	
Manufacture of chemicals and of chemical petroleum, rubber and plastic products	6	
Manufacture of food and beverage and tobacco	9	
Manufacture of non-metallic mineral products	3	
Manufacture of paper and paper products, printing and publishing	5	
Basic metal industries	3	
Textile, wearing apparel and leather industries	17	
Other manufacturing industry	3	
<i>Transportation, Communication and Storage</i>	2	2
Transportation	2	
<i>Technology</i>	6	5
Information technology	6	
<i>Wholesale and Retail Trade, Hotels and Restaurants</i>	9	7
Wholesale trade	3	
Consumer trade	4	
Restaurant and hotels	2	
Total	128	100

Source: ISE

Table 4 summarizes the frequency of IPOs by year. One IPO issued in 2001 is eliminated due to getting accurate calculation. The highest number of IPOs observed in 2000 with 33 IPOs, followed by 24 IPOs in 1997.

Table 4: Frequency of IPOs by year

Year	Number of firms
1996	20
1997	24
1998	18
1999	10
2000	33
2002	3
2003	2
2004	10
2005	8
2006	3
Total	131

Source: ISE

Table 5 reports the frequency of IPOs by sectors and years. The highest number of IPOs observed in manufacturing industry in 1996, 1997, 1998, 2000 and 2003. In 1999 and 2005 Financial Institutions IPOs are higher than the other sectors. Education, Health, Sports and other Social Services realized highest IPOs compared to the other sectors in 2002. In 2004 IPOs of Financial Institutions and Manufacturing Industry are equal.

Table 5: Frequency of IPOs by sectors and years

Sector	1996	1997	1998	1999	2000	2002	2003	2004	2005	2006
Education, health, sports and other social services	0	0	0	0	1	2	0	2	1	0
Electricity, gas and water	0	0	0	1	3	0	0	0	0	0
Financial institutions	8	7	7	8	8	1	0	3	5	0
Manufacturing industry	9	15	11	1	13	0	2	3	0	1
Mining	0	1	0	0	0	0	0	0	0	0
Transportation, communication and storage	1	0	0	0	1	0	0	0	0	1
Technology	0	0	0	0	4	0	0	1	1	0
Wholesale and retail trade, hotels and restaurants	2	1	0	0	3	0	0	1	1	1
Total	20	24	18	10	33	3	2	10	8	3

Source: ISE

4.2. METHODOLOGY

The total return for stock i in the period t is calculated as in Equation (1) where $P_{i,t}$ is the price of stock i at time t and $P_{i,0}$ is the offer price.

$$R_{i,t} = \frac{P_{i,t}}{P_{i,0}} - 1 \quad (1)$$

Where $P_{i,t}$ is the price of the stock i at time t and $P_{i,0}$ is the offer prices of the stock i .

The Market Index is calculated as follows:

$$R_{m,t} = \frac{P_{m,t}}{P_{m,0}} - 1 \quad (2)$$

where $P_{m,t}$ is the market index value at time t and $P_{m,0}$ is the market index value at the offer date.

Two measures of performance are calculated for each initial public offering:

Initial Underpricing: While initial raw return for each stock is defined as relative price change from offer price to closing price at the end of first trading day, the initial adjusted return is defined to be the initial raw return less the market return on initial day.

$$AR_i = R_i - R_m \quad (3)$$

Adjusted Return for n stock at time t is calculated as:

$$AR = \frac{\sum AR_{i,t}}{n} \quad (4)$$

The following t -statistics is used to test whether or not Adjusted Return is statistically significant:

$$t = \frac{\overline{AR}}{\overline{\sigma AR_t}} \quad (5)$$

Where $\overline{\sigma AR_t}$ is the standard deviation of stock i at the month t and formulated as;

$$\overline{\sigma AR_t} = \sigma(AR_t)\sqrt{n} \quad (6)$$

where (AR_t) is cross-sectional standard deviation of adjusted returns for initial day.

Long-Run Returns: The long-run aftermarket return assesses stock performance during 36 calendar months following the first month of trading. Monthly market adjusted abnormal returns for stock i in event month t is defined as:

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (7)$$

The cumulative adjusted return during the period between t_1 and t_2 is computed as follows:

$$CAR_{t_2}^{t_1} = \sum_{t_2}^{t_1} AR_t \quad (8)$$

The following standard error is used to test whether or not CAR is statistically significant:

$$\bar{\sigma}(CAR_t) = \sigma(CAR_t) \sqrt{n} \quad (9)$$

CHAPTER V EMPIRICAL RESULTS

5.1. EMPIRICAL RESULTS OF INITIAL AND AFTER-MARKET PERFORMANCES

Table 6 presents the initial and immediate after-market adjusted daily average abnormal returns (AARs) for all firms, sectors and sub-sectors¹. The mean underpricing for all firms is 9.5%, while those for Financial, Manufacturing, Transportation, Communication and Storage, Technology, Wholesale and Retail Trade, Hotels and Restaurants, and Education, Health, Sports and Other Social Services sectors are 11.9%, 9.1%, 20.6%, 10.3%, 3.3%, and 0.9%, respectively. All underpricing levels are statistically significant at the conventional levels except for the Wholesale and Retail Trade, Hotels and Restaurants, and Education, Health, Sports and Other Social Services sectors. As for the sub-sectors, the highest underpricing is observed in Manufacture of Non-Metallic Mineral Products (21.2%) followed by Manufacture of Fabricated Metal, Products, Machinery and Equipment (18.5%); and Real Estate Investment Trusts (17.6%). Initial returns are statistically significant for mostly financial and manufacturing sub-sectors. Although we use different data and sample period, our results support the findings of Kiymaz (2000), Durukan (2002) and Kucukkocaoglu (2005). Their results also indicate statistically significant underpricing for the period 1990-1996, 1990-1997, and 1993-2005, respectively. Hence, our results together with the results of the previous studies suggest that the underpricing is the main characteristic of the Turkish IPO market.

¹ As mentioned in previous sections, to obtain accurate initial returns sectors and sub-sectors that have only one IPO were eliminated. These were mining sector, entertainment, medical and other health services, and communication sub-sectors.

The after-market AARs show that indicate that most sectors and sub-sectors continue to enjoy positive excess returns only in next two or three days after the first trading. Then excess returns vanish and it becomes negative².

Table 7 reports initial returns by year. As seen in Table initial returns fluctuate significantly during the sample period. The sample period witnessed several national and international economic and/or financial crises. For instance, Asian crisis of 1997, Russian crisis of 1998, and 2000 and 2001 financial crises of Turkey. These events might have had some impacts on the initial returns of the Turkish IPOs. As seen in Table 7, initial returns decreases constantly from 1996 to 2002. Negative initial return observed in 2002. The initial returns becomes positive and start to increase after 2002.

² Average abnormal returns for each sector and sub-sector ranging 1st month to 36th month are reported in Appendix A.

Table 6: Mean underpricing for all firms, sectors and sub-sectors, and immediate after-market average abnormal returns

Initial and Average Abnormal Returns (1 st day-2 nd Month) (AARs)									
Sectors	No. of Firms	Initial Return	2 nd day	3 rd day	4 th day	1 st week	2 nd week	3 rd week	1 st month
All Firms	132	0.095***	0.007	-0.004	0.001	0.100***	-0.014	-0.018*	0.133**
Education, Health, Sports and Other Social Services	4	0.009	-0.002	-0.052**	-0.059	-0.059	-0.070	-0.052	-0.208
Sports Services	4	0.009	-0.002	-0.052*	-0.059	-0.059	-0.070	-0.052***	-0.208
Electricity, Gas and Water	4	0.045	0.088	0.072	0.045	0.294	0.075	0.217	1.602
Financial Sector	48	0.119***	-0.006	-0.016*	-0.004	0.086	-0.013	-0.048***	0.057
Banks and Special Finance Corporations	5	0.071*	-0.046**	-0.046*	-0.001	-0.045	-0.031	-0.017	-0.132
Insurance Companies	2	0.049	-0.052	-0.065**	-0.010	-0.139	-0.032*	-0.007	-0.176***
Financial Leasing and Factoring	4	0.097	0.100	0.027	-0.021	0.270	0.007	-0.047	0.319
Holding and Investment Companies	8	0.078*	-0.010	-0.033	-0.010	0.007	-0.065*	-0.030	-0.096*
Real Estate Investment Trusts	10	0.176***	0.002	-0.017	0.003	0.162	0.040	-0.081***	0.394
Investment Trusts	19	0.131	-0.015	-0.005	-0.002	0.099	-0.017	-0.052**	-0.034
Manufacturing Industry	55	0.091***	0.006	-0.005	0.001	0.083**	-0.018	-0.017	0.087
Manufacture of Fabricated Metal, Products, Machinery and Equipment	9	0.185**	0.053	0.012	0.011	0.248**	0.009	-0.032	0.218*
Manufacture of Chemicals and of Chemical Petroleum Rubber and Plastic Products	6	0.137**	0.044	-0.019	-0.017	0.088	-0.048	-0.023	-0.011
Manufacture of Food and Beverage and Tobacco	9	0.041	0.011	-0.009	0.004	0.067	-0.001	0.025	0.236
Manufacture of Non-Metallic Mineral Products	3	0.212*	-0.017	-0.008	-0.025	0.126	-0.059***	-0.023	0.014
Manufacture of Paper and Paper Products, Printing and Publishing	5	0.051	-0.012	-0.011	-0.008	-0.003	-0.033	-0.008	-0.032
Basic Metal Industries	3	-0.075**	-0.029	0.013	0.039	-0.003	0.125	-0.109	-0.034
Textile, Wearing Apparel and Leather Ind.	17	0.056	-0.024	-0.021	-0.012	-0.021	-0.037	-0.013	-0.027

Table 6 (continued)

Initial and Average Abnormal Returns
(1st day-1st Month) (AARs)

Sectors	firms	Initial Return	2 nd day	3 rd day	4 th day	1 st week	2 nd week	3 rd week	1 st month
Other Manufacturing Industry	3	0.176*	0.053	0.069	0.086	0.407	-0.071	-0.033	0.489
Transportation, Communication and Storage	2	0.206***	0.098	0.079	-0.003	0.416	-0.007	0.043	0.474
Transportation	2	0.206***	0.098	0.079	-0.003	0.416	-0.007	0.043	0.474
Technology	6	0.103*	0.012	0.007	-0.011	0.112	-0.038	0.031	0.124
Information Technology	6	0.103*	0.012	0.007	-0.011	0.112	-0.038	0.031	0.124
Wholesale and Retail Trade, Hotels and Restaurants	9	0.033	0.028	0.032	0.042	0.188	0.014	-0.010	0.238
Wholesale Trade	3	-0.004	-0.008	-0.016	-0.027*	-0.083**	-0.051**	0.010	-0.170**
Consumer Trade	4	0.053	0.028	0.060	0.059	0.215**	0.001	-0.042	0.208
Restaurants and Hotels	2	0.050	0.081	0.049	0.113	0.544	0.140	0.020	0.913

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 7: Mean underpricing by year

Year	Number of firms	AAR	t-value
1996	20	0.094*	3.507
1997	24	0.142***	1.698
1998	18	0.106*	2.759
1999	10	0.087**	1.869
2000	33	0.091*	4.271
2002	3	-0.063	-1.438
2003	2	0.004	0.424
2004	10	0.045	0.999
2005	8	0.039	1.416
2006	3	0.364*	2.385

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 8 reports the cumulative abnormal returns (CARs) for each sector and sub-sector ranging 2-day to 1-month. For all firms in the sample, the results show that the statistically significant underpricing continues to be present in the first 4 weeks. The statistically significant underpricing for financial sector continues to be present only until end of first week. As for the manufacturing sector, significant underpricing continues to be present in the first 4 weeks. One can easily observe that most sub-sectors have statistically insignificant negative CARs in the first four weeks.

Table 9 reports the cumulative abnormal returns for all firms ranging from 1st month to 36th month. The results indicate that the CARs for all firms are positive and statistically significant up to 5 months. They are positive but not statistically significant up until 13th month. Negative CARs are observed after 13th month but statistically significant negative CARs started to be observed after 24th month.

Table 10-13 reports the CARs sectors and sub-sectors ranging from 1st month to 36th month. Except for a few sub-sectors, all sub-sectors experience mostly statistically significant negative abnormal returns. In general, the results of the long-run performance of the IPOs made between 1996 and 2006 reveal the existence of negative abnormal returns.

Overall, our results indicate that the Turkish IPOs experience a statistically significant underpricing both on the initial day and in the immediate after-market periods. But in the long-run we observe statistically significant negative abnormal returns. For the 36 month period, contrary to Kiymaz (2000) and Durukan (2002), we observe statistically significant negative abnormal returns in line with the majority of international evidence about the long-run performance of IPOs.

Table 8: After-market cumulative abnormal returns (CAR%)

Cumulative Abnormal Returns (1 st day-1 st Month) (CARs)									
SECTORS	No. of Firms	Initial Return	2 nd day	3 rd day	4 th day	1 st week	2 nd week	3 rd week	1 st month
All Firms	132	0.095***	0.103***	0.099***	0.100***	0.201***	0.186***	0.168***	0.302***
Education, Health, Sports and Other Social Services	4	0.009	0.007	-0.045	-0.104	-0.163	-0.233	-0.286	-0.495
Sports Services	4	0.009	0.007	-0.045	-0.104	-0.163	-0.233	-0.286	-0.495
Electricity, Gas and Water	4	0.045	0.133	0.205	0.251	0.546	0.621	0.839	2.442
Financial Institutions	48	0.119***	0.113**	0.096*	0.092*	0.179*	0.165	0.117	0.175
Banks and Special Finance Corporations	5	0.071*	0.025	-0.021	-0.022	-0.067	-0.099	-0.117	-0.249
Insurance Companies	2	0.049	-0.003	-0.068	-0.079	-0.218	-0.250	-0.258	-0.434*
Financial Leasing and Factoring	4	0.097	0.198	0.225	0.203	0.474	0.482	0.434	0.753
Holding and Investment Companies	8	0.078**	0.068	0.034	0.023	0.030	-0.034	-0.064**	-0.161
Real Estate Investment Trusts	10	0.176***	0.179**	0.162	0.165**	0.327	0.368	0.286	0.681
Investment Trusts	19	0.131	0.115	0.110	0.107	0.207	0.190	0.138	0.104
Manufacturing Industry	55	0.091***	0.098***	0.092***	0.094***	0.178**	0.159**	0.141*	0.228*
Manufacture of Fabricated Metal, Products, Machinery and Equipment	9	0.185**	0.238***	0.251**	0.263***	0.511**	0.521**	0.489**	0.708*
Manufacture of Chemicals and of Chemical Petroleum Rubber and Plastic Products	6	0.137**	0.181*	0.161*	0.144**	0.233	0.184	0.160	0.149
Manufacture of Food and Beverage and Tobacco	9	0.041	0.052	0.043	0.047	0.115	0.114	0.139	0.376
Manufacture of Non-Metallic Mineral Products	3	0.212*	0.194	0.186	0.160	0.287	0.227	0.203	0.217
Manufacture of Paper and Paper Products, Printing and Publishing	5	0.051	0.038	0.027	0.018	0.014	-0.018	-0.027	-0.060
Basic Metal Industries	3	-0.075**	-0.105***	-0.092	-0.052	-0.055	0.069	-0.040	-0.074
Textile, Wearing Apparel and Leather Ind.	17	0.056	0.031	0.010	-0.002	-0.023	-0.060	-0.074	-0.102

Table 8 (continued)

Initial and Average Abnormal Returns
(1st day-1st Month) (AARs)

Sectors	No. of Firms	Initial Return	2 nd day	3 rd day	4 th day	1 st week	2 nd week	3 rd week	1 st month
Other Manufacturing Industry	3	0.176*	0.230*	0.299	0.386	0.794	0.722	0.689	1.179
Transportation, Communication and Storage	2	0.206***	0.305**	0.385**	0.382**	0.798	0.790	0.834	1.308
Transportation	2	0.206***	0.305*	0.385*	0.382**	0.798	0.790	0.834	1.308
Technology	6	0.103*	0.116	0.123	0.112	0.225	0.186	0.217	0.342
Information Technology	6	0.103*	0.116	0.123	0.112	0.225	0.186	0.217	0.342
Wholesale and Retail Trade, Hotels and Restaurants	9	0.033	0.061	0.093	0.135	0.324	0.339	0.328	0.567
Wholesale Trade	3	-0.004	-0.012	-0.029***	-0.057***	-0.140***	-0.192***	-0.181***	-0.352**
Consumer Trade	4	0.053	0.082	0.142***	0.201**	0.416**	0.418**	0.375**	0.583**
Restaurants and Hotels	2	0.050	0.131	0.181	0.294	0.838	0.979	1.000	1.913***

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 9: CARs of All Firms in the sample during 1996-006

CARs	All Firms
Initial Return	0.095***
1st month	0.302***
2nd month	0.306***
3rd month	0.287***
4th month	0.287***
5th month	0.273**
6th month	0.196
7th month	0.183
8th month	0.129
9th month	0.091
10th month	0.050
11th month	0.062
12th month	0.066
13th month	0.033
14th month	-0.004
15th month	-0.032
16th month	-0.037
17th month	-0.050
18th month	-0.082
19th month	-0.105
20th month	-0.132
21st month	-0.151
22nd month	-0.188
23rd month	-0.198
24th month	-0.199
25th month	-0.246*
26th month	-0.273*
27th month	-0.249*
28th month	-0.280*
29th month	-0.321**
30th month	-0.317**
31st month	-0.327**
32nd month	-0.349**
33rd month	-0.343**
34th month	-0.292*
35th month	-0.332**
36th month	-0.353**

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 10: CARs of Financial Institutions Sector & sub-sectors of Financial Inst. Sector

	Financial Institution	Banks- Special Fin. Groups	Insurance Comp.	Financial Leasing Factoring	Holding &Invest.	Real Estate Invest. Trusts	Investment Trusts
Initial Return	0.119***	0.071*	0.049	0.097	0.078**	0.176***	0.131
1st month	0.175	-0.249	-0.434*	0.753	-0.161	0.681	0.104
2nd month	0.223	-0.432	-0.555**	1.231	0.027	0.851	0.019
3rd month	0.174	-0.436	-0.492	1.035	0.057	0.720	-0.013
4th month	0.172	-0.456	-0.671	1.142	0.044	0.622	0.040
5th month	0.145	-0.608	-0.643	1.357	0.059	0.614	-0.039
6th month	0.032	-0.812	-0.762	1.175	-0.000	0.516	-0.142
7th month	0.021	-0.749	-0.845	1.241	-0.018	0.599	-0.227
8th month	-0.012	-0.833	-0.843	1.213	-0.076	0.613	-0.232
9th month	0.001	-0.717	-0.841	1.485	-0.109	0.721	-0.250
10th month	-0.042	-0.688	-0.924	1.345	-0.047	0.649	-0.323
11th month	-0.024	-0.743	-1.216**	1.636	-0.189	0.614	-0.201
12th month	-0.008	-0.591	-1.185***	1.540	-0.389	0.640	-0.119
13th month	-0.049	-0.589	-1.403**	1.513	-0.437	0.560	-0.133
14th month	-0.097	-0.567	-1.422**	1.564	-0.509	0.438	-0.190
15th month	-0.148	-0.912	-1.568**	1.532	-0.516	0.473	-0.168
16th month	-0.153	-1.565	-1.818***	1.803	-0.522	0.518	-0.223
17th month	-0.166	-1.459	-1.841**	1.585	-0.558	0.437	-0.178
18th month	-0.240	-1.323	-1.848***	1.257	-0.560	0.372	-0.283
19th month	-0.235	-1.305	-1.887***	1.136	-0.479	0.408	-0.297
20th month	-0.269	-1.329	-2.059**	1.135	-0.614	0.378	-0.290
21st month	-0.294	-1.314	-2.166**	1.118	-0.609	0.403	-0.357
22nd month	-0.287	-1.170	-2.145**	1.176	-0.621	0.453	-0.385
23rd month	-0.273	-1.203	-2.128**	1.166	-0.705	0.383	-0.276
24th month	-0.247	-1.228	-1.965*	1.422	-0.572	0.451	-0.298
25th month	-0.319	-1.281	-1.961*	1.375	-0.592	0.394	-0.408
26th month	-0.372	-1.433	-2.111*	1.210	-0.646	0.442	-0.468*
27th month	-0.337*	-1.390	-2.047*	1.085	-0.390	0.493	-0.508*
28th month	-0.346*	-1.498	-1.831**	1.098	-0.406	0.487	-0.521*
29th month	-0.420*	-1.360	-1.740**	0.812	-0.429	0.312	-0.546*
30th month	-0.376*	-1.097	-1.869***	0.757	-0.480	0.347	-0.502
31st month	-0.396*	-1.160	-1.702**	0.719	-0.603	0.289	-0.473
32nd month	-0.402*	-1.216	-1.688**	0.734	-0.480**	0.316	-0.541
33rd month	-0.344	-0.877	-1.714**	0.892	-0.258	0.252	-0.539
34th month	-0.323	-0.565	-1.815*	0.723	-0.408	0.245	-0.484
35th month	-0.321	-0.713	-1.701*	0.771	-0.309	0.212	-0.477
36th month	-0.334	-0.865	-1.555**	0.668	-0.356	0.195	-0.405

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 11: CARs of Manufacturing Industry Sector & sub-sectors

	Manu. Industry	Metal Pro. Mach.& Equip.	Chemicals. &Che. Petro. & Rubber	Food& Bever. Tobacco	Non- Metallic Mineral Product	Paper &Pap Prod. Print. Pub.	Basic metal Industry	Textile- Wearing App.- Leather	Other Manuf. Ind.
Initial Return	0.091***	0.185**	0.137**	0.041	0.212*	0.051	-0.075**	0.056	0.176*
1st month	0.228*	0.708*	0.149	0.376	0.217	-0.060	-0.074	-0.102	1.179
2nd month	0.230*	0.658*	0.025	0.350	0.257	0.007	-0.209	-0.060	1.431
3rd month	0.245	0.607*	0.061	0.597	0.506*	-0.296	-0.260	-0.052	1.308
4th month	0.265*	0.614*	0.123	0.846	0.443	-0.359	-0.155	-0.090	1.060
5th month	0.284*	0.640*	0.157	0.859	0.451	-0.310	-0.284	-0.043	0.996
6th month	0.213	0.608*	-0.028	0.877	0.392	-0.356	-0.393	-0.144	0.922
7th month	0.146	0.722*	-0.122	0.785	0.304	-0.358	-0.456	-0.233	0.481
8th month	0.075	0.616**	-0.256	0.789	0.250	-0.409	-0.602	-0.294	0.380
9th month	-0.007	0.689**	-0.349	0.732	0.190	-0.525	-0.774**	-0.464	0.362
10th month	-0.062	0.704**	-0.334	0.598	0.131	-0.570	-0.592	-0.642**	0.602
11th month	-0.059	0.638**	-0.225	0.729	-0.011	-0.640*	-0.751*	-0.561*	0.541
12th month	-0.040	0.527*	-0.073	0.861	0.342	-0.531*	-0.927*	-0.637**	0.473
13th month	-0.057	0.553	-0.112	0.888	0.362	-0.457	-0.992**	-0.687**	0.208
14th month	-0.111	0.452*	-0.340	0.725	0.212	-0.481	-1.057**	-0.656**	0.645
15th month	-0.153	0.534*	-0.493	0.497	0.253	-0.331	-0.984**	-0.739**	1.205
16th month	-0.171	0.572	-0.417	0.457	0.316	-0.310	-0.979**	-0.794**	1.112
17th month	-0.220	0.475*	-0.422	0.453	0.341	-0.417	-1.124**	-0.762**	0.846
18th month	-0.304*	0.511***	-0.424	0.249	0.329	-0.641	-1.207***	-0.801**	0.716
19th month	-0.409**	0.505***	-0.442	0.088	0.370	-0.818**	-1.095*	-0.951***	0.739
20th month	-0.427***	0.479*	-0.468	-0.021	0.191	-0.642*	-1.469	-0.986***	0.724
21st month	-0.471***	0.429*	-0.516	0.063	0.280	-0.732*	-1.656*	-1.080***	0.958
22nd month	-0.551***	0.319*	-0.551	-0.002	0.456	-0.703	-1.670	-1.231***	0.532
23rd month	-0.597***	0.280	-0.731	0.045	0.235	-0.660*	-1.803	-1.228***	0.324
24th month	-0.626***	0.266	-0.756	0.097	0.234	-0.526**	-1.958*	-1.227***	0.348
25th month	-0.664***	0.249	-0.948	0.381	0.211	-0.572*	-1.985*	-1.353***	0.322
26th month	-0.679***	0.190	-0.920	0.341	0.217	-0.477	-2.004	-1.388***	0.578
27th month	-0.642***	0.184	-1.038*	0.352	0.234	-0.356	-1.774	-1.298***	0.554
28th month	-0.648***	0.165	-0.964	0.277	0.213	-0.213	-1.836	-1.434***	0.578
29th month	-0.702***	-0.049	-0.799	0.231	0.282	-0.237	-1.911	-1.565***	0.683
30th month	-0.702***	-0.156	-0.770*	0.185	0.441	-0.072	-1.862*	-1.524***	0.559
31st month	-0.693***	-0.063	-0.908	0.190	0.233	-0.101	-2.007*	-1.500***	0.581
32nd month	-0.760***	-0.113	-0.955*	0.130	0.199	0.076	-2.111**	-1.659***	0.370
33rd month	-0.802***	-0.150	-1.036*	0.137	0.661*	0.230	-2.227**	-1.672***	0.572
34th month	-0.818***	-0.318	-1.030**	0.051	0.585	0.162	-2.279**	-1.469***	0.573
35th month	-0.880***	-0.188	-0.984**	-0.054	0.335	0.115	-2.022**	-1.614***	0.452
36th month	-0.952***	-0.090	-0.908**	-0.079	0.389	-0.240	-2.192**	-1.683	0.210

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 12: CARs of Wholesale & Retail Trade, Hotels and Restaurants Sectors & Sub-sectors

	Wholesale and Retail Trade, Hotels and Restaurants	Wholesale Trade	Consumer Trade	Restaurant and Hotels
Initial Return	0.033	-0.004	0.053	0.050
1st month	0.567	-0.352**	0.583**	1.913***
2nd month	0.479*	-0.320*	0.559**	1.520***
3rd month	0.381	-0.473*	0.581**	1.265***
4th month	0.314	-0.561**	0.576*	1.102***
5th month	0.139	-0.819**	0.571	0.713
6th month	0.144	-0.866**	0.691	0.569
7th month	0.364	-0.779**	0.733	1.345
8th month	0.357	-0.897**	0.758	1.440
9th month	0.329	-0.923**	0.768	1.330
10th month	0.470	-0.685**	0.900*	1.346
11th month	0.572	-1.059**	1.049**	1.252
12th month	0.487	-1.139**	0.975**	1.137
13th month	0.421	-1.123*	0.936**	0.938
14th month	0.467	-1.122**	1.092**	0.805
15th month	0.613	-1.136**	1.251**	1.089
16th month	0.553	-1.212*	1.252**	0.921
17th month	0.572	-1.072**	1.109*	1.142
18th month	0.714	-0.528	1.176**	1.036
19th month	0.829	-1.060	1.163*	1.106
20th month	0.843	-1.093	1.232**	1.488*
21st month	0.964*	-1.064	1.485***	1.654*
22nd month	0.876*	-0.923	1.384***	1.470*
23rd month	0.789*	-0.884	1.267**	1.365*
24th month	0.733	-0.951	1.222***	1.056*
25th month	0.573	-0.795	1.312***	1.084
26th month	0.561	-1.035	0.488	1.247
27th month	0.526	-1.180	0.967**	1.025
28th month	0.432	-0.960	0.910***	0.718
29th month	0.490	-1.009	0.812**	0.971
30th month	0.526	-1.030	0.740	0.892*
31st month	0.560	-0.673	0.956	0.838
32nd month	0.666	-0.091	0.843	0.869
33rd month	0.691	-0.386	0.847	0.842
34th month	0.673	-0.350	0.843	0.900
35th month	0.523	-0.238	0.737	1.411
36th month	0.371	-0.255	0.691	1.344

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table 13: CARs of Education, Health, Sports and Other Social Services Sector & Transportation, Communication and Storage Sector and Technology Sector

	Education, Health, Sports and Other Social Services	Transportation Communication and Storage	Technology
Initial Return	0.009	0.206***	0.103*
1st month	-0.495	1.308	0.124
2nd month	-0.631	1.231	0.031
3rd month	-0.590	1.184**	-0.071
4th month	-0.496	1.421	-0.075
5th month	-0.584	1.422	-0.006
6th month	-0.586	1.298	-0.089
7th month	-0.664	1.413	0.038
8th month	-0.743	1.339	-0.058
9th month	-0.870	1.403	-0.167
10th month	-0.940	1.414	-0.048
11th month	-0.885	1.286	-0.060*
12th month	-0.879	1.158	-0.117
13th month	-0.820	1.122	-0.025
14th month	-0.755	2.104	-0.048
15th month	-0.673	1.945	-0.006
16th month	-0.721	2.035	-0.009
17th month	-0.716	2.022	0.015
18th month	-0.686	1.781	0.120
19th month	-0.782	1.857	0.133
20th month	-0.943	1.695	0.077
21st month	-1.062	1.665	0.052
22nd month	-1.084	1.660	0.189
23rd month	-1.175*	1.609	0.053*
24th month	-1.450**	1.704	-0.050
25th month	-1.604**	1.580	0.011
26th month	-1.699**	2.114	-0.199
27th month	-1.689**	1.921	0.120
28th month	-1.639**	1.682	-0.084
29th month	-1.587**	1.611	-0.043
30th month	-1.667**	1.286	0.040
31st month	-1.584*	1.133	-0.107
32nd month	-1.724**	0.940	-0.032
33rd month	-1.694**	0.726	-0.048
34th month	-0.262*	0.869	0.009
35th month	-0.902**	0.693	-0.053
36th month	-0.976**	1.254	-0.072

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

CHAPTER VI

DETERMINANTS OF UNDERPRICING

6.1. DETERMINANTS OF UNDERPRICING IN THE TURKISH IPO MARKET

In this section we discuss the control variables that are widely used in IPO literature as determinants of underpricing. These variables used in the regression analysis to check which variables have statistically significant impact on underpricing. In the literature generally market adjusted initial return is used as a proxy for the level of underpricing. This is, as discussed earlier, calculated as the difference between initial return and the market return.

The following variables are used to in the regression analysis:

MRETURN: It is the percentage change in ISE-100 index during last 15 days before the first trading day. This variable controls the market trend. A positive relationship is expected.

LPROCEED: It is the natural logarithm of gross proceed and controls the size of issue. The small issue size may indicate higher level of uncertainty. Hence, we expect a negative sign for this variable. The proceeds are converted into dollar amount are used by using the exchange rate on the last day of public offering sales to remove the effect of inflation.

LSIZE: It is another commonly used size variable in the literature and the natural logarithm of the total dollar value of assets at the end of year prior to the year of going public. It is expected that larger firms' IPOs have lower uncertainty than the smaller firms' IPOs. Hence, an inverse relationship is expected.

AGE: It is calculated by subtracting the year the firm was established from the year of IPO. Older firms have higher ex-ante uncertainty than younger firms since they have more information available to the public than younger firms do. Thus, higher initial returns are expected for younger firms. An inverse relationship between age and underpricing is expected.

REPU: It represents the reputation of the underwriter and used to examine the relationship between underwriter reputation and underpricing. We used the relative frequency to define reputation of underwriters in the sample. The variable takes a value from 1 to 12, with a value of 1 indicating the most prestigious underwriter and value of a 12 indicating the least (see Kirkulak and Davis, 2005). The sign of this variable is uncertain. Negative sign indicates that more prestigious underwriters bring lower risk issues to the market and so reduce the level of underpricing. The positive sign, however, indicate that underwriters reward investors by underpricing issues.

PRIVATE: In the last two decades, the governments have tried to privatize publicly-owned enterprises. Particularly, in last five years some of the prestigious enterprises have been privatized by offering the existing shares of firms to public. To analyze the impact of privatization on underpricing, a dummy variable, which takes value of one if the IPO is taking place under the privatization program of government and zero otherwise, is used. The expected sign for this variable is uncertain.

OWN: This variable, which is calculated as the percentage institutional ownership of firms' stocks prior to going public, captures the impact of ownership structure on the level of underpricing. An inverse relationship is expected.

METHOD: This variable controls the impact of method of going public on the underpricing. IPOs can be classified as either the primary shares (new issues) or secondary shares (previously issued outstanding shares). In the latter case, proceeds will go to the existing shareholders and may not be used for firms' growth strategies (see Kiymaz, 2000). Hence, this may suggest a higher level of underpricing. A dummy

variable is employed and takes the value of one if offering is new issue, and zero otherwise.

SMETHOD: This variable examine the impact of sales method of new issues on the underpricing. Generally, two sales methods used in the Turkish IPO market. Standby Underwriting and Best Efforts. We should mention that more commonly used method is the standby underwriting. A dummy variable is used and takes the value of one if standby underwriting is used, and zero otherwise. When the issuing firm is not well-know, the investment banker and the issuing firm may execute a best efforts agreement. Hence, a positive sign is expected.

SELF: Following Kiymaz (2000), we use this variable check whether or not investment bankers underwrite their own IPOs or one of family-firms' IPOs have some impact on the underpricing. A dummy variable, which takes value of one if investment bankers underwrite their own or one of family-firms' IPOs, and zero otherwise.

The cross-sectional regression results are reported in Table 14. SIZE, PROCEED, AGE and SELF are serving as proxies for ex-ante uncertainty. As discussed earlier, positive relationship between underpricing and ex-ante uncertainty is expected. All variables except for PROCEED have the expected sign but only SELF has statistically significant impact on the underpricing. MRETURN has a significant positive coefficient, suggesting that the rising market between the offer price time and the first trading day is one of the determinants of underpricing. PRIVATE has a statistically significant negative coefficient, indicating that the IPO is taking place under the privatization program of government has lower underpricing level than the others. Another important variable REPU has negative sign but, surprisingly, it is statistically insignificant, suggesting that reputation of underwriter has no impact on underpricing. The other control variables have expected sign but they are insignificant.

Table 14: Regression results

Variable	coefficient	Standard error	t-statistics
MRETURN	0.2539*	0.1399	1.8431
LPROCEED	-0.0112	0.0139	-0.8085
LSIZE	0.0064	0.0081	0.7967
AGE	0.0008	0.0009	0.8806
REPU	-0.0053	0.0051	-1.0451
PRIVATE	-0.0081*	0.0467	-1.7200
OWN	-0.0466	0.0335	-1.3919
METHOD	-0.0531	0.0352	-1.5071
SMETHOD	-0.1064	0.1118	-0.9510
SELF	0.0913*	0.0532	1.7156
R ²	0.08		

Note:* indicates statistical significance at 10% level

CONCLUSION

The pricing and performance of IPOs have long been an issue of interest in the finance literature and many studies have investigated the underpricing of IPOs both theoretically and empirically. Underpricing seems to be a common characteristic of most international markets. This paper aimed to provide additional international evidence on the Initial Public Offerings (IPOs), using data from the Turkish IPO market for the period 1996-2006. In this study the initial and after-market returns for the Turkish IPOs is investigated for the period 1996-2006.

Empirical results of the initial and immediate after-market adjusted daily average abnormal returns (AARs) for all firms show that the mean underpricing for all firms is 9.5%, while those for Financial, Manufacturing, Transportation, Communication and Storage, Technology, Wholesale and Retail Trade, Hotels and Restaurants, and Education, Health, Sports and Other Social Services sectors are 11.9%, 9.1%, 20.6%, 10.3%, 3.3%, and 0.9%, respectively. All underpricing levels are statistically significant at the conventional levels except for the Wholesale and Retail Trade, Hotels and Restaurants, and Education, Health, Sports and Other Social Services sectors. As for the sub-sectors, the highest underpricing is observed in Manufacture of Non-Metallic Mineral Products (21.2%) followed by Manufacture of

Fabricated Metal, Products, Machinery and Equipment (18.5%); and Real Estate Investment Trusts (17.6%). Initial returns are statistically significant for mostly financial and manufacturing sub-sectors. Although we use different data and sample period our results support the findings of Kiymaz (2000), Durukan (2002) and Kucukkocaoglu (2005). Their results also indicate statistically significant underpricing for the period 1990-1996, 1990-1997, and 1993-2005, respectively. Hence, our results together with the results of the previous studies suggest that the underpricing is the main characteristic of the Turkish IPO market.

Cumulative abnormal returns (CARs) analysis covers period of 1 month to 36 month. For all firms, CARs are positive and statistically significant up to 5 months. From 5th month to 13th month, CARs are positive but not statistically significant. Negative CARs are observed after 13th month but statistically significant negative CARs started to be observed after 24th month.

In breakdown of CARs into sectors and sub-sectors ranging from 1st month to 36th month, mostly statistically significant negative abnormal returns are observed except for a few sub-sectors, all sub-sectors. For the 36 month period, contrary to Kiymaz (2000) and Durukan (2002), we observe statistically significant negative abnormal returns in line with the majority of international evidence about the long-run performance of IPOs.

Another conclusion reached by analyzing initial returns by year is that initial returns fluctuate significantly during the sample period. The sample period witnessed several national and international economic and/or financial crises such as Asian crisis of 1997, Russian crisis of 1998, and 2000 and 2001 financial crises of Turkey. These events might have had some impacts on the initial returns of the Turkish IPOs and it is observed that initial returns decreases constantly from 1996 to 2002. Negative initial return observed in 2002. The initial returns becomes positive and start to increase after 2002.

In investigation of the factors influencing the initial performance, control variables such as the control variables such as the percentage change in ISE-100 index during last 15 days before the first trading day, gross proceeds, size of issuer, the operating history of the firm before going to public, the reputation of underwriter, privatization, institutional ownership, method of going public, sale method of new issues, self-offered IPOs are employed. Size of issuer, gross proceeds, the operating history of the firm before going to public and self-offered IPOs are serving as proxies for ex-ante uncertainty. As discussed earlier, positive relationship between underpricing and ex-ante uncertainty is expected. All variables except for gross proceeds have the expected sign but only self-offered IPOs has statistically significant impact on the underpricing. The percentage change in ISE-100 index during last 15 days before the first trading day has a significant positive coefficient in line with Kiymaz (2000), suggesting that the rising market between the offer price time and the first trading day is one of the determinants of underpricing. Contrary to Durukan (2002), privatization has a statistically significant negative coefficient, indicating that the IPO is taking place under the privatization program of government has lower underpricing level than the others. Another important variable, the reputation of underwriter has negative sign but, surprisingly, it is statistically insignificant, suggesting that reputation of underwriter has no impact on underpricing. The result obtained from the reputation of underwriter supports underwriter measurement on underpricing of Guner, Onder, and Rhoades (1999). The other control variables have expected sign but they are insignificant.

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APPENDIX

Table A1: AARs of All Firms in the sample during 1996-2006

AARs	All Firms
Initial Return	0.095***
1st month	0.133**
2nd month	0.004
3rd month	-0.019
4th month	-0.000
5th month	-0.013
6th month	-0.076***
7th month	-0.013
8th month	-0.053**
9th month	-0.037**
10th month	-0.036*
11th month	0.011
12th month	0.004
13th month	-0.045**
14th month	-0.037*
15th month	-0.029
16th month	-0.004
17th month	-0.018
18th month	-0.059***
19th month	-0.034
20th month	-0.023
21st month	-0.015
22nd month	-0.031
23rd month	-0.016
24th month	0.002
25th month	-0.047**
26th month	-0.026
27th month	0.023
28th month	-0.030
29th month	-0.040*
30th month	0.003
31st month	-0.009
32nd month	-0.043*
33rd month	0.012
34th month	0.013
35th month	-0.035
36th month	-0.016

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table A2: AARs of Financial Institutions Sector & sub-sectors of Financial Inst. Sector

	Financial Institution	Banks- Special Fin. Groups	Insurance Comp.	Financial Leasing Factoring	Holding &Invest.	Real Estate Invest. Trusts	Investment Trusts
Initial Return	0.119***	0.071*	0.049	0.097	0.078*	0.176***	0.131
1st month	0.057	-0.132	-0.176***	0.319	-0.096*	0.394	-0.034
2nd month	0.048	-0.182	-0.120**	0.477	0.188	0.170*	-0.085***
3rd month	-0.049	-0.004	0.062	-0.195	0.030	-0.130**	-0.032
4th month	-0.002	-0.020	-0.179	0.106	-0.013	-0.098*	0.054
5th month	-0.027	-0.151	0.027	0.215	0.014	-0.007	-0.080
6th month	-0.112***	-0.204	-0.119*	-0.182	-0.059*	-0.098	-0.102**
7th month	-0.010	0.063	-0.082	0.066	-0.017	0.082	-0.084**
8th month	-0.034	-0.084	0.002	-0.200	-0.057	0.014	-0.004
9th month	0.013	0.116	0.002	-0.132	-0.032	0.107	-0.018
10th month	-0.043	0.028	-0.083*	-0.140*	0.061	-0.071	-0.072
11th month	0.017	-0.055	-0.291	0.291	-0.141***	-0.035	0.121
12th month	0.015	0.151*	0.030	-0.096***	-0.200**	0.026	0.082
13th month	-0.041	0.001	-0.217	-0.026	-0.047	-0.079	-0.013
14th month	-0.046	0.022	-0.018	0.051	-0.010	-0.122	-0.057
15th month	-0.048	-0.344**	-0.146	-0.032	-0.118	0.034	0.021
16th month	0.001	-0.045	-0.250	0.271	0.080	0.045	-0.054
17th month	-0.012	0.105***	-0.022	-0.218	-0.036	-0.080	0.044
18th month	-0.070**	0.136	-0.006	-0.327**	-0.002	-0.065*	-0.095*
19th month	0.004	0.017	-0.038	-0.121	0.081	0.035	-0.014
20th month	-0.033	-0.023	-0.172	-0.000	-0.134	-0.029	0.006
21st month	-0.019	0.015	-0.107	-0.017	0.004	0.025	-0.049
22nd month	0.014	0.143	0.021	0.057	-0.012	0.049	-0.027
23rd month	0.021	-0.033	0.016	-0.009	-0.083	-0.070	0.133*
24th month	0.033	-0.024	0.162	0.255	0.132	0.025	-0.021
25th month	-0.071*	-0.052	0.003	-0.046	-0.019	-0.057	-0.110
26th month	-0.053	-0.152*	-0.149*	-0.164	-0.054	0.048	-0.059
27th month	0.035	0.042	0.063	-0.125	0.256	0.051	-0.040
28th month	-0.009	-0.107	0.216	0.012	-0.015	-0.006	-0.012
29th month	-0.073*	0.137	0.090**	-0.285	-0.022	-0.174*	-0.025
30th month	0.043	0.262	-0.128	-0.055	-0.050	0.035	0.043
31st month	-0.019	-0.063	0.167	-0.037	-0.122	-0.057*	0.029
32nd month	-0.006	-0.055	0.013	0.014	0.123	0.027	-0.068
33rd month	0.057	0.338	-0.025***	0.158	0.221	-0.064	0.001
34th month	0.021	0.312	-0.100	-0.169	-0.150	-0.006	0.055
35th month	0.001	-0.148	0.113	0.048	0.098	-0.033	0.007
36th month	-0.013	-0.152	0.145	-0.102	-0.046	-0.017	0.071

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively

Table A3: AARs of Manufacturing Industry Sector & sub-sectors

	Manu. Industry	Metal Pro. Mach.&Equip.	Chemicals. &Che. Petro. & Rubber	Food& Bever. Tobacco	Non- Metallic Mineral Product	Paper &Pap Prod. Print. Pub.	Basic metal Industry	Textile- Wearing App.- Leather	Other Manuf. Ind.
Initial Return	0.091***	0.185**	0.137**	0.041	0.212*	0.051	-0.075**	0.056	0.176*
1st month	0.087	0.218*	-0.011	0.236	0.014	-0.032	-0.034	-0.027	0.489
2nd month	0.001	-0.049	-0.123	-0.025	0.040	0.067	-0.134**	0.041	0.251
3rd month	0.015	-0.050*	0.036	0.246	0.248	-0.303	-0.050	0.008	-0.122
4th month	0.019	0.006	0.062	0.248	-0.062	-0.063	0.104	-0.038	-0.247
5th month	0.018	0.026	0.033	0.013	0.008	0.048	-0.128	0.047	-0.063
6th month	-0.07***	-0.032	-0.185**	0.018	-0.059	-0.045	-0.109	-0.101*	-0.074
7th month	-0.066**	0.113	-0.094	-0.092	-0.088	-0.002	-0.062	-0.088*	-0.441
8th month	-0.071*	-0.105	-0.133	0.004	-0.053	-0.050	-0.14***	-0.061	-0.100
9th month	-0.08***	0.072	-0.093	-0.057	-0.060	-0.116	-0.172	-0.16***	-0.018
10th month	-0.054	0.014	0.014	-0.134**	-0.058	-0.044	0.181	-0.178**	0.240
11th month	0.002	-0.065	0.109	0.131	-0.143	-	-0.158	0.080	-0.061
12th month	0.018	-0.110**	0.151	0.132	0.353	0.109	-0.175	-0.076	-0.068
13th month	-0.016	0.026	-0.038	0.026	0.019	0.074	-0.06***	-0.050	-0.264
14th month	-0.054	-0.100	-0.228**	-0.163	-0.149	-0.024	-0.065	0.031	0.308
15th month	-0.037	0.081	-0.153	-0.228*	0.040	0.149	0.072	-0.082	0.237
16th month	-0.015	0.038	0.076	-0.039	0.063**	0.020	0.005	-0.055	-0.092
17th month	-0.048	-0.097	-0.005	-0.003	0.024	-0.106	-0.14***	0.031	-0.265
18th month	-0.083**	-0.068	-0.001	-0.203*	-0.011	-0.223	-0.082	-0.038	-0.13***
19th month	-0.09***	-0.070*	-0.017	-0.16***	0.041	-0.177	0.112	-0.144	0.023
20th month	-0.045	-0.026	-0.026	-0.109	-	0.176	0.173	-0.108	-0.015
21st month	-0.034	-0.049	-0.048	0.084	0.088	-0.090	-0.187*	-0.028	0.233
22nd month	-0.079	-0.110	-0.034	-0.066	0.176	0.029	-0.013	-0.151	-0.42***
23rd month	-0.046	-0.038	-0.179	0.048	-0.220	0.043	-0.133*	0.002	-0.207
24th month	-0.028	-0.014	-0.025	0.051	-0.000	0.133	-0.154**	0.001	0.023
25th month	-0.037	-0.016	-0.192*	0.284***	-0.023	-0.046	-0.027	-0.12***	-0.026
26th month	-0.015	-0.059	0.028	-0.040	0.006	0.095	-0.018	-0.035	0.256
27th month	0.037	-0.006	-0.118	0.011	0.017	0.120	0.230**	0.090	-0.024
28th month	-0.006	-0.018	0.074	-0.075	-0.020	0.142*	-0.062	-0.136**	0.024
29th month	-0.054	-0.215	0.164	-0.046	0.068	-0.023	-0.075	-0.130	0.104**
30th month	-0.000	-0.107*	0.029	-0.045	0.158*	0.165	0.049	0.041	-0.124
31st month	0.009	0.093	-0.138	0.005	-0.20**	-0.029	-0.145**	0.024	0.022
32nd month	-0.066**	-0.049	-0.047	-0.060	-0.033	0.177	-0.103**	-0.158**	-0.21***
33rd month	-0.008	-0.021	-0.080	0.007	0.461**	0.154	-0.116**	-0.013	0.201*
34th month	0.001	-0.167	0.005	-0.086	-0.075	-0.006	-0.052	0.203	0.001
35th month	-0.061*	0.130	0.045	-0.105	-0.249	-0.208	0.257	-0.145**	-0.120
36th month	-0.029	0.129	0.076	-0.025	0.053	-0.395	-0.169	-0.068	-0.242

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table A4: AARs of Wholesale & Retail Trade, Hotels and Restaurants Sectors & sub-sectors

	Wholesale and Retail Trade, Hotels and Restaurants	Wholesale Trade	Consumer Trade	Restaurant and Hotels
Initial Return	0.033	-0.004	0.053	0.050
1st month	0.238	-0.170**	0.208	0.913
2nd month	-0.087	0.032	-0.024	-0.393
3rd month	-0.098*	-0.153**	0.021	-0.254
4th month	-0.067	-0.087	-0.004	-0.162
5th month	-0.174	-0.258	-0.004	-0.389
6th month	0.005	-0.047	0.119	-0.144
7th month	0.220	0.086	0.042	0.776
8th month	-0.007	-0.117	0.024	0.095
9th month	-0.028	-0.026	0.010	-0.110
10th month	0.073	0.034	0.131	0.016
11th month	0.043	-0.031	0.148**	-0.094
12th month	-0.085	-0.079	-0.073	-0.114
13th month	-0.065	0.015	-0.038	-0.199
14th month	0.045	0.001	0.155**	-0.132
15th month	0.146	-0.014	0.159	0.283
16th month	-0.060	-0.075	0.001	-0.168
17th month	0.018	0.139	-0.142	0.220
18th month	0.018	0.046	0.066	-0.106*
19th month	0.012	-0.002	-0.012	0.070
20th month	0.143	-0.033	0.068	0.381
21st month	-0.019	0.029	-0.158	0.166
22nd month	-0.088	0.140	-0.100	-0.184
23rd month	-0.087	0.039	-0.117	-0.104
24th month	-0.056	-0.067	-0.044	-0.309
25th month	-0.160	0.156	0.089	0.027
26th month	-0.011	-0.240	-0.823**	0.163**
27th month	-0.035	-0.145	0.478	-0.221
28th month	-0.094	0.220	-0.057	-0.307
29th month	0.058	-0.049	-0.097	0.253**
30th month	0.035	-0.020	-0.072	-0.079
31st month	0.034	0.356	0.216	-0.054
32nd month	0.105	0.581	-0.113**	0.030
33rd month	0.025	-0.294	0.003	-0.026
34th month	-0.018	0.035	-0.004	0.057
35th month	-0.149	0.111	-0.105	0.511***
36th month	-0.152	-0.016	-0.045	-0.067

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.

Table A5: AARs of Education, Health, Sports and Other Social Services Sector & Transportation, Communication and Storage Sector and Technology Sector

	Education, Health, Sports and Other Social Services	Transportation Communication and Storage	Technology
Initial Return	0.009	0.206***	0.103*
1st month	-0.208	0.474	0.124
2nd month	-0.135	-0.077	0.031
3rd month	0.040	-0.046	-0.071
4th month	0.094	0.237	-0.075
5th month	-0.088	0.001	-0.006
6th month	-0.001	-0.124	-0.089
7th month	-0.078	0.114	0.038
8th month	-0.078***	-0.074	-0.058
9th month	-0.127***	0.063	-0.167
10th month	-0.069	0.010	-0.048
11th month	0.054	-0.127	-0.060*
12th month	0.006	-0.128*	-0.117
13th month	0.058	-0.035	-0.025
14th month	0.065	-0.140	-0.048
15th month	0.081	-0.158	-0.006
16th month	-0.048	0.089	-0.009
17th month	0.005	-0.012	0.015
18th month	0.029	-0.241	0.120
19th month	-0.095	0.076	0.133
20th month	-0.160**	-0.161	0.077
21st month	-0.119	-0.030	0.052
22nd month	0.067	-0.004	0.189
23rd month	-0.019	-0.050	0.053*
24th month	0.313	0.094	-0.050
25th month	-0.154*	-0.124	0.011
26th month	-0.095**	0.533	-0.199
27th month	0.010	-0.192	0.120
28th month	0.049	-0.238	-0.084
29th month	0.052	-0.070	-0.043
30th month	-0.079	-0.325	0.040
31st month	0.082	-0.152	-0.107
32nd month	-0.139***	-0.192	-0.032
33rd month	0.030	-0.214	-0.048
34th month	0.358***	0.143	0.009
35th month	-0.378	-0.175	-0.053
36th month	-0.073	0.561	-0.072

Note: *, **, *** denote statistical significance at 1%, 5%, and 10%, respectively.