The Market Performance of Initial Public Offerings in the İstanbul Stock Exchange

Recep Bildik*
Mustafa K. Yılmaz**

Abstract

This study examines the long-standing IPO performance in the Istanbul Stock Exchange (ISE) by using new factors such as source of shares (new issue or sale of large shareholders), allocation of shares and dispersion of investors as well as existing factors such as market conditions (hot/cold), underwriters' reputation, and firm characteristics (firm size, E/P, and B/M ratios) in the period of 1990-2000. Our results differ from the previous studies at least three ways. First, the magnitude of underpricing is significantly lower, while underperformance is higher than those of in other studies. Our strong evidence supports the existence of the underpricing by positive initial excess returns (5.94%) and the long-term underperformance up to three-year holding period (-84.5%) in the ISE. Second, underperformance starts much earlier than in other markets i.e. at the end of first month following the IPO because of myopic behavior of investors seeking short-term returns. Third, the underperformance disappears for IPOs made in a cold market, and those made through the sale of large shareholders. Allocation of shares in an IPO and firm size also impact after-market performance of shares.

Keywords: *Initial Public Offerings, Underperformance, Underpricing, Market Efficiency, Emerging Markets.*
JEL Classification: *G14, G12, G15*

Özet - İMKB'de İlk Halka Arzların Piyasa Performansı

Bu çalışmada, İstanbul Menkul Kıymetler Borsası (İMKB) nda 1990-2000 yılları arasında yapılan ilk halka arzların uzun dönemli performansı, piyasanın durumu (hareketli/durağan), halka arza aracılık eden kurumların ünü ve hisseleri halka arz edilen şirketlerin özellikleri (şirket büyüklüğü, F/K ve PD/DD oranları) yanında, hisse ihracının kaynağı (yeni hisse ihracı veya büyük ortakların satışı), ihraç edilen hisse senetlerinin yatırımcılar arasındaki dağılımı ve yatırımcıların farklılığı gibi yeni faktörler kullanılarak analiz edilmiştir. Çalışmanın sonuçları, ayn konuda daha önce yapılmış çalışmalarda ortaya konulan bulgulardan üç yönden farklılık göstermektedir. İlk olarak, diğer çalışmalarla karşılaştırıldığında, ilk halka arzdaki düşük fiyatlamanın (underpricing) boyutu daha küçük olmakla birlikte, halka arz edilen hisse senetlerinin uzun dönemli getirilerinin düşük performansının (underperformance) daha yüksek boyutta olması dikkat çekmektedir. Çalışmadaki kısa dönemli pozitif getiriler (% 5.94) düşük fiyatlamayı, uzun dönemli negatif getiriler (% -84.5) ise uzun dönemdeki düşük performansı güçlü olarak desteklemektedir. İkinci olarak, İMKB'de düşük performans, dalgalı piyasada kısa dönemde yüksek getiri elde etmek isteyen yatırımcıların kısa ufuklu bakış açısı nedeniyle diğer piyasalarla karşılaştırıldığında daha erken bir dönemde (halka arzı izleyen birinci ayın sonunda) başlamaktadır. Üçüncü olarak ise, piyasanın cazip olmadığı (durağan olduğu) yıllarda ve büyük ortakların satışı şeklinde gerçekleştirilen ilk halka arzlarda uzun vadedeki düşük performansın ortadan kalktığı gösterilmektedir. İlk halka arzlarda hisse senetlerinin dağılımı ve firma büyüklüğü de hisse senetlerinin ihraç sonrası performansı üzerinde etkili olmaktadır.

Anahtar Kelimeler: *İlk Halka Arz, Performans, Piyasa Etkinliği, Gelişen Piyasalar.*
JEL Sınıflaması: *G14, G12, G15*

* *Kokkalis Fellow in the Kennedy School of Government, Harvard University and also Stock Market Assistant Director at the İstanbul Stock Exchange.*
** *Chief of Staff Director, İstanbul Stock Exchange.*
The opinions expressed do not necessarily represent those of the İstanbul Stock Exchange.

1. Introduction

The puzzle of initial public offerings' (IPOs) pricing both in the short and long-run has become a riveting example of pervasive market inefficiency. Ritter (1991) and Loughran and Ritter (1995) document severe underperformance of IPOs during the past 25 years in US. They show that companies issuing stocks during 1970-1990, significantly underperform relative to non-issuing firms for five years after the offering date. Many researchers confirmed that underperformance extends to other countries as well as to seasoned equity offerings. For example, Loughran, Ritter, and Rydqvist (1994), Kang and Stulz (1996), Cai and Wei (1997), Hamao, Packer, and Ritter (1998), Levis (1993), Carter, Dark, and Singh (1998), Affleck-Graves, Hedge, and Miller (1996), Field (1995), Hanley (1993), Aggarwal, Leal, and Hernandez (1993), Loughran (1993) are a few of the studies that show IPOs on average underperform the market index over a two-to-five year period in the aftermarket in a wide range of countries developed as well as developing markets. However, in some countries, the long-run performance is more pronounced. For instance, in Germany, Stehle, Ehrhardt, and Przyborowsky (2000) estimate that IPOs underperform a portfolio consisting of stocks with a similar market capitalization by 6% in a three-year period. Loughran et al. (1994) illustrate that IPO returns do not significantly differ from market returns in Sweden. Aggarwal, Leal and Hernandez (1993) report three-year market adjusted returns of –47.0%, -19.6% and -23.7% for Brazil, Mexico and Chile, respectively, which are the representative examples for emerging markets like Turkey. At the extreme, Kiymaz (1997, 2000) finds positive post-listing abnormal returns for Turkish IPOs in the long-run.

Previous studies also demonstrate that IPOs, on average, are underpriced relative to the first trading day closing price. Welch (1989) reports an average underpricing of 26% for 1028 IPOs issued during 1977-1982, Ritter's (1984) analysis shows an average underpricing of 26.5%, Booth and Chua (1996) find an average underpricing of 13.1% for a sample of 2151 IPOs during 1977-1988, and Keloharju (1993) cites an average underpricing of 8.7% for Finnish IPOs. Other research indicates a positive relation between the initial day return and aftermarket underperformance.[1] Ritter (1991) finds a negative, but statistically insignificant relation between initial IPO returns and three-year aftermarket performance.

Although extensive amounts of research, mostly on the US markets, variously indicate the existence of short-term outperformance and long-term underperformance of IPOs, there is no consistent and conclusive evidence of the determinants of this phenomenon, particularly through the examination on international data. However, it is important for the policy-makers, portfolio managers, shareholders and corporate managers. Hence, the purpose of this study is not only to examine the

(1) Ibbotson, Sindelar, and Ritter (1994), Carter, Dark, and Singh (1998), Affleck-Graves, Hedge, and Miller (1996), Foerster and Karolyi (1999)

performance of IPOs in the Turkish market by providing additional evidence from a leading emerging market to understand whether the IPO puzzle is a sample-specific or world-wide phenomenon, but also to scrutinize the factors that affect the performance of IPOs through new factors such as source of shares sold in the IPO (new issue or sale of large shareholders), ownership of foreign investors, and number of investors at the IPO representing the divergence of investors' opinions, as well as factors used in previous studies such as firm size, earnings-to-price ratio, book-to-market ratio, underwriters' reputation, and market conditions (cold vs. hot market).

There are few studies that examine this issue in emerging markets, which have different risk and return characteristics than developed markets. There are also several underlying differences that inform the IPO process in the Turkish capital market. For example, intermediary institutions rarely underwrite an issue because of the high- risk profile in the market due to political and macroeconomic instability during our sample period. Hence, our paper makes an important difference from other studies. Another distinguishing difference underlying our research is that all IPOs adopted the fixed-price offer method, which is published in the prospectus, before the offer starts.

This study also aims to shed further light on questions that remained unclear in previous studies in the literature such as: Does the underperformance of IPOs reflect reversal of high initial returns? Is there a systematic relation between long-term underperformance and first-day returns? Is there a recovery in the underperformance in a long- term period? And, finally, what are the determinants of post-issue performance of stocks? These issues are important because they have implications for a large body of literature dealing with the short-run underpricing phenomenon. To address these questions, this paper is divided into five sections. Section 2 highlights the recent literature about IPOs performance in the long run, while Section 3 gives a short description of the IPO procedure in Turkey including data and methodology used in the study. Section 4 shows the results of the empirical analyses. Finally, Section 5 concludes the paper.

2. Literature Review

While a large body of research examines different aspects of the post-IPO stock return performance of new listings, little has been documented regarding the firm-specific characteristics that are associated with the IPO puzzle. Jain and Kini (1994) report that occasionally financial performance ratios of firms that go public fall dramatically in the three-year period following the IPO. Mikkelson and Shah (1994) indicate that IPOs have poor subsequent returns due to misvaluations of the firm by the time it goes public. Loughran and Ritter (1995) also find that holding both size and book-to-market ratio constant, issuing firms have lower subsequent returns than non-issuers. This evidence remains consistent with a market in which firms capitalize on their shares being overvalued during an IPO. Brav and Gompers (1997) find that venture-backed IPOs outperform non-venture-backed IPOs using equal-weight-

ed returns. Value-weighting substantially reduces underperformance. In contrast, Hamao et al. (1998) find no difference for the performance of venture-backed IPOs.

Short-term underpricing and long-term underperformance suggests that investors may systematically be too optimistic about the prospects of the firms that are issuing equity for the first time. Rajan and Servaes (1997) state that security analysts are systematically overoptimistic about the earnings potential and long-term growth prospects of the recent IPOs. Miller (1997) explains IPO underperformance assuming divergence of investor opinions, if there are no short sales. Morris (1996) also shows that heterogeneity of beliefs can support an over-valued IPO right after the issue relative to the long-run value. Brav and Gompers (1997) mentioned that bouts of investment sentiment are a possible explanation for their underperformance, since individuals are more likely to be influenced by fad, misleading or incomplete information spread by rumors during an IPO. Shiller (1990) argues the IPO market is subject to fads exploited by intermediary firms that manage the IPO through underpriced issues. Such fads must eventually fade leading to long-run low performance.

Recently, Krigman et al. (1999) find an interesting link between the initial trading volume and the long-term performance: first-day winners continue to be winners over the first year, and first- day losers continue to be losers. The exception is extra-hot IPOs, which are seriously underpriced, and yield the worst future performance since major informed investors sell shares on the first trading day. Thus, sales of insiders indicate long-run negative performance. Loughran and Ritter (2000) posit that underperformance is more severe in high-volume trading periods than in low-volume periods.

3. Empirical Research

3.1. Institutional Specifications of the ISE

The Istanbul Stock Exchange (ISE) was established in 1986, and has shown rapid growth since then. As a leading emerging market, the ISE's progressive infrastructure and unique dynamism increasingly attracts international interest. On average, international institutional investors own 50% of the free float of the shares at the ISE. Total market capitalization is approximately US$ 100 billion. This is a highly active market, with an average daily trading value of US$ 753 million and 287 listed stocks as of year-end 2002. The ISE is an order-driven, multiple-price, continuous auction market with no market makers or specialists. The trading is realized through a computerized trading system. The "National-100 Index" (ISE-100), which is the main market indicator of the Istanbul Stock Exchange, is a market capitalization-weighted index that represents at least 80% of the total market capitalization, traded value, number of shares traded, and number of trades realized in the market.

A company seeking to go public and then listing in the ISE should, first, make an agreement with an investment bank (brokerage firm) that will subsequently manage

and conduct the IPO process. After shares to be issued are registered by the Capital Market Board (SEC of Turkey), a legal notice and a prospectus are published specifying the number of shares to be offered to the public, including the price and the date of the offer. The intermediary brokerage house managing the IPO prepares the circular and prospectus. The company chooses between a fixed price offer or tender.[2] In a fixed price offer, the brokerage house managing the IPO fixes the price of the issue long before the offer is made public and distributes the shares at this fixed price. Once the price of the issue is determined, it can neither be changed in response to emerging demand nor can it be withdrawn. While the shares are offered to the public at a fixed price, the issue might be partially or fully underwritten by an intermediary brokerage house that manages the IPO. In practice, investment banks or brokerage houses never or rarely underwrite the issue in Turkey because of the high political risk volatility in the country. If there is excessive demand for the IPO, the IPO manager must allocate the shares based on the "fairness" rules stated in the regulations of the Capital Market Board. In addition to the valuation, preparation of the circular and the prospectus of the issuer company plus all red-tape documentation and application procedures, the main function of the IPO manager is to sell and distribute the shares. After the offer is made to the public and the shares are sold, the issuing company applies to the Exchange for listing. After a short period of examination by the ISE that begins before the actual offer is made the new shares start trading at the ISE.

3.2. Data and Methodology

There are 244 firms in the ISE that went public from 1990-2000. The companies that did not have data for more than 12 months were excluded from our sample. If the offering firm is delisted or merges with another firm, the holding-period returns of that firm are truncated on the same day. Only 10 firms, which have one of these conditions, are deleted from the main IPO file. Thus, we use a sample of 234 companies going public and listed on the ISE in this period and their return data of 1990-2003.[3] All data are obtained from the ISE.

We calculate the buy-and-hold returns from the IPO price to the anniversary date of the offering since there are no allocation problems or concerns regarding excluding the first trading day price as considered by Loughran and Ritter (1995). For example, in Turkish IPOs, all investors are capable of buying shares at a fixed IPO price, which is announced long before the offer date. To measure the long-run performance of IPOs, we compute an aftermarket return from purchasing the stocks at the IPO price. The

(2) Companies that want to go public, most often prefer the "offer for sale at a fixed-price" method in Turkey because of the high uncertainty in the political and macroeceonomic environment.

(3) There are just few companies went public between 2001 and 2005 because of the negative market conditions following the global market crash in 2000 and the devastating local economic crisis in February 2001.

aftermarket consists of the following 36 months, where months are defined as successive 21-trading day periods. We computed only holding-period returns since Conrad and Kaul (1993) show that long-term cumulative adjusted returns are potentially biased.

We have not examined beyond three years like Loughran (1993), who shows that IPO underperformance extends beyond three years, since our sample period is limited to only 11 years. Market return, which is computed by the daily change in the ISE-100 index as a representative of market portfolio, is used as a benchmark to measure the abnormal return of IPOs.

The percentage abnormal buy-and-hold return for an IPO stock i (ARi) is calculated as formula (1);

$$AR_i = R_i - R_m \qquad (1)$$

R_i = Return on stock i computed for various holding periods from one day up to three years (1, 2, 3, 4, 5 trading days, 1, 3, 6, 12, 24, 36 months following the IPO)[4]

R_m = Return on market portfolio (value-weighted ISE-100 index) over the same period of stock i.

We used both parametric (t-test) and non-parametric tests (sign and Wilcoxon signed rank) to test the statistical significance of findings since the returns in our sample have non-normal distribution characteristics. Abnormal returns used in this study are not explicitly adjusted for systematic risk. Instead, we used market beta to adjust the returns of IPO stocks for systematic risk. The assumption that the beta is equal to 1.00 is unlikely to affect the essence of our results.

Based on the evidence in previous studies, the sample is also divided into several categories to determine the nature of the observed average long-run underperformance. First, the performance of IPOs is examined by each calendar year to determine if the underperformance is skewed in certain years of study. Then, the sample is classified according to various firm characteristics, such as firm size, earnings-to-price ratio, book-to-market ratio, foreign institutional ownership represented by the fraction of shares that are sold to foreign institutional investors at the IPO, underwriters' reputation, market conditions (cold vs. hot market), number of investors, issue size in US Dollars, source of shares that are sold at the IPO, i.e., from capital increase (rights issue) or sale of large shareholders. Industry classification is not used since the number of firms in the sample is limited and may lead to biased results.

4. Empirical Findings

Table 1 reports the summary statistics for the abnormal (buy-and-hold) returns of an equally weighted portfolio that consists of 234 IPO stocks traded during the period 1990-2003. Initial abnormal returns are positive and statistically significant (at

(4) The returns are not adjusted by the inflation.

the 0.01 level). In other words, on average, the IPO stocks generate 5.94% more return on their first trading day than the other stocks in the market. This short-term outperformance (initial underpricing) following the offering is consistent with the short-term positive abnormal IPO returns found in several studies. Our results provide some evidence of reversal in prices of stocks starting from one month following the IPO, as the median return declines significantly, even to negative (-1.19%) at the end of the first month. This means that half of the IPO stocks provide lower returns than the market portfolio even by the end of the first month after the IPO. After the first 24 months, the average abnormal return of IPO stocks is strongly negative (-13.03%), and reached to –84.50% at the end of the 36-month holding period, a finding which is similar to but significantly higher than that of Ritter (1991) (Figure 1 and 2). Thus, IPOs in the ISE underperform the market significantly even in shorter holding periods (i.e., one month) than the case in other stock markets, in particular, when the median returns are considered. The magnitude of this underperformance carries much economical weight.

Table 1: Table 1: Summary Statistics for Abnormal Returns of IPOs (Equal-weighted)

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0594***a	0,0783***a	0,0889***a	0,0962***a	0,1037***a	0,1421***	0,1688***	0,0874	0,0234a	-0,1303a	-0,8450a
t-value	(7,30)	(5,88)	(5,01)	(4,60)	(4,34)	(3,31)	(2,70)	(1,32)	(0,14)	(-1,03)	(- 1,51)
Median	0,0422	0,0433	0,0202	0,0218	0,0276	-0,0119	-0,0098	-0,0504	-0,1842	-0,5343	-1,9454
Std. Dev.	0,1224	0,1987	0,2608	0,3092	0,3520	0,6360	0,9103	0,9052	1,3095	2,9566	7,8818
Kurtosis	1,3437	2,6744	3,1057	3,8779	5,5842	20,4352	32,0072	8,8476	14,5428	8,5568	24,0715
Skewness	0,3066	0,1768	1,0269	1,3822	1,7492	3,3984	4,3911	2,1709	2,8291	2,4207	4,0927
Min.	-0,3495	-0,8017	-0,8219	-0,8179	-0,8269	-1,0840	-1,3267	-2,2322	-2,8990	-5,5650	-10,9136
Max.	0,5858	0,7841	1,0858	1,4599	1,8111	5,2384	8,5088	5,6969	9,0215	17,1856	57,3014
Count	234	234	234	234	234	234	234	234	232	223	190
Wilcoxon	(6,61)	(5,27)	(3,79)	(3,14)	(2,94)	(0,83)	(0,51)	(0,99)	(2,65)	(5,10)	(5,56)

*, **, and *** statistically significant at 0.10, 0.05 and 0.01 levels, respectively at the t test, whereas a, b, and c statistically significant at 0.01, 0.05 and 0.10 levels at Wilcoxon signed-rank and sign tests, respectively.

Figure 1: The Market Performance of IPOs in the ISE

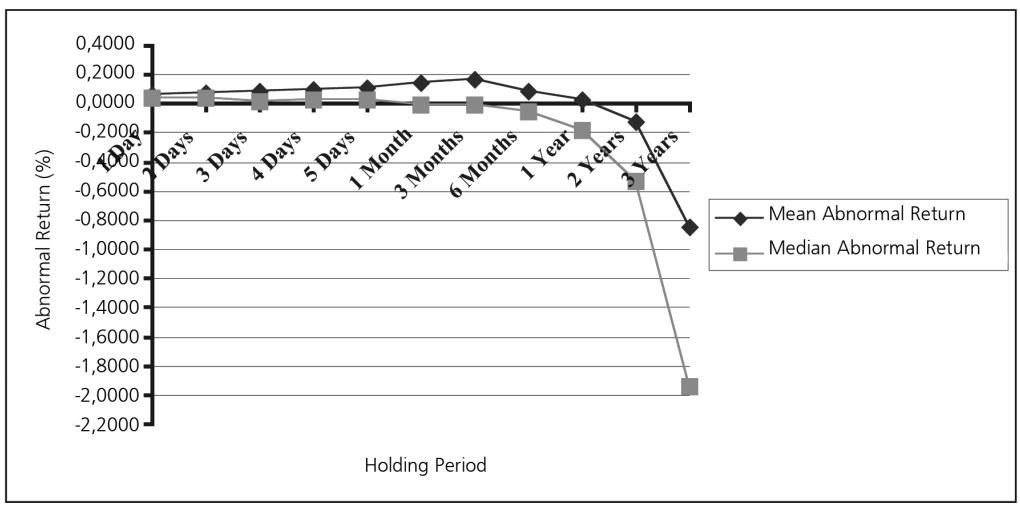
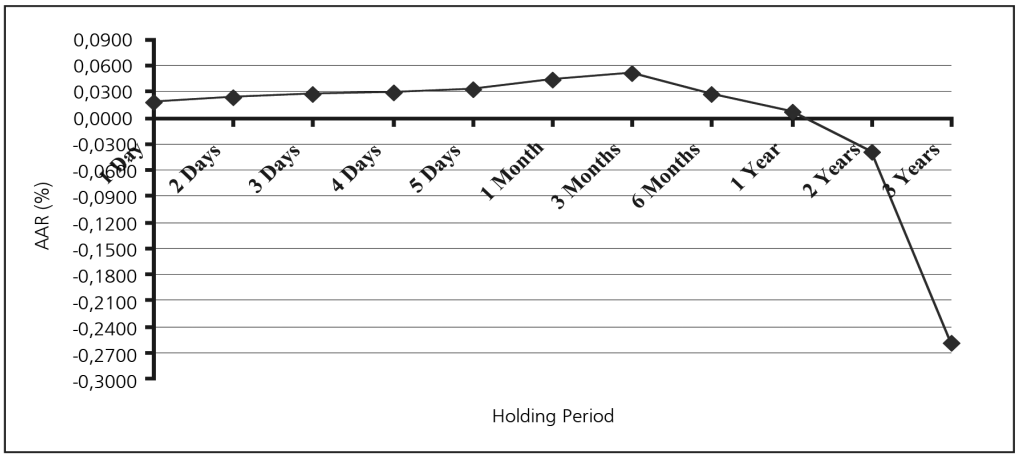


Figure 2: The Average Value-Weighted Abnormal Returns of IPOs in the ISE



To examine the existence of the underperformance phenomenon of IPOs across years and to investigate the relation between annual volume of issues, first day returns and long-run performance, IPOs are categorized by their year of issuance. Table 1-A and 1-B presents the distribution of IPOs across years. The number of IPOs fluctuates from year to year. It seems that initial returns are persistently large across years, whereas the long-run performance varies depending on the year of issuance. In most of the years, however, the average, and in particular, median long-run abnormal returns of IPOs, are lower than the market. For instance, in nine out of eleven years, median abnormal returns are less than the market return for the one-year holding period. Similarly, the median abnormal returns of IPOs indicate underperformance in eight out of eleven years for both two-year and three-year holding periods. The pattern is similar for the average abnormal returns across years, but the results are relatively mixed due to the non-normal skewed distribution of the average returns across years. There are notable occurrences of outperformance in some years for different investment horizons as well. For example, IPOs made in 1993 and 1999 seem to outperform their benchmarks in the long run according to both the average and the median returns. On average, more than 70% of the stocks underperform the market following the first year after the issue. In sum, in spite of some differences across years of issuance, the findings are in favor of our previous findings: IPOs consistently underperform the market in long holding periods on the ISE.

Table 1-A: The Average Abnormal Returns of IPOs Across Years

Year	# of IPOs	Proceeds (Million USD)	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
1990	25	898,54	0,0021	0,0300	0,0324	0,0221	0,0270	-0,0255	0,0050	-0,0271	-0,0134	0,0100	0,2966
1991	22	365,47	-0,0135	-0,0018	0,0008	-0,0232	0,0050	-0,0393	-0,0599	-0,0075	-0,0052	0,8631	2,0324
1992	10	72,49	0,0437	0,0458	0,0393	0,0391	0,0465	-0,0330	-0,0017	-0,0164	-0,4195	1,2845	0,2229
1993	16	156,00	0,0858	0,1750	0,2577	0,3228	0,3734	0,9555	0,9343	0,8669	1,2545	2,7114	7,1169
1994	20	229,94	0,0550	0,0303	0,0581	0,0520	0,0546	-0,1124	-0,1412	-0,1912	0,0267	-0,6414	-4,4057
1995	27	223,21	0,0818	0,1384	0,1583	0,2039	0,2235	0,1443	0,3667	0,1330	-0,1167	-0,8951	-2,1003
1996	26	164,92	0,0584	0,0321	0,0204	0,0212	0,0150	0,0833	-0,0129	-0,0517	-0,5350	-1,4212	-3,0671
1997	30	425,25	0,0498	0,0490	0,0296	0,0290	0,0072	-0,0050	-0,1606	-0,2417	0,0689	-1,0606	-3,2936
1998	22	383,35	0,0919	0,1072	0,1149	0,1325	0,1274	0,1735	0,2675	0,1944	-0,0896	-0,9614	-1,3093
1999	9	87,41	0,0768	0,0765	0,0930	0,1406	0,2496	0,2759	0,4761	0,6350	0,9452	0,8021	0,0936
2000	37	2.800,04	0,0667	0,1136	0,1358	0,1383	0,1464	0,3170	0,4177	0,2484	0,0013	0,0235	
Total	**244**	**5.806,62**											

Table 1-B: The Median Abnormal Returns of IPOs Across Years

Year	# of IPOs	Proceeds (Million USD)	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
1990	25	898,54	0,0168	0,0222	0,0247	0,0102	0,0359	-0,0164	0,0283	0,0011	-0,0223	-0,1823	0,0064
1991	22	365,47	-0,0060	-0,0310	-0,0364	-0,0892	-0,0850	-0,0657	-0,0774	-0,1241	-0,2017	-0,7212	-2,0860
1992	10	72,49	0,0325	0,0446	0,0177	-0,0161	-0,0231	-0,0557	-0,1955	-0,1145	-0,4168	0,4085	-1,4989
1993	16	156,00	0,0926	0,1953	0,3214	0,3244	0,4291	0,5676	0,7477	0,0951	0,1830	0,4112	1,1185
1994	20	229,94	0,0766	0,0567	0,0252	0,0411	0,0475	-0,0503	-0,0875	-0,1681	-0,1625	-0,6502	-5,3510
1995	27	223,21	0,0378	0,0279	0,0087	0,0273	-0,0012	0,0034	0,0278	0,0248	-0,2128	-1,5277	-4,4829
1996	26	164,92	0,0219	0,0199	0,0183	0,0092	0,0034	-0,0409	0,0483	0,0059	-0,6776	-2,1744	-4,2940
1997	30	425,25	0,0475	0,0303	0,0023	-0,0087	-0,0130	-0,0681	-0,2577	-0,4544	-0,3857	-1,3350	-3,1218
1998	22	383,35	0,1059	0,0663	0,0326	0,0584	0,0487	0,0382	0,0161	-0,0800	-0,3051	-1,8322	-1,5170
1999	9	87,41	0,0828	0,0457	0,0367	0,0518	0,0605	0,0122	0,2487	0,3669	0,8037	0,2204	-0,1433
2000	37	2.800,04	0,0525	0,0452	0,0116	0,0407	0,0170	0,0563	0,0596	0,0150	-0,1668	-0,0289	
Total	**244**	**5.806,62**											

To detect more evidence on the relation between the initial- and long-run performance, the firms are categorized into five groups according to their first day returns.[5] The average 36-month holding period returns also provide some evidence for a relation between the performance of initial and long-run IPOs. IPOs with the highest initial abnormal returns generate the lowest long-term returns (-146.40%), while IPOs with the lowest initial abnormal returns generate the largest (but still negative, -2.21%) abnormal returns across groups. These findings support Ritter (1991), who argues that long-run underperformance is positively related with initial abnormal returns; however, the evidence is neither consistent nor strong.

We also computed the value-weighted abnormal returns. The results in Table 2 show that post-issue performance of IPOs is significantly affected by the size of the firms. Value-weighted abnormal returns display additional evidence for the existence of underperformance in both small and large firms. However, smaller firms are associated with more severe underperformance. Value-weighted (issue) average abnormal returns of IPOs are significantly lower than those of equal-weighted IPOs both for short- and long- holding periods. Although the underperformance of IPOs is mostly due to small firms and can at least partially be explained by the firm size.

Table 2: Summary Statistics for Abnormal Returns of IPOs (Value-weighted)

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0183***[a]	0,0241***[a]	0,0274***[a]	0,0296***[a]	0,0319***[a]	0,0437***	0,0520***	0,0269	0,0072[a]	-0,0401[a]	-0,2602[a]
Std. Err.	0,0025	0,0040	0,0052	0,0062	0,0071	0,0128	0,0183	0,0182	0,0265	0,0610	0,1760
Median	0,0130	0,0133	0,0062	0,0067	0,0085	-0,0037	-0,0030	-0,0155	-0,0567	-0,1645	-0,5989
Std. Dev.	0,0377	0,0612	0,0803	0,0952	0,1084	0,1958	0,2803	0,2787	0,4032	0,9103	2,4266
Kurtosis	1,3437	2,6744	3,1057	3,8779	5,5842	20,4352	32,0072	8,8476	14,5428	8,5568	24,0715
Skewness	0,3066	0,1768	1,0269	1,3822	1,7492	3,3984	4,3911	2,1709	2,8291	2,4207	4,0927
Min.	-0,1076	-0,2468	-0,2531	-0,2518	-0,2546	-0,3338	-0,4085	-0,6872	-0,8926	-1,7133	-3,3600
Max.	0,1803	0,2414	0,3343	0,4495	0,5576	1,6128	2,6197	1,7539	2,7775	5,2911	17,6418
Count	234	234	234	234	234	234	234	234	232	223	190

Then, in order to determine the nature of the observed average long-run underperformance, our sample is classified into three groups of stocks that contain equal numbers of IPOs. Specific criteria analyzed include: firm and issue size, number

(5) Not presented here due to space constraints.

of investors at the IPO, foreign institutional ownership, source of shares in the IPO, market conditions (hot vs. cold market), underwriters' reputation, firms' risk and valuation (E/P, B/M ratios).

IPO Size: One key size benchmark (Table 3), the proceeds in USD generated from the IPOs, indicates that the smaller the IPO, the greater the abnormal return of stocks up to six months following the IPO. Interestingly, the picture is reversed after six months, when the small firms start to lose their appeal to investors because of their significantly lower returns than larger firms. Although underperformance seems to be stronger for the smaller firms in the long run, it is not only due to small firms since the average abnormal returns of the largest firms is also significantly negative over the 24-month and 36-month holding periods. In sum, our findings here parallel those related to firm size. A positive relationship between issue size and long-run performance is also consistent with Levis (1993) and other studies of the US markets. Usually, issue size and company size are strongly correlated and so the larger negative returns of small size issues might be generated by their financially distressed position. Many small firms want to go public to raise a capital to finance their new investment projects and reduce their high level of debt. If the outcome of these projects ends up with failure, this situation puts them in a more distressed position, which eventually is reflected in share prices.

Table 3: Abnormal Returns of IPOs Based on Issue Size (USD Proceeds)

Large	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0454***a	0,0460***b	0,0311	0,0193	0,0174	0,0017	0,0437	-0,0102c	0,1182 c	-0,2349a	-0,8202 b
Std. Err.	0,0119	0,0179	0,0199	0,0216	0,0220	0,0419	0,0572	0,0641	0,1517	0,2649	0,7967
Median	0,0344	0,0260	0,0092	-0,0092	-0,0168	-0,0256	-0,0318	-0,0857	-0,1870	-0,3894	-1,6821
Std. Dev.	0,1049	0,1578	0,1762	0,1911	0,1946	0,3697	0,5048	0,5662	1,3314	2,2629	5,8546
Count	78	78	78	78	78	78	78	78	77	73	54
Medium	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0711***a	0,1046***a	0,1148***a	0,1185***a	0,1197***a	0,1085**	0,0869	0,0466	0,0214	0,5020	-1,2087a
Std. Err.	0,0130	0,0197	0,0280	0,0311	0,0334	0,0483	0,0701	0,0864	0,1552	0,4361	1,1844
Median	0,0747	0,0569	0,0563	0,0478	0,0506	-0,0176	-0,0140	-0,0069	-0,1643	-0,3174	-3,1218
Std. Dev.	0,1151	0,1739	0,2470	0,2750	0,2953	0,4264	0,6187	0,7632	1,3529	3,8022	9,5490
Count	78	78	78	78	78	78	78	78	76	76	65
Small	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0617***a	0,0843***a	0,1208***a	0,1508***a	0,1740***a	0,3161***b	0,3759**c	0,2259	-0,0792	-0,6765**a	-0,5309a
Std. Err.	0,0163	0,0283	0,0373	0,0463	0,0551	0,1046	0,1521	0,1408	0,1425	0,2836	0,9053
Median	0,0478	0,0593	0,0379	0,0518	0,0592	0,0193	0,0378	0,0167	-0,2887	-0,8769	-1,9370
Std. Dev.	0,1439	0,2501	0,3297	0,4093	0,4869	0,9241	1,3431	1,2432	1,2582	2,4393	7,6282
Count	78	78	78	78	78	78	78	78	78	74	71

Number of Investors at IPO: We also use the number of investors, who bought shares from the IPOs, as a representative of both size of the IPO and the distribution of allocated shares in the IPO. A larger number of investors might represent not only the size of the IPO but, more importantly, the interest attracted by the IPO.

The more investors participate in the IPO, the larger initial returns might be expected as a result of excess demand in the IPO shares and eventually the larger the underperformance may be in the long run. This variable might also evidence the level of dispersion among investors by providing insight into investors' general view of the company's valuation. That is, a larger number of investors might show higher level of overvaluation attributed to the issue by the market as a whole. Thus, IPOs with more investors may well result in larger initial abnormal returns because of market psychology, especially under hot market conditions, which reverse to underperformance in the long-run after investors realize they were too optimistic about the value of the IPO (overvaluation) during the initial IPO offering. Consistent with this, Pham et al. (2003) argue that underpricing could be used to increase the number of new investors in IPOs and to decrease the inequality of shareholder distribution so as to encourage greater ownership dispersion towards higher after-market liquidity. They show that the higher the underpricing, the more investors participate to the IPO, and the more evenly distributed shareholder structure becomes. This variable is strongly and positively related with the level of oversubscription given the regulation of allocation of IPO shares in Turkey. This can lead to a more equitable distribution among bidders. So, the number of investors who bought shares in an IPO, shows how heterogeneous their expectations on company value. In other words, number of investors which is a signal for the over or under subscription and also the degree of equal allocation of shares in IPO, shows to what degree the IPO is undervalued or overvalued. A number of studies show that an issue's success is directly related to its attraction to small investors.[6] Like Turkey, some countries also mandate a significant degree of ownership spread.

The sample of stocks analyzed is divided into three groups defined by the number of investors in the IPO. Table 4 displays the summarized statistics of the abnormal returns for each of these groups. Consistent with our expectations, the average abnormal initial return of IPOs of the first group (9.19%), which consists of the largest number of investors, is significantly higher than the last group with the smallest number of investors (7.18%). The outperformance of IPOs with the largest number of investors lasted until the end of the first six- month period following the IPO, then the trend reverses. Twenty-four months after the IPO, the average return of the first group dropped to negative (-55.79%), while the average return of the third group of stocks increased 12.96%, which is 68% higher than the former group. The data show that the IPOs with fewer investors outperform the IPOs with a larger number of investors in the long-run. However, the test results are weak.

(6) See for example Ibbotson and Ritter (1995)

Table 4: Abnormal Returns of IPOs Based on Number of Investors at IPOs

High	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0919***a	0,1189***a	0,1164***b	0,1070***c	0,0863**	0,1722***	0,2205***b	0,1966*	-0,0199	-0,5579**a	-2,0957a
Std. Err.	0,0156	0,0284	0,0359	0,0367	0,0361	0,0672	0,0827	0,1136	0,1288	0,2447	1,2809
Median	0,0856	0,0491	0,0097	0,0035	0,0018	0,0075	0,1103	0,0233	-0,1598	-0,3391	-2,8906
Std. Dev.	0,1102	0,2005	0,2540	0,2592	0,2555	0,4749	0,5845	0,8032	0,9108	1,7302	6,5315
Count	50	50	50	50	50	50	50	50	50	50	26
Medium	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0424**b	0,0616***b	0,0733**c	0,0826**	0,0855**	0,0769	0,0530	0,0674	0,1171	-0,4811a	-1,7774**a
Std. Err.	0,0175	0,0246	0,0325	0,0381	0,0406	0,0645	0,0962	0,1135	0,2520	0,3347	0,8156
Median	0,0442	0,0193	0,0175	0,0029	0,0131	-0,0036	-0,1227	-0,1642	-0,3097	-0,9371	-2,3751
Std. Dev.	0,1236	0,1736	0,2295	0,2691	0,2870	0,4563	0,6800	0,8025	1,7820	2,3668	5,4714
Count	50	50	50	50	50	50	50	50	50	50	45
Low	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0718***a	0,0689***a	0,0914**a	0,1201***b	0,1195**b	0,2111	0,1400	-0,0588c	0,1122	0,1296c	-1,1404a
Std. Err.	0,0125	0,0279	0,0400	0,0483	0,0593	0,1335	0,1295	0,1763	0,2497	0,5601	1,3380
Median	0,0625	0,0745	0,0427	0,0537	0,0493	-0,0409	-0,0948	-0,1952	-0,1530	-0,8847	-3,1218
Std. Dev.	0,0886	0,1972	0,2831	0,3417	0,4192	0,9443	0,9159	1,2465	1,7658	3,9604	9,3660
Count	50	50	50	50	50	50	50	50	50	50	49

Foreign Institutional Ownership: Earlier evidence by Fields (1995) shows that the IPOs having larger institutional shareholdings significantly outperform those with smaller institutional shareholdings. In addition, if investor sentiment is an important factor influencing the underperformance of IPOs, small IPOs may be more affected. Individuals are more likely to hold the shares of small IPOs since many institutional investors are restricted from holding less liquid small-cap stocks. To our knowledge, there is little direct evidence in the literature regarding the effects of foreign institutional investors who bought shares in IPOs on the IPO performance. Similar to the share of foreign ownership, Pham et al. (2003) used share of block holders (who buy more than 5% of issue) to measure the level of ownership concentration and inequality in distribution of shares in IPOs. Following suit, we apply foreign institutional ownership in the same way manner. Furthermore, since this variable carries special importance for Turkish IPOs because the share of domestic institutional investors who invest in stocks in the ISE is quite low because of the record high risk-free real interest rates on Turkish T-Bills and the high volatility in the stock market as a result of political and macroeconomic instability in our sample period.

This variable can be analyzed from variety of perspectives. The larger share of foreign investors in the IPO might indicate the level of profit opportunity in the short-term since investors tend to move quickly via smart money among countries, in particular in emerging markets like Turkey, where IPOs carry higher risk relative to developed markets. So, in addition to risks different from those faced by local investors, foreign portfolio managers seek additional return to compensate for the risks

incurred. Moreover, higher demand by foreign investors lends an aura of assurance to domestic investors during the IPO bidding stage and encourages them to participate to the offering. Therefore, the higher the fraction of shares devoted to foreign investors, the larger the return in the first trading days and, conversely, the larger the potential for underperformance because of a less dispersed ownership base over the long term. Nonetheless, concentrated ownership may confer more value on the company since it increases incentives among large shareholders who wish to avoid agency costs through more effective monitoring; however, this is less pronounced in Turkish IPOs, because Turkish companies that go public sell only 15% to 20% of their outstanding shares to avoid losing control. Therefore, monitoring by effecting a more concentrated ownership structure is not a pertinent concern when discussing Turkish IPOs. On the other hand, the higher fraction of shares bought by foreign institutional investors would be seen as the more rational valuation of the IPO since institutional investors are less subject to fads and rumors in valuation relative to individual investors.

To determine whether the foreign ownership affects the performance of IPOs, we classified the fraction of stocks that are sold to foreign institutional investors in the IPOs studied into three groups. Consistent with our expectations, Table 5 illustrates that initial returns of IPOs, consisting of a larger share of foreign institutional ownership, are significantly higher than those of the IPOs that have no foreign institutional ownership. For example, the first group, which contains stocks with the highest fraction of shares sold to foreign institutional investors, generated 8.46% of return in the first trading day, while the fourth group that has no foreign ownership provided only 5.31%. But the outperformance of the first group reversed following the second trading day, possibly indicating a profit sell-off by foreign investors. One month following the IPO, the average return of the first group declined to negative, -7.99%, while the average return of the last group rose to 20.17%. However, all groups underperformed regardless of the number of shares bought by foreign institutional investors during IPO in the long run, underperformance remains significantly less severe for stocks that attract low or no interest by foreign institutional investors. This result surprises from two perspectives. First, foreign investors normally are expected to hold stocks they acquire for longer periods. Second, foreign institutional investors presumably make more accurate valuation decisions relative to individuals. Interestingly, our findings are inconsistent with both of these expectations.

Table 5: Abnormal Returns of IPOs Based on the Fraction of Shares Sold to Foreign Investors

High	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0846^{***a}	0,0587^{***a}	0,0261	0,0238	0,0090	-0,0799^{*c}	-0,0862*	-0,1545^{c}	0,0518	-0,6916^{*a}	-2,7516^{*a}
Std. Err.	0,0147	0,0195	0,0182	0,0216	0,0264	0,0438	0,0599	0,1103	0,1698	0,3525	1,3981
Median	0,0799	0,0303	0,0154	0,0236	0,0095	-0,0942	-0,1398	-0,1674	-0,1870	-0,9390	-4,2940
Std. Dev.	0,0792	0,1052	0,0978	0,1163	0,1422	0,2357	0,3227	0,5939	0,9145	1,7973	6,8491
Count	29	29	29	29	29	29	29	29	29	26	24
Medium	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0742^{***a}	0,1102^{***b}	0,1167^{***c}	0,1215**	0,1044*	0,1773*	0,1943	0,2153	-0,0555^{c}	-0,1353^{c}	-3,0791^{***a}
Std. Err.	0,0245	0,0367	0,0498	0,0557	0,0535	0,0914	0,1294	0,1859	0,3633	0,8629	1,0000
Median	0,0496	0,0550	0,0362	0,0451	0,0518	-0,0140	0,0514	0,0657	-0,3154	-0,9791	-3,5100
Std. Dev.	0,1321	0,1974	0,2682	0,2997	0,2881	0,4921	0,6968	1,0009	1,9566	4,4835	5,1964
Count	29	29	29	29	29	29	29	29	29	27	27
Low	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0385^{*c}	0,0565	0,0587	0,0739	0,0779	0,3764*	0,2279	0,2632	-0,1571	-0,5752^{***b}	0,3087^{a}
Std. Err.	0,0205	0,0341	0,0361	0,0455	0,0556	0,2029	0,1624	0,2410	0,2176	0,2121	2,0104
Median	0,0222	-0,0119	-0,0010	-0,0249	-0,0098	0,0608	-0,0035	0,0153	-0,2443	-0,2781	-1,3971
Std. Dev.	0,1083	0,1805	0,1908	0,2409	0,2942	1,0737	0,8594	1,2752	1,1514	1,0815	10,2510
Count	28	28	28	28	28	28	28	28	28	26	26
None	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0531^{***a}	0,0690^{***a}	0,0939^{***b}	0,1088^{***c}	0,1212^{***c}	0,2017**	0,2104**	0,0096	0,0205	-0,3973^{a}	-0,8343^{c}
Std. Err.	0,0131	0,0249	0,0337	0,0389	0,0449	0,0832	0,1036	0,1045	0,1476	0,3249	0,8118
Median	0,0470	0,0342	0,0150	0,0228	0,0391	-0,0339	0,0254	-0,0623	-0,1051	-0,5386	-1,2295
Std. Dev.	0,1107	0,2097	0,2844	0,3276	0,3783	0,7008	0,8726	0,8808	1,2351	2,6595	4,9378
Count	71	71	71	71	71	71	71	71	70	67	37

Source of shares in IPO: Another factor that is used to classify the sample of IPOs in this study is the source of shares that are sold at the IPO, whether from capital increases (rights issue) or from sales generated by large shareholders. This variable defines where the proceeds from the shares sold to investors at an IPO come from, which might be important for investors since it may also indicate where the proceeds of the IPO may go – that is, whether into the pockets of large shareholders or revert back to the company. The former increases the wealth of the large shareholders but provides no benefit to the company itself, while the latter provides cash flow for the company that can be used to finance new positive-NPV projects that can lead to further growth. Companies that go public through capital increases are supposed to grow faster in the future than companies that go public through sales to large shareholders. With this consideration in mind, investors prefer to invest in IPOs whose shares are sold as a "rights issue" through increases in paid-in capital. The source of shares sold through the IPO thus affect investors' decisions as whether to participate in the IPO; investors also consider the size of demand for the IPO shares by evaluating expectations about the projected growth rate of the company. Thus, more demand for the IPOs through a rights issue capital increase may be expected to lead to higher initial returns relative to IPOs made through the sale of shares of large shareholders.

Within this framework, all IPOs split into two groups, those of rights issues or sales to large shareholders. The total number of IPOs in Table 6 seems to be slightly higher than the number of observations we reported earlier since some IPOs that

employ both methods, are included in each of the groups. Consistent with our expectations, our findings show that the average abnormal initial return of IPOs made through a rights issue is significantly higher than IPOs made through the sale of large shareholders (6.60% vs. 4.64%). The difference between the mean returns of the two groups in favor of first group rises to 4.2% at the end of the third trading day and it lasts for six months following the IPO, then reverses to negative. The average abnormal return of capital-increase IPOs declined to –68.1%, while the average abnormal return of the sale of large shareholders IPOs increased to 24.4% at the end of the two-year holding period and kept rising until the end of the third year following the IPO. Interestingly, underperformance never exists for the IPOs made through the sale of large shareholders.

Table 6: Abnormal Returns of IPOs Based on the Source of Shares Sold in IPOs

New Issues (Capital Increase)	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0660***a	0,0888***a	0,0964***a	0,0992***a	0,0908***a	0,1505***	0,1588***	0,0987	-0,0570b	-0,6810***a	-2,6088***a
Std. Err.	0,0104	0,0156	0,0220	0,0254	0,0280	0,0519	0,0649	0,0755	0,1013	0,1960	0,4222
Median	0,0595	0,0433	0,0184	0,0097	0,0159	-0,0158	-0,0313	-0,0638	-0,2484	-0,7648	-2,7114
Std. Dev.	0,1158	0,1743	0,2447	0,2826	0,3121	0,5781	0,7230	0,8406	1,1189	2,1023	3,9601
Count	124	124	124	124	124	124	124	124	122	115	88
Sale of Large Shareholders	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0464***a	0,0540***a	0,0544***b	0,0576**b	0,0730***b	0,1035*	0,1304	0,0196c	0,0725c	0,2440a	0,3771a
Std. Err.	0,0085	0,0156	0,0198	0,0227	0,0264	0,0579	0,0902	0,0833	0,1290	0,3033	0,9355
Median	0,0366	0,0334	0,0152	0,0148	0,0279	-0,0184	-0,0163	-0,0385	-0,1572	-0,5161	-1,6236
Std. Dev.	0,0953	0,1756	0,2226	0,2547	0,2968	0,6495	1,0121	0,9346	1,4478	3,3636	9,7225
Count	126	126	126	126	126	126	126	126	126	123	108

Market conditions: Another criterion used to partition our sample focuses on market conditions when the firm goes public. There is some evidence in the literature that points to the effect of market conditions whether hot or cold, on the post-IPO performance of stocks. IPOs made under hot market conditions, which represents heavy interest by investors in the IPO, are expected to yield larger returns in the first few trading days than IPOs made in a cold market. The prices of hot market IPO's reverse as a result of change in beliefs of investors who realize that too much optimism may be attributed to the new issues (overvaluation) under the hot market conditions after some time elapses following the IPO. This reversion in prices relative to the market generates underperformance of IPOs made in hot markets. On the other hand, cold market IPOs, which might have lower initial returns due to weaker interest by investors than hot market-IPOs, tend to maintain their outperformance even in the long term. IPOs in a hot market might also relate to exemplify the signalling hypothesis, which assumes that the firm's stock issue decision signal management's belief that it is now permissible for the company shares to become overvalued.

Similar to the previous studies, we used the number of companies that go public and the gross proceeds of IPOs across years as representative of hot and cold mar-

kets. The years that involve the highest IPO proceeds and the highest number of IPOs relative to the average number of annual IPOs are considered hot markets (1990, 1997, and 2000), whereas the years with the lowest number of IPOs are deemed cold markets (1992, 1993 and 1999). Consistent with earlier evidence and expectations, our findings, displayed in Table 7, confirm the effect of market conditions on the underperformance puzzle of IPOs in the ISE. We find that cold market IPOs always, even on their first days in the market, significantly outperform both the market and hot market IPOs continue to do so until the end of the 36-month holding period. There is a significant difference between the initial (first day) average abnormal returns of cold market and hot market IPOs (7.13% vs. 4.46%), respectively. The longer the holding period, the larger the average abnormal return of cold market IPOs than hot market IPOs. For instance, cold market IPOs resulted in approximately 69% more return than hot market IPOs in 12-month holding period, while the outperformance of cold market-IPOs reached as high as 248% at the end of the two-year holding period (-39.84% vs. +208.13%). In contrast to hot market IPOs, cold market IPOs are never subject to an underperformance problem. Thus, the underperformance puzzle of IPOs disappears, when the firms go public under cold market conditions. The statistical and economic significance of the results lead us to conclude that market conditions, whether hot or cold, significantly impact the post-IPO performance of stocks. Our results are also consistent with Ritter's (1991) observation that long-run IPO underperformance may be dominated by a few years in a sample, consistent with "windows of opportunity" for the firm. The characteristics of what constitutes "cold market" years require further examination in the future.

Table 7: Abnormal Returns of IPOs Based on Market Conditions

Hot	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0446***a	0,0698***a	0,0725**b	0,0702***c	0,0608**	0,1115*	0,1089	0,0037	0,0045c	-0,3984***a	-1,7046***a
Std. Err.	0,0112	0,0167	0,0217	0,0244	0,0297	0,0594	0,0752	0,0776	0,1081	0,1125	0,5338
Median	0,0368	0,0358	0,0096	-0,0049	0,0014	-0,0214	-0,0097	-0,0540	-0,1620	-0,2567	-1,1805
Std. Dev.	0,1043	0,1547	0,2016	0,2262	0,2754	0,5513	0,6970	0,7198	0,9908	0,9935	3,7749
Count	86	86	86	86	86	86	86	86	84	78	50
Cold	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0713***a	0,1138***a	0,1547***a	0,1965***a	0,2481***a	0,5049***a	0,5512***c	0,5526**	0,6894*	2,0813**	4,0131*
Std. Err.	0,0118	0,0212	0,0350	0,0474	0,0582	0,1826	0,2109	0,2699	0,3960	0,8561	2,2066
Median	0,0828	0,1078	0,1007	0,0991	0,1723	0,1696	0,0278	0,0028	0,2169	0,5701	0,6335
Std. Dev.	0,0686	0,1238	0,2040	0,2762	0,3395	1,0650	1,2296	1,5739	2,3090	4,6104	11,8830
Count	34	34	34	34	34	34	34	34	34	29	29
Neutral	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0547***a	0,0614***a	0,0699***	0,0770**	0,0844**	0,0477	0,0807	-0,0076	-0,1887*a	-0,6311**a	-1,7664**a
Std. Err.	0,0118	0,0206	0,0275	0,0331	0,0363	0,0444	0,0876	0,0667	0,0985	0,2908	0,7295
Median	0,0313	0,0151	0,0127	0,0071	0,0099	-0,0407	-0,0468	-0,1030	-0,2891	-1,0760	-3,0554
Std. Dev.	0,1247	0,2184	0,2913	0,3498	0,3846	0,4699	0,9271	0,7059	1,0425	3,0780	7,6158
Count	112	112	112	112	112	112	112	112	112	112	109

Underwriters' reputation: The reputation of underwriters is another factor we used to categorize our IPO sample since previous studies (for example, see Carter et al. (1998)) show the positive relation between the underwriters' reputation and the long-term performance of IPOs. They document that IPOs managed by good invest-

ment banks outperform compared to the performance of IPOs managed by investment banks that have a relatively poor reputation in the market. Consistent with prior studies, they also find that IPOs managed by more reputable underwriters are associated with less short-run underpricing. Also, a substantial number of studies examine the effects of an underwriter's reputation on the initial IPO performance (for example, Logue (1973), Beatty and Ritter (1986), Maksimovic and Unal (1993), Michaely and Shaw (1994)).

While Megginson and Weiss (1991) use the relative market share of underwriters, Michaely and Shaw (1994) use the capital of investment banks as a proxy for their reputation. On the other hand, Chemmanur and Fulghieri (1994) argue that investors use the investment bank's past performance, as measured by the quality of firms in which they have previously sold equity, to assess their credibility. Given these considerations, we ranked underwriters based on their market share and paid-in capital. We also employed a survey on brokers in the trading floor to check the quantitative ranking results used in previous studies. The underwriters' ranks place them in one of three categories, where one represents the most prestigious underwriter and three the least prestigious underwriter.

Table 8 summarizes our findings for the effects of reputation of underwriters on the post-issue performance of stocks, which are consistent with the previous findings in the literature. IPOs managed by more prestigous underwriters significantly outperform IPOs conducted by less prestigious underwriters both for short and long holding periods. This outperformance increases sharply as the holding period continues. It seems that an investment bank's reputation strongly affects IPO aftermarket performance. However, it is not the sole reason behind the underperformance of Turkish IPOs.

Table 8: Abnormal Returns of IPOs Based on the Reputation of Underwriters

Good	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0606^{***a}	0,0772^{***a}	0,0831^{***a}	0,0771^{***b}	0,0727^{***b}	0,1213***	0,1189**	0,0922	0,0615	0,0506^{a}	-0,2063^{b}
Std. Err.	0,0105	0,0173	0,0237	0,0258	0,0257	0,0482	0,0612	0,0773	0,1179	0,3283	0,7316
Median	0,0392	0,0410	0,0213	0,0149	0,0219	-0,0079	-0,0072	-0,0065	-0,1428	-0,5555	-1,8232
Std. Dev.	0,1076	0,1764	0,2415	0,2628	0,2620	0,4913	0,6240	0,7880	1,1970	3,2662	6,6653
Count	104	104	104	104	104	104	104	104	103	99	83
Normal	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0540^{***a}	0,0837^{***a}	0,0980^{***a}	0,1146^{***a}	0,1140^{***a}	0,1360*	0,2316***	0,1299	0,0506^{b}	-0,2725^{a}	-1,8340^{**a}
Std. Err.	0,0123	0,0191	0,0253	0,0316	0,0354	0,0771	0,1240	0,1109	0,1625	0,2767	0,8369
Median	0,0425	0,0489	0,0483	0,0305	0,0446	-0,0095	0,0226	-0,0603	-0,1960	-0,4105	-2,0841
Std. Dev.	0,1158	0,1799	0,2389	0,2982	0,3339	0,7275	1,1700	1,0466	1,5334	2,5955	7,3917
Count	89	89	89	89	89	89	89	89	89	88	78
Bad	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0384^{**b}	0,0332	0,0480	0,0703	0,1259	0,2001	0,1300	-0,0637	-0,2409	-0,9543^{***a}	-2,9576^{***a}
Std. Err.	0,0184	0,0397	0,0539	0,0708	0,0949	0,1404	0,1702	0,1577	0,1807	0,3124	0,7087
Median	0,0237	0,0225	-0,0200	-0,0257	-0,0425	-0,0339	-0,1444	-0,2514	-0,2891	-0,5979	-2,9303
Std. Dev.	0,1058	0,2279	0,3094	0,4068	0,5449	0,8064	0,9776	0,9060	1,0221	1,6529	3,3241
Count	33	33	33	33	33	33	33	33	32	28	22

Earnings-to-Price (E/P) and Book-to-Market (B/M) Ratios: The last two factors that we used to categorize IPOs are E/P and B/M ratios of the companies that went public. Both of these ratios are widely used by investment banks during the valuation

process of the IPOs. In addition, there is extensive evidence in the literature indicating the strong positive relationship between these ratios (as also risk factors) and stock returns as a compensation of the relatively higher risk of these stocks. Therefore, we computed the E/Ps and B/Ms through the public offering price of the stock and the last disclosed earnings figure as of the day before the first trading day of the IPO. Then we divided the sample into three groups by ranking the IPOs from high to low levels of E/P and B/M, separately. High-E/P and High-B/M IPOs are considered as value or distressed firms, which might be expected to generate larger initial returns and less underperformance in the long run due to undervaluation at the IPO. Contrarily, Pham et al. (2003) find that firms with lower B/Ms are less interested in underpricing their shares since they expect large shareholders' monitoring in the future. In that sense, there is no interest by Turkish firms in conducting effective monitoring, they offer only limited shares of the company making the IPO, and this will not change the concentrated ownership after the IPO.

Indeed, our findings in Table 9 show that the average abnormal return of the highest-E/P IPOs is significantly and consistently higher than the lowest-E/P IPOs both in the short and the long run. For example, high-E/P IPOs provide 3.8% higher return (7.84% vs. 4.01%) in their first trading day, whereas this difference in returns rises to 20.3% (-20.86% vs. –41.19%) two years after the IPO. Long-run underperformance of high E/P IPOs is seriously lessened, although not eliminated completely. On the other hand, although the highest B/M IPOs seem to be the most underpriced IPOs in parallel to our expectations, surprisingly, they provide the lowest returns across groups in the long term (Table 10). The average abnormal returns of the lowest B/M IPOs are always positive even up to the 36 month-holding period. This seems to be related with the size of the firms of which low-B/M firms, mostly large firms, and underperformance weakens as the size of the firms that went public increases.

Table 9: Abnormal Returns of IPOs Based on the Earnings-to-Price Ratios

High	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0784***a	0,1150***a	0,1336***a	0,1560***a	0,1730***a	0,3076***a	0,1886*	0,1987	0,1253	-0,2086a	-0,0289a
Std. Err.	0,0143	0,0251	0,0327	0,0423	0,0477	0,1018	0,1001	0,1331	0,1903	0,3971	1,1096
Median	0,0823	0,0649	0,0588	0,0533	0,0592	0,0510	0,0442	0,0895	-0,1531	-0,8769	-2,3751
Std. Dev.	0,1200	0,2097	0,2740	0,3541	0,3991	0,8517	0,8372	1,1138	1,5919	3,2746	8,8069
Count	70	70	70	70	70	70	70	70	70	68	63
Medium	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0451***a	0,0420***a	0,0440***b	0,0470***c	0,0463**	0,0370	0,1288**	0,0253	-0,1097b	-0,0570b	-2,0880***a
Std. Err.	0,0120	0,0211	0,0267	0,0302	0,0313	0,0492	0,0823	0,1039	0,1747	0,4219	0,7522
Median	0,0390	0,0397	0,0086	0,0071	-0,0014	-0,0153	-0,0454	-0,1395	-0,2708	-0,8911	-2,6072
Std. Dev.	0,1008	0,1763	0,2230	0,2529	0,2616	0,4118	0,6883	0,8693	1,4616	3,4791	6,0172
Count	70	70	70	70	70	70	70	70	70	68	64
Low	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0401**b	0,0574*c	0,0659*	0,0661	0,0561	0,0692	0,1043	0,0308	0,0708	-0,4119a	-0,6506a
Std. Err.	0,0127	0,0183	0,0283	0,0304	0,0361	0,0691	0,0876	0,0885	0,1210	0,2445	1,3838
Median	0,0344	0,0279	0,0108	0,0006	-0,0012	-0,0515	-0,0113	-0,0085	-0,1428	-0,3357	-1,8885
Std. Dev.	0,1073	0,1541	0,2385	0,2558	0,3045	0,5827	0,7381	0,7456	1,0055	1,9559	9,5873
Count	71	71	71	71	71	71	71	71	69	64	48

Table 10: Abnormal Returns of IPOs Based on the Book-to-Market Ratios

High	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0658***a	0,0930***a	0,0982***a	0,1154***a	0,1339***a	0,1485***	0,0732	-0,0484	-0,1823c	-0,3686b	-1,7987a
Std. Err.	0,0130	0,0231	0,0287	0,0377	0,0457	0,0663	0,0696	0,0959	0,1532	0,2895	0,7183
Median	0,0569	0,0540	0,0201	0,0117	0,0344	0,0017	-0,0312	-0,1446	-0,2703	-0,5934	-2,0841
Std. Dev.	0,1055	0,1873	0,2331	0,3066	0,3713	0,5390	0,5655	0,7794	1,2448	2,3515	5,5636
Count	66	66	66	66	66	66	66	66	66	66	60
Medium	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0415**b	0,0510	0,0401	0,0359	0,0216	0,0059c	-0,0015	0,0341	0,0265c	-0,2879a	-1,4440a
Std. Err.	0,0153	0,0196	0,0247	0,0286	0,0274	0,0501	0,0611	0,0767	0,1447	0,4108	0,6511
Median	0,0305	0,0178	0,0031	-0,0002	-0,0014	-0,0549	-0,0867	-0,0223	-0,2420	-1,1783	-2,5138
Std. Dev.	0,1245	0,1593	0,2005	0,2327	0,2222	0,4071	0,4962	0,6233	1,1756	3,2866	5,1264
Count	66	66	66	66	66	66	66	66	66	64	62
Low	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Mean	0,0587***a	0,0708***a	0,1041***c	0,1154***c	0,1148***	0,2241*	0,3051**	0,3046*	0,1926	0,0699a	1,0574a
Std. Err.	0,0127	0,0255	0,0375	0,0417	0,0469	0,1119	0,1274	0,1542	0,1892	0,4763	2,2021
Median	0,0416	0,0342	0,0210	0,0318	0,0405	0,0139	0,0568	0,0266	-0,0674	-0,3357	-3,0080
Std. Dev.	0,1025	0,2054	0,3023	0,3359	0,3782	0,9020	1,0269	1,2432	1,5020	3,5641	13,9272
Count	65	65	65	65	65	65	65	65	63	56	40

To check the robustness of our findings and the affect of size on the factors used in this study, all abnormal returns based on the various factors previously cited were also re-computed on a value-weighted basis. Table 11 confirms that size of firm does matter and significantly affects an IPO's aftermarket performance. Similarly, size also significantly impacts other factors analyzed in this study. It seems that most long-run underperformance is mostly due to small firms combining with some other factors such as hot market conditions and source of shares sold in IPO. Value-weighted abnormal returns confirm and strengthen our previous findings.

Table 11: Value-weighted Average Abnormal Returns of IPOs Based on Number of Investors at IPO

High	0,0559	0,0507	0,0549	0,0521	0,0517	0,0298	-0,0172	-0,0316	-0,0983	-0,1079	-0,0188
Medium	0,0021	0,0032	0,0038	0,0042	0,0053	0,0025	0,0042	0,0072	0,0521	0,0152	-0,0141
Low	0,0059	0,0043	0,0032	0,0036	0,0030	0,0004	0,0053	-0,0103	-0,0121	-0,0478	-0,2226

Value-weighted Average Abnormal Returns of IPOs Based on the Fraction of Shares sold to Foreign Investors

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
High	0,0496	0,0376	0,0400	0,0393	0,0426	0,0124	-0,0368	-0,0438	-0,0961	-0,1202	-1,8235
Medium	0,0082	0,0135	0,0130	0,0126	0,0099	0,0094	0,0058	0,0042	-0,0145	-0,0090	-0,1360
Low	0,0064	0,0077	0,0047	0,0042	0,0029	0,0164	0,0115	0,0066	0,0069	-0,0192	-0,0628
None	0,0017	0,0027	0,0033	0,0031	0,0032	0,0084	0,0167	-0,0036	-0,0087	-0,0167	-0,0194

Value-weighted Average Abnormal Returns of IPOs Based on the Source of Shares sold in IPO

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
New Issues	0,0726	0,1004	0,1094	0,1152	0,1061	0,1583	0,1688	0,1035	-0,0552	-0,6726	-2,5455
Sale of Large Shareholders	0,0526	0,0607	0,0641	0,0710	0,0905	0,1159	0,1310	0,0129	0,0468	0,2172	0,2690

Value-weighted Average Abnormal Returns of IPOs Based on Market Conditions

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Hot	0,0605	0,0569	0,0556	0,0526	0,0473	0,0347	-0,0289	-0,0255	-0,0929	-0,1548	0,0229
Cold	0,0044	0,0061	0,0074	0,0087	0,0094	0,0273	0,0328	0,0264	0,0436	0,0773	0,0761
Neutral	0,0099	0,0088	0,0061	0,0030	0,0020	-0,0165	-0,0095	-0,0323	-0,0353	-0,0290	-0,3749

Value-weighted Average Abnormal Returns of IPOs Based on the Reputation of Underwriters

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
Good	0,0256	0,0251	0,0187	0,0132	0,0083	0,0268	0,0363	0,0425	0,0499	0,1079	0,1846
Normal	0,0446	0,0409	0,0490	0,0492	0,0508	0,0204	-0,0420	-0,0623	-0,1112	-0,1938	-0,4452
Bad	0,0048	0,0063	0,0018	0,0024	-0,0002	-0,0018	-0,0004	-0,0124	-0,0262	-0,0289	-0,0832

Value-weighted Average Abnormal Returns of IPOs Based on the E/P Ratios

E/P	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
High	0,0062	0,0075	0,0079	0,0087	0,0084	0,0248	0,0197	0,0196	0,0413	-0,0023	0,0243
Medium	0,0092	0,0093	0,0067	0,0061	0,0061	0,0006	0,0072	-0,0145	-0,0243	0,0127	-0,3108
Low	0,0589	0,0530	0,0508	0,0467	0,0419	0,0189	-0,0335	-0,0270	-0,0911	-0,2020	-0,0118

Value-weighted Average Abnormal Returns of IPOs Based on the B/M Ratios

B/M	*1 Day*	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*1 Month*	*3 Months*	*6 Months*	*1 Year*	*2 Years*	*3 Years*
High	0,0066	0,0072	0,0053	0,0047	0,0031	-0,0004	-0,0022	-0,0009	0,0083	-0,0041	-0,0193
Medium	0,0124	0,0122	0,0062	0,0032	0,0027	-0,0058	0,0004	0,0040	0,0121	0,0335	-0,0921
Low	0,0493	0,0451	0,0512	0,0520	0,0539	0,0273	-0,0203	-0,0433	-0,1100	-0,1806	-0,1728

We also examined the cross characteristics of IPOs by each factor to clarify which ones dominate the sample of returns are examined. Additionally, we also examined the macroeconomic fundamentals of cold-market years, in which IPOs are always able to beat the market. In these years, both interest rates were significantly higher, whereas the growth rates were much lower than those of hot-market years. Issue size, number of investors, and share of foreign investors are substantially lower in cold- than hot-market IPOs and these IPOs are more likely to be in rights issue than in large shareholder sales.[7] The characteristics of outperformers in one-year and two-year periods (Table 12) confirm that IPOs that outperform the market in the long run are mostly mid-size issues, of which shares are sold to a large number of investors while the share of foreign investors is lower than the average. Then, we developed additional factors to measure how evenly the shares are allocated in such an IPO. Consistent with the factors used by Pham et al. (2003), these factors include the number of investors divided by the size-adjusted share of retail investors and per dollar value share of retail investors. In contrast to Pham et al. (2003), we find that firms for which shares are allocated in a more equal and less concentrated fashion generate less underpricing and underperformance. Table 13 shows that there is a negative relationship between the dispersion of shares among shareholders at IPO and the magnitude of long-run underperformance and the initial underpricing. The more dispersed the allocation of shares, the smaller the long-run underperformance and underpricing. Last, we run cross-sectional regressions to clarify which factors are most influential on the performance of IPOs. Table 14 confirms our previous findings that market condition (cold/hot) is the only statistically significant (at .01 level) factor affecting long-run returns. Size also seems to influence the returns even though it is not statistically significant. The number of investors and the E/P are the only two variables effective (at .05 level) on first-day abnormal returns of IPOs.[8]

(7) Also, real interest rates are significantly higher (16.6% vs -0.8%), whereas growth rate of economy is significantly lower in cold market years than hot market years (2.8% vs. 8%). Not cited more due to space constraints but can be obtained from authors based on request.

(8) Findings from the single-variable regressions and step-wise regression analysis are completely consistent with the results of multi-variable regressions, while the possible multicollinearity are also controlled.

Table 12: Descriptive Statistics of Outperformers

	One-Year Outperformers			Two-Year Outperformers			All Sample		
	Size (Million USD)	*# of Investors*	*% FI*	*Size (Million USD)*	*# of Investors*	*% FI*	*Size (Million USD)*	*# of Investors*	*% FI*
Mean	18.082.514	32.078	18,6	17.249.431	44.605	16,7	24.873.167	27.058	21,48

Table 13: Abnormal Returns of IPOs Based on the Concentration of Allocation of the IPO

Panel A: Breadth 1 (Number of Investors / adjusted-share of retail investors)

High	*1 Day*	*2 Day*	*3 Day*	*4 Day*	*5 Day*	*1 Month*	*3 Month*	*6 Month*	*1 Year*	*2 Year*
Mean	0.0509***	0.0387	0.0605	0.0770	0.0899	0.0597	- 0.0224	- 0.1342	0.2454	0.1237
Std. Err.	0.0145	0.0303	0.0440	0.0508	0.0585	0.0819	0.1059	0.1338	0.2752	0.5923
Median	0.0383	0.0273	0.0149	0.0008	0.0205	- 0.0429	- 0.1369	- 0.2109	- 0.2580	- 1.1613
Medium	*1 Day*	*2 Day*	*3 Day*	*4 Day*	*5 Day*	*1 Month*	*3 Month*	*6 Month*	*1 Year*	*2 Year*
Mean	0.0603***	0.0816***	0.0915***	0.1155***	0.1223***	0.2783**	0.2041*	0.1261	0.0142	0.0603***
Std. Err.	0.0150	0.0225	0.0277	0.0368	0.0423	0.1252	0.1210	0.1591	0.2207	0.0150
Median	0.0681	0.0417	0.0201	0.0287	0.0511	0.0068	-0.0574	-0.1111	-0.2521	0.0681
Low	*1 Day*	*2 Day*	*3 Day*	*4 Day*	*5 Day*	*1 Month*	*3 Month*	*6 Month*	*1 Year*	*2 Year*
Mean	0.0906***	0.1263***	0.1292***	0.1188***	0.0957***	0.1422**	0.2200**	0.1803	-0.0638	-0.6069**
Std. Err.	0.0170	0.0283	0.0369	0.0373	0.0359	0.0629	0.0863	0.1192	0.1515	0.2510
Median	0.0927	0.0661	0.0270	0.0164	0.0143	0.0066	0.1196	0.0177	-0.2173	-0.5120

Panel B: Breadth 2 (Issue Size USD / Number of retail investors)

High	*1 Day*	*2 Day*	*3 Day*	*4 Day*	*5 Day*	*1 Month*	*3 Month*	*6 Month*	*1 Year*	*2 Year*
Mean	0.0764***	0.1146***	0.1218***	0.1165***	0.0983**	0.1941**	0.2545**	0.1792	0.0503	- 0.3645
Std.Err.	0.0191	0.0320	0.0403	0.0411	0.0399	0.0777	0.1038	0.1219	0.1587	0.2493
Median	0.0900	0.0673	0.0339	0.0407	0.0254	0.0169	0.0913	0.0150	- 0.1621	- 0.2438
Medium	*1 Day*	*2 Day*	*3 Day*	*4 Day*	*5 Day*	*1 Month*	*3 Month*	*6 Month*	*1 Year*	*2 Year*
Mean	0.0587***	0.0551**	0.0564*	0.0706*	0.0622	0.1138	0.0565	0.0328	- 0.1373	- 0.7230**
Std.Err.	0.0188	0.0249	0.0294	0.0365	0.0410	0.0865	0.0868	0.1091	0.1807	0.3487
Median	0.0496	0.0320	0.0175	0.0103	0.0107	- 0.0339	- 0.1187	- 0.1255	- 0.3777	- 0.8970
Low	*1 Day*	*2 Day*	*3 Day*	*4 Day*	*5 Day*	*1 Month*	*3 Month*	*6 Month*	*1 Year*	*2 Year*
Mean	0.0942***	0.1319***	0.1399***	0.1298***	0.1043**	0.1908**	0.2835***	0.2628*	- 0.0923	- 0.4168
Std.Err.	0.0189	0.0329	0.0443	0.0456	0.0436	0.0765	0.0994	0.1416	0.1537	0.2860
Median	0.0877	0.0673	0.0200	0.0080	0.0091	0.0169	0.1426	0.0204	- 0.1870	- 0.3352

Table 14: Regression Results

	Initial Abnormal Returns			1 year Abnormal Returns			2 year Abnormal Returns		
	R Square	*F-stat.*	*P-value*	*R Square*	*F-stat.*	*P-value*	*R Square*	*F-stat.*	*P-value*
	0.0808	2.44	0.02	0.0572	1.68	0.10	0.1025	3.17	0.00
	Coefficients	*t Stat*	*P-value*	*Coefficients*	*t Stat*	*P-value*	*Coefficients*	*t Stat*	*P-value*
Intercept	0.0040	0.08	0.94	- 0.8156	- 1.35	0.18	- 2.2934	- 1.79	0.07
Size	- 0.0003	- 0.10	0.92	0.0402	1.06	0.29	0.1293	1.60	0.11
# of Investors	0.0041	2.22	**0.03**	0.0140	0.63	0.53	- 0.0132	- 0.28	0.78
FI %	0.0439	1.36	0.17	- 0.1598	- 0.41	0.68	- 0.5385	- 0.65	0.51
UndRep	0.0074	0.50	0.62	0.0500	0.28	0.78	0.3689	0.97	0.33
RI / SS	0.0154	1.04	0.30	0.0045	0.03	0.98	- 0.4946	- 1.30	0.19
Cold / Hot	0.0179	0.82	0.41	0.8044	3.07	**0.00**	2.2462	4.04	**0.00**
E/P	0.1447	2.14	**0.03**	0.2204	0.27	0.79	- 1.1445	- 0.66	0.51
B/M	- 0.0032	- 0.23	0.82	- 0.0206	- 0.12	0.90	0.1731	0.49	0.63

5. Summary and Conclusion

One of the most striking empirical regularities is the initial underpricing (large and positive abnormal returns in the first trading day) and underperformance (large and negative abnormal returns) of IPOs in the long run. Although there is extensive amount of research that evidences, on a small scale, the existence of short-term out-

performance and long-term underperformance of IPOs, mostly on the US markets, there is still no consistent and conclusive evidence pointing to the determinants of this phenomenon, especially with regard to international data, despite its importance for policy-makers, portfolio managers, shareholders and corporate managers.

This study examines the long-standing IPO puzzle in a leading emerging market, Istanbul Stock Exchange by using new factors affecting the performance of IPOs such as source of shares in the IPO (new issue or sale of large shareholders), allocation of shares and dispersion of investors (ownership of foreign investors, number of investors, and breadth), as well as existing factors such as market conditions (hot/cold), underwriters' reputation, and firm characteristics (issue and firm size, E/P, and B/M ratios).

Using a sample of 234 IPOs listed on the Istanbul Stock Exchange covering the 1990-2000 time period, this study documents an average abnormal first day return of 5.94%, which is substantially lower than those cited in previous studies. We also find that IPOs underperform on a number of relevant benchmarks in the 36-month holding period following their listing. On average, IPOs underperformed the market by 84.5% in this holding period, which is significantly higher than the performance IPOs in other markets. The magnitude of underperformance is larger for smaller companies. This result runs counter to Kiymaz (1997, 2000), who finds positive abnormal returns for the long run in the Turkish market. However, we provide strong evidence of the existence of an IPO 'puzzle' in ISE paralleling those of other markets worldwide. Hence, we would prefer to remain cautious in interpreting the evidence for long-run IPO performance on the ISE due to non-normal skewed distribution of IPO returns in a highly volatile market in our relatively short sample period.

By analyzing specific factors, we find that market conditions, source of shares, size, and the underwriters' reputation apparently affect the underperformance phenomenon. In particular, there is no underperformance in the long run for an IPOs made in a cold market or those sales are primarily executed by large shareholders. There is also a positive relationship between underwriters' reputation, firm size, issue size and long-run performance of IPOs. Additionally, our research indicates a negative relationship between the B/M ratio of firms as well as the fraction of foreign ownership in an IPO and the returns of new issues over the long term. In contrast, IPOs with large numbers of investors and foreign ownership generate large and positive abnormal initial returns. Allocation of shares in an IPO also affects after-market performance of shares. There is a negative relationship between the dispersion of shares among shareholders at IPO and the magnitude of long-run underperformance and the initial underpricing. The more dispersed allocation of shares decreases the magnitude of long-run underperformance and the initial underpricing.

One of the most striking differences of the findings in this study versus those of earlier studies is that underperformance starts much earlier than shown for other markets; as noted, it has even become apparent at the end of first month following the IPO. At least, half of the IPOs underperform the market in their first month of trading. This difference seems to be due to myopic investing behavior of investors in the ISE, who mostly seek short-term returns in a volatile environment by exploiting the abnormal initial returns of IPOs.[9] Another significant difference from other studies is our finding of a substantially lower magnitude of underpricing, less than 6%. At this point, our interpretation of this finding runs completely counter to those of several other researchers (for example, see Stehle, Ehrhardt, and Przyborowsky, 2000), who argue that the increase in competition among investment banks for underwriting mandates lead underwriters underprice the IPOs deliberately to capture the monopoly rents. In contrast, we think that heavy competition among investment banks to mandate the IPOs in a market such as the ISE, where the number of IPOs is very limited, leads to overvaluation, and so causes underperformance in the long run, while limiting the abnormality often found in initial returns. Large shareholders of companies seek higher IPO prices to maximize the value of their shares. Indeed, the underpricing in the ISE is substantially lower than other markets shown in previous studies, whereas underperformance is significantly higher. Anecdotal and survey-based information we receive from investment banks strongly support our above hypothesis. It motivates us to focus on the valuation of IPOs to further elucidate the evidence for this argument in the future. Another fact related with the IPO process is, in practice, the rumors spread by the IPO manager that there is excess demand for the IPO shares to attract the attention of investors. Large and positive first day returns seem to be related to this behavior of investment bankers, causing a magnet effect, mostly the overreaction of investors, who attribute too much optimism (overvaluation) to the new issue.

The question remaining to be answered is how to interpret the economically significant long-run existence of the underperformance phenomenon of Turkish IPOs. One interpretation might be that a large information asymmetry causes the investors especially in developing country markets to be irrationally optimistic about windfalls initial public offerings may yield. This attitude leads investors to pay too

(9) Persistently high level of inflation in the sample period, which is around 65% on average annually, and high volatility in the economy shortened the average holding period of financial instruments including high-yield (approx. 20% in real-term USD based annual returns) T-Bills and bank deposits. For example, as of the end of 2002, 40.1% of local currency based bank deposits in only one month or shorter maturity. The share of the deposit accounts whose maturity is three months or less is 88%. Moreover, 63.9% of the USD-based deposit accounts have a maturity of three months or less. Average maturity of T-Bills is around 4 months. (Daily Milliyet, November 26, 2003). A large portion of the trading volume in the stock market has been generated by day traders.

much in the immediate aftermarket period for an IPO, and then discover their "mistake" in the following years as argued by Ritter (1991) who concludes that the offering price of underperformed IPO stocks is not too low but, rather, too high. Although our results are consistent with this fact, the evidence of this simple irrationality during IPOs does not seem to completely explain the phenomenon. Another interpretation might be the ability of managers in timing the IPO by observing the willingness of the market to pay too much for their stocks. Large and significant negative returns for the IPOs made in hot markets support this argument.

This interpretation assumes that the market does not interpret the equity issuing correctly even after much evidence for the underperformance of IPOs in the long run. Our results also provide evidence of the market's inefficiency since the information is not fully reflected in prices paid after IPO, which results in long-run price declines relative to the market. In contrast, prices of IPO stocks rise in the first days and months following the IPO, before they start declining relative to the market for periods of up to three years. If this interpretation is correct, then the evidence of persistent and economically significant market inefficiency has important implications for financial economists and regulators. The third explanation for our results might be the mismeasurement of the relative risk of the firms in our sample. It is reasonable to assume that significant risk differences could persist for long periods of time. The market, firm size, book-to-market and earnings-to-price ratio may not be enough to capture all risks confronting these firms.

Finally, our strong evidence supports the existence of the significant short-term underpricing and the long-term underperformance of up to a three-year holding period in the ISE. Investors should be aware of the risk that temporary large and positive initial returns of the firms issuing stock to the public for the first time may prove to be hazardous to investors' wealth in the long run. However, although our evidence shows that most of the factors used in this study, in particular, market conditions, source of shares, and size significantly influence the post-issue performance of IPOs, the mystery of this phenomenon requires further investigation.

References

1. Affleck-Graves, J., Hedge, S. and Miller, R.E.(1996), "The Relationship Between the First Day Return and the Aftermarket Performance of IPOs", Unpublished Manuscript, *Northern Illinois University*.
2. Aggarwal, R., Leal, R. and Hernandez, F. (1993), "The Aftermarket Performance of Initial Public Offerings in Latin America", *Financial Management*, 22 (1), pp. 42-53.
2. Beatty, R. and Ritter, J. (1986), "Investment Banking, Reputation and the Underpricing of IPOs, *Journal of Financial Economics,* Vol. 15, pp. 213-232.
3. Booth, J.R. and Chua, L. (1996), "Ownership Dispersion, Costly Information and IPO Underpricing", *Journal of Financial Economics*, 41, pp. 201-310.
4. Brav, A. and Gompers, P.A. (1997), "Myth or Reality? The Long-run Underperformance of Initial Public Offerings: Evidence from Venture and Nonventure Capital-backed Companies", *Journal of Finance*, Vol. 52, pp. 1791-1821.
5. Cai, J., and Wei, K.C.J. (1997), "The Investment and Operating Performance of Japanese Initial Public Offerings", *Pacific Basin Finance Journal*, 5, pp. 389-418.
6. Carter, R.B., Dark, F.H. and Singh, A.K. (1998), "Underwriter Reputation, Initial Returns, and the Long-run Performance of IPO Stocks', *Journal of Finance*, Vol. 53 (1), pp. 285-311.
7. Chemmanur, T. and Fulghieri, P. (1994), "Investment Bank Reputation, Information Production and Financial Intermediation", *Journal of Finance*, 49, pp. 57-79.
8. Conrad, J. and Kaul, G. (1993), "Long-term Market Overreaction or Biases in Computed Returns?", *Journal of Finance 48*, pp. 39-63.
9. Fields, L. (1995), "Is Institutional Investment in IPOs Related to Long-run Performance of these Firms?", Unpublished Manuscript, *UCLA*.
10. Foerster, S.R. and Karolyi, G.A. (1999), "The Long-Run Performance of Global Equity Offerings", *Journal of Financial and Quantitative Analysis*.
11. Hamao, Y., Packer, F. and Ritter, J.R. (1998), "Institutional Affiliation and the Role of Venture Capital: Evidence from Initial Public Offerings in Japan", *Federal Reserve Bank of New York*, Staff Reports, Number 52.
12. Hanley, K.W. (1993), "The Underpricing of Initial Public Offerings and the Partial Adjustment Phenomena", *Journal of Financial Economics 34,* pp. 177-197.

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

14. Ibbotson, R.G., and Ritter, J. (1995), "Initial Public Offerings", In: Jarrow R.A., Maksimovic V., Ziemba W., *Handbooks in Operations Research and Management Science: Finance,* Vol:9, North-Holland, Amsterdam, pp. 993-1016.

15. Jain, B., and Kini, O. (1994), "The Post-issue Operation Performance of IPO Firms", *Journal of Finance 49*, pp. 1699-1726.

16. Kang, Jun-Koo and Stulz, R. (1996), "How Different is Japanese Corporate Finance? An Investigation of the Information Content of New Security Issues", *Review of Fiancial Studies 9*, pp.109-139

17. Keloharju, M. (1993), "Winner's Curse, Legal Liability and Long-run Price Performance of IPOs in Finland", Unpublished Working Paper, *Helsinki School of Economics*.

18. Kiymaz, H. (1997), "The Long-run Performances of Turkish Industrial IPOs: 1990-1995 Experience", *ISE Review,* Year 1, No. 3, pp. 43-68.

19. Kiymaz, H. (2000), "The Initial and Aftermarket Performance of IPOs in an Emerging Market: Evidence from Istanbul Stock Exchange", *Journal of Multinational Financial Management 10,* pp. 213-227.

20. Krigman, L., Shaw, W.H., and Womack, K.L. (1999) "The Persistence of IPO Mispricing and the Predictive Power of Flipping", *Journal of Finance 54*, pp. 1015-1044.

21. Levis, M. (1993), "The Long-run Performance of Initial Public Offerings: The UK Experience 1980-88", *Financial Management* 22 (1), pp. 28-41.

22. Logue, D. (1973), "On the Pricing of Unseasoned Equity Issues:1965-1969", *Journal of Financial and Quantitative Analysis*, 8, pp. 91-103.

23. Loughran T., Ritter, J.R. and Rydqvist, K. (1994), "Initial Public Offerings: International Insights," *Pacific Basin Finance Journal 2,* pp. 165-199.

24. Loughran, T. and Ritter, J.R. (1995) "The New Issues Puzzle", *Journal of Finance,* Vol. 50, pp. 23-51.

25. Loughran, T. (1993), "NYSE vs. NASDAQ Returns: Market Microstructure or the Poor Performance of Initial Public Offerings?", *Journal of Financial Economics,* Vol. 33, pp. 241-260.

26. Loughran, T. and Ritter, J. (2000), "Uniformly Least Powerful Tests of Market Efficiency", *Journal of Financial Economics 55:3*, pp. 361-389.

27. Maksimovic, V., and Unal, H. (1993), "Issue Size Choice and Underpricing in Thrift Mutual-to-stock Conversions", *Journal of Finance 48*, pp. 1659-1692.

28. Megginson, W. and Weiss, K. (1991), "Venture-capitalist Certification in IPOs", *Journal of Finance 46*, pp. 879-904.

29. Michaely, R. and Shaw, W. (1994), "The Pricing of IPOs: Tests of Adverse Selection and Signalling Theories", *The Review of Financial Studies 7*, pp. 279-319.

30. Mikkelson, W.H., and Shah, K. (1994) "Performance of Companies Around IPOs", Working Paper, *University of Oregon*.

31. Miller, E. M., 1977, Risk, Uncertainty, and Divergence of Opinion, *The Journal of Finance*, 32, 4, 1151-1168.

32. Morris, S. (1996), "Speculative Investor Behavior and Learning", *Quarterly Journal of Economics 111*, pp. 1111-1133.

33. Pham, P.K., Kalev, P.S. and Steen, A.B. (2003), "Underpricing, Stock Allocation, Ownership Structure and Post-listing Liquidity of Newly Listed Firms", *Journal of Banking and Finance 27*, pp. 919-947.

34. Rajan, R.G., and Servaes, H. (1997), "Analyst Following of Initial Public Offerings", *Journal of Finance 52:2*, pp. 507-529.

35. Ritter, J.R. (1984), "The Hot Issue Market of 1980", *Journal of Business 57*, pp.215-241

36. Ritter, J.R. (1991), "The Long-run Performance of Initial Public Offerings", *Journal of Finance,* Vol. XLVI, No. 1, pp. 3-27.

37. Shiller, R.J. (1990), "Speculative Prices and Popular Models", *Journal of Economic Perspectives 4*, pp. 55-65.

38. Spiess, D.K., and Affleck-Graves, J. (1995), "Underperformance in Long-run Stock Returns Following Seasoned Equity Offerings", *Journal of Financial Economics,* Vol. 38, pp. 243-267.

39. Stehle R., Ehrhardt, O. and Przyborowsky, R. (2000), "Long-run Stock Performance of German Initial Public Offerings and Seasoned Equity Issues", *European Financial Management*, Vol.6, pp. 173-196.

40. Welch, I. (1989), "Seasoned Offerings, Imitation Costs and the Underpricing of Initial Public Offerings", *Journal of Finance*, 44, pp. 421-449.