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INITIAL PUBLIC OFFERING (IPO) PERFORMANCE: A CASE STUDY FROM ISTANBUL STOCK EXCHANGE MARKET

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INITIAL PUBLIC OFFERING (IPO) PERFORMANCE: A CASE STUDY FROM İSTANBUL STOCK EXCHANGE MARKET

Ph.D. Thesis by

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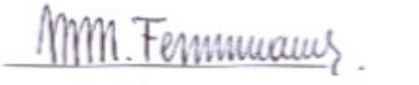
Prof. Murat FERMAN	Işık University	
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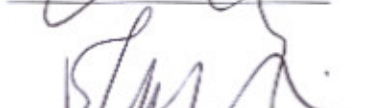
Assoc.Prof. Emrah CENGİZ	İstanbul University	
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IPO Performance: A Case Study from Istanbul Stock Exchange Market

Abstract

The significance of IPO underpricing has attracted many researchers' attraction in the past decades. This study addresses the IPO mispricing phenomenon in Istanbul Stock Exchange (ISE) market, and aims to provide additional evidence on IPOs. Using 1996-2004 data, pricing of the IPOs were compared in terms of several determinants in both short and long term. These determinants were found to be explaining the short term performances, the first day mean abnormal return for the IPOs that are underwritten by well known banks or investment agencies was found to be %4 and this increased to %6 for the IPOs with badly reputed underwriters. In the next step, we show that the underpriced and overpriced IPOs both outperform the market in the short-run but the underpriced stocks stopped outperforming after the first year. Finally, the tests on the effects of the five factors on the short-run and long-run performance of the IPO stocks explain us that they are significant only in the short term.

Halka Arz Performansı: İstanbul Menkul Kıymetler Borsası Üzerine Bir Çalışma

Özet

Bu çalışma, İstanbul Menkul Kıymetler Borsası'nda (İMKB) 1996-2004 yılları arasında gerçekleştirilmiş olan 138 Halka Arz'ı inceleyerek, bu konudaki literatüre katkıda bulunmayı amaçlamıştır. Kısa ve uzun vade performansları firma yaşı, tahsis miktarları, arzın büyüklüğü, aracı kurumun repütasyonu ve piyasa koşullarına göre incelenmiş, ve bunların Türkiye'deki halka arzların yanlış fiyatlamasına olan etkileri test edilmiştir.

İlk bölümde, halka arz kavramının genel bir açıklamasına değinilmiş, ilk halka arz konuları; tanımları, özellikleri, faydaları ve meydana gelmesi olası bazı olumsuzlukları açıklanmıştır. Dünya ve Türkiye'deki Halka Arz'larla ilgili kısa ve uzun dönem performansların incelendiği literatür kısmından sonraki bölümlerde ise fiyat performanslarının araştırılması istatistiki testker yardımı ile gerçekleştirilmiştir. Bunun sonucunda kısa vadede gerek düşük fiyatlı halka arzlar, gerekse yüksek fiyatlı halka arzların piyasanın üzerinde getiriler sağladığı görülmüştür. Fakat uzun vadede (2 yıl) ise düşük fiyatlı halka arzların endekse oranla anormal getirilerinin olmadığı saptanmıştır.

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achievable as long as the desire and hard work remains. And to my brother, Aytac Polat, who has always stood by me no matter how the weather is.

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Chapter 1
Introduction

Initial public offering (IPO) could be briefly described as the first sale of a corporation's common shares to investors on a public stock exchange. The reason why companies generally trade their shares is to raise capital, which could not be generated by internal resources such as retained earnings. However, by joining the public stock markets, companies have to meet heavy regulations. These regulations usually include regulatory compliance as well as reporting requirements. When the companies fail to meet these criteria, they would not be eligible to sell shares in the stock market and hence raise capital.

There might be mismatches between the quantity demanded and quantity supplied for some of the IPOs. Certain initial public offerings are demanded highly by investors and this demand could be higher than the amount of shares issued by the company. Once the trading starts, this excess demand could be met by selling and buying in the market. The demand and supply for a share is not evident until the trading of the IPO shares come close. The most valued clients have the advantage of being offered more popular shares, or in other words, shares that have higher demand.

Historically, initial public offerings are, in US and in many others, have been underpriced. Underpricing basically means that the shares to be sold are priced or valued below the levels they would get in the secondary markets. For an IPO, underpricing is generally defined as the difference between the first price on the secondary market and the issue price of a share of initial public offerings (IPOs)[1]. In general, the issue price of initial public offerings is below the first trading price on the secondary market.

Pricing disparities normally occur when an IPO appeals to many investors since this will lead to excess demand, and the imbalance between the supply and the

[1] Ibid.

demand of the IPO would cause the price of the popular shares to rise immediately during trading. At later stages of trading, the price discrepancy usually disappears. Given that there is uncertainty about the demand of the IPOs until the actual trading happens, the investors will encounter a price difference at the beginning of the process. This difference arises from the price investors paid for an initial offering and the price they perceive when the IPO shares start trading in the secondary market.

The investors, who subscribed to the issue and received an allocation, would benefit from underpricing in the markets since they are enabled to realize considerable trading gains in a few days only. They can sell their shares, which they bought at a lower price during the initial offering, at higher prices in the secondary market. The difference will accrue to the latter investors. However, the corporation whose shares are traded will be losing money if the issue price is way below the trading price on the secondary markets. Thus, many investments could not practically be realized. The remaining shareholders would also be indirectly but negatively affected by this process. Because of these concerns, both the costs and benefits of underpricing, therefore, should be taken into consideration.

Many studies so far tried to figure out where this price difference originates from, and how it is generated. While some researchers try to look at whether the issue price is low or the first trading price high according to previous issuances and/or the market, the others analyze analyze how this price differential fits into the efficient capital markets[2]. One of the explanations relates the underpricing to expectations and risk. According to this theory, investors who buy IPO shares are also concerned by expected liquidity and by the uncertainty about its level when shares start trading on the after-market. When the shares are expected to be less liquid and the liquidity is expected to be less predictable, then the price difference would most probably be larger[3].

[2] The low issue price would mean underpricing whereas high issue price would mean overpricing. Efficient capital markets would anticipate no price differential and the IPOs should have the correct pricing in a perfect world.

[3] Pagano, M. (2003), "IPO Underpricing and after Market Liquidity", *Centre for Studies in Economics and Finance (CSEF) Working Paper*, No: 99.

Some other models explain the undepricing with information asymmetry about the true value of the IPO shares. For example, Baron argues that the issuer knows less about the true value of the company than the investment bank entrusted with the sale[4]. While, in Rock, the information asymmetry is among potential IPO investors[5] rather than the issuer and the underwriter. Certain investors have superior knowledge than others and this result in price divergences. The investors with more information are expected to end up with the underpriced shares, which is why this kind of models are called "winner's curse".

There are also institutional, agency and behavioral explanations to why IPOs could be underpriced. The first set of reasoning, namely institutional, is based on the regulations in several countries concerning the liability laws and tax codes. The agency explanations see the attempt to control ownership as the key factor. And finally, the behavioral ground for underpricing emphasizes the irrational behavior such as information cascades, investor sentiments and prospect theory.

This study will examine the initial public offerings in Istanbul Stock Exchange Market (IMKB or ISE) for the period of 1996-2004. The study aims to show the determinants of underpricing in Turkey; as well as exploring long run IPO performance. Although, there are several studies analyzing the Turkish case, we believe that our study provides one of the most comprehensive accounts of empirical testing, via the extension of the international literature on IPOs issued in the ISE. The explanatory variables are derived from the theoretical underpinnings offered in the existing literature and a combined evaluation is presented. The purpose of this study is to measure the performance of firms after initial public offerings and to evaluate approaches concerning underpricing. Our claim is to display that IPOs are underpriced in both short and long run in the Turkish case and our study aims to show that the underpriced initial public offerings (IPOs) underperform ISE 100.

[4] Baron, D. (1982), "A Model of the Demand for Investment Banking, Advising and Distribution Services for New Issues", *Journal of Finance*, 37(4), pp: 955-76.
[5] Rock, K. (1986), "Why New Issues are Underpriced?", *Journal of Financial Economics*, 15, pp: 187-212.

The study is organized in two main parts. The next section will explain the methods of initial public offerings, selling methods of stocks, required qualifications for firms to be quoted and related costs. This section will first present these methods, requirements, and costs in general. Then a summary of the IPO methods in Turkey will be presented. Subsequently, in the second part (3rd, 4th and 5th sections) the pricing issues and IPOs in Turkey will be discussed.

The third section will review the models and theories explaining the underpricing in the literature. Among those, winner's curse, information revelation theories, principal agent models, and underpricing as a signal of firm quality will be examined. All these models and theories take information asymmetry as the basis and argue that the mispricing is caused by either the missing information or uncertainty. Besides, institutional, behavioral and agency explanations will be investigated.

The fourth section will first give an overview of the existing studies of Turkish IPO market and then compare it with other countries. Next, it will present the data, the method and the results. For the methodology, first the initial returns on the first day will be calculated, then the cumulative abnormal returns will be estimated, and finally, the after-market performance will be analyzed. Then, several regression equations for distinguishing which factors affect IPO mispricing, short-term and long-term IPO performance will be held. Firm age, allotment, offer size, underwriters' reputation and market conditions will be considered as the main determinants and try to estimate their impact on the mispricing of initial public offerings in Turkey. Additionally, the impact of these factors on short-term and long-term after market performance will be analyzed.

The fifth section will conclude and also provide some advisory remarks for improving the performance of the initial public offerings and supporting individual and small investors.

Chapter 2
Conceptual Definitions About the IPOs

2.1 Methods of Initial Public Offering

Large IPOs are generally underwritten by a "syndicate" of investment banks. A syndicate of investment banks means a group of investment banks, which jointly underwrite and distribute a new security offering, or jointly lend money to a specific borrower[6]. A banking syndicate is not a permanent entity, but forms specifically to handle a deal that might be too difficult or too risky for a single underwriter or borrower to handle. For the IPO trading, the underwriters keep a commission based on a percentage of the value of the shares sold.

The offering can include the issuance of new shares, intended to raise new capital, as well the secondary sale of existing shares. However, certain regulatory restrictions and restrictions imposed by the lead underwriter are often placed on the sale of existing shares. Institutional investors get majority of the initial public offerings but some shares are also allocated to the underwriters' retail investors and individuals[7]. For instance, in United States, it has been pointed out that between years 1997 and 1998, institutional investors acquired the three quarters of the offerings[8].

The underwriters, in consultation with the company, decide on the basic terms and structure of the offering well before trading starts, including the percentage of shares going to institutions and to individual investors. Most underwriters target institutional or wealthy investors in IPO distributions. The individual investors are less likely to buy huge portions of shares. Underwriters believe that institutional and wealthy investors are better able to buy large blocks of IPO shares, assume the financial risk, and hold the investment for the long term. Underwriting firms

[6] Adopted from Investorwords, www.investorwords.com/411/**banking_syndicate**.html.
[7] See, Aggarwal, R., Prabhala, N., and M. Puri, (2002), "Institutional Allocation in Initial Public Offerings: empirical evidence", *NBER Working Paper*, No: 9070.

that have a high percentage of individual investors as clients are more likely to allocate portions of IPO shares to individuals[9]. Several online brokers offer IPOs, but these firms often have only a small allotment of shares to sell to the public. As a result, individual investors' ability to buy these shares may be limited no matter which firm they do business with.

There could also be direct public offering (DPO), where a company sells its shares directly to the public without the help of underwriters. Direct public offering is defined as raising capital by marketing shares directly to customers, employees, suppliers, distributors and friends in the community. DPOs are an alternative to underwritten public offerings by securities broker-dealer firms where a company's shares are sold to the broker's customers and prospects. Direct public offerings have considerably lower cost than traditional underwritten offerings[10]. Additionally, they do not have the restrictions that are typically associated with bank and venture capital financing. Direct public offerings have become possible especially via the internet. Nevertheless, the liquidity, or the ability to sell shares, in a direct public offering is generally extremely limited.

Initial public offerings (IPO) have several methods, but three of them dominate most of the markets. These are; book building, fixed price, and auction methods[11]. Among these, book building is on average the most common method across countries. Over the last decade, the U.S. book building method has become increasingly popular worldwide for initial public offerings. Additionally, IPO auctions have been abandoned in nearly all of many countries in which they have been tried. Fixed price method is still utilized in certain stock exchange markets. Below, we will try to briefly explain each of these three methods.

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[8] Ibid., p. 3.
[9] Carter, R. and S. Manaster. (1990), "Initial Public Offering and Underwriter Reputation", *The Journal of Finance*, Vol:45(4), pp:1045-1067.
[10] Sjostrom, W. (2001), "Going Public Through an Internet Public Offering: a sensible alternative for small companies?", *Florida Law Review*, Vol:53, pp:529-540.
[11] Gregoriou, G. (2006), *Initial Public Offerings (IPOs)*, Oxford: Butterworth-Heineman.

2.1.1 Book Building

In book building the price is not known in advance. However, there is a range within which investors can put their bids. The bids must be above the minimum price mentioned in the range. Once the bids are submitted the amount that is equivalent of the shares demanded is deposited to underwriters' account. Then, the bidding period is closed[12].

The shares are allocated by first noting the highest price and the amount demanded. Rest of the amount is listed for each price level and then the shares are allocated by comparing the cumulative bids and the offered bids. When the cumulative shares exceed the offered shares, this price is denoted as the selling price. All the bids above this price level is distributed certain shares. Once the bidding and allocation process is completed the above procedure is followed. The underwriter submits the list to issuer, issuer reviews and comes back to the underwriter and the final decision is made public.

The book building is a capital issuance process which aids price and demand discovery[13]. It is a mechanism where, during the period for which the book for the IPO is open, bids are collected from investors at various prices, which are above or equal to the floor price. The offer price is then determined after the bid closing date based on certain evaluation criteria. There are two ways how the underwriters can make their share offers. First is selling everything through book building, the second is selling a certain portion by book building and the rest by fixed price issue.

[12] Jenkinson, T. and H. Jones, (2004), "Bids and Allocations in European IPO Bookbuilding", *Journal of Finance*, Vol: 59(5), pp: 2309-2338.
[13] Ibid.

2.1.2 Fixed Price

This method permits the investors to know the price of the shares that they should pay to obtain them in advance. There is a period decided by the underwriters in the prospectus and investors submit their bids during this period. The amount to buy the demanded shares is deposited to underwriter's account. When all the bids are submitted the process is closed and the shares are allocated among the investors based on a pro-rate basis. The sale is completed when all the shares are allocated to the investors[14].

Within several days of the end of the bid collection process the underwriters present a list of the investors and the corresponding shares to the issuer and the issuer approves and returns the list to the underwriter in another two days. The shares that are not allocated are announced by the underwriter immediately, and these shares are given back to the issuer. Finally, the shares that are distributed to investors are released. In fixed price offerings, market prices are determined before the sale of shares. Shares are randomly rationed or prorated among all bidders if the demand exceeds the quantity of offered shares. If there is not enough demand, an IPO fails or is postponed.

There are several differences between book building and fixed price offerings in terms of prices, demand, and payments. The differences between these methods are given below[15]. Table 2.1 summarizes these.

[14] Bierbaum, J., and V. Grimm, (2003), Selling Shares to Retail Investors: auctions versus fixed-price", Humboldt-University of Berlin, *Working Paper*.
[15] Sherman, A. (2003), "Global Trends in IPO Methods: Book Building vs. Auctions", *University of Notre Dame Working Paper.*

Table 2.1 Methods of IPO

Features	Fixed Price process	Book Building process
Pricing	Price at which the securities are offered is known in advance to the investor.	Price at which securities will be offered is not known in advance to the investor. Only an indicative price range is known.
Demand	Demand for the securities offered is known only after the closure of the issue	Demand for the securities offered can be known everyday as the book is built.
Payment	Payment if made at the time of subscription wherein refund is given after allocation.	Payment only after allocation.

Source: Sherman, A. (2003), "Global Trends in IPO Methods: Book Building vs. Auctions

Besides the above categories, the researchers also evaluated the two methods in relation to pricing. Related to pricing issues, Ljungqvist, Jenkinson and Wilhelm compared data on book building and fixed price IPOs for a large number of countries. They aim to see whether the large usage of book building is due to the efficiency in price gains. For this purpose they look at both direct and indirect costs of both methods book building and fixed price. They found that book building is substantially more expensive than fixed price and that it does not, by

itself, reduce underpricing[16]. The book building method is expected to decrease the underpricing since the price is determined by looking at the bids made throughout the process. Nevertheless, these authors couldn't verify these expectations and hence concluded that the efficiency of international IPOs have not risen due to book building.

Countries that use bookbuilding typically have less underpricing than countries using fixed-price offerings. According to Ritter, higher underpricing under fixed-price offering procedures can be attributed to informational cascades[17]. Similarly, Sherman shows that fixed price offer, can lead to higher underpricing than book building. Contrary to the fixed price offer and the auction method, in book building underwriters discriminate investors in the allocation of shares to establish long-run relationship with intermediates. Book building gives the underwriter greater flexibility in designing a solution that reflects the individual issuer's preferences. By controlling investor access to IPO shares, book building controls both the winner's curse problem that affects discriminatory auctions and the free rider problem that affects uniform price auctions[18].

In a study, Chowdhry and Sherman found that fixed price offers tend to lead to greater underpricing relative to the book building method. This is attributable to two reasons; first reason is the length of the bidding process. When the time gap between the offer and first day market price widens a greater price information leakage occurs. Second reason is related to the requirement of advance payment. In the fixed price offer investors have to pay in advance for their entire order[19].

A similar conclusion has been reached by Loughran, Ritter and Rydqvist. They found that the fixed price method is associated with greater underpricing worldwide since this method is subject to a greater probability of the issue failing

[16] Jenkinson, T., Ljungqvist, A. P., and W. Wilhelm. (2000), "Has the Introduction of Bookbuilding Increased the Efficiency of International IPOs?", *CEPR Discussion Papers*, No: 2484.
[17] Ritter, J.R., (1998), "Initial Public Offerings", *Contemporary Finance Digest*, Vol: 2, pp.5-30.
[18] Sherman, A., (2000), "IPOs and Long Term Relationships: An Advantage of Book Building", *Review of Financial Studies*, Vol: 13, pp.697-714.
[19] Chowdhry, B., and A. Sherman, (1996), "International differences in oversubscription and underpricing of IPOs", *Journal of Corporate Finance*, Vol. 2, Issue 4, pp.359-381.

and the increased uncertainty associated with the longer time delay between offer and issuance time[20].

2.1.3 Auctions

There are several types of auctions; however, in IPO markets usually Dutch auction method is used. In traditional auctions, the price rises until one bid is left, while in a Dutch auction, the auctioneer sets an extraordinarily high price and lowers it until someone bids on the item. In a Dutch auction[21], the seller or auctioneer starts at a high price and subsequently lowers the price. While the price is going down the bidders try to decide which price is appropriate for them to buy the item. The first bidder who communicates that he will accept the current price wins the item at that price. Each bidder can stop the auction at any time if they find the current price is what they would like to pay.

From a regulatory standpoint, the auction method is a subset of book building in which the underwriter pre-commits to a specific allocation rule. In practice, underwriters that are given full discretion seldom pre-commit voluntarily to one of these two subsets. Instead, they choose to explicitly collect information from an established group of investors, aggregating that information and incorporating it into the price. They use allocations strategically, from a long term perspective, rather than pre-committing to a simple rule[22]. Both, auctioning and book building have their advantages and disadvantages for pricing and for the volume of sales.

[20] Loughran, T., Ritter, J.R., and K. Rydqvist, (1994), "Initial public offerings: international insights", *Pacific-Basin Journal*, Vol. 2, pp.165-199.
[21] Vernon, L. S. (1987), "Auctions", in J. Eatwell, et al. (eds.), *The New Palgrave: A Dictionary of Economics*, New York: The Stockton Press.

[22] Sherman, A. (2003), "Global Trends in IPO Methods: Book Building vs. Auctions", *University of Notre Dame Working Paper.*

Although there are convincing theoretical and empirical arguments in favor of auctions in IPO, book building continues to be the most dominating method and more countries adopt his strategy when they market their stocks. Many authors argue that auctions are less costly not only because they have lower direct fees but also because they cause less underpricing[23]. The underpricing increases when the IPO shares are highly demanded and the supply is not enough to cover all the demands. If this is the case, then the price deviation in the first and second markets are expected to be bigger. Some studies found that auctioning generates lower initial returns than the book building method, which in turn decreases the price differentials and underpricing.

There are different predictions on the performance of different IPO methods regarding underpricing. An auction method could turn out relatively well when information gathering is not an issue, and when auctions for the same type of securities are held at regular intervals so that the pool of participants in the auction is stable. Book building method could be more successful when a reward for information gathering and price discovery is important, when the number of bidders varies significantly over time in an unpredictable manner, or when a large number of bidders may try to free ride on the information gathering efforts of others.

The primary difference between book building and other IPO methods is that the book building method gives underwriters control over the allocation of shares. The underwriters have the ability to decide on amount of shares to be offered by collecting the bids throughout the process. In contrast, auctions require the allocation of shares to be based on current bids, without regard to any past relationship between certain bidders and the auctioneer, and they are usually open to more or less everyone. Also, in the fixed price offerings, the allocation of IPO shares can be allocated more randomly than bookbuilding approach. When equity is issued through a fixed price offering, it is argued that winner's curse will result in underpricing and this can be overcome giving some rents to investors by the

[23] Ibid.

underwriter in exchange for information extraction[24]. Thus, in bookbuilding, some shares can be allocated to privileged investors.

Jagannathan and Sherman summarize the results of various IPO methods and when they will be more beneficial for the companies to follow. They found that;

1) the auction method is more effective when there is little or no uncertainty about the number of bidders and the consequently large winner's curse and free rider problems.

2) if maximizing proceeds, inducing information gathering, and the transparency and the ease with which the method can be implemented are important, then, fixed price offering is more successful.

3) book building method is more successful when information gathering is relatively more important since it can result in better price discovery and lower underpricing.

For initial public offerings, different countries tried different methods. However as mentioned above in most of the countries, the auction method has been over the years. Japan and France gave up auctions only after unrestricted book building was permitted. Countries like Singapore, UK, Italy, Portugal, and Switzerland returned to public offering after leaving the auction method. In Turkey, firms are allowed to sell their initial offerings by three methods. The issuers and underwriters are free to choose among the three alternatives listed below in offering their shares[25]. These three methods are fixed-price offering, book building and sale through the stock exchange[26].

[24] Cornelli, F., and D. Goldreich, (2001), "Bookbuilding and Strategic Allocation", University of London, *Working Paper*.
[25] Kucukkocaoglu, G. (2004), "Underpricing in Turkey: a Comparison of the IPO Methods", *Baskent University Working Papers.*
[26] In sale through stock exchange, the investors can buy the shares in the primary market, nevertheless to sell their share they have to wait until the shares are open in the secondary market. Price is set by the CMBT as the price at the registration time of the firm.

Various countries use various methods for initial public offerings. The most common are fixed price, book building and auctions. It can clearly be seen that book building is gaining more significance in almost all the countries and auctions are losing their share as an IPO method globally. However, in Turkey the fixed price method for initial public offering is still the most commonly used one. The Table 2.2 below shows the comparison of IPO methods among countries.

Table 2.2 Comparison of IPO Methods Across Countries

	Public Offer/Fixed Price	**Book Building**	**Auction**
Argentina	Yes		Tried in 1992, then abandoned
Austria	Yes, usually for small firms	Yes, traditional for large firms and privatizations	No
Brazil	Yes, but IB has discretion in allocation	Yes, originally for global offerings only but it has expanded to domestic offers	Allowed
Canada	Sometimes	Yes, primary method	No
Chile	Allowed	Yes	Yes, on stock exchange
China	Yes	Yes	

Finland	Yes	Yes	Allowed
France	Yes, Offre a Prix Ferme (OPF)	Yes, Placement Garanti (PG) only as hybrid	Rare
Germany	Yes	Yes, used almost for every IPO	No
India	Yes, most common	Yes, allowed in last few years	No
Italy	Yes, only for retail	Yes, only for institutional	Not used
Japan	Yes, but with allocation discretion	Yes	
Korea	Yes, in hybrids. It was the only method until 1998	Yes, most common	Yes
Mexico	Yes		Yes, only for privatizations and one buyer
Netherlands	Becoming obsolete	Yes	Allowed
Portugal	Yes, the most common	Yes, hybrid with public offer tranche	Very rare

South Africa	Yes, but not popular	Yes	Yes, placing and public offer
Spain	Yes, retail tranche	Yes, institutional and sometimes %100	Allowed, not habitually used
Sweden	Yes	Yes, for institutional tranche	Not used
Switzerland	Yes, most common in 1980s	Yes, first for large and international IPOs, not for domestic also	Allowed, not used in 1990s
Thailand	Yes, most common	Yes, for large IPOs such as privatizations	
Turkey	Yes, most common	Allowed, popular in mid-1990s but not popular since then	Allowed, not used
UK	Yes, most popular	Yes	Allowed, not popular
US	No	Yes	Yes

Source: NBER

2.2 Required Qualifications for Firms

In this section we will first look at the requirements for firms that are planning to have public offerings in United States and then summarize the rules for the Turkish market. A public offering can be a hugely complicated affair in United States, and generally, the companies do not go for public offerings until the following steps have been undertaken[27]:

1) The company has had a chance to prove itself and has a profitable business model that will scale to much larger operation on regional, nationwide or even international levels

2) The company must also have a strong business plan in place with clear arguments on what reason it wants to go public. These arguments may include raising high amounts of capital to fund an expansion and growth of a very profitable business model.

All offerings of stock and other securities are subject to the federal securities laws, as well as to the securities laws of any state where the securities are being offered or sold. Unless there is an exemption that applies to a given situation, these laws generally require that an offering go through a difficult securities registration process.

There are two federal laws that apply when a company wants to offer and sell its securities to the public[28]:

1) The Securities Act of 1933 requires a company to give investors "full disclosure" of all "material facts" relating to the

[27] See, http://www.newcap.com/userfiles/File/Publications/pub16.pdf, [accessed August 09, 2008]
[28] See, www.sec.gov

investment, including anything that investors would find important in making an investment decision. This law also requires a company to file a registration statement with the Securities and Exchange Commission that includes information for investors.

2) The Exchange Act of 1934 requires publicly held companies to continually disclose information about business operations, financial conditions and management. These reporting requirements are rigorous and continuing. They may apply not only to a company itself, but also to officers, directors and significant shareholders.

Similar to the US' Securities and Exchange Commission (SEC), in Turkey, a company's shares are investigated by Capital Markets Board (CMB) to confirm the ability to be offered and also investigated by ISE to confirm the ability to be traded at the stock exchange market[29]. It is mostly preferred to apply both of them at the same time in order to shorten the process. A company, after deciding to go for an IPO first selects an authorized investment bank for the IPO. Then, the company makes the necessary changes and adjustments in the articles of association in order to comply with the CMB Regulations. If the company undertakes the IPO by capital increase method, the board makes a decision according to the Turkish Trade Law about both increasing the capital and classifying the new rights for obtaining shares.

In US, the main law that regulates the securities exchange is the Securities of Act of 1933. According to the Act, the companies should register with the Securities and Exchange Commission (SEC)[30]. There is an outline for the registration, which is mainly drafted by the lead underwriter. It takes a while to get ready for the

[29] See, http://www.spk.gov.tr/index.aspx.
[30] See, http://www.sec.gov

procedure and be registered. The registration statement has two parts: The first part consists of the prospectus that is needed to be made public and shown to the buyers of the securities. The second part is not publicly available but the SEC can inspect the information contained in this part. As soon as the registration statement is accepted by the SEC, the securities could be exchanged in the market. This is all done after the Red Herring, which could be defined as the registration statement that contains information about the stocks issued and the issuing company. This must be also filled with SEC and shown to the institutional investors[31].

While these are in progress, the company and the underwriter attempt to promote the initial public offerings to the institutional investors. These are generally called road shows and the company and the underwriter make several presentations about the company and the stocks through these. The road shows do not only aim to provide information to the investors but the company and the underwriters also gather information from the investors[32]. The investors signal their interests to the underwriter and the company, and these indications generally differ according to the characteristics of the investor.

Since the registration and marketing process can take a long time, in United States, sometimes as long as several months, certain information cannot be put in the initial filing with SEC. At the beginning of the process, the underwriter doesn't know the final price of the IPO, the discount to the dealers, and the names of the syndicate members. These details are discussed with the issuer and decided before the effective date.

In Turkey, after the completion of documents for the public offering, auditors from Istanbul Stock Exchange (ISE) visit the company in order to carry out company investigation. Although there are several differences between the investigations of different industries, the qualitative and quantitative considerations are mostly common. These include qualitative issues, raw material

[31] *United States: Initial Public Offerings (IPO) Regulations Handbook*, World Business Library.
[32] Ibid.

supply, manufacturing process, manufacturing facilities, imports and exports, investments (both existing and projected), formation of the board and management, relations with group companies, subsidiaries and partnerships, legal due diligence, license issues and know-how agreements, and registered brands, etc[33].

The quantitative issues are mostly related to financial topics. Financial figures are analyzed and thoroughly investigated in order to understand the company's current financial condition[34]. Here, financial tables and explanatory notes are inspected and in many cases, trail balance and ledger books are also inspected for further information. Beside the static and dynamic analyses, which are made to understand financial situation, cash flow projections and ratio analyses are also applied.

In Turkey, the procedure, which is mentioned above, is the procedure that is related to the public offerings of investment banks out of the stock exchange. Companies can offer their shares at the stock exchange market in the same way. If the initial public offering method is being used, the offer takes place at the initial market, shares can be offered at the initial market after shares are quoted and the Board approves it at their first meeting. Public offer at the stock exchange market can be started after one week from the Board's approve. Public offering at the stock exchange market is realized during the time, which is mentioned by the Board's explanation. The shares are being traded by the end of that time, mentioned above. If the sales of the shares end before the mentioned time, they can be traded at the some working day.

The distribution of the stock begins in both countries when the above procedures are followed and on the effective date the investors can purchase the shares. The transaction ends after three days when the company delivers its stock and the underwriter deposits the net proceeds from the IPO into the firm's account. The

[33] Aziz, E., and O. Collak, (2006), "Taking a company public in Turkey", International Financial Law Review, available at: http://www.paksoy.av.tr/pdf/Taking_a_company_public_in_Turkey.pdf, [accessed August 09, 2008]
[34] Ibid.

underwriter's role still continues even after the initial transaction because it has to deal with the after market stabilization, the provision of analyst recommendations and making a market for the stock.

Prior to the commencement of the IPO process, company counsel should review with management the legal restrictions on publicity relating to the offering. U.S. securities laws provide that, without an exemption, it is unlawful to offer to sell any security unless a registration statement has been filed. The securities laws broadly define what constitutes an offer, and the U.S. Securities and Exchange Commission has made it clear that publicity which has the effect of conditioning the public or arousing public interest in the issuer should be construed as an offer to sell[35]. Consequently, certain activities or publicity prior to the filing of a registration statement may result in a violation of the securities laws, even if the activity or publicity was not phrased in terms of an express offer to sell stock and regardless of whether it was made orally or in writing.

Once a company has begun the process towards launching an IPO, it generally may continue to issue press releases in the normal course of business with respect to factual business developments, to advertise products, and to communicate with its shareholders, provided that such disclosures are consistent with prior practice and do not contain projections, forecasts or opinions regarding valuation. However, a company generally should not conduct interviews with newspapers and magazines, or effect speeches to special groups covering the company's business or financial condition or outlook.

Normal product marketing activities, such as articles in trade publications relating to specific product lines, are generally permitted, but comments by management relating to the company's performance, prospects or related matters are suspect. Any such violation could result in sanctions from the Securities and Exchange Commission, including a delay in the offering itself[36]. Restrictions on publicity, and on the limited manner in which offers may be made, continue after the filing of the registration statement as well.

[35] *United States: Initial Public Offerings (IPO) Regulations Handbook*, World Business Library.

There is a quiet period through which the investors rely on the information provided by the security laws and regulations. When the quiet period finishes a market environment is generated and the investors can now look into the signals from the market as well. The underwriter and other syndicate members can analyze and evaluate the new company after this period[37].

Unlike United States, in Turkey, the companies and underwriters are responsible for sending sales information to CMB and ISE. After the sales procedure is completed, related results are sent both to ISE and CMB. Both with the results of initial public offer and the inspection report about the company, the Board of ISE decides for the market in which shares will be traded. In the end, the ultimate decision of the ISE Board and the results of the public offer, explanation notes and other necessary information are published at the Daily Stock Exchange Bulletin. Over the counter sales start to be traded at the relevant market two days after the announcement.

As can be understood from above, the initial public offering process has several dimensions including the company, underwriter and investors. The company provides information about itself and the stocks, the underwriter markets, distribute and advertise the shares while the investors purchase them depending on how attractive they are. In the end, the company gains capital for new investment projects or other purposes and the investors find an opportunity to buy shares.

In US, each state has laws that apply to stock offerings and issuing securities. These laws usually parallel the federal securities laws to some degree, but state laws vary. An IPO may involve following not only federal securities laws, but also the securities laws of all 50 states, and the laws of other countries if the offering is extended that far.

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[36] Ibid.

[37] Michaely, R. and K. Womack, (1998), "Conflict of interest and the credibility of underwriter", *Cornell University Working Paper* , Ithaca NY.

There are different requirements for foreign firms, which are willing to offer their shares in the public market. With huge volumes of equity offerings, US markets continue to be very attractive for foreign companies. In determining to undertake an initial public offering in the United States, and in preparing itself for the offering process, a non-U.S. company should take steps to make the company more accessible to U.S. investors. For foreign companies there are several issues to be considered before offering shares. These are corporate governance, financial reporting, disclosure and publicity and corporate culture.

After the above pre-offering preparations, the company, in consultation with its investment bankers, will need to determine the number of shares to be offered to the public and the price per share. The number of shares to be offered is a function of a number of factors, including the amount of capital to be raised, the valuation of the company, the need to create a sufficient market float, and the desire to avoid too great a reduction of existing shareholders' ownership interest[38].

A company will also need to determine whether shareholders will be permitted to offer shares in the IPO. If the company does not need to raise a large amount of capital, the company may wish to solicit shareholder participation to increase the size of the offering and the size of the public float. In addition, existing shareholders may desire to achieve liquidity for a portion of their shares immediately when the offering happens.

2.3 IPO Benefits and Costs

There are two major reasons for IPO offerings. First, it helps the firms' initial shareholders in diversifying their holdings. A second rationale is to assist managers in procuring the necessary funding for undertaking new projects. At the point at which firm management undertakes an IPO, managers typically have a substantial portion of their personal wealth invested in the firm. The IPO enables

[38] Gregoriou, G. (2006), *Initial Public Offerings (IPOs)*, Oxford: Butterworth-Heineman.

these individuals to sell a portion of their holdings in the firm and utilize the funds generated from the sale of stock to diversify their investment risk[39]. In general, the firms aim to achieve the both goals simultaneously.

Arkebauer (1991) found that the need to generate funds to pursue new projects dominated portfolio diversification. For many entrepreneurial ventures, an IPO enables firm management to pursue growth opportunities that would otherwise be impossible to fund. Entrepreneurs routinely leverage themselves to a point where they are unable to further increase either their own or the firm's debt load. Issuing firm equity via an IPO can be beneficial in that it serves the dual purpose of providing needed funds and reducing the firm's debt to equity ratio. Even in those instances where additional commercial credit is available to the entrepreneur, the covenants attached to the loan may be sufficiently restrictive as to hinder his or her ability to pursue opportunities with high-growth prospects, but also high risk[40]. Therefore, the firms might prefer IPO as a substitute to credit and when it is not available, the major source of funds.

The costs and benefits of going public have been extensively studied in the literature. Besides, the regulatory and procedural costs, the biggest cost of IPO is underpricing. When there is underpricing in the IPO stocks, the corporations are losing money and funds for further growth opportunities. Table 2.3 summarizes the findings for costs and benefits of going public.

[39] Rock, K. (1986). "Why new issues are underpriced", *Journal of Financial Economics*, 15, pp: 187–212.

Table 2.3 The Costs and Benefits of Going Public

Author	Costs	Benefits
Ritter (1987)	• Direct costs including registration and underwriting costs, etc	• Outside finance
	• Indirect costs including underpricing	• Diversification
Welch (1989), Grinblatt and Hwang (1989)	• Temporary loss of market value to the initial owners	• Future fund raising in the form of seasoning equity offering
Holmstrom and Tirole (1993)	• Not explicitly identified	• Increased liquidity and outside monitoring
Booth and Chua (1996)	• Underpricing	• Improve liquidity
Brennan and Franks (1997)	• Underpricing	• Dispersed outside shareholding
Zingales (1995)	• Not explicitly identified	• Lower Cost of Debt

Source: Pagano, Marco and Ailsa Roell. (1998), "The Choice of Stock Ownership Structure: Agency costs, Monitoring and the Decision to Go Public", *Quarterly Journal of Economics*, 113, pp: 187-225.

As can be seen from the table above, most important benefit to be derived from going public according to Ritter is both outside funding and diversification while

[40] Pagano, M., Panetta, F. And L. Zingales, (1998). "Why do companies go public? An empirical analysis", *Journal of Finance*, 53, pp: 27–64.

the costs associated include direct costs and underpricing[41]. Firms usually go public when there is the necessity of liquidity. This will be especially beneficial for the firm if the stocks are sold to a large number of diversified investors. Nevertheless, Ritter also mentions that there are both direct and indirect costs associated with going public.

For Welch (1989), the biggest benefit of an IPO is the future fund raising in the form of seasoned equity offering. Seasoned equity offering is new equity issue by a company after its IPO[42]. As opposed to secondary equity offering where owners sell their shares, in seasoned equity offering, the company raises further capital and gets ownership strength. He also argues that the temporary loss of market value is the most important cost attached to IPOs.

Holstrom and Tirole (1993) give outside monitoring and increased liquidity as the main contributions of deciding to go public. Outside monitoring refers to outside large shareholders' having access to the company's financials and business information to some extent, and relevant institutions' auditing the financials periodically. Booth and Chua (1996) also agree on the liquidity issue. Outside monitoring can be understood as the discipline and overseeing that would be provided by the large shareholders. It has been argued that outside monitoring provides better incentives for the managers and boost the company's profits and growth. The insiders to the company can manipulate share prices and company's prospects for their own benefits while the outsider monitoring will allow mitigating these.

Finally, Brennan and Franks (1997) show that despite the cost of underpricing IPOs bring dispersed ownership to the company structure. Dispersed ownership, which refers to the ownership of the company by a wide shareholder basis, exploits the benefits of portfolio diversification. Any one investor holds only a small proportion of any one stock and investors can hold a large number of shares

[41] Ritter, J. R. (1987), "The Costs of Going Public", *Journal of Financial Economics*, Vol: 19, pp: 269-281.

in their portfolio. Dispersed ownership also promotes liquidity in stock markets by making a high proportion of shares available for trading.

There are several potential costs related to IPOs and the most significant of these costs is the loss of control that may ensue from being a publicly traded firm. As firms get larger and the owners are tempted to sell some of their holdings over time, the owner's portion of the outstanding shares will generally decline. This might lead to loss of control of the company by the owners and further threats by stockholders.

Other costs associated with being a publicly traded firm are the information disclosure requirements and the legal requirements. A private firm experiencing challenging market conditions may be able to hide its problems from competitors, whereas a publicly traded firm has no choice but to reveal the information. Yet another cost is that the firm has to spend a significant portion of its time on investor relations, a process in which equity research analysts following the firm are cultivated and provided with information about the firm's prospects. Finally, firms may not be able to go public if they do not meet the minimum listing requirements for the exchange on which they want to be traded.

Overall, the net tradeoff to going public will generally be positive for firms with large growth opportunities and funding needs. It will be smaller for firms that have smaller growth opportunities, substantial internal cash flows, and owners who value the complete control they have over the firm.

Another type of costs is related to the ones paid to the underwriters. The stocks are generally offered to the public via underwriters because the companies that are in need of capital are unknown to the public. This will make their shares unattractive and the investors won't demand these shares. Thus, the corporations resort to experienced intermediaries that consist of investment bankers. The underwriters have several roles to play throughout the IPO process. Initially, they assist the firm to meet the requirements of the Securities and Exchange Commission, and then they advertise and promote the stock so that the public will

[42] See, http://www.investopedia.com/terms/s/seasonedissue.asp.

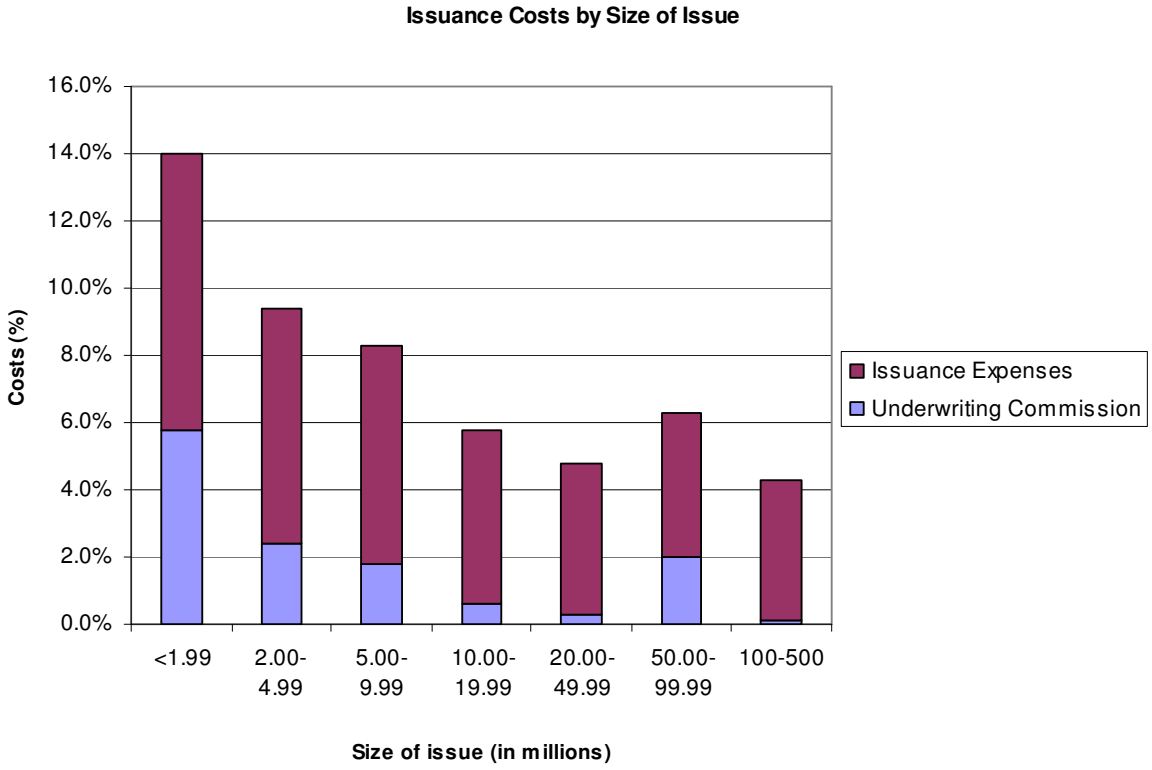
buy it. Also, they give advice to the company about the value of its stocks and assist the company for the pricing issues. There is risk absorption role too since the underwriter guarantees an offer price on the issue. Lastly, the underwriters attempt to sell the stock on the market either alone or with a group of other investment bankers.

There are numerous costs associated with initial public offerings. These could be classified under three headings. The first type of costs includes the legal and administrative costs. The second type of costs is related to underwriters, and the third type of costs comes from underpricing of the stocks.

1) As mentioned earlier, due to the laws and regulations by the according securities commission or the capital board in each country, the firms need to meet a range of requirements. These requirements generally involve certain fees and payments as well.

2) Since the underwriters have an essential role during the IPO process, they charge certain fees too. The company has to pay a price per share to the investment banks. Some authors like Ritter argue that the commission paid to the underwriter decreases with the volume of the stocks. In other words, the price to share ratio declines when there are more shares offered to the public.

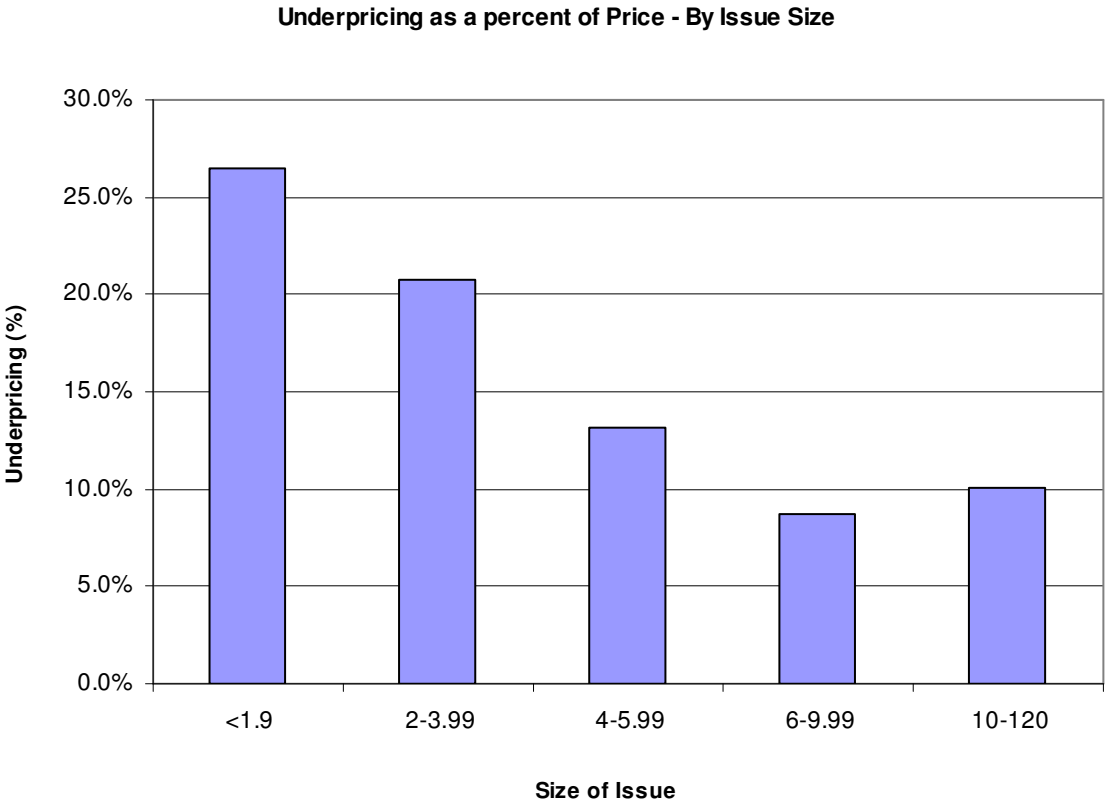
Figure 2.1 Issuance Cost by Size of Issue



Source: Taken from Ritter, Jay, (1998), "Initial Public Offerings", Contemporary Finance Digest, 2 (1), pp: 5-30.

3) The third type of the costs is generated as a result of the underpricing of the shares in the market. When the shares are marketed the investors usually buy these at a lower price and then sell it at a higher price. The difference in the price accrues to the investors and the company raises less capital. Ibbotson, Sindelar, and Ritter found that there is a relationship between the volume of the shares and the extent of the underpricing.

Figure 2.2 Underpricing as a percent of Price



Source: Taken from Ibbotson, R.G., Sindelar, J. and J. Ritter, (1994), "The Market's Problems with the Pricing of Initial Public Offerings", Journal of Applied Corporate Finance, 7, pp: 66-74.

The above costs and benefits also roughly apply to the Turkish firms. More concretely, the IPO related costs in Turkey consists of payments to the investment banks, payments to the CMB, payments to the ISE, other costs, and underpricing.

The company pays an amount to the investment bank and if exists, to the other consortium members, according to the type of the service and the amount of the public offer. That payment is determined with the contract between the company and the investment bank. Also, a registration fee, which is 0,2% of the public offer is paid to the CMB. Additionally, taxes and contribution share are also paid separately. There are two types of fees that should be paid to the ISE. The first one is quotation fee, which is collected from the firms that are traded at the

domestic stock exchange market. Second is the market registration fee that is collected from the companies, which are traded at the regional or new companies market. Quotation fee and registration fee for regional markets are %0,1 of the companies' nominal capital. Registration fee for new companies market is half of %0,1 of the companies' nominal capital. Additionally, taxes and contribution share are also paid discretely.

In addition to the costs mentioned above, other related costs are: the amount paid to the independent audit firms for independent audit reports, costs for the press of the equity stocks and related paper costs, international and national introduction costs, advertisement costs, payments to law firms and other relevant costs.

Chapter 3
Pricing of IPOs

The IPOs could either be underpriced or overpriced or else have exactly the same price with the closing return once they are offered in the market. It has been observed that initial public offerings have generally been underpriced. Underpricing basically means that the shares to be sold are priced or valued below the levels they would get in the secondary markets. In other words, underpricing is the difference between the first price on the secondary market and the issue price of a share at the initial public offerings (IPOs)[43].

One of the explanations relates the underpricing to asymmetric information and risk. According to this theory, investors who buy IPO shares are also concerned by expected liquidity and by the uncertainty about its level when shares start trading on the after-market. When the shares are expected to be less liquid and the

[43] Barry, C. B. (1989), "Initial Public Offering Underpricing: the issuer's view-a comment", *Journal of Finance*, Vol: 44(4), pp: 1099-1103.

liquidity is expected to be less predictable, then the price difference will be larger[44]. The liquidity will decrease the price disparity since more liquid shares mean more cash-like assets.

Some other models explain the undepricing with information asymmetry about the true value of the IPO shares. For example, Baron (1982) argues that the issuer knows less about the true value of the company than the investment bank entrusted with the sale. While, in Rock (1986), the information asymmetry is among potential IPO investors. Certain investors have superior knowledge than others and this result in price divergences.

In some markets, the IPOs could be overpriced, which basically means that the first price on the secondary market is lower than the issue price of a share of initial public offerings. The reasons for overpricing could be similar to the reasons for underpricing. Information asymmetry and risk might account for overpricing as well. Underwriter's reputation and firm characteristics might also account for these price differentials. Nevertheless, it should be noted that overpricing is less frequent than underpricing in developed financial markets.

We will look at these and other explanations in more detail in the following sections. IPO pricing has been evaluated from various perspectives, and these could be grouped under a main heading of asymmetric information models.

3.1 Asymmetric Information Models

Asymmetric information models in general argue that agents on one side of the market have much better information than those on the other side. For example, borrowers know more than the lender about their repayment prospects; the seller knows more than buyers about the quality of his car; the CEO and the board know

[44] Pagano, M. (2003), "IPO Underpricing and after Market Liquidity", *Centre for Studies in Economics and Finance (CSEF) Working Paper*, No: 99.

more than the shareholders about the profitability of the firm; policyholders know more than the insurance company about their accident risk; and tenants know more than the landowner about their work effort and harvesting conditions.

In these models, one of the parties has more relevant information compared to other interested parties and as a result there is an asymmetry. There are two main issues related with asymmetric information: first is adverse selection and second is moral hazard. Adverse selection models assume that the ignorant party lacks information while negotiating an agreed understanding of or contract to the transaction. In moral hazard, the ignorant party lacks information about performance of the agreed-upon transaction or lacks the ability to retaliate for a breach of the agreement[45].

An example of adverse selection is high risk bearers seeking insurance. The issuer cannot identify who is a high risk and who is a low risk, but the person seeking insurance does have this information. Since it is impossible to distinguish the individual risks fully, the insurer will charge a single average rate. However, this will lead to underpricing for the high risk buyers and overpricing for low risk buyers. Reckless behavior when there is insurance can be given as an example to moral hazard problem.

In financial markets, the information asymmetry opens out in equity and debt markets. For equity finance, shareholders demand a premium to purchase shares of relatively good firms to offset the losses they incur from funding efforts. This premium raises the cost of new equity finance faced by managers of relatively high-quality firms above the opportunity cost of internal finance faced by existing shareholders. In debt market, a borrower who takes out a loan usually has better information about the potential returns and risk associated with the investment projects for which the funds are earmarked. The lender on the other hand does not have sufficient information concerning the borrower. Lack of enough information

[45] Mas-Colell, A., M. D. Whinston, and J. R. Green, (1995), *Microeconomic Theory*. Oxford University Press.

creates problems before and after the transaction is entered into. The presence of asymmetric information normally leads to adverse selection and moral hazards problems. These are also prevalent in the financial markets and for the IPO trading information asymmetries can lead to price disparities for various reasons that will be examined below.

3.1.1 The Winner's Curse

In an auction, the auctioned item can be differently valued for all the bidders; however the bidders don't know the equilibrium value of the item until after the bidding ends. There is a lack of information on the side of the bidders and each one of them independently estimates the value of the item before bidding. The highest bidder wins the bid and if the average bid is assumed to be the equilibrium value then the winner is said to overestimate the value. The severity of the winner's curse increases with the number of bidders. This is because the more bidders, the more likely it is that some of them have overestimated the auctioned item's value. It should be noted that winner's curse doesn't happen in all auctions. If the auctioned item has a private value then there is no objective equilibrium value and hence the winner cannot be said to overestimate.

The key parties to an IPO transaction are the issuing firm, the underwriter and the investor. Asymmetric information models of underpricing assume that one of these parties know more than the others. Rock (1986) argues that the information asymmetry is among potential IPO investors. This will give way to a winner's curse model. Certain investors have superior knowledge than others and this result in price divergences. Informed investors bid only for attractively priced IPOs whereas the uninformed investors bid for all the shares. This imposes a 'winner's curse' on uninformed investors, which basically means that the uninformed investors get all the shares they bid for when the shares are unattractive and partially crowded out when the shares are attractively priced by the informed

investors. This causes allocation of underpriced shares among informed investors while overpriced shares among uninformed investors. Thus, the informed investors earn a positive return.

The price differential makes the relatively uninformed investors to bid for the IPO allocations. Without any positive expected returns, these investors won't try to buy the shares and the market will be full of relatively equally informed investors. However, this is not very healthy for the market and Rock claims that a certain amount of uninformed investors is required. Thus, positive expected return is a required condition to some extent. Rock, also argues that since the aim of IPO is raising capital the companies need to attract investors including uninformed ones. Therefore, the firms can try to appeal to the uninformed investors by underpricing a little[46].

According to the winner's curse model, the uninformed investors' abnormal return on average should be zero if the market is properly adjusted for rationing. The informed investors' abnormal return will be enough only to cover their cost of becoming informed.

One of the major problems with testing the asymmetric information models empirically is deciding who is an informed and who is an uninformed investor. Some studies distinguish institutional versus retail investors. Certainly, information asymmetries can exist within groups, not only between groups like retail and institutional. Hanley and Wilhelm (1995) found out that there is not a big difference for the allocation of shares between institutional and retail investors. According to this study the institutional investors don't get the shares that have higher abnormal returns.

Winner's curse model rests on the supposition that there is information heterogeneity among investors. Michaely and Shaw (1994) claim that when this heterogeneity goes to zero the winner's curse model of price disparity disappears. This prediction could be tested if a relatively more homogenous group of initial

[46] Beatty, R.P., and J.R. Ritter, (1986), "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings", *Journal of Financial Economics* 15, 213-232.

public offerings can be discerned and used for looking at returns. Another empirical prediction states that underpricing should increase in the ex ante uncertainty about the value of the IPO firm[47].

As mentioned above the uninformed investors are needed for IPO market and the underwriters sometime force the firms to underprice their shares to keep these types of investors. Nanda and Yun (1997) pointed out that overpricing lead to a decrease in the underwriter's own stock market value while moderate levels of underpricing causes underwriter's own stock market value to increases. Hence, low levels of undepricing rewards the underwriters. Too much underpricing makes the underwriters to lose issuers and too much overpricing makes the underwriters to lose investors.

When the information asymmetries are decreased the underpricing could be reduced according to the winner's curse model. Therefore, there are clear incentives to reduce the information asymmetry and the resulting adverse selection problem between informed and uninformed investors. Habib and Ljungqvist (2001) argue that if issuers can take costly actions that reduce underpricing, they will do so up to the point where the marginal cost of reducing underpricing further just equals the marginal benefit. This marginal benefit is not measured by underpricing itself, but by the reduction in the issuer's wealth loss that underpricing implies.

A prestigious underwriter or a highly regarded auditor might decrease the information asymmetry. Booth and Smith (1986) assert that by doing so the issuer of the company shows its credibility to the public and indicate that it is a good company. The well known underwriters will only accept to underwrite the high quality firms if they consider their reputation important. Thus, by working with good and reputable underwriters the firm would need to disclose less information about itself, which in turn decreases the winner's curse. The investment bankers' quality will decrease the information requirement of the issuing company in the eyes of the public. The underwriter, in many cases would make an effort to keep

[47] Beatty, R.P., and J.R. Ritter, (1986), "Investment Banking, Reputation, and the Underpricing of

the uninformed investors in the market; thus maintain their confidence in the system.

3.1.2 Information Revelation Theories

The above model is based on the allocation rule that is predetermined. Rock developed his model by assuming that the investors get a certain allocation of the shares. But, many countries have been changing their allocation methods and have adopted book building. Book building gives the underwriter a lot of discretion over the allocation of shares. The underwriter gathers information from the investors and then set the price according to these indications. In a book building method, the asymmetric information by the investors make the pricing the most important task of the underwriter. The underwriter has to set the price by looking at the various information provided by the investors.

The investors will know that the information given by them will affect the pricing of the share. More importantly, they are aware of the fact that positive information about the shares might increase the price of the shares and hence decrease their profit opportunities from trading. The positive revelations and the pricing are directly linked. Hence, the investors might not be willing to reveal positive information to the underwriter.

Moreover, the investors might be willing to mislead the underwriter by providing negative information. This might make the underwriter to set a lower price than the shares deserve. One of the duties for the underwriter, then, becomes making the investors supply correct information by investors. The investors will do this a long as revealing correct information is in their interest. Therefore, the underwriter should devise mechanism whereby correct information revelation is possible.

Initial Public Offerings", *Journal of Financial Economics,* 15, 213-232.

According to Benveniste and Spindt, and Benveniste and Wilhelm (1989), book building might help to get the right information from the investors. There are several conditions to make this work. For example, if the underwriter allocates no or very few shares to the conservative bidders, the investors might be willing to increase their bids. This allocation rule will force the investors to reveal the correct information because otherwise they won't be getting any shares. The investors who provide the positive information receive big chunks of shares and profit from the transaction. But, this might not be enough to make the investors to supply the correct information. To create incentives for the investors the underwriter should leave some underpriced shares since having underpriced shares would increase the profit opportunities for the investors.

According to this model, there will be still underpricing, however the issuing company will benefit from it because by putting a lower price they will draw investors and collect truthful information. The price will increase after the trading of the stocks but the company will benefit because they are able to decide a higher offer price. This will produce a relationship between the underpricing and the price revision through the bookbuilding. More revisions might mean more underpricing. This is often referred to as the 'partial adjustment' phenomenon[48]. When the investors have more positive information about the shares, their incentive to withhold will be greater and hence the company will have to leave a higher amount of money on the table.

Repeated transactions can be a mechanism to decrease the information asymmetry by decreasing the cost of gathering information. This is well known in the literature as repeated game. Repeated dealings between the institutional investors and underwriters will decrease the transaction costs. The institutional investor should decide whether the cost of holding back the information is worth it. The investors should consider not only getting allocations from the current transaction but also the transactions made by the same underwriter in the future. Therefore,

[48] Hanley, K., 1993, The Underpricing of Initial Public Offerings and the Partial Adjustment Phenomenon, *Journal of Financial Economics*, 34, 231-250.

the bankers and underwriters that are more active in the market will have an advantage since they will be able to modify the incentives of the investors more easily.

The repeated transactions can also generate a second advantage. This advantage comes from the fact that the underwriters can tie the offerings together over time. This will force the investors to purchase some relatively less lucrative shares at certain times if the believe that doing transaction with the same underwriter will give them enough present value of future rents. The underwriter behavior will also be affected from this type of transaction. They will begin to allocate greater shares to the institutional investors with whom they expect to have deals in the future.

The above methods are some of the ways that can be used to reduce the information costs. In general, any mechanism that grants discretion to the underwriter will allow a decrease in the acquisition costs. Especially, when the underwriter can decide and direct the rewards, the acquisition costs will decrease even further.

Benveniste, Busaba and Wilhelm (1996) discuss an instrument for selective pricing and price support. In this mechanism a put option is offered selectively towards investors that cooperate. The underwriters, in practice, guarantee the returns on shares by not letting the after trading price to fall below the offer price. This type of guarantee can be very influential on institutional investors, which are likely to be the type of investors underwriters seek to involve in the bookbuilding process.

Busaba, Benveniste, and Guo (2001) demonstrate that the underpricing can decline when the issuing company has the option to pull out the offering. If there is such an option the investors will be less likely to keep the information since withholding information will increase the likelihood of pulling out the offer. This will allow a cut down in the amount of the reward necessary to stimulate truthful information disclosure.

When more information increases the truthiness of price discovery, a trade-off between the benefit of greater pricing accuracy and the cost of more information production ensues[49]. Therefore, the underwriter and issuer should carefully estimate the relative costs and try to get the investors reveal these information according to that.

3.1.3 Principal Agent Models

Principal agent models arise as a result of information asymmetry and it includes motivating one party to act on behalf of another is known as the principal-agent problem. This problem is seen when a principal compensates an agent for performing certain acts that are useful to the principal and costly to the agent. Principal agent theory is concerned with resolving two problems that can occur in agency relationships. The first is the agency problem that arises when the desires or goals of the principal and agent conflict and it is difficult or expensive for the principle to verify what the agent is actually doing[50]. The problem here is that the principal cannot verify that the agent has behaved appropriately. The second is the problem of risk sharing that arises when the principal and agent have different attitudes towards risk. The problem here is that the principle and the agent may prefer different actions because of the different risk preferences.

The above discussed models did not particularly attribute any role to investment banks. In winner's curse model, banks are assumed to be as ignorant about a firm's value as the firm itself, and in the information revelation models bank are simply passive distributors of shares to the public. The principal-agent model

[49] Sherman, A., and S. Titman, (2002), Building the IPO Order Book: Underpricing and Participation Limits with Costly Information, *Journal of Financial Economics*, Vol: 65, 3-29.

[50] Eisenhardt, M, K. (1989), "Agency theory: An assessment and review. Academy of Management Review", 14(1), 57.

focuses on potential agency problems between the investment bank managing the IPO and the issuing firm.

It has been argued that underwriters exploit their superior knowledge of the market and underprice issues to minimize marketing effort and to favor certain clients[51]. This is a classical example of principal agent problem and the issuer of the shares should come up with a solution to make the underwriter not to underprice deliberately. Although this argument may be conceivable Muscarella and Vetsuypens (1989) find that the investment banks under price themselves by as much as other IPOs when they go public. If the investment bankers were, in fact, informationwise advantaged, we would not expect to find them under pricing their own shares at IPO.

Bookbuilding method of IPO differs from the other methods by giving the underwriter wide discretion over information extraction and price setting decisions. Furthermore, the underwriters have discretion over the allocation decisions. Loughran and Ritter (2004) discuss that because of these wide discretions bookbuilding method has several shortcomings. This arrangement generates agency problems between the issuer and the investment bank. The investment banks could intentionally underprice the issues and opt for side payments. Or investment bankers might allocate underpriced stock to executives at companies in the hope of winning their future investment banking business.

One way to get around this agency problem and create disincentives for the investment bank to underprice is linking the underwriting fees to IPO proceeds. When these are directly retaliated then the investment banks will be less inclined to underprice the issues since this will also mean that the proceeds from the sales, and hence their fees will be low. Nevertheless, if the side payments and the future expected deals with certain investors have much greater benefits than the fees then this mechanism will fail to avoid underpricing.

[51] Baron, D.P., and B. Holmstrom, (1980), The Investment Banking Contract for New Issues under Asymmetric Information: Delegation and the Incentive Problem, *Journal of Finance*, Vol: 35, 1115-1138.

There are two main ways to mitigate the agency problems related to IPO underpricing. The first is related to monitoring and regards that the issuer supervises the underwriter's selling effort and discuss the pricing decision extensively. The second way is about designing an optimal contract in which the compensation of the underwriter becomes a function of the offer price.

In the earlier models of agency conflicts and IPO undepricing, the focus was on the sub optimal allocation and marketing decision. Since the investment bank has informational advantage they are believed to underprice instead of marketing the new issues and allocate the shares to preferred investors. The issuing firm cannot observe the effort of the underwriter perfectly and this creates a moral hazard problem for the investment banks. Baron and Holmstrom (1980) developed screening models in which the underwriter benefits from underpricing. The uninformed issuer will offer a menu of options to the informed banks and the banks are left with several options. The goal of the different options is to raise optimal solution; however this won't be the first best solution.

In Baron's (1982) model, the investment bank is bestowed with the capacity to decide the price of the shares. This is because the investment banks have more information about the demand for the shares and will price accordingly. The issuing firm gives several combinations of IPO prices and allocations and the bank selects the most preferable option. When the demand for the shares are high in the market the underwriter will select a combination of high price and low spread whereas when the demand for shares is low the investment bank will opt for low price and high spread. Compared to the first best solution this will still result in underpricing. The information asymmetry allows the underwriter to capture positive rents by underpricing the shares.

Asymmetric information increases when the uncertainty about the firm's value increases. Under this scenario, the underwriter's role become even more important and it's chance to underprice. Biais, Bossaerts, and Rochet (2002) develop a model that draws principal-agent and information revelation theories together. The model assumes supposes that there could be situations where the

investment bank and the informed investors act together at the expense of the issuing company.

They, then, formulate an optimal IPO mechanism that maximizes the issuer's proceeds from the sales of the shares. According to this mechanism, the IPO pricing is adjusted to the allocations given to retail and institutional investors. The retail investors are uninformed and if they get fewer shares the IPO price is set higher. When the institutional investors get fewer shares, the IPO shares will have a lower price[52]. This mechanism is aimed to solve winner's curse and information revelation problems at the same time.

3.1.4 Underpricing as a Signal of Firm Quality

Contract theory presumes that by signaling one party reveals useful information to another party. That party would then interpret the signal and adjust her behavior accordingly. Spence (1973), for example, argues that job-market employees signal the level of their skills to employers by acquiring a certain degree of education.

The signaling models suggest high quality firms wish to signal their quality to investors by underpricing the IPO. The signal reveals the mean and variance of the firm's future cash flows and hence the firm's quality. Firm quality can be described as the likelihood of the generation of positive information. If the after market is efficient, there should be no differential risk-adjusted expected return between a low and high quality firm. Given the arrival of new information, good news would be expected to generate positive abnormal returns and bad news would be expected to generate negative abnormal returns. It is plausible that a high quality firm is more likely to enjoy good news and less likely to suffer bad news than a low quality firm.

[52] Ibid.

Therefore, given a set of low and high quality firms with identical risk and arrival of new information, we would expect the high quality firms to outperform the low quality firms. If we assume that the market is efficient and there is arrival of new information subsequent to initial offerings, then we can expect a differential risk-adjusted return between low and high quality firms. If the risk is high enough then the low quality firms will refrain from underpricing their shares and high quality firms will be distinguished.

Titman and Trueman used the quality of the auditing firm's reputation as a signal in their model. When companies decide to float shares on secondary markets, auditors are usually employed as independent valuers of the company's financial status and they prepare the financial information which is to be included in the prospectuses. It is perceived that some auditors offering the service are known for higher quality standards. Titman and Trueman's (1986) model posits that issuers who wish to disseminate favorable financial information to their potential investors would be willing to pay the prestigious auditor who most likely would produce favorable financial information. Certainly, the more prestigious the auditor is the pricier it is. Whereas issuers with less favorable information to release to the public would most likely find it not worthwhile to pay the cost of a high quality auditor since the auditor's revealed information would be less favorable. Therefore, the quality of the auditor chosen might significantly affect the price of an IPO. Higher quality auditors might mean a higher price of the IPO, which would also signal that the issuer is a high quality company.

Allen and Faulhaber (1989) used a bivariate signaling model in which the issuer deliberately undervalues his IPO as a second signal to convey the high quality of the company to investors. By doing this, the issuer is conveying the message that it is financially sound and will be able to recoup losses incurred by undervaluing the issue.

3.2 Determinants of IPO Pricing

The pricing of the IPO stocks as discussed in the earlier section spurred a great interest in the literature. A range of explanations have been offered to account for the underpricing in most of the world markets. These illustrations frequently mention the asymmetric information and the incomplete market hypotheses. According to these theories, since the investors and the issuing firm together with the underwriter have different levels of information about the stocks, there has to be signaling or guaranteeing mechanisms that the stocks could perform well. Although the extent of the signals and other remedies to informational asymmetries is considerable in size and still debated, we will focus on five elements in this study.

Firm age at the time of the IPO will be the first determinant in our analysis. Then we will discuss the relationship between IPO pricing and IPO offer size. The third explanatory factor comes from the allotment, or in other words how much of the shares are going to institutional as opposed to individual investors. The fourth explanation takes the underwriter reputation into consideration. And finally, the market conditions are believed to have important effects on the pricing of the IPO. The next parts will elaborate these factors in more detail.

3.2.1 Firm Age

The IPO researchers have extensively used the age of the firms as a proxy for risk. As can be expected intuitively, the more established firms are taken to be less risky. There are various reasons for the attachment of lower risk to older or more established corporations. The visibility, transparency and the reputation of the

older firms are higher than their younger counterparts[53]. Firm's age also serve as a surrogate for other risks in these studies. For example, Rasheed et al. (1997) argued that less-seasoned firms will have fewer years of published financial data and are less likely to have been assessed by financial analysts. This can exacerbate the informational problems that are already prevalent in the market. Also, lack of adequate financial data might mean lower demand for the IPO stocks under certain circumstances.

The idiosyncratic risk of the firms could also rise with the age of the firm or when there are more new listings on the market. For instance, Jovanovic and Rousseau (2001) find that the age of the typical firm at its IPO date, measured from its founding date or date of incorporation, has fallen dramatically from nearly 40 years old in the early 1960s to less than 5 years old by the late 1990s in U.S. Besides, the younger firms being listed in the market, at the same time there was increasing public offerings among those firms. Therefore, the proportion of total equity market capitalization represented by young firms has increased steadily. Since the equity of young firms typically represents a claim on future cash flows, Fink et al. (2005) argue that the increasing proportion of these firms in the sample could lead to a significant positive trend in aggregate measures of idiosyncratic risk.

Fama and French (2004) document a significant increase in the number of new listings after 1979 for the United States. Further, they find that these new lists have more disperse profitability, higher growth rates, and lower survival rates. These results are reassuring since they suggest that the trend in idiosyncratic risk may be driven by firm fundamentals.

Pastor and Veronesi (2003) argue that uncertainty about future growth rates causes firms to have higher market-to book ratios and more volatile returns. It is also found that market-to-book ratios and return variance decline with firm age. Thus, to the extent that the age of the firm at IPO is a proxy for uncertainty

[53] Carter, R.B., Dark, F.H., & Singh, A.K. (1998). "Underwriter reputation, initial returns, and the long-run
performance of IPO stocks", *Journal of Finance*, 53, pp: 285–311.

regarding future growth rates, the argument supporting that volatility declines as investors learn more about the profitability of the firm is validated.

All of the above explanations delineate the links between the firm's age and the possible risks that could be covered in more established firms. These range from reputation and visibility to information dispersion. Moreover, the fundamentals might be different among the young and old firms. Hence, the time span of the firm at the date of the IPO becomes an issue since the investors will take the above risk concerns into consideration.

In the literature, it has been well documented that the age is empirically important and explanatory for both the initial underpricing and longer term performance of the stock. Megginson and Weiss (1991) pointed that having venture capitalists in the firm alone has an impact on the pricing and the performance of the stocks.

It can be argued that the age of the firm is more relevant for the developed markets where we observe higher shares of new and venture capital going public. However, the fundamentals argument proposed by Fama and French, and Pastor and Veronesi could apply to the same extent in developed and emerging markets. Nevertheless, Unlu (2006) and Kucukkocaoglu (2004) could not find a relationship between the firm's age and the IPO pricing and short-term performance for the firms traded in Istanbul Stock Exchange. Unlu (2006) analyzed several determinants for the long-term performance and the initial underpricing of banks and concluded that age is not explanatory. Kucukkocaoglu investigated whether firm's age can be a determinant of the IPO method and later the short-term performance but couldn't empirically prove the link.

The study undertaken by Unlu considers only the financial firms, particularly banks. Banks might have different leverage and other fundamentals compared to non-financial firms and the age of the bank might play a different role. Kucukkocaoglu evaluates all types firms; however, our study extends her by increasing the time span. We will claim that in the longer-run the age effect can be seen more pervasive. Overall, we will argue that for the larger sample the firm's age is still a factor in determining the mispricing and performance.

3.2.2 IPO Size

The IPO offer size is argued as another important factor in explaining the initial pricing of the stocks. Short and long run performances of the IPO stocks are sometimes also linked to the offer size. Before the IPO process takes place, the firms are firm owners or executives are free to decide how much equity they will prefer to give at the time of IPO. This information is disclosed in the firm's prospectus and publicly available. Therefore, this is an observable signal that is known in advance by the investors. As argued in the asymmetric information theories, this type of signal will have a direct impact on the investor's assessment of the stocks.

The signal is powerful in another sense as well. Since it is very difficult to fake or blur the ownership structure right before the IPO, a notable change in the ownership immediately prior to the IPO will catch attention. If the firm insiders are divesting equity, this would signal the investors not to buy the stocks.

The level of retained equity signals to investors the confidence that management has in the future prospects of the firm, with higher levels of retained equity signaling greater confidence in the firm's future. It is on this basis that Jensen and Meckling (1976) predicted a positive relationship between managerial equity holdings and firm value. Furthermore, investors view high levels of managerial ownership as an indication that the goals of firms' managers are effectively aligned with those of potential investors in the IPO firm. Retained equity, then, should reduce underpricing.

The IPO offer size then becomes important since the retained equity will be dependent on it. When the corporations are willing to offer the majority of the stocks when going public, this might signal the investors that the insiders are dumping their shares and are not willing to hold stakes at the company.

Empirical evidence on the relationship between retained earnings, IPO size and the underpricing is mixed at best. Some authors claimed that there is a positive

link between the two while others pointed out a negative relationship. Leland and Pyle (1977) focused on the issue of why the initial owner might retain a certain fraction of equity when they decide to go public. They argue that the initial owners possess a better understanding of the likely future cash flows of the firm, but this information is not verifiable to the outside investor. However, the outside investors can find clues about the quality of the firm by observing the equity retention ratio. A higher ratio would indicate a higher quality firm, because the owners are reluctant to release a high proportion of the future cash flows to the outside investors.

Later on, Grinblatt and Hwang (1989) formalized the notion that the initial owner of high-quality firms might use both underpricing and retained shares as signals at an IPO in order to convey their private information about the firm value to uninformed investors. The cost of the underpricing could then be recovered in the aftermarket by selling the shares retained at the IPO, or by issuing further shares through seasoned equity offers (SEOs). The testable implication of their model was that there is a positive relationship between the IPO underpricing and the later SEO, as well as a positive relationship between the IPO underpricing and the divestment of the initial owners.

The above models provide contrasting results for the relationship between the retained earnings or IPO offer size and underpricing. Therefore, one of our aims in this paper is to test which one of these theories hold for the Turkish stock market. IPO size is revealed by the corporations before the process takes place hence we can assume that the investors have adequate time to evaluate the ownership structure and the behavior of the insiders before they invest into the stocks.

There are several studies, which take the IPO size in terms of share times price as a determinant of the underpricing in the Turkish case. Among these, Kucukkocaoglu (2004) couldn't distinguish any explanatory power of IPO offer size or the source of the equities. Bildik and Yilmaz (2006) argued that IPO size is important in explaining the initial abnormal returns of IPO shares.

3.2.3 Allotment

The basic definition of an institutional investor is as follows. The institutional investor is an investor, such as a bank, insurance company, retirement fund, hedge fund, or mutual fund, which is financially sophisticated and makes large investments, often held in very large portfolios of investments. Usually, institutional investors face fewer protective regulations because it is assumed that they are more knowledgeable and better able to protect themselves.

Recently, the literature started to emphasize how the shares are allocated and traded as a possible cause of underpricing. As mentioned in the winner's curse models, there are qualitative differences between the institutional and individual investors. The institutional investors as a result of their ties to the underwriters or firms offering the IPOs and their better informational position generally receive more underpriced shares. Besides, the institutional investors are more important to the underwriter and the firm compared to individual or retail investors.

According to Rock (1986) the information asymmetry arise among the potential IPO investors. Certain investors have superior knowledge than others and this result in price divergences. Informed investors bid only for attractively priced IPOs whereas the uninformed investors bid for all the shares. This imposes a 'winner's curse' on uninformed investors, which basically means that the uninformed investors get all the shares they bid for when the shares are unattractive and partially crowded out when the shares are attractively priced by the informed investors. For several reasons, the institutional investors are more likely to be informed and hence receive underpriced shares more than the individual investors.

In addition to the winner's curse models analyzed before, the fact that IPO underwriters may favor particular clienteles of institutional investors is another important element of why allotment will matter for underpricing. When the underwriters are trying to establish a network, they should offer the shares at

relatively lower prices to the investors. In the end, this type of arrangement might turn out to be efficient for all the parties in the long run[54].

Especially with the book building method of IPO, the underwriters have wide discretion over whom to allocate the shares. In making allocations, underwriters might be exercising discretion based on the shares' long- as well as short-term potential. Boehmer et al. (2007) claims that the institutional investors receive higher allocations in the best-performing new issues. They also seem to know which issues should be flipped and which held for longer periods.

Binay and Pirinsky (2004) find that ongoing relationships between underwriters and institutional investors are a strong predictor of the participation rate of institutional investors in IPOs. They point out the fact that underwriters favor institutions they have previously worked with. Nevertheless, it should be noted that there is no automatic relationship between the relationship and the allocation of IPO shares. The allotment differs considerably from industry to industry and from hot IPOs to less demanded ones.

The above explanations, efficient networks, will argue that the larger the network the lower the IPO. However, agency theories of IPO underpricing will claim the opposite. This is due to the unaligned interests of the issuers and underwriters in the distribution of IPOs. The objectives of the underwriter and the firm do not always have to perfectly match. In those cases, the underwriters build clienteles of favored buy-side clients who benefit at the expense of the issuing firm[55]. Because of this conflict of interest the underwriters might sometimes act on despite the issuer's benefits. With the growing numbers of IPO underpricing, the agency theories gained considerable importance and it has been argued that shares have been allocated unfairly given the large amount of money left on the table. The agency theory is empirically supported by Reuter (2002), who finds that the IPO participation rate of mutual fund families is proportional to their brokerage commissions paid to lead underwriters.

[54] Benveniste, L.M., and P. A. Spindt, (1989), "How investment bankers determine the offer price and allocation of new issues?", *Journal of Financial Economics,* 24, pp: 343-362.

To our knowledge, there is no direct examination of the underwriter-institutional investor relationship for the Turkish IPO market. Our aim is to check the significance of this determinant by using the share of IPOs that are granted to institutional investors, both foreign and domestic.

3.2.4 Underwriter Reputation

Generally, underwriter reputation or the quality of the investment bank following the IPO process is taken another important signal to the investors and hence another facto affecting the underpricing in the market. Prestigious investment bankers may signal less uncertainty surrounding the IPO thereby enhancing IPO firm performance.

One of the advantages of working with prestigious underwriters is that they have prior experience and have already worked with other firms when they were going public. Secondly, they will have the visibility and credibility as effective protectors of the IPOs. These two advantages are expected to have an influence on the IPOs' performance both in the short and in the long run. This might indicate a negative relationship between the underwriter's reputation and undepricing of IPOs since higher quality investment banks will not need lower prices to attract investors.

There are pervasive market imperfections and market failures in finance, therefore the firms need intermediaries to act between them and the potential investors. These are commonly investment banks or financial institutions that underwrite the public offerings. However, this type of arrangement could lead to agency problems[56]. Problems arise whenever investment banks have private information about investor demand of IPOs prior to signing the underwriting contract.

[55] Loughran, T., and J. Ritter, (2002), "Why don't issuers get upset about leaving money on the table in IPOs?", *Review of Financial Studies,* 15, pp: 413-443.
[56] Baron, D.P. (1982), "A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues", *The Journal of Finance*, 37, pp: 955-976.

Underwriters may induce issuers to accept a relatively low offer price, which attracts more investors and reduces the required selling effort and hence IPO failure.

Although intuitively, principal-agent models make a lot of sense, the empirical findings are not so clear. Muscarella and Vetsuypens (1989) examine self-marketed IPOs of investment banks where agency conflicts are not an issue because the bank is both underwriter and issuer. The study does not report a significant difference between underpricing of self-marketed and other IPOs.

An investment bank's ability to carry out an intermediary function as an underwriter relies on its reputation capital with IPO firms and investors. Investment banks and underwriters that cannot be trusted will not be able to survive. Only reputable investment banks and underwriters will attract strong interest from IPO firms and investors alike. There has been some evidence that underwriters who underprice too much loose business from issuers, while if investment banks who underprice too little loose business from investors[57].

Nevertheless, the relationship between underwriter prestige and IPO underpricing is not very straightforward. Since the underwriters have a dual role of representing the issuing firm and the clients in the market, they have contrasting duties[58]. The issuing firm will be opposed to IPO underpricing because this increases the amount of money left on the table, but the clients, and especially the effective institutional investors will benefit from underpricing.

There are various empirical testings of the relationship between underwriter's reputation and undepricing of IPOs. The empirical evaluations and the results derived depend on the measurements used for reputation. This is not an easy task and different authors have utilized different proxies to estimate the reputation of the underwriter.

[57] Dunbar, C. (2000), "Factors affecting investment bank initial public offering market share", *Journal of Financial Economics*, 55, pp: 3-41.
[58] Gordon, M.J. and J. Jin, (1993). "Risk, asymmetric payoffs, and the underpricing of initial public offerings", *Research in Finance*, 11, pp: 133–165.

For example, Carter and Manaster (1990) used the tombstone rankings for reputation capital. They basically developed rankings based on the advertisements of the underwriters. Megginson and Weiss (1991) developed a measure looking at the market share of all IPO proceeds. This measure takes the leading or co-leading role in underwritings into account.

Carter and Dark (1992) examined the explanatory power of investment banking reputation measures. The first measure is calculated by looking at the relative position of the underwriter's name within the tombstone announcements of security offerings. A second one is estimated by assigning four ranks according to the investment banking bracket of the underwriter. This "bracket" measure is considerably easier to create than the "tombstone" measure. Then, they employ both measures in identical initial public offering empirical models and assess their relative performance. Their findings suggest that the tombstone measure appears to be superior.

Using the above or slightly different proxies for reputation, the empirical literature posed mixed findings. The relationship between the underwriter's reputation and IPO underpricing cannot be verified in any certain way. Partly because of employing different measures for reputation and partly because of looking at the underpricing from different theoretical point of views, the results of the empirical tests are inconclusive. Some studies report a negative relationship while others report a positive association while still others report no statistically significant findings.

For the Turkish stock market there are several studies looking at the effects of underwriter's reputation on IPO underpricing. Bildik and Yilmaz (2006) could not identify any statistical relationship between the initial abnormal returns of IPOs and underwriter's reputation in their regression results whereas they found significantly different mean returns for each group. They used a measure which consists of the market share of the underwriter firms and the paid-in capital. Guner et al. (2000) calculate four different reputation measures based on Megginson and Weiss and concluded that all of the measures are not explanatory

and the US evidence on the importance of underwriter reputation is not validated for the Turkish case.

We will employ a reputation measure based on the market share of the underwriter companies as suggested by Megginson and Weiss. Additionally we will analyze the fundamentals of the investment banks and make a ranking out of the financial ratios. Then, by combining the market shares and financial ratios, we will estimate an index of underwriter's reputation. In the econometric analysis, the underwriters will be categorized as goo, bad or neutral. Confirming with the earlier findings in the literature, we will claim that there is a negative relationship between the underwriter's reputation and IPO underpricing.

3.2.5 Market Conditions

The final factor for our study will be the market condition during the initial IPO period. There are two main reasons that are provided in the literature for the impact of market conditions on IPO pricing and performance. The first one is discussed by Miller (1977) and it shows that the price of financial securities is subject to divergence of opinion among investors and short sale constraints is driven by optimistic investors. Therefore, when the IPOs are marketed during an upward trend, then lower prices might not be required to attract investor's attention.

Another reason why optimism or pessimism in the market could affect the IPO pricing and performance is provided by D'avolio (2002). He demonstrates that short-sale constraints are the most severe for stocks that are small, illiquid, and for which uncertainty is high. Most of the IPOs have the same characteristics, and hence would be vulnerable to market conditions unproportionately.

When we look at the private placements in the market we see a clear relationship to IPO underpricing. The relations to IPO underpricing and activity suggest that

private placements tend to occur during periods when attractive investment projects that firms wish to fund are plentiful relative to the supply of equity capital in the public market.

Derrien (2005) affirms that when the pricing decision is done by an underwriter, it depends on both the intrinsic value of the company, revealed by institutional investors, and noise trader sentiment. Therefore, there will be a positive relationship between the noise trader sentiment and the IPO price. However, the information about noise trader sentiment is partially incorporated into IPO prices, and the level of initial return is also positively related to noise trader sentiment. The adjustment to the information about noise trader sentiment is partial because the underwriter is concerned with the aftermarket behavior of IPO shares. Wang (1999) concludes that both interest rate and percentage of underpriced issues in the cold market are significantly higher than that in the hot market.

For Turkey, the market conditions are assessed by Bildik and Yilmaz (2006). In their study, hot and cold market IPOs are found to perform differently in the long run. The categorization turned out to be insignificant for the initial abnormal returns and hence underpricing. Teker and Ekit (2003) found significant effect of market trend on the performance of the IPO stocks in the short run. They utilized an event analysis for the year 2000 and argued that the performance of the IPOs significantly depend on the trend in the market.

Adhering to the literature, we will also claim that when the market is on a rise, the IPOs will not be necessarily underpriced. Therefore, IPOs traded when the market is how will have higher prices.

Chapter 4
IPOs in Turkey

In this section we will combine the studies looking at the Turkish IPO underpricing phenomenon and the performance of the stocks over short-term and long-term. First, the studies directly linked to ISE will be reviewed, and then a country comparison will be undertaken.

4.1 Literature Review

4.1.1 Existing Studies

The public offering proceeds since 2000 in Turkey amount to 3,33 billion USD, and 83% of that amount is raised in year 2000. The average public offering size has been 64 million USD during this period while largest five offerings amount to 70% of total proceeds. For the IPOs that are under consideration, the biggest five were Turkcell, Doğuş Otomotiv, Yazıcılar Otomotiv, Ak Enerji and Deniz Bank according to amounts proceeded[59]. As can be seen from the amounts IPOs are becoming increasingly important. Accordingly, the studies investigating the initial public offerings and how they are affected by several factors, and how they perform become a topic that is widely studied.

There are various studies looking at the pricing of initial public offerings in Istanbul Stock Exchange Market. These studies analyze the mispricing and evaluate the performance of IPOs. Sometimes, they reach to contradictory results regarding whether IPOs are underpriced or overpriced and about the performance indicators. We will briefly go over these studies and then offer our own

[59] For a detailed view, see the websites for the respective companies.

explanation and empirical tests to examine the validity of our claims raised in the paper.

Kiymaz (1997) found that in ISE, there is underpricing of initial public offerings, and he asserted that one reason of underpricing of IPOs in the Turkish context is the institutional lag. The institutional lag means that there is a lag between the pricing and offering periods, and the stock exchange index might have changed between these two periods. This can of course also apply to any market with a similar structure. He additionally pointed that in ISE the "Winner's Curse Model" is present. This model states that informed investors will only buy a share if it is underpriced, therefore the underwriters are forced to put a low price on the initial public offerings. In his 2000 article, Kiymaz pointed out that shows that initial public offerings in the Turkish market between 1990-1996 provided an average abnormal return of 13.1 percent. Also, the underwriters, according to this author are not fully incorporating all of the available information into the IPO offer price. In his conclusions, he found that the size of issuer, rising stock market between the date of public offering and first trading day, institutional ownership, and self-issued offerings are significant determinants of underpricing[60].

Guner et al. (2000) studied the effect of underwriter reputation on IPO underpricing in the Istanbul Stock Exchange (ISE). They proxied the underwriter reputation by four measures developed using the number and the dollar magnitude of size the offerings an underwriter conducts. First, they estimated the traditional model and couldn't identify any relationship between initial day IPO returns and the underwriter reputation regardless of which reputation measure is used. Then, they added some variables to capture the unique characteristics of the IPO market in Turkey. In this extended model, they estimated a negative relationship between the initial day IPO returns and the one of the reputation measures whereas a positive relationship appeared with an alternative measure of underwriter reputation. Therefore, the results are sensitive to which measure is employed and cannot be taken without caution.

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[60] Ibid.

Kiymaz (2000) investigated 163 stocks listed on the ISE in the period on 1990-1996. The size of the issuer, the upward change in the stock market index during the initial trading day and self-issued offerings are underlined as the major factors affecting the short term IPO returns. In the long run, company size and rations of shares are stated as the major variables.

In her paper, Durukan (2002) uses 1990-97 data on IPOs in ISE, and finds that there are initial abnormal returns, which are realized by investors in ISE regarding IPOs, but no long run underperformance of the market. She claims that winner curse hypothesis holds for Turkish context. She concludes that initial abnormal returns are due to both deliberate underpricing and overvaluation by investors. Moreover, factors which decrease uncertainty lead to lower abnormal returns.

Bildik and Yilmaz (2006) argue that magnitude of underpricing in ISE is low, while underperformance is high. They claim that the underpricing is a result of the positive initial excess returns in the ISE, and the underperformance goes up to three years. They explain this with heavy competition among investment banks to mandate the IPOs in a market, where the number of IPOs is very limited, which leads to overvaluation and so underperformance in the long run, while limiting abnormal initial returns. They also claim that a temporary large and positive initial return experienced by firms issuing stock to the public for the first time turns out to be hazardous to the wealth of their shareholders in the long-run.

In their study, hot and cold market IPOs are found to perform differently in the long run. The categorization turned out to be insignificant for the initial abnormal returns and hence underpricing. They also argued that IPO size is important in explaining the initial abnormal returns of IPO shares. Finally, they could not identify any statistical relationship between the initial abnormal returns of IPOs and underwriter's reputation in their regression results whereas they found significantly different mean returns for each group.

Teker and Ekit (2003) undertook event analysis to distinguish the different trends in Istanbul Stock Exchange market during 2000. They found significant effect of market trend on the performance of the IPO stocks in the short run. They also

reported that the first two days of trading generally provide positive abnormal returns regardless of the conditions.

Unlu (2006) attempted to analyze the long-run performance of the IPOs for banking sector in Turkey. He found that the banking sector IPOs underperform during the one and two-year periods. But afterwards start to outperform the market. He uses the method of IPO, the underwriter, the year of the IPO, the share of the IPO, and the standard deviation of the returns as explanatory variables.

Kucukkocaoglu (2004) mainly studies the choice of the IPO method in Turkey and what determines the different outcomes preferred by the firms. In her analysis, several variables are considered as important, but the econometric results indicate that issue related characteristics such as source of equity, amount of IPO, etc. are explanatory for the original choice of IPO method. Then, the IPO method itself is statistically significant for the initial abnormal returns. The fixed price offer has a significantly higher average abnormal return during the first day of trading.

An overall assessment of the studies reveals that there are three important aspects regarding the underpricing and performance of IPOs in Turkey. The valuation matters since it will determine the pricing partially. Previous empirical work on IPOs has found environmental, industry, and firm factors related to IPO valuation, as well as evidence of the long-term underperformance of IPO firms compared to more mature firms[61]. The correct timing is the second important aspect in order to catch the unsatisfied demand. Timing of entry and exit into the equity markets is also important when we consider the different market trends. Lastly, to avoid unpleasant surprises to the investors, transparency is crucial. By increasing transparency, the need to underprice or overprice could be decreased, which then will affect the performance of IPOs. Transparency will assist to overcome the asymmetric information problems that are relevant in all financial markets. When

[61] Bildik, R. and M. K. Yilmaz, (2006), "The Market Performance of Initial Public Offerings in the Istanbul Stock Exchange", *SSRN Working Paper*.

there is lack of transparency there would be a larger gap between the price of the initial offering and the price of the share in the secondary market.

In this paper, we will argue that IPOs are underpriced in the Turkish case in line with the findings in the literature. Then, we will try to demonstrate that underpriced initial public offerings overperform in the market. The returns on IPOs will be compared to ISE-100 Index for this purpose. We will argue that firm's age, IPO size, allotment, underwriter's reputation and market conditions are the key factors affecting the performance of IPOs.

4.1.2 Comparison with Other Countries

Numerous studies have examined the performance of initial public offerings and documented the existence of short-run excess returns in combination with long-run underperformance. The studies vary from country to country and over time. Regulations concerning the IPO and costs might vary across countries since all authorities and capital market boards ask for distinct obligations.

The literature showed us that in different countries, the extent of IPO has differed considerably. Table 4.1 summarizes the results that have been conducted for several countries previously.

Table 4.1 The Mean Underpricing

Country	Reference	Period	Sample Size	Mean Underpricing
Australia	Lee et al. (1999)	1976-1994	328	15.20%
Austria	Aussenegg (1997)	1984-1996	67	6.50%
Belgium	Rogiers et al.	1984-1990	28	10.10%
Brazil	Leal (1998)	1979-1992	66	74.10%
Canada	Jog and Srivastava	1971-1992	258	5.40%
Chile	Aggarwal et al., Maturana	1982-1997	55	8.8%
China	Datar and Mao	1990-1996	226 (A-shares)	388.0%
	Su and Fleisher (1999)	1987-1995	57 (B-shares)	37.1%
Denmark	Bisgard	1989-1997	29	8.00%
	Jakobsen and Sørensen (1999)	1984-1992	76	3.9%
Finland	Keloharju (1993), Rimpi (1998)	1984-1997	102	9.90%
France	Vandemaele (1999)	1984-1995	228 (Second Marchè)	20.9%
	Derrien and Womack (1999)	1992-1998	264	13.2%
Germany	Ljungqvist (1996)	1970-1993	180	9.20%

Greece	Kazantzis and Thomas (1997)	1987-1994	129	51.70%
Hong Kong	Zhao and Wu	1980-1996	334	15.9%
India	Krishnamurti and Kumar (1999)	1992-1994	386	72.30%
Indonesia	Hanafi (1997)	1989-1994	106	15.10%
Israel	Kandel et al. (1999)	1993-1994	28	4.50%
Italy	Giudici and Paleari (1999)	1985-1998	135	20.30%
Japan	Fukuda et al.	1970-1996	975	24.0%
	Hamao et al. (1998)	1989-1995	456 (OTC market)	15.7%
Korea	Dhatt et al.	1980-1990	347	78.1%
Malaysia	Yong (1997)	1990-1994	220	72.60%
Mexico	Aggarwal et al. (1993)	1987-1990	37	33.00%
Netherlands	Wessels	1982-1991	1982-1991	7.2%
	Roosenboom et al. (1999)	1984-1994	1984-1994	4.0%
New Zealand	Vos and Cheung	1979-1991	149	28.8%
Nigeria	Ikoku	1989-1993	63	19.10%
Norway	Emilsen et al.	1984-1996	68	12.50%
Philippines	Sullivan and Unite	1987-1997	104	22.7%

Poland	Aussenegg (1999)	1991-1998	149	35.60%
Portugal	Almeida and Duque (2000)	1992-1998	21	10.50%
Singapore	Lee et al.	1973-1992	128	31.40%
Spain	Fernandez et al. (1993)	1985-1990	71	10.80%
Sweden	Holmen and Högfeldt (1999)	1979-1997	233	29.30%
Switzerland	Ogna et al. (1999)	1985-1994	55	34.60%
Taiwan	Chen	1971-1990	168	45.00%
Thailand	Wetyavivorn and Koo-Smith	1988-1989	32	56.73
Turkey	Kiymaz (1997)	1990-1995	138	13.60%
UK	Dimson and Levis	1959-1990	2,133	12.0%
	Khurshed and Mudambi (1999)	1989-1996	385	10.10%
USA	Ibbotson et al.	1960-1997	13,910	15.70%

Source: Ritter, (2003), "The Differences between European and American IPO Markets", *European Financial Management*, 4, pp: 421-434.

As can be seen from Table 4.1, the highest IPO mean underpricing was recorded in Chinese stock market with %388 for A-shares. It should be noted that the Chinese A-shares are only denominated in Yuans, and they are traded solely by mainland Chinese companies and foreign investors are not allowed to invest in them. Therefore, we can expect to have different reasons for this extremely high

underpricing. In fact, Datar and Mao (2006) propose that the Chinese government has deliberately underpriced the IPOs primarily to create a viable capital market. In order to do this, the government did not particularly care about the maximization of issue proceeds or minimization of underpricing. Therefore, the high underpricing ratios is Chinese market can be taken as an intended policy through government control. For other financial markets, this cannot be the explanation.

The lowest mean undepricing has been observed in Denmark with %3.9, the lower IPO underpricing also comes mostly from the developed countries. Among developing countries, Turkey, Nigeria and Indonesia have relatively lower undepricing for the sample periods considered in the above studies. The average underpricing of IPOs in the stock markets of these various countries suggests that there is a wide variation in the levels of short-run underpricing, with the average underpricing of IPOs in the stock markets of developed countries usually being much lower than that of IPOs in the emerging capital markets of developing countries. However, there is no conclusive evidence that the average long-run underpricing of IPOs in developed countries as a group is clearly different from the long-run underpricing of IPOs in developing countries as a group, in contrast to the findings for short-run underpricing.

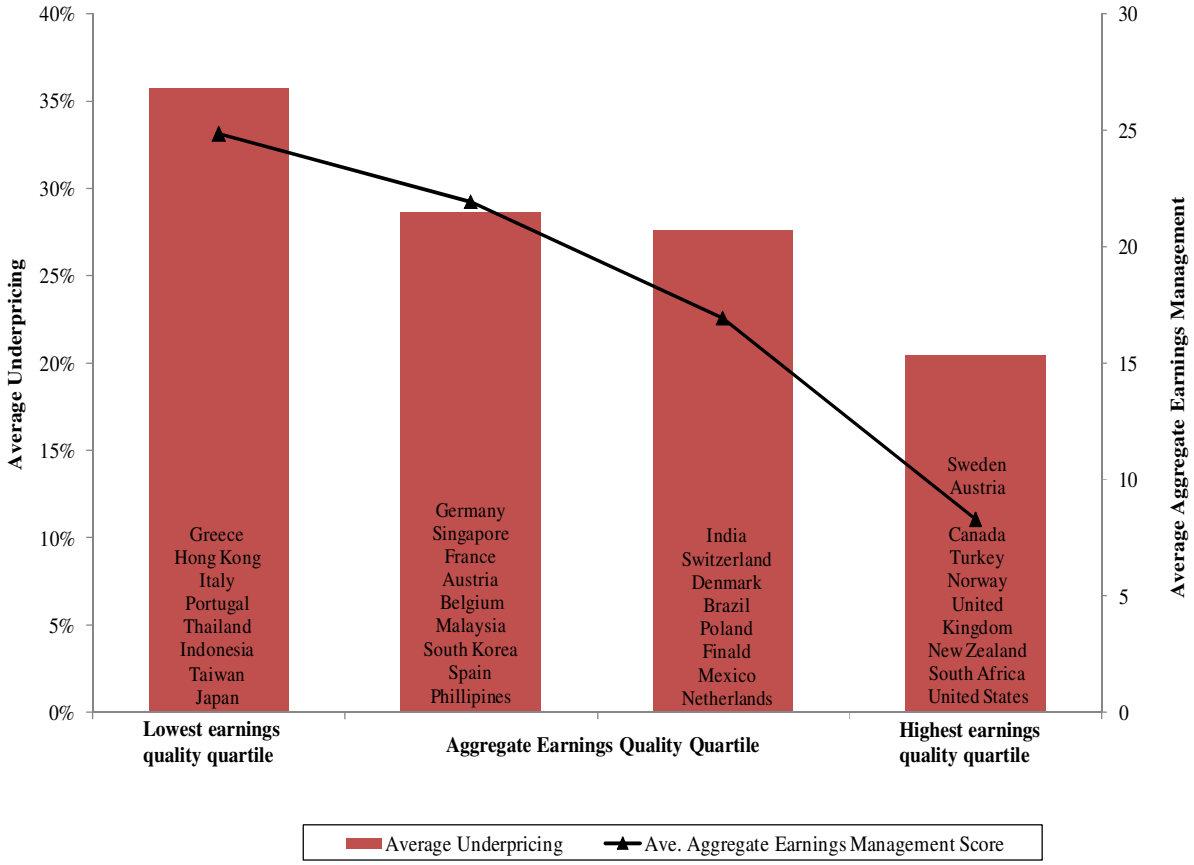
Loughran, Ritter, and Rydqvist (1994) report that average underpricing varies internationally. They show that differences in selling mechanisms, characteristics of firms going public, and government regulation of the IPO process are correlated with average first-day returns across countries. Nevertheless, they don't empirically test whether these factors are affecting the IPO underpricing systematically. Rather they provide a descriptive picture of the developments in the IPO markets.

In a cross-country study, Boulton et al. (2007) demonstrated a systematic relation between IPO underpricing and country-level earnings quality measures. They suggested a possible connection between financial accounting information and underpricing. To the extent that more opaque earnings information leads to greater information asymmetries among IPO participants, the commonly accepted

IPO underpricing theories would predict higher underpricing in countries with less reliable financial data. Thus, information asymmetries could be exacerbated by the poor earnings quality.

Below figure displays the link between the IPO underpricing and the earnings quality. As Boulton et al. claims, there is an inverse relationship between the earnings quality and the extent of IPO underpricing across countries. The countries with the highest quality of earnings index have lower average undepricing.

Figure 4.1 Link Between IPO Underpricing and Earnings Quality



Source: Boulton, T., S. Smart, and C. Zutter, (2007), "Earnings Quality and International IPO Underpricing", *unpublished mimeo.*

When a company goes to public, they can trade their IPO shares in the domestic or in the foreign market. However, foreign listings bring additional regulations

and obligations that the issuing firm has to comply with. For example, firms listing in the U.S. subject themselves to SEC oversight, agree to meet generally accepted accounting principles (GAAP), and face the scrutiny of financial intermediaries involved in the security markets.

In the United States, the initial public offering is governed by the Federal Securities Act of 1993, together with the rules and regulation of the U.S. Securities and Exchange Commission. In addition, each exchange has their respective and separate rules that any company that will go on public must comply. For small companies that will undergo the IPO process, it may be affected by a certain state's blue sky laws, though such laws may pre-empted by federal laws especially when the common shares are listed on major exchanges.

Before the IPO process jumps off, the issuer (the company that will sell its common shares to the public) must outline a prospectus. It will contain the overview of the company's history, corporate background, products, operations, risk factors, and other essential information. The Securities and Exchange Commission will actively review the content of the prospectus and major law firms are involved in the drafting process.

Because of the regulatory differences and probably additional costs, the firms listed abroad might have different pricing decisions than the firms with only domestic listings. There are also significant regulatory variance between Europe and U.S., and in the latter, we see higher levels of IPO underpricing.

In the US, communications with investors are guided by the 1933 Securities Act. The Act requires that investors receive financial and other significant information concerning securities being offered for public sale and prohibits deceit, misrepresentations, and other fraud in the sale of securities[62]. Section 5 of the Act prohibits any "offer" prior to the filing of a registration statement.

Investors in US offerings are only asked to reveal their views about the IPO once the registration statement, including an initial indicative price range, has been

filed. During the registration period, and for 40 days after the IPO (the "quiet period"), the company and their advisors are able to present statements of fact, but are not allowed to publish any opinions regarding the valuation of the company[63]. Research analysts associated with members of the investment banking syndicate are important in providing post-IPO coverage, but do not produce their first reports until the end of the quiet period. During the bookbuilding phase, which involves road-show presentations, one-on-one meetings with selected investors and direct marketing by members of the investment banking syndicate, bids are submitted to the bookrunner who constructs a demand curve for the issue. If demand is strong the initial price range can be revised.

Within Europe the exchange of information between investors and the investment banking syndicate can occur earlier, before the initial price range is set. This reflects less strict interpretation of securities laws within Europe as there are few formal regulations that prescribe the details of how an offer should be conducted. The research analysts associated with the investment banking syndicate routinely produce written research reports prior to the offering's registration. Draft reports are typically vetted by the lead manager to ensure "consistency" before being distributed by syndicate members to potential investors[64].

Usually, the research reports give an indication of the valuation range that the analyst believes is reasonable. Key investors are offered meetings with the syndicate's analysts to discuss the offering. Subsequently, they are asked for feedback regarding the price at which they would subscribe. The formality of the process varies considerably across IPOs. At its most formal, investment banks request responses to extensive questionnaires that survey the investor's investment strategy and holdings as well as its reaction to the company and its thoughts on valuation. The information gathered during this pre-marketing phase

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[62] www.sec.gov

[63] Bradley, D. J., Jordan, B. D., J. R. Ritter, (2003), "The quiet period goes out with a bang", *Journal of Finance*, 58, pp: 1-26.

[64] Benveniste, L. M. and W.J. Wilhelm, (1990), "A comparative analysis of IPO proceeds under alternative regulatory regimes", *Journal of Financial Economics*, 28, pp: 173-207.

can then be taken into account in setting the initial indicative price range. Conditional upon the price range, the investors can then submit formal bids.

Due to these regulatory differences and the procedure while deciding on the price of the IPOs, Jenkinson et al. (2004) affirm that the IPOs are generally less underpriced in Europe. The opportunity to gather information from the investors and looser controls help the underwriter to reach to the "correct" price whereas in US, the strict rules prevent this.

Table 4.2 The Pricing of IPOs in Europe and U.S.

Country	**Initial Price Range**					**Proportion of Firms Priced**		**Initial Underpricing**	
	# of IPOs	wide	min	max	std.dev.	strictly below	strictly above	Price adjustment	Relative to Issue Price
Belgium	61	16.0%	8.9%	31.6%	5.0%	6.6%	4.9%	1.4%	17.9%
France	174	14.4%	4.9%	38.7%	5.8%	2.3%	2.9%	3.5%	15.2%
Germany	224	16.2%	8.0%	26.1%	3.8%	0.9%	0.0%	5.1%	47.5%
Italy	51	20.3%	3.3%	40.0%	7.5%	0.0%	0.0%	2.6%	4.8%
Netherlands	50	15.5%	6.9%	35.8%	5.2%	2.0%	22.0%	6.8%	14.3%
Spain	25	14.6%	5.0%	23.1%	3.8%	0.0%	8.0%	3.6%	5.2%
Sweden	31	14.1%	2.4%	21.3%	4.3%	9.7%	3.2%	0.1%	-2.2%
UK	124	19.4%	4.7%	66.7%	12.2%	19.4%	14.5%	0.7%	9.0%
United States	2930	15.2%	0.0%	80.0%	7.0%	23.6%	26.2%	2.5%	25.2%

Source: Jenkinson, T., A. Morrison and W.J. Wilhelm, (2004), "Why are European IPOs so rarely priced outside the indicative price range?", *unpublished mimeo*.

As can be seen from Table 4.2, the initial price range in U.S. is significantly higher compared to most of the European countries. The standard deviation is also high but Italy and U.K score higher than United States. The proportions of the firms priced strictly below and above the range are also highest in U.S. Only other European country that comes close to United States is UK on that front. Lastly, the initial underpricing relative to issue price is biggest in Italy, and Italy is followed by U.S. In Sweden there is overpricing by 2.2%.

This section tried to display the differences across countries in terms of IPO pricing and performance. Although there might be some underlying factors of initial IPO underpricing, the regulations, the functioning of the market, and the external conditions might determine the pricing decisions of IPOs. In the next section, we will empirically test the validity of the theoretical models described previously.

4.2 Theoretical Model

4.2.1 Calculating Mispricing and After-Market Performance

To look at the pricing of IPOs, we first calculate the aftermarket returns. These returns for each day will be computed for each stock as follows:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

$R_{i,t}$ = the daily return

$P_{i,t}$ = the price at the close of trading day

t= day

i = IPO

(i.e.: t=1 is the first day of trading for the IPO_i. For the first day return $R_{i,1,}$ $P_{i,1}$ is the offer price).

The above equation tells us that the first day return is the percentage difference between the closing price on day 1 and the offer price. The prices are taken in nominal terms and denominated in Turkish Liras.

Then, we will move on to calculate the abnormal returns. There are two ways to measure abnormal returns to a share, market adjusted and mean adjusted. Market adjusted return is the raw return adjusted for changes in ISE-100 Index. Mean adjusted return is computed by looking at the average return on the IPO for the time period. We will utilize only market adjusted return to calculate abnormal returns in this study.

Cumulative abnormal return is the sum of the differences between the expected return on a stock and the actual return that comes from the release of news to the market. Then cumulative abnormal returns (CAR), based on market adjusted return, for each IPO, at the end of the first day of trading, end of the first week (5 trading days), first month (20 trading days), third month (60 trading days), first year (180 trading days) and second year (360 trading days) will become:

$$CAR_{i,t} = R_{i,t} - R_{i,t}^{m}$$

t = time

i = IPO

The short-run in our analysis is accepted to be the one month and three months periods. In addition to these periods, the very short-run would be also estimated in the research. The very short-run will consist of one week. Long-run will be defined as one and two years in our study, and to measure the long-run performance we will look at the cumulative abnormal returns in these periods.

In order to evaluate the means of cumulative abnormal returns for different periods, we will conduct one sample t-test. The test will help us to identify if they are different from zero or significantly positive or negative. When the mean is different than zero then we can conclude that the IPOs have abnormal returns. Having statistically significant and positive mean will indicate that the IPOs are outperforming the market while statistically significant and negative mean will point to underperformance.

Finally, we will calculate the increases or decreases of ISE-100 between one week before and one week after each IPO. This will enable us to identify the market trend due to the change of ISE-100 performance between these two weeks periods. Then, we will compare the market trend with the one-week CAR's of the IPOs. This will tell us whether the abnormal returns are due to market trend or are independent of them.

4.2.2 Regression Method

In this part we will attempt to look at the determinants of the mispricing in the IPO market in Turkey. This will be closely linked to the theoretical models discussed above. Nevertheless, since it is impossible to quantify all the factors that can have an impact on the pricing of initial public offerings and their after-market performance, we will only focus on the information asymmetry models that have been widely tested in the literature for other countries as well.

As mentioned before, Rock's winner's curse model implies a negative correlation between initial returns and allocations to investors. Since informed investors avoid overpriced IPOs, uninformed investors receive larger allocation of shares on which they earn low or negative returns, and smaller allocations in underpriced IPOs. Thus, the joint participation by both informed and uninformed investors in underpriced IPOs makes the demand for underpriced IPOs high, and allocation rate low.

It is also well documented that ex ante uncertainty will increase the undepricing and there are several elements affecting the ex ante uncertainty. One of these elements is underwriter's reputation. It is argued that more prestigious underwriters can reduce the informational asymmetry and thereby cut the underpricing cost.

Another factor is that hot issue periods, which are characterized by a higher level of ex ante uncertainty, necessitating higher underpricing. The initial public

offerings are clustered usually and hence the timing of the IPO also becomes important for pricing. When there are a lot of shares in the market one can expect that the demand for a firm's share might decline.

For these and other common factors influencing the ex ante uncertainty, we will use the age of the firm at the time of offering, the offer size, allotment, standard deviation of the after-market return, and underwriter's reputation as proxies.

We use multiple linear regression model to examine the explanatory power of ex ante uncertainty and control for other well-known determinants of IPO underpricing. The regression model is as follows:

$$R = \beta_0 + \beta_1 AGE + \beta_2 \ln ALL + \beta_3 \ln IPOSZ + \beta_4 MC + \beta_5 UWR + \varepsilon$$

R = cumulative abnormal returns

AGE = age of a firm at the date of IPO

ALL = allotment to individual investors

IPOSZ = IPO offer size

MC = market conditions

UWR = underwriter reputation

ε = error term

Then the short-run and long-run market performance of the initial public offerings will be analyzed and whether the above mentioned factors are effective will be tested. As short-term, one month and three month periods after the shares have been publicly traded will be considered. Market return and market volume as explanatory variables will be included. One and two-year periods are taken as long-term in this study.

In the final set of empirical section the short-term and long-term performance of the IPOs compared to ISE-100 index will be analyzed. Whether the initial underpriced stocks are overperforming and vice versa would be tested.

4.3 Data and Descriptive Statistics

4.3.1 Dependent Variable

Our sample consists of IPOs of equity stocks in the ISE during the 1996-2004 period. We choose this period because we would like to analyze the long-run performance, which is defined with 1 and 2 years separately. To calculate the cumulative abnormal returns for the two-year period, we had to cut our sample period in 2004. This lets us to look at the long run performance of the companies under consideration.

Also, the total sample was reduced to IPOs which are for the private firms only, not including the privatizations. This will allow us to eliminate certain biases that can rise from being a publicly owned company. This resulted in a sample of 139 IPOs. Price information was obtained from IMKB and the company websites. The data for returns on ISE-100 Index are collected from Istanbul Stock Exchange website. Subsidiary sources are also used when necessary. Daily, weekly and monthly price performances were exploited.

There have been 27 public offerings in 1996, 29 public offerings in 1997, 20 public offerings in 1998, 10 public offerings in 1999, 34 public offerings in 2000, 4 public offerings in 2002, 2 public offerings in 2003 and 12 public offerings in 2004.

Table 4.3 shows the amount of stock sold, their value, and the type of initial public offering in each year from 1996 to 2004. Fixed offer pricing is the most widely used method in pricing IPOs in Turkey. The second favorable method is

selling the stocks through stock exchange and book building has been rarely used. The biggest amount of sales was realized in 2000 when 34 firms issued shares for trading. As a result of the high value of the stocks in 2004, the amount sold was also considerably high.

Table 4.3 IPOs between 1996-2004

Year	Fixed Price Offer	Sale through the Stock Exchange	Book Building	Nominal Value (Thousand USD)	Amount Sold (Thousand USD)
1996	24	3	0	34,626	167,922
1997	28	0	1	66,091	420,377
1998	19	1	0	66,998	383.,48
1999	8	2	0	52,391	87,413
2000	34	1	0	157,69	2, 809, 532
2002	3	1	0	17,062	56,467
2003	0	2	0	1,958	11,252
2004	9	2	1	107,114	482,575

4.3.2 Independent Variables

The first explanatory factor in our analysis is the age of the firms that went public within this period. Age information is obtained from the companies' websites. Since, the age of the firm at the time of IPO is a continuous variable; we will directly utilize it in the regressions nevertheless the years will be transformed into natural logarithms. Descriptive statistics concerning the firm's age are provided below.

Table 4.4 Summary Statistics for Firm's Age across Years

	1996	1997	1998	1999	2000	2002	2003	2004
Mean	20.69	24.31	19.80	11.60	23.20	3.75	13.00	18.33
Standard Error	2.99	3.05	3.56	2.02	2.40	2.14	1.00	4.73
Median	14.00	22.00	14.50	10.00	19.00	2.00	13.00	11.00
Mode	10.00	12.00	13.00	6.00	20.00	1.00		10.00
Standard Deviation	15.25	16.43	15.92	6.38	14.22	4.27	1.41	16.38
Sample Variance	232.70	270.08	253.43	40.71	202.34	18.25	2.00	268.42
Range	50	53	54	18	55	9	2	53
Minimum	0	3	0	5	1	1	12	1
Maximum	50	56	54	23	56	10	14	54
Sum	538	705	396	116	812	15	26	220
Count	26	29	20	10	35	4	2	12

The mean age across years where IPOs take place in Turkish stock market differs, for example the mean firm age was 24.31 in 1997 but this went down to 11.6 in 1999 and 3.75 in 2002. More and more, younger firms started to go public and trade their IPOs in the Istanbul stock exchange.

Allotment data are gathered from the IMKB website and when necessary the company websites have been used as well. The allotment is measured by the share of individual investors as a percentage of all shares. This is believed to have an impact on the magnitude of underpricing since institutional investors have informational advantages as mentioned in previous parts. Also, if the underwriter is willing to have long-term relationships with the institutional investors, they are more likely to offer underpriced stocks. Table 4.5 summarizes the descriptive statistics for the allotment.

Table 4.5 Summary Statistics for Allotment across Years

	1996	1997	1998	1999	2000	2002	2003	2004

Mean	20.59	37.55	29.12	19.30	26.56	27.73	0.00	17.66
Standard Error	4.90	5.46	8.16	6.95	4.24	14.65	0.00	6.22
Median	16.50	32.33	15.00	18.50	15.00	22.95	0.00	9.89
Mode	0.00	0.00	0.00	0.00	10.00		0.00	0.00
Standard Deviation	24.98	29.42	35.56	21.96	25.09	29.30	0.00	21.56
Sample Variance	623.77	865.28	1264.54	482.46	629.55	858.78	0.00	464.96
Range	89.80	90.00	94.01	70.00	86.85	65.00	0.00	62.07
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	89.80	90.00	94.01	70.00	86.85	65.00	0.00	62.07
Sum	535.29	1088.96	553.32	193.00	929.62	110.90	0.00	211.94
Count	26	29	19	10	35	4	2	12

From the table we can see that except in year 2003, the institutional investors have received an important chunk of the IPOs. This ranged from mean allotment of %37.55 in 1997 to %17.66 in 2004. The institutional investors in certain years got the majority of the IPO shares in Istanbul Stock Exchange market.

IPO size data is collected from IMKB too. This is calculated as the ratio of the total IPO offerings as a percentage. Table 4.6 shows the summary statistics for the IPO size and how they varied across years.

Table 4.6 Summary Statistics for IPO Size across Years

	1996	**1997**	**1998**	**1999**	**2000**	**2002**	**2003**	**2004**
Mean	28.90	23.26	26.32	38.33	20.08	25.00	35.12	33.20
Standard Error	4.42	2.17	3.54	7.40	1.32	8.07	9.89	6.48
Median	22.60	20.00	21.54	49.00	20.00	18.00	35.12	29.29
Mode	15.00	20.00	49.00	49.00	15.00			15.00
Standard Deviation	22.52	11.67	15.82	23.42	7.80	16.15	13.98	22.44
Sample Variance	507.04	136.16	250.14	548.26	60.83	260.67	195.43	503.39

Range	75.34	45.00	61.00	74.19	40.15	34.00	19.77	84.07
Minimum	4.66	5.00	5.00	5.81	5.00	15.00	25.23	15.00
Maximum	80.00	50.00	66.00	80.00	45.15	49.00	45.00	99.07
Sum	751.31	674.49	526.30	383.33	702.76	100.00	70.23	398.44
Count	26	29	20	10	35	4	2	12

The average IPO size in 1996 is almost %30 and this goes up over %38 in 1999 but later the size of initial public offerings or in other words, the amount of stocks offered in the market as a portion of company's total stocks declines. The maximum IPO size is %99 but in most cases the IPO size is less than half of the company.

Market condition is estimated by looking at the overall performance of the IMKB-100 index at a certain period. If the trend is in the direction of an increase, then, the markets will be titled as hot and if the trend is in the direction of a decrease then the market will be titled as cold. The summary statistics results are given in Table 4.7.

Table 4.7 Summary Statistics for Market Conditions across Years

	1996	**1997**	**1998**	**1999**	**2000**	**2002**	**2003**	**2004**
Hot	7	12	11	7	11	3	2	4
Cold	17	9	5	0	20	1	0	8
Neutral	2	8	0	3	4	0	0	0
Count	26	29	20	10	35	4	2	12

The market conditions were defined according to the trends in the ISE-100 index. By looking at the monthly movements in the abnormal returns for ISE-100, each year was divided in terms of hot, cold and neutral market conditions. Then, by looking at the exact date of the IPO the firms were classified accordingly.

As can be seen from Table 4.7, there are 17 firms, which went public in 1996 when there was a downward trend in the market. This number decreased to 8 in 2004. There are several firms that started to offer stocks publicly when there was neither a rise nor a decline in the market. It should be noted that most of the IPO dates in the Turkish case are quite close to each other.

Finally, the underwriter reputation is calculated and IPOs are categorized according to the quality of the underwriter. For underwriter quality, based on the earlier studies the financial ratios of these firms and banks were evaluated. In Turkey, the data on underwriters does not allow us to estimate all of the underwriter reputation measures used in the US. Therefore, modified versions of the measures utilized in the literature are calculated. The reputation measure is an index of the underwriters with the highest number of IPOs lead or co-lead, and financial ratios of these firms. The underwriters with higher numbers of lead or co-lead are assumed as prestigious and the rest are not. This variable measures the visibility of an underwriter in the IPO market. The financial ratios are estimated from the data obtained by Turkish Capital Market Underwriter's Association (Türkiye Sermaye Piyasası Aracı Kuruluşları Birliği). The summary statistics are provided below.

Table 4.8 Summary Statistics for Underwriter's Reputation across Years

	1996	**1997**	**1998**	**1999**	**2000**	**2002**	**2003**	**2004**
Good	13	10	5	5	14	3	0	5
Bad	11	13	10	4	13	1	2	5
Neutral	2	4	5	1	8	0	0	2
Count	26	29	20	10	35	4	2	12

Table 4.8 demonstrates that almost every year the IPOs are underwritten by a combination of famous and reliable as well as unreliable investment banks and financial institutions. For example, in 1996, 13 IPOs are marketed by reputable

underwriters while 11 of them were in the hands of bad or not so reliable ones. As we discussed above our reputation measure is an index constructed by the amount of leading and co-leading plus financial ratios of the underwriting firms. In 2004, the good and bad underwriters had equal number of IPOs.

4.4 Hypotheses

The sample will be divided into several categories to analyze the determinants of the short and long term performance of the IPOs in Turkey. These categories will be:

1) Firm age,

2) Allotment

3) Offer size,

4) Underwriters' reputation,

5) Market Condition

Once the first day return is calculated we will also see how the underpriced and overpriced shares are distributed over the above categories. For each category, the performance of the IPO will be assessed both in the short and the long run. There are contending views about how the above determinants would affect the direction and the magnitude of the IPO underpricing and its performance and we will try to test these views with the Turkish data. The hypotheses will be as follows:

H_1: IPO initial returns are inversely correlated with allocations to investors.

This hypothesis is directly related to winner's curse model and the belief that uninformed investors will get more overpriced shares since the expected underpriced shares will be allocated or somehow collected by informed investors. Therefore, we will expect a negative relationship between the initial returns and allotment.

H_2: The offer size of the firm is inversely related to IPO underpricing.

Underpricing is positively related to offer size if there is no inelastic demand for the shares. Thus, when the offer size increases the IPO underpricing goes down.

H_3: The age of the firm is inversely related to IPO underpricing.

As the age of the firm gets older the uncertainty regarding the issuer will be decreased. Newly established firms will have more difficulty in selling their shares if they don't offer higher returns. Therefore, we will expect a negative relationship between the age of the firm and underpricing.

H_4: The underwriter's reputation is inversely related to IPO underpricing.

It is obvious that a credible and famous underwriter could decrease the ex-ante certainty about the shares, thus having high reputation will tend to cut the underpricing down.

H_5: Market condition is directly related to IPO performance.

When the markets are buoyant the individual shares could also perform better than otherwise. Therefore, the market conditions will affect especially the short-term performance of the IPO if we assume that the individual firms are not able to modify the market conditions alone.

4.5 Results

After the details of the independent and dependent variables, we now can switch to the results we obtained from our sample. In the following sections, we will show the cumulative abnormal returns of the whole sample for different periods, 1 day, 1 week, 1 month, 3 months, 1 year and 2 years. Then, we will disaggregate the cumulative returns over the five determinants we discussed above, namely firm age, IPO size, allotment, market conditions and underwriter reputation. We will analyze both the summary statistics and the statistical significance of the means.

In Table 4.9, the average abnormal returns over different periods (first day, short-term and long-term) over the years are provided. When we look at the table it can easily be observed that over the years the abnormal returns have varied significantly. The first day average abnormal return in 1996 was %3 whereas it rose up to %12 in 2004. This indicates the existing of very short term underpricing in the Turkish IPO market. In 1997, the average abnormal initial day return was recorded as zero and hence no mispricing. The rest of the years, 2000, 2002 and 2003, actually displayed overpricing on average since the abnormal returns were negative.

The first week average abnormal returns followed the same trend with the first day returns. However, in the short-run and in the long-run the shares showed different movements. For example, the short-run (1 month) average abnormal returns for the year 1996 turns out to be -%3 indicating that the earlier high returns have turned into losses. The long-run returns are positive in all years except 2000, 2002, 2003, and 2004.

Table 4.9 The Abnormal Returns of IPOs across Years (Average)

Year	1 Day	1 Week	1 Month	3 Months	1 Year	2 Years
1996	0,03	0,027	-0,03	0,005	-0,03	0,01
1997	0,0	0,005	-0,04	-0,06	-0,008	0,86
1998	0,04	0,04	-0,03	-0,002	-0,02	12,84
1999	0,3	0,4	1,0	0,93	0,87	27,11
2000	-0,02	-0,15	-0,13	-0,16	-0,19	-0,64
2002	-0,52	-0,43	-0,19	-0,16	-0,05	-14,21
2003	-0,05	-0,07	-0,61	-0,68	-0.05	-12.98
2004	0,12	0,1	-0,18	0,28	-0,24	-10,60

In the following Table, the market adjusted cumulative returns for the first day for each firm will be presented. This will give us a better understanding of the extent of underpricing in the Turkish IPO market during 1996-2004 period. The companies are ranked from the highest overpricing to highest underpricing. As can be seen from the table below, Burçelik Vana Sanayi ve Ticaret A.Ş. has the most overpriced stock offer with -%65 returns at the end of the first day of trading. EGS Ege Giyim A.Ş., on the other hand had the most underpriced IPO with a return of %35.

Table 4.10 CAR for the Companies

Year	Name of the Company	1st Day CAR
2004	Burçelik Vana Sanayi ve Ticaret A.Ş.	-0.65
2003	Gersan Elektrik Ticaret Sanayi A.Ş.	-0.55
2004	İndeks Bilgisayar Sistemleri Mühendislik Sanayi ve Ticaret A.Ş.	-0.52
2000	Ayen Enerji A.Ş.	-0.45
2004	Şeker Finansal Kiralama A.Ş.	-0.43
2000	Nuh Çimento Sanayii A.Ş.	-0.42
2000	Link Bilgisayar Sistemleri Yazılımı ve Donanımı Sanayi ve Ticaret A.Ş.	-0.39
2002	Metemtur Otelcilik ve Turizm İşletmeleri A.Ş.	-0.30
1997	Taç Yatırım Ortaklığı A,Ş,	-0.30
2004	Türk Traktör ve Ziraat Makineleri A.Ş.	-0.29
2000	Favori Dinlenme Yerleri A.Ş.	-0.27
2000	EGS Holding A.Ş.	-0.27
2000	Acıbadem Sağlık Hizmetleri ve Ticaret A.Ş.	-0.27
2000	Sezginler Gıda San. ve Tic. A.Ş.	-0.26
2000	Ak Enerji Elektrik Üretimi Otoprodüktör Grubu A.Ş.	-0.26
2004	Fenerbahçe Sportif Hizmetler San. ve Tic. A.Ş.	-0.20
1997	Ceylan Giyim Sanayi ve Ticaret A,Ş,	-0.18
1997	Mensa Mensucat San. ve Tic. A.Ş.	-0.16
2000	Alkim Kağıt San. ve Tic. A.Ş.	-0.16
1996	Alternatif Yatırım Ortaklığı A.Ş.	-0.14
1997	Kristal Kola ve Meşrubat Sanayi Tic, A,Ş,	-0.14
2002	Atakule Gayrimenkul Yatırım Ortaklığı A.Ş.	-0.12
2004	Denizbank A.Ş.	-0.12
2000	Batısöke Söke Çimento Sanayii A.Ş.	-0.11
2000	İş Genel Finansal Kiralama A.Ş.	-0.10
1998	Metemteks Tekstil Sanayi ve Ticaret A.Ş.	-0.09
2004	Desa Deri Sanayi ve Ticaret A.Ş.	-0.09
2000	Turkcell İletişim Hizmetleri A.Ş.	-0.08
1997	Toprak Factoring A.Ş.	-0.08

2000	Arena Bilgisayar Sanayi ve Ticaret A.Ş.	-0.07
1996	Yataş A.Ş.	-0.06
2000	Anadolu Hayat Sigorta A.Ş.	-0.06
1998	Alfa Menkul Değerler A.Ş.	-0.05
1996	Birlik Mensucat A.Ş.	-0.05
1999	Gedik Yatırım Ortaklığı A.Ş.	-0.05
1997	Kipa Kitle Pazarlama ve Ticaret A.Ş.	-0.05
1998	Osmanlı Gayrimenkul Yatırım Ortaklığı A.Ş.	-0.05
2000	Escort Computer Elektronik San. ve Tic.A.Ş.	-0.04
1999	Ak Yatırım Ortaklığı A.Ş.	-0.04
1997	Apeks Dış Ticaret San, A,Ş,	-0.04
1999	Nurol Gayrimenkul Yatırım Ortaklığı A.Ş.	-0.04
2000	EGS Finansal Kiralama A.Ş.	-0.03
2000	Lio Yağ San. ve Ticaret A.Ş.	-0.03
1997	Demisaş Döküm Emaye Mamulleri Sanayii A,Ş,	-0.03
1997	Ata Yatırım Ortaklığı A.Ş.	-0.02
1997	Boyasan Tekstil San, ve Tic, A,Ş,	-0.02
1998	Kardemir A.Ş.	-0.02
1997	Meges Boya Sanayi ve Ticaret A,Ş,	-0.02
1998	Pastavilla Makarnacılık Sanayi ve Ticaret A.Ş.	-0.02
2000	Yazıcılar Otomotiv ve Gıda Yat. ve Paz. San. ve Tic. A.Ş.	-0.01
2004	İnfo Menkul Kıymetler Yatırım Ortaklığı A.Ş.	-0.01
1996	İntermedya Yayıncılık A.Ş.	-0.01
1999	Aksu Enerji ve Ticaret A.Ş.	0.00
1996	Çarşı Büyük Mağazacılık A.Ş.	0.00
1998	Doğan Yayın Holding A.Ş.	0.00
1998	Penguen Gıda Sanayi A.Ş.	0.00
1997	Ray Sigorta A,Ş,	0.00
2000	Türk Ekonomi Bankası A.Ş.	0.00
1996	Sasa A.Ş.	0.01
2000	Tek-Art Turizm A.Ş.	0.01
2000	Logo Yazılım ve Ticaret A.Ş	0.02

2003	Koza Davetiye Mağaza İşletmeleri ve İhracat A.Ş.	0.02
1997	Park Tekstil Sanayi ve Ticaret A.Ş.	0.02
1997	Uzel Makina Sanayii A,Ş,	0.03
2000	Vakıf Risk Sermayesi Yatırım Ortaklığı A.Ş.	0.04
1996	Alarko Gayrimen.Yat.Ort. A.Ş.	0.04
1997	Toprak Finansal Kiralama A.Ş.	0.04
2000	Şeker Piliç ve Yem Sanayi Ticaret A.Ş.	0.06
1997	Berdan Tekstil Sanayi ve Ticaret A,Ş,	0.06
1998	Yapı Kredi Koray Gayrimenkul Yat. Ort. A.Ş.	0.06
1999	Yatırım Finansman Yatırım Ortaklığı A.Ş.	0.06
2004	AFM Uluslararası Film Prodüksiyon Ticaret ve Sanayi A.Ş.	0.06
1997	Bayraklı Boya ve Vernik Sanayii A,Ş,	0.07
1997	Çimbeton Hazırbeton ve Prefabrik Yapı Elemanları San. ve Tic. A.Ş.	0.07
1996	İhlas Ev Aletleri A.Ş.	0.07
1998	Efes Sınai Yatırım Holding A.Ş.	0.08
1997	Ünal Tarım Ürünleri İhracat ve Sanayi A.Ş.	0.08
2000	Sanko Pazarlama İthalat İhracat A.ş.	0.08
2004	Doğuş Otomotiv Servis ve Ticaret A.Ş.	0.09
1997	Mazhar Zorlu Holding A.Ş.	0.09
1997	Arat Tekstil Sanayi ve Ticaret A.Ş.	0.10
1998	Arsan Tekstil Ticaret ve Sanayi A.Ş.	0.10
1996	ÇBS Printaş A.Ş.	0.10
1996	Garanti Yatırım Ortaklığı A.Ş.	0.10
1999	Goldaş Kuyumculuk Sanayi İthalat İhracat A.Ş.	0.10
1999	GSD Holding A.Ş.	0.10
1998	Serve Kırtasiye Sanayi ve Ticaret A.Ş.	0.10
1997	Şekerbank T,A,Ş,	0.11
1997	Sevgi Özel Sağlık Hizmetleri A,Ş,	0.11
1996	Vakıf Gayrimen.Yat.Ort. A.Ş.	0.11
1996	Akın Tekstil A.Ş.	0.12
1996	Bisaş Tekstil A.Ş.	0.12

1996	Gimsan Gediz İplik A.Ş.	0.12
1998	Van-Et Entegre Et San. ve Tic. A.Ş.	0.12
1996	İhlas Finans Kurumu A.Ş.	0.13
1999	İhlas Gayrimenkul Yatırım Ortaklığı A.Ş.	0.13
1998	Vakko Tekstil ve Hazır Giyim San.İşlt. A.Ş.	0.13
1998	Varlık Yatırım Ortaklığı A.Ş.	0.13
1997	Klimasan Klima Sanayi ve Ticaret A,Ş,	0.14
1996	Finans Yatırım Ortaklığı A.Ş.	0.15
1997	H.Ö. Sabancı Holding A,Ş,	0.15
2000	Zorlu Enerji Elektrik Üret.Otoprodüktör Grubu A.Ş..Ş.	0.15
1996	Borusan Yat. ve Paz. A.Ş.	0.17
1998	EGS Gayrimenkul Yatırım Ortaklığı A.Ş.	0.18
2000	Ersu A.Ş.	0.19
2000	Doğan Burda Rizzoli	0.19
1996	Avrasya Men. Kıy.Yat. Ort. A.Ş.	0.19
1998	Bak Ambalaj A.Ş.	0.21
1999	İş Gayrimenkul Yatırım Ortaklığı A.Ş.	0.21
1996	İş Yatırım Ortaklığı A.Ş.	0.21
2000	Soda Sanayi A.Ş.	0.21
2000	Alkim Alkali Kimya Sanayi	0.22
1996	ADEL Kalemcilik A.Ş.	0.22
1998	Emek Elektrik Endüstrisi A.Ş.	0.22
1998	Selçuk Gıda A.Ş.	0.22
1998	Toprakbank A.Ş.	0.22
1997	Anadolu Isuzu Otomotiv San, ve Tic, A,Ş,	0.23
1996	Çelebi Hava Servisi A.Ş.	0.23
1997	Ceytaş Ceyhan Tekstil Sanayii A,Ş,	0.23
1999	Eczacıbaşı Yatırım Ortaklığı A.Ş.	0.23
1997	Gümüşsuyu Halı ve Yer Kaplamaları Sanayi ve Ticaret A,Ş,	0.23
1998	İdaş İstanbul Döşeme Sanayii A.Ş.	0.23
1996	Konfrut Gıda A.Ş.	0.23
1996	Mudurnu Tavukçuluk A.Ş.	0.23

2000	Altınyağ Kombinaları A.Ş.	0.24
1996	Anadolu Gıda A.Ş.	0.24
1996	Tansaş A.Ş.	0.24
2000	Karsan Otomotiv Sanayii ve Ticaret A.Ş.	0.25
2004	İş Girişim Sermayesi Yatırım Ortaklığı A.Ş.	0.25
2000	Sınai Yatırım Bankası	0.26
2000	MenderesTekstil A.Ş.	0.29
2000	Dentaş Ambalaj ve Kağıt Sanayi A.Ş.	0.30
2002	Galatasaray Sportif Sınai ve Ticari Yatırımlar A.Ş.	0.31
2004	PLASTİKKART Akıllı Kart İletişim Sistemleri Sanayi ve Ticaret A.Ş.	0.31
2000	İpek Matbaacılık Sanayi veTicaret A.Ş.	0.33
2002	Beşiktaş Futbol Yatırımları Sanayi ve Ticaret A.Ş.	0.34
1996	EGS Ege Giyim A.Ş.	0.35
1997	EGS Egeser Giyim Sanayii İç ve Dış ticaret A,Ş,	0.35

As can be discerned from the Table 4.10, out of 139 companies 52 had overpriced initial public offerings, while 6 were neither overpriced nor underpriced and finally 81 of them had underpriced shares; however these are first day results. This is in line with the findings regarding other countries as well as the studies done for Turkey. The range of underpricing is considerable with the 35 per cent abnormal cumulative returns being the highest. Both the average overpricing and underpricing have been 16 per cent for the whole period.

In the next section the summary statistics for the whole sample and the significance of the means will be analyzed. The mean for first day abnormal returns for the whole sample is %6 whereas the mean for 1 week and 1 month goes up to %10. The mean of abnormal returns for 3 months is as high as %20 but then falls to %2 for the year. The 2-years' mean abnormal return is -%13.

Table 4.11 Summary Statistics for Abnormal Returns of IPOs

	1 Day	1 Week	1 Month	3 Months	1 Year	2 Years
Mean	0,06	0,1	0,1	0,2	0,02	-0,13
Median	0,04	0,03	-0,02	-0,1	-0,2	-0,53
Std. Dev.	0,12	0,4	0,63	0,91	13,1	29,6
Min.	-0,6 5	-0,82	-10,84	-13,31	-29,0	-55,7
Max.	0,35	18,11	52,31	85,1	90,21	171,81

Table 4.12 t-test for abnormal returns

Test Value = 0						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
1 Day	7,3***	139	0,00	-0,04	-0,11	0,03
1 Week	4,3***	139	0,001	-0,14	-0,2	-0,07
1 Month	3,3***	139	0,006	-0,01	-0,17	0,01
3 Months	2,7**	139	0,02	-0.32	-0.21	0.03
1 Year	0,2	139	0,43	-0,1	-0,23	0,06
2 Years	-1.3	139	0,75	-0.05	-0.36	-0.04

*Significant at the 0,01 level

**Significant at the 0,5 level

When we look at the statistical significance of the abnormal returns, we can easily see that the 1 day, 1 week, 1 month and 3 month abnormal returns are all statistically different from zero. The first three time periods, 1 day, 1 week, and 1 month, are significant at %1 level and 3 month abnormal returns are statistically

significant at %5 level. In the long-run the abnormal returns become insignificant or in other words they are statistically not different from zero.

In this section we divide the sample according to the factors we believe that are influential in underpricing. The explanatory factors are taken as age of the firm at the time of IPO, the allotment of the shares towards institutional versus individual investors, the underwriter reputation, IPO size and market conditions. Table 4.13 shows the summary statistics of abnormal returns based on firm's age. The mean of abnormal returns for the first day for old firms is %5 while it is %1 for young and %3 for middle-aged firms. The gap between the means between old and young firms widens for 1 week means. For old firms, in the long-run the abnormal returns turn out to be positive for the 1st year and zero for the 2nd year whereas they stay positive for young firms in the 1st year and become negative for longer-terms. For the middle-aged firms there are %50 abnormal returns for 1 year and -%2 for two years. This goes up to -%7 in the case of young firms for 2 year CAR.

Also it can be seen that the mean differences between the old and the young firms' returns are significant for the 1st day, 1st week and 1st month. The significance levels are %10, %5 and %1 respectively for these time periods. On longer terms, the mean differences vanish statistically meaning that the older and younger firms' average cumulative abnormal returns are not different from each other. These results are in line with the general findings in the literature that the underpricing would be less severe in older firms since firm's age could be taken as a measure against uncertainty. Since the mean abnormal returns are much lower in the older firms and these are statistically different than the younger firms' returns at least in the short run.

Table 4.13 Abnormal Returns of IPOs Based on Firm Age

Old Firms	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0.05	-0.09	0.21	0.89	0.49	0.00
Median	0.07	-0.15	0.06	0.46	0.47	0.00
Std. Dev.	0.17	0.72	0.71	1.18	0.60	0.43
Middle Aged Firms	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0.03	-0.07	0.27	0.78	0.50	-0.02
Median	0.06	-0.18	0.08	0.41	0.38	-0.06
Std. Dev.	0.19	0.70	1.04	1.21	0.66	0.44
Young Firms	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0.01	-0.14	0.21	0.96	0.49	-0.07
Median	0.04	-0.24	0.14	0.63	0.29	-0.23
Std. Dev.	0.22	0.51	0.57	1.45	0.74	0.47

Independent Samples Test

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Day	Equal variances assumed	2.58	102.00	0.09	0.06	0.04	-0.02	0.14
	Equal variances not assumed	2.45	54.52	0.09	0.06	0.04	-0.02	0.15

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Week	Equal variances assumed	3.48	102.00	0.03	0.07	0.14	-0.21	0.34
	Equal variances not assumed	3.53	90.25	0.03	0.07	0.12	-0.18	0.31

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Month	Equal variances assumed	4.19	102.00	0.00	0.03	0.15	-0.27	0.32
	Equal variances not assumed	4.20	87.31	0.00	0.03	0.14	-0.24	0.30

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
3 Months	Equal variances assumed	-0.41	102.00	0.68	-0.11	0.27	-0.64	0.42
	Equal variances not assumed	-0.38	56.57	0.70	-0.11	0.29	-0.69	0.47

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Year	Equal variances assumed	0.01	102.00	0.99	0.00	0.14	-0.27	0.27
	Equal variances not assumed	0.01	56.18	0.99	0.00	0.15	-0.30	0.30

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
2 Years	Equal variances assumed	0.73	102.00	0.47	0.07	0.09	-0.12	0.25
	Equal variances not assumed	0.70	61.01	0.49	0.07	0.10	-0.13	0.26

Then we repeat the same exercise for abnormal returns distinguished by the allotment to institutional versus individual investors. Table 4.14 provides the results for cumulative abnormal returns based on the allocation of IPOs to institutional versus individual investors.

Table 4.14 Abnormal Returns of IPOs Based on Allotment

Institutional	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,07	0,02	0,00	0,04	0,12	-0,23
Median	0,03	-0,02	-0,03	-0,03	-0,10	-0,39
Std. Dev.	0,10	0,19	0,37	0,50	13,31	22,62
Equal Share	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,06	0,12	0,11	0,09	0,02	0,50
Median	0,07	0,05	-0,02	-0,01	-0,16	-0,31
Std. Dev.	0,12	0,3	0,43	0,62	13,5	38,02
Individual	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,05	0,17	0,32	0,38	-0,08	-0,68
Median	0,05	0,06	0,02	0,04	-0,29	-0,87
Std. Dev.	0,14	0,5	0,92	13,41	12,6	24,4

Table 4.14 shows us that the mean abnormal return for the IPOs where majority of the shares are sold or given to institutional investors for the first day is %7. This rises to %6 for allotments that are more or less equally distributed between individual and institutional investors, and %5 for the IPOs that are mostly sold individuals. The mean of the abnormal returns disappear in the first month while for equal allotments and allotments to individual investors, the means remain to be positive.

Independent Samples Test

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Day	Equal variances assumed	4.47	136.00	0.00	0.02	0.03	-0.05	0.08
	Equal variances not assumed	4.48	134.74	0.00	0.02	0.03	-0.05	0.08

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Week	Equal variances assumed	3.10	136.00	0.03	0.13	0.12	-0.10	0.37
	Equal variances not assumed	3.05	101.38	0.03	0.13	0.12	-0.12	0.38

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Month	Equal variances assumed	-1.22	136.00	0.22	-0.22	0.18	-0.57	0.13
	Equal variances not assumed	-1.31	118.63	0.19	-0.22	0.17	-0.55	0.11

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
3 Months	Equal variances assumed	3.34	136.00	0.03	0.07	0.21	-0.34	0.48
	Equal variances not assumed	3.33	114.33	0.03	0.07	0.21	-0.35	0.49

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Year	Equal variances assumed	-0.35	136.00	0.73	-0.04	0.11	-0.26	0.18
	Equal variances not assumed	-0.35	129.86	0.73	-0.04	0.11	-0.26	0.18

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
2 Years	Equal variances assumed	-0.94	136.00	0.35	-0.07	0.07	-0.22	0.08
	Equal variances not assumed	-0.96	134.97	0.34	-0.07	0.07	-0.22	0.07

The statistical significance of the mean differences is at %1 level for the 1st day, %5 level for the 1st week and first month. During the rest of the time periods, the average returns to IPOs given to institutional investor and IPOs received by individual investors don't vary. Thus, we can say that the underpricing becomes a more relevant issue when the IPOs are distributed more to individual investors and only in the long-run the mean abnormal returns turn out to be statistically not different than zero. This is in similar lines with winner's curse literature, which argues that individual investor's would end up with overpriced shares.

Next, we investigate the abnormal returns of the IPOs by distinguishing between the IPOs that are marketed during cold, hot or neutral market conditions. The hot market is generally accepted as a market where demand is high and there is an upward trend. The neutral markets can be labeled as stagnant markets and the cold markets can be seen as the markets in which the demand is decreasing and there is a downward trend. The abnormal cumulative returns for the corporations that underwent public offerings under different conditions are provided at Table 4.15.

Table 4.15 Abnormal Returns of IPOs Based on Market Conditions

Hot	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,04	0,06	0,11	0,11	0,00	-0,4
Median	0,04	0,00	-0,02	0,00	-0,16	-0,26
Std. Dev.	0,10	0,28	0,55	0,7	0,99	0,99
Neutral	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,05	0,08	0,05	0,08	-0,19	-0,63
Median	0,03	0,00	-0,04	-0,05	-0,3	-10,8
Std. Dev.	0,12	0,38	0,47	0,94	10,43	30,8
Cold	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,07	0,25	0,50	0,55	0,69	2,08
Median	0,08	0,17	0,17	0,03	0,21	0,57
Std. Dev.	0,07	0,34	10,7	12,3	23,1	46,1

The mean abnormal return for the IPOs, which are offered in the stock market when the market is hot, is %4 for the first day and rises to %6 in the first week and %11 for the first month and 3 months. When the markets are neutral the mean underpricing is %5 the first day and this goes up to %8 in the first week. Then the mean abnormal returns become %5 for the first month and goes back to %8 for the three months. When the market is cold the mean abnormal return for the IPOs the first day is %7. The cumulative abnormal returns increases up to %25 in the first week and %50 in the first month and %55 in the first three months.

Independent Samples Test

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Day	Equal variances assumed	-5.46	136.00	0.00	-0.02	0.03	-0.08	0.05
	Equal variances not assumed	-5.46	121.89	0.00	-0.02	0.03	-0.08	0.05
		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the**	

							Difference	
							Lower	Upper
1st Week	Equal variances assumed	4.35	136.00	0.00	0.04	0.12	-0.20	0.28
	Equal variances not assumed	4.36	130.02	0.00	0.04	0.12	-0.19	0.28

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Month	Equal variances assumed	3.63	136.00	0.01	0.29	0.18	-0.06	0.64
	Equal variances not assumed	3.46	72.93	0.01	0.29	0.20	-0.11	0.69

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
3 Months	Equal variances assumed	-0.19	136.00	0.85	-0.04	0.21	-0.46	0.37
	Equal variances not assumed	-0.20	134.69	0.84	-0.04	0.20	-0.44	0.36
		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Year	Equal variances assumed	-4.26	136.00	0.00	-0.14	0.11	-0.37	0.08
	Equal variances not assumed	-4.24	116.53	0.00	-0.14	0.12	-0.37	0.08

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
2 Years	Equal variances assumed	-0.51	136.00	0.61	-0.04	0.08	-0.19	0.11
	Equal variances not assumed	-0.50	117.33	0.62	-0.04	0.08	-0.19	0.11

For the t-test results of the mean abnormal return differences under various market conditions, we can look at the above table. It appears from the table that

the hot market IPO means are statistically different than cold market average IPO returns for the 1st day, 1st week, 1st month and 1st year periods. Once again, the difference ceases to exist in the very long-run for our study, namely 2 years. In the literature it has been discussed that IPOs that are offered during a downward trend in the market should have lower offer prices to attract investors. Definitely, this will increase the underpricing of the shares. Our summary statistics indicate that the market conditions might be linked to the extent of underpricing since the mean of the abnormal returns in cold market IPOs have a higher value as well as its significance is more prevalent.

Underwriter reputation is another factor that could help us to understand why some IPOs are underpriced. The asymmetric information models claim that underwriter reputation or trustworthiness affect the undepricing inversely. When the investors know the bank which is underwriting the IPO or have confidence in the underwriter arranging the IPO shares trading then they will see this as a sign of quality of the shares. Therefore, the IPOs would be attached a higher value and hence higher price. Contrarily, the bad or unknown underwriter's might cause the price of the stocks to decline since to attract investors they need to come up with higher returns. Table 4.16 shows the distribution of mean abnormal returns for the whole sample divided by the underwriter's reputation.

Table 4.16 Abnormal Returns of IPOs Based on Underwriter's Reputation

Bad	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,06	0,07	0,12	0,12	0,06	0,05
Median	0,04	0,02	0,00	0,00	-0,14	-0,56
Std. Dev.	0,106	0,26	0,5	0,62	12,0	32,66
Normal	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,05	0,11	0,14	0,23	-0,05	-0,27
Median	0,04	0,04	-0,01	0,02	-0,2	-0,41
Std. Dev.	0,12	0,33	0,73	11,7	15,33	26,0
Good	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0,04	0,13	0,20	0,13	-0,24	-0,95

Median	0,02	-0,04	-0,03	-0,14	-0,29	-0,6
Std. Dev.	0,11	0,54	0,80	1,0	10,21	16,52

The first day mean abnormal return for the IPOs that are underwritten by well known banks or investment agencies is %4 and this increases to %5 for the IPOs with normal underwriters and %6 for the IPOs with badly reputed underwriters. Therefore, we can say that the underwriter's reputation seems to matter for the initial underpricing. The mean abnormal returns for the first week is %13 for the IPOs with good, %11 for the IPOs with normal and %7 for the IPOs with bad underwriters. In the short run, the means remain to be positive and high for all underwriter types while in the long run only the IPOs with bad underwriters have positive cumulative returns.

Independent Samples Test

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Day	Equal variances assumed	-3.65	113.00	0.02	-0.02	0.04	-0.09	0.05
	Equal variances not assumed	-3.65	112.42	0.02	-0.02	0.04	-0.09	0.05

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Week	Equal variances assumed	-0.91	113.00	0.37	-0.11	0.12	-0.35	0.13
	Equal variances not assumed	-0.89	86.39	0.37	-0.11	0.12	-0.35	0.13

		t-test for Equality of Means					
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**

							Lower	Upper
1st Month	Equal variances assumed	3.12	113.00	0.03	0.02	0.21	-0.38	0.43
	Equal variances not assumed	3.12	88.83	0.03	0.02	0.20	-0.38	0.43

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
3 Months	Equal variances assumed	-0.24	113.00	0.81	-0.05	0.23	-0.50	0.39
	Equal variances not assumed	-0.24	111.62	0.81	-0.05	0.23	-0.50	0.39

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Year	Equal variances assumed	2.66	113.00	0.10	0.21	0.13	-0.04	0.47
	Equal variances not assumed	2.66	112.92	0.10	0.21	0.13	-0.04	0.47

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
2 Years	Equal variances assumed	-0.78	113.00	0.44	-0.06	0.08	-0.23	0.10
	Equal variances not assumed	-0.78	112.99	0.44	-0.06	0.08	-0.23	0.10

For IPOs that are undertaken by infamous banks or financial agencies, the mean abnormal return at the end of the first day is statistically different than average returns of the IPOs that are underwritten by good investment banks at %5 level. The mean abnormal returns stay to be significantly different at %5 for the first month, then the statistical significance level decreases to %10 for the first year.

Only in the very long run, the mean of abnormal returns for IPOs with bad underwriters become statistically not different than good ones.

Finally, the IPO size will be the last factor that we will be looking at and desegregating the returns in each period accordingly. Table 4.17 gives the results for the average returns of IPOs with small, medium, and big size.

Table 4.17 Abnormal Returns of IPOs Based on IPO Size

Big	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0.07	0.09	0.15	0.15	0.07	0.06
Median	0.05	0.02	0.00	0.00	0.00	-0.69
Std. Dev.	0.13	0.32	0.62	0.76	14.76	40.17
Medium	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0.06	0.14	0.17	0.28	-0.06	-0.33
Median	0.05	0.05	-0.01	0.02	-0.25	-0.50
Std. Dev.	0.15	0.41	0.90	14.39	18.86	31.98
Small	**1 Day**	**1 Week**	**1 Month**	**3 Months**	**1 Year**	**2 Years**
Mean	0.05	0.16	0.25	0.16	-0.30	-1.17
Median	0.02	-0.05	-0.04	-0.17	-0.36	-0.74
Std. Dev.	0.14	0.66	0.98	1.23	12.56	20.32

As can be discerned from the table the average abnormal return to an IPO with bigger size is %7 in the first day whereas this is %5 for a small and %6 for a medium size IPO. The cumulative returns for the big IPOs increase until the end of first year and then started to decline. The medium size IPOs have significant returns over the first week, month and three months but then the returns become negative. Lastly, the small IPOs start to have negative returns in the first year and this carries on to the second year.

When we look at the sample means, it turns out that the big and small IPO shares don't have statistically different means for the first day closing return. However,

they start to vary in the first week, and the significance level is %10 for the equal variances and %5 for unequal variances. The difference disappears for the first month but comes back for the 3 months period at the level of %10, and at the level of %5 for two years. These results suggest that IPO size might matter in the longer-run.

Independent Samples Test

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Day	Equal variances assumed	1.27	121.00	0.21	0.04	0.03	-0.02	0.11
	Equal variances not assumed	1.24	96.88	0.22	0.04	0.04	-0.03	0.12

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Week	Equal variances assumed	1.79	121.00	0.08	0.23	0.13	-0.03	0.49
	Equal variances not assumed	1.99	101.02	0.05	0.23	0.12	0.00	0.47

		t-test for Equality of Means						
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Month	Equal variances assumed	-0.88	121.00	0.38	-0.17	0.19	-0.55	0.21
	Equal variances not assumed	-0.80	66.84	0.43	-0.17	0.21	-0.60	0.26

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
3 Months	Equal variances assumed	-1.89	121.00	0.06	-0.40	0.21	-0.83	0.02
	Equal variances not assumed	-1.80	89.93	0.07	-0.40	0.22	-0.85	0.04

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
1st Year	Equal variances assumed	1.38	121.00	0.17	0.16	0.12	-0.07	0.40
	Equal variances not assumed	1.42	117.92	0.16	0.16	0.12	-0.07	0.39

t-test for Equality of Means								
		t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
2 Years	Equal variances assumed	2.00	121.00	0.05	0.15	0.08	0.00	0.30
	Equal variances not assumed	2.02	115.35	0.05	0.15	0.07	0.00	0.30

In this section we will try to see how the underpriced and overpriced IPOs are performing in the short and the long run relative to the ISE-100 index. For this, we will divide our sample into two, underpriced and overpriced, and compare the returns to the market return for the 1 and 3 months periods as well a 1 and 2 years.

Table 4.18 Summary Statistics for Underpriced IPOs

	1st Week	1 Month	3 Months	1st Year	2 Years
Mean	0.04	0.20	0.85	0.46	-0.03
Standard Error	0.10	0.07	0.13	0.06	0.05
Median	-0.13	0.07	0.46	0.39	-0.10
Mode					
Standard Deviation	0.87	0.63	1.19	0.56	0.44
Sample Variance	0.75	0.39	1.42	0.31	0.19
Range	5.52	3.55	6.22	2.76	2.12
Minimum	-0.69	-0.74	-1.06	-0.73	-0.82
Maximum	4.83	2.81	5.16	2.03	1.30
Sum	3.39	15.71	68.36	36.67	-2.73
Count	81	81	81	81	81

As can be seen from Table 4.18, the average abnormal cumulative returns for the underpriced sample are positive except for the very long-run, 2 years. The 1st week mean CAR is %4 whereas this increases to %85 for three months period. This indicates that underpriced IPOs are outperforming the market in all periods except the very 2 years span.

Table 4.19 gives the summary statistics for the overpriced sample. It shows us that for the underpriced sample, the mean CAR for the 1st week is negative and amounts to %23. The returns turn out to be positive later on and continue as such even in the long-run. This relationship points out the fact that the overpriced shares outperform the market both in the short-run and in the long-run.

Table 4.19 Summary Statistics for Overpriced IPOs

	1st Week	1 Month	3 Months	1st Year	2 Years
Mean	-0.23	0.15	0.68	0.51	0.02
Standard Error	0.04	0.10	0.18	0.10	0.06
Median	-0.21	0.06	0.31	0.34	0.03
Mode				0.00	
Standard Deviation	0.28	0.72	1.31	0.74	0.41
Sample Variance	0.08	0.51	1.71	0.54	0.17
Range	1.23	3.13	5.72	3.20	1.72
Minimum	-0.82	-0.71	-1.39	-0.57	-0.65
Maximum	0.41	2.42	4.33	2.63	1.06
Sum	-12.10	8.02	35.51	26.63	0.99
Count	52	52	52	52	52

Now, we will check the t-statistics for the means for underpriced and overpriced samples. As can be seen from the table the return of underpriced IPOs' during the 1st week is different than overpriced IPOs' returns at the same period. We should also remember that the underpriced IPOs were outrunning the market whereas the overpriced IPOs performed worse than the market. The mean difference of these two samples are significant at %5 level when equal variances are assumed and they are different at %0.01 level when equal variance assumption is given up.

Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
1st Week	Equal variances assumed	2.197	136	.030	.26489	.12059	.02643	.50336
	Equal variances not assumed	2.690	111.954	.008	.26489	.09848	.06977	.46001

Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
1st Month	Equal variances assumed	0.76	136.00	0.45	0.16	0.21	-0.26	0.76
	Equal variances not assumed	0.74	97.86	0.46	0.16	0.22	-0.27	0.74

When we look at the sample mean differences for between the underpriced and overpriced stocks for the first month, we see that from the below independent sample test statistics, the mean differences are not statistically significant. Hence, for the first month the cumulative abnormal returns for underpriced and overpriced IPOs don't differ from each other. Next, we look at the 3 months period.

Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
3 Months	Equal variances assumed	1.00	136.00	1.00	0.18	0.18	-0.18	0.55
	Equal variances not assumed	1.13	136.00	0.26	0.18	0.16	-0.14	0.51

Once again, the short-run sample mean differences are not statistically significant for the underpriced and overpriced samples. It should be noted that both

underpriced and overprices stocks have outran the market considerably in he 3 month period.

The next two tables will provide the test results for the long-run performance and sample mean differences for both type of samples. Neither the 1 year nor the 2 year periods have significant mean differences between the underpriced and overpriced samples. Hence we can conclude that the variations in the performance of the underpriced and overpriced IPOs cease to exist after the first week. And although in the long-run underpriced IPOs display losses, these are not statistically different than the mean abnormal returns of the overpriced IPOs at the same period.

Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
1 Year	Equal variances assumed	-0.12	136.00	0.91	-0.01	0.12	-0.24	0.22
	Equal variances not assumed	-0.11	93.18	0.91	-0.01	0.12	-0.26	0.23

Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
2 Years	Equal variances assumed	-0.89	136.00	0.38	-0.07	0.08	-0.22	-0.89
	Equal variances not assumed	-0.91	114.51	0.37	-0.07	0.08	-0.22	-0.91

In the following part, we will run our regressions to test whether the above mentioned factors have an impact on the pricing of IPOs in the Turkish stock market. For this purpose we will employ the following regression equation:

$$R_t = \beta_0 + \beta_1 AGE + \beta_2 \ln ALL + \beta_3 \ln IPOSZ + \beta_4 MC + \beta_5 UWR + \varepsilon$$

R_t = cumulative abnormal returns at time t

AGE = age of a firm at the date of IPO

ALL = allotment to individual investors

IPOSZ = IPO offer size

MC = market conditions

UWR = underwriter reputation

ε = error term

Table 4.20 provides the regression results for the first day cumulative return. The results show us that for the first day cumulative abnormal returns, the model we formed is significant at %5 level, which is derived from the F-statistics. The $R^2$of the model is 0.75, which could be considered pretty high. When we look at the each factor we see that the constant term, firm age, IPO size, allotment, and underwriter's reputation are all statistically significant. Allotment has the highest coefficient with 0.21. The negative sign on the underwriter's reputation indicate a negative relationship between the investment bank's reputational capital and initial underpricing. This is in agreement with most of the findings in the literature. The positive sign of IPO size, however, contradicts some of the findings in the literature that are based on retained earning's models.

Table 4.20 Regression Results for 1st Day CAR

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.76							
R Square	0.75							
Adjusted R Square	0.73							
Standard Error	0.19							
Observations	138							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	0.31	0.06	3.70	0.04			
Residual	132	4.78	0.04					
Total	137	5.09						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.11	0.06	-1.79	0.08	-0.24	0.01	-0.24	0.01
Firm Age	0.04	0.02	2.22	0.04	0.00	0.07	0.00	0.07
IPO Size	0.17	0.07	2.42	0.04	-0.03	0.37	-0.03	0.37
Allotment	0.21	0.06	3.53	0.02	-0.13	0.11	-0.13	0.11
UR	-0.11	0.02	5.51	0.00	-0.03	0.04	-0.03	0.04
MC	-0.02	0.02	-1.00	0.32	-0.05	0.02	-0.05	0.02

Next, we do the same regression analysis for the first week return. The results tell us that model's explanatory power had declined by almost %10 since the R^2 dropped to 0.62. The overall model is significant at %5 level. There are several changes in the significance levels and coefficients of our factors. Constant term, firm age, underwriter's reputation continue to keep their statistical significance, while, IPO size becomes insignificant. Also, market condition series turns out to be significant at %10 level. The factors maintain their signs. Allotment has the highest coefficient with 0.55 whereas underwriter's reputation has a coefficient of -0.15. The results are summarized in Table 4.21.

Table 4.21 Regression Results for 1st Week CAR

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.65							
R Square	0.62							
Adjusted R Square	0.61							
Standard Error	0.69							
Observations	138							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	3.21	0.64	3.34	0.05			
Residual	132	63.13	0.48					
Total	137	66.34						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.25	0.03	-8.09	0.00	-0.72	0.21	-0.72	0.21
Firm Age	0.32	0.06	5.33	0.00	-0.12	0.13	-0.12	0.13
IPO Size	0.56	0.37	1.52	0.13	-0.17	1.29	-0.17	1.29
Allotment	0.55	0.22	2.54	0.08	-0.39	0.49	-0.39	0.49
UR	-0.15	0.07	2.14	0.09	-0.08	0.18	-0.08	0.18
MC	-0.12	0.06	-1.89	0.06	-0.25	0.01	-0.25	0.01

Subsequently, we turn to the analysis of short-run performance of the IPOs and undertake the regression estimations for the first month returns. Table 4.22 gives us the results for the first month IPO stock returns in Istanbul Stock Exchange market.

Table 4.22 Regression Results for 1st Month CAR

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.6							
R Square	0.6							
Adjusted R Square	0.59							
Standard Error	0.06							
Observations	138							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	1.46	0.29	3.26	0.03			
Residual	132	147.30	1.12					
Total	137	148.76						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.25	0.06	4.70	0.00	-0.45	0.96	-0.45	0.96
Firm Age	0.33	0.10	3.31	0.06	-0.16	0.22	-0.16	0.22
IPO Size	-0.25	0.56	-0.44	0.66	-1.37	0.87	-1.37	0.87
Allotment	0.56	0.14	4.18	0.00	-0.61	0.73	-0.61	0.73
UR	-0.02	0.10	-0.16	0.87	-0.21	0.18	-0.21	0.18
MC	-0.09	0.10	0.89	0.37	-0.11	0.28	-0.11	0.28

The R^2 of the model decreased further indicating that overall the explanatory power of these factors all together is declining. When we look at the F-statistics we see that the model is significant at %5 level. Among the coefficients, allotment continues to be the highest with 0.56. Firm age follows allotment with 0.33. For the statistical significance, constant term, firm age and allotment happen to be significant. The significance level of firm age declines compared to earlier regressions. Moreover, although underwriter reputation keeps its sign, it loses significance.

Table 4.23 will provide the estimation results for three months cumulative abnormal returns. The same factors will be included in the regression equation to check whether they determine three month returns.

Table 4.23 Regression Results for 3 Months CAR

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.64							
R Square	0.66							
Adjusted R Square	0.62							
Standard Error	0.20							
Observations	138							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	12.07	2.41	3.68	0.04			
Residual	132	190.10	1.44					
Total	137	202.16						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.27	0.04	6.17	0.00	-0.73	0.87	-0.73	0.87
Firm Age	0.19	0.11	1.72	0.09	-0.03	0.40	-0.03	0.40
IPO Size	1.05	0.64	1.64	0.10	-0.22	2.32	-0.22	2.32
Allotment	0.09	0.39	0.24	0.81	-0.86	0.67	-0.86	0.67
UR	-0.01	0.11	-0.09	0.93	-0.23	0.21	-0.23	0.21
MC	-0.23	0.11	2.08	-0.04	0.01	0.46	0.01	0.46

Overall the model is explanatory at %5 level. The R^2 of the model improved relative to 1-month model. Among the factors, the constant term, firm age, IPO size, and market condition series are explanatory. Firm age is statistically significant at %10 level like the IPO size. The market conditions turn out to be statistically significant at %5. The negative sign on market coefficient means that hot markets have a lower number of outperformers. However, it should be noted that the market condition in the previous regressions was insignificant and hence there might be robustness problems. The underwriter reputation and allotment are statistically insignificant for 3-months returns.

Table 4.24 Regression Results for 1 Year CAR

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.22							
R Square	0.25							
Adjusted R Square	0.21							
Standard Error	0.66							
Observations	138							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	2.89	0.58	1.34	0.25			
Residual	132	56.85	0.43					
Total	137	59.75						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.70	0.22	3.17	0.00	0.26	1.14	0.26	1.14
Firm Age	0.03	0.06	0.44	0.66	-0.14	0.09	-0.14	0.09
IPO Size	-0.34	0.35	-0.98	0.33	-1.04	0.35	-1.04	0.35
Allotment	0.20	0.21	0.93	0.36	-0.61	0.22	-0.61	0.22
UR	-0.09	0.06	-1.53	0.13	-0.22	0.03	-0.22	0.03
MC	-0.08	0.06	-1.23	0.22	-0.20	0.05	-0.20	0.05

When we investigate the longer term returns and performance of the initial public offerings, we see that for the first year returns, the factors are not explanatory. Also, the model overall is insignificant and the R^2 decreases to a very low level of 0.22. This might suggest that the factors we take into account are not explanatory for the long-run performance. The size of the series remains to be same with the previous estimation. The final regression will repeat the regression for two years cumulative abnormal returns.

Table 4.25 Regression Results for 2 Years CAR

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.19							
R Square	0.14							
Adjusted R Square	0.11							
Standard Error	0.44							
Observations	138							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	0.92	0.18	0.97	0.44			
Residual	132	25.16	0.19					
Total	137	26.08						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.04	0.15	0.28	0.78	-0.25	0.33	-0.25	0.33
Firm Age	0.02	0.04	0.39	0.70	-0.09	0.06	-0.09	0.06
IPO Size	-0.17	0.23	-0.73	0.47	-0.63	0.29	-0.63	0.29
Allotment	0.04	0.14	0.29	0.77	-0.24	0.32	-0.24	0.32
UR	-0.04	0.04	-0.90	0.37	-0.04	0.12	-0.04	0.12
MC	-0.08	0.04	-1.91	0.06	-0.16	0.00	-0.16	0.00

Table 4.25 shows us that the model becomes less explanatory when we consider the two-year abnormal cumulative returns. The R^2 of the model decreases even further to 0.14. The F-statistics demonstrates that the factors are insignificant jointly. Only, market condition series turn out to be statistically significant at %10 level. The other series keep their signs but lost their explanatory power. Since both of the long-term regression results revealed that the factors are not explanatory, we can conclude that the factors studied are not sufficient to explain the long-term performance. But they are able to indicate the changes in the short-term performance.

Conclusion

In this study, the initial public offering underpricing phenomenon for the Turkish market was analyzed. The attempt was to analyze the determinants of undepricing in the Turkish market. First part of the study dealt with an overview of the methods of IPO and which method has been chosen across countries. It has been documented that book building is becoming the dominant method in IPO markets; however, in Turkey all three ways of going public are still preferred by the issuing firms.

Next, the study focused on the regulations and laws regarding the procedure of offering stocks to the public. For this purpose, the US and the Turkish systems have been analyzed. Both countries require the firms, which are willing to offer shares through several steps of preparation and marketing. Besides the regulations, the associated costs of IPOs have been reviewed. The direct costs include underwriter fees, the fees paid to the regulatory agencies, advertisement, etc. The most important item of the costs for us is the indirect cost of underpricing. Underpricing is costly for the issuing firm since it means funds foregone.

The third part of the study extensively overviewed the theories of underpricing and how this anomaly can be explained. Most widely accepted and used explanations in the literature are based on asymmetric information models. We investigated several theoretical models that could help us to elucidate the pricing and the performance of the Turkish IPOs. Among these, winner's curse and signaling models have been given more emphasis.

After evaluating the models, the possible determinants we can derive from these were explored. Five determinants stood up as being empirically testable and important. These are firm age, IPO size, allotment, underwriter reputation, and market conditions. Each of these variables and the theories were attempted to

display why they could be explanatory and are reviewed in the third section as well.

The fourth section of the study focuses on the Turkish IPO markets. Before our own analysis was emphasized, existing studies about Turkey and evaluated their findings were examined. In general, the findings showed underpricing in the Turkish case. This is in line with the broader literature. However, the studies have focused on various aspects of IPO pricing and performance and have utilized distinct variables to illuminate these.

Only then, the initial abnormal returns around the world were compared via examining the studies across countries. The findings suggested that due to both country specific and more general reasons, like earnings quality, there is a big variation in the extent of IPO underpricing. Overall, the developing countries tend to have higher average IPO abnormal returns than their developed counterparts. Moreover, Europe has much lower initial mispricing than United States, and this has been attributed to the different laws and regulations concerning the IPO process.

The second part of chapter four discussed the methodological issues, the data, and presented the results. Initially, the cumulative abnormal returns were calculated, for the short-run, and for the long-run for all firms that went public between the years of 1996 and 2004. The sampling period had to be halted at 2004, since the long term performance of the IPOs, and the factors affecting it were sought to be tested.

The sample consisted of 140 firms that were not publicly owned. Among these 140 firms, we found that 52 had overpriced initial public offerings, while 6 were neither overpriced nor underpriced and finally 81 of them had underpriced shares. This is in line with the findings regarding other countries as well as the studies done for Turkey. The range of underpricing is considerable with the 35 per cent abnormal cumulative returns being the highest.

All of the five factors that were considered had statistically significant abnormal returns depending on the classification. For example, the older firms' initial abnormal returns were significantly lower than the younger firms, and in the long-run the older firms' IPOs have outperformed the younger firms' IPOs. The mean abnormal return for the IPOs where majority of the shares are sold or given to institutional investors for the first day was found to be higher than the shares mostly going to individual investors. This validates the winner's curse model, that institutional investors by having greater information ends up with more underpriced shares. The mean abnormal return for the IPOs, which are offered in the stock market when the market is hot, is significantly lower at the initial day. This points out the fact that the rising trend in the market helps the issuing companies to attract investors more easily. The first day mean abnormal return for the IPOs that are underwritten by well known banks or investment agencies was found to be %4 and this increased to %6 for the IPOs with badly reputed underwriters. Therefore, it can be stated that the underwriter's reputation seems to matter for the initial underpricing. Finally, the cumulative returns for the big IPOs are higher than the smaller size IPOs indicating the retained earning models' accuracy.

In the second part of the empirical examination, the performance of the underpriced and overpriced IPOs in the short and long run were focused. The findings revealed that the average abnormal cumulative returns for the underpriced sample are positive except for the very long-run, 2 years. The 1st week mean CAR is %4 whereas this increases to %85 for three months period. This showed that underpriced IPOs are outperforming the market in all periods except the very 2 years span. In the overpriced sample, the mean CAR for the 1st week was recorded as negative and it amounted to %23. The returns turned into positive later on and continued as such even in the long-run. This relationship pointed out the fact that the overpriced shares outperform the market both in the short-run and in the long-run.

The final step of the empirical evaluation tested the effects of the five factors on the short-run and long-run performance of the IPO stocks. The findings were that

in the short-run, firm age, allotment, IPO size and underwriter reputation are important in explaining the different performances. Our estimations also bestowed the expected signs on the factor coefficient, with the exception of IPO size. The positive sign on IPO size that was found in our regression estimations contradicts some of the findings in the literature that are based on retained earning's models. Nevertheless, all the factors lost their explanatory power in the long-run. Only market conditions turned out to be statistically significant for the two-year cumulative abnormal returns. The model was insignificant in the two-year case.

This study was limited to the analyses of the performances of IPOs in Istanbul Stock Exchange for the period of 1996-2004. The determinants of underpricing in Turkey were aimed to be revealed; as well as exploring long run IPO performance. A further research; on the other hand, should focus on the possible causes and clarifications for the longer-term performance; as well as amplification of the outperformance of overpriced stocks in the long-run.

Based on the empirical tests and results of this study, we can conclude that there is a pervasive underpricing phenomenon in Turkey. The underpriced and overpriced IPOs both outperform the market in the short-run but the underpriced stocks stopped outperforming after the first year. Some of the factors that have been widely accepted in the literature, such as firm age, underwriter reputation, allotment, and IPO size, proven to be important for the pricing and performance behavior for the short-run in the Turkish stock market. These variables; however, are not sufficient to explain the long-run performance.

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