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Full Length Article

Turkish IPOs in a changing regulatory and economic environment

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Abstract

The larger underpricing (15 percent) in the early years following the inauguration of Borsa Istanbul indicates the importance of investors, intermediaries, and firm insiders learning about the trading and pricing of firms in organized stock markets. The underpricing in recent years (from 2010 to 2020) averages 5 percent. Micro-level uncertainties about the firm as evidenced by the smaller underpricing in IPOs marketed using fixed offer prices, and the IPOs where underwriters signed on for firm commitment also prove important. Underpricing also proves smaller in larger IPO firms.

JEL classification: G15; G32

Keywords: IPO underpricing; Developing markets; Regulation; Turkish capital markets

1. Introduction

We investigate how a changing regulatory and economic environment affects the cost of equity financing in initial public offerings (IPOs) in a developing-market country. Financing in public equity markets allows firms to access a broad investor base. Understanding how the characteristics of developing markets affect financing costs is essential. We choose to study the Turkish equity markets since Turkey, as a developing market country and its stock exchange, Borsa İstanbul, as a relatively young stock market, is ideal for investigating how a fast-paced change in the regulatory and economic environment affect IPOs. Our sample is comprehensive, covering 456 firms listed on the Turkish stock exchange, Borsa İstanbul, from 1990 and extending through to 2020. The sample enables us to analyze how IPO underpricing changes during the maturing of the stock exchange.

Pastor and Veronesi (2009) argue that investors' learning about uncertain parameters may explain many financial anomalies. The decline in first-day returns since the early years following the inauguration of Borsa İstanbul corroborates the importance of learning by investors, intermediaries, and firm insiders. The first chairperson of Borsa İstanbul underlines the importance of parameter uncertainty when he states, “I also did not know what a stock exchange was.” Turkey initiated a financial liberalization program that structurally changed the Turkish economy in the early 1980s. Borsa İstanbul (formerly, Istanbul Stock Exchange or İstanbul Menkul Kıymetler Borsası, in short IMKB) was established in 1986 as a part of the liberalization program. The first four years of operations were marked with many changes and innovations, such as introducing new trading systems and establishing a central securities depository. Chambers and Dimson (2009) in a similar spirit to our study take a long-run perspective and study UK IPOs from 1917 to 1986. The authors find a significant difference in underpricing in

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different time periods. Underpricing averaged 3.8% from 1917 to 1945 as compared to 9.15% in the period from 1946 to 1986. The authors show that the marked difference in underpricing cannot be attributed to changes in firm composition. The authors argue that the reduced level of trust between investors, issuers, and sponsors after the Second World War may account for the change in underpricing and observe changes in the methods underwriters used to market IPOs. Similar to Chambers and Dimson (2009), we also find a significant difference in underpricing in Turkish IPOs and the marketing methods used in the years immediately following the inauguration of the exchange when compared to the later years.

Balaban and Kunter (1997) and Antoniou et al. (1997) discuss how inefficiencies resulting from lack of investor participation and thin trading in the early years of Borsa İstanbul improved over time with higher trading volume and structural reforms. We find a marked difference in deal terms and the market reaction to IPOs in the years immediately following the opening of the exchange relative to the IPOs that come in the later years. First-day returns in IPOs from 1990 to 1993 average 15 percent and are significantly higher than the first-day returns of 5 percent from 2010 to 2020. Investors expected, intermediaries advised, and firm insiders seem to have accepted large underpricing in the early years since all agents were still learning about trading stocks and valuing firms.

Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), Sherman (2005), and Busaba and Chang (2010) explain underpricing as a by-product of the marketing process of IPOs where investors are compensated (via lower offer prices) for truthfully revealing their preferences when bookbuilding is used. Empirical results confirm the theoretical predictions. First-day returns (or underpricing) of Turkish IPOs in the period from 1994 to 2002 that are priced and marketed using a fixed offer price proves significantly lower at 8 percent relative to returns of 19 percent for IPOs in which underwriters elicit price and quantity demand from investors before setting the offer price. Furthermore, first-day returns are lower when underwriters sign on for firm commitment. First-day returns are also decreasing in the post-issue market value of equity, valued at the offer price.

2. Brief history of exchanges in Turkey

The history of exchanges in Turkey predates to the time of the Ottoman Empire. The Ottoman Empire needed short-term funding for the budget deficits it started facing in the mid-nineteenth century. Intermediaries, the so-called Galata Bankers, provided the financing needed. The Ottoman Empire recognized the need to regulate the market in which Galata Bankers traded Ottoman debt, and the first organized exchange, Dersaadet Tahvilat Borsası, was founded in 1873. A bylaw dated 1906 introduced significant regulations and renamed Dersaadet Tahvilat Borsası as Esham ve Tahvilat Borsası. Only Ottoman debt and the securities of foreign corporations traded on Dersaadet Tahvilat Borsası whereas stocks of domestic corporations started trading on Esham ve Tahvilat Borsası. This regulation change meant that domestic corporations gained access to organized capital markets in the Ottoman Empire (Fertekligil, 1993; Kurdoğlu et al., 2010; Pamuk, 2004).[1]

The new Turkish Republic, founded in 1923, introduced new regulations for the stock exchange. A new law for capital markets passed in 1929 renamed the exchange as İstanbul Menkul Kıymetler ve Kambiyo Borsası (IMKKB). The Turkish Republic followed a domestic market-oriented, high tariff protected, import-substitution growth strategy from its foundation until the 1980s. Turkey embarked on a financial liberalization program to integrate with the global economy in the 1980s (Boratav & Yeldan, 2006). The introduction of Capital Market Law Number 2499 in 1981, which aimed to regulate and supervise capital markets and to encourage the general public to invest in financial assets, was an essential step in the program. Capital Market Law mandated the founding of the Capital Markets Board of Turkey (SPK, "Sermaye Piyası Kurulu"). SPK worked on the regulatory framework to establish a new exchange in the next four years. The stock exchange, first named IIMKB in 1985, and renamed Borsa İstanbul in 2013, was both shaped and evolved with the regulations outlined in the liberalization program. IIMKB started operations on December 26, 1985 trading the stocks that previously traded on Menkul Kıymetler ve Kambiyo Borsası, which stopped its operations on the same date (Fertekligil, 1993; Kurdoğlu et al., 2010).

Trading in the new stock exchange, IMKB, grew rapidly and far exceeded the trading in the stock exchange that replaced. Table S1 (See the Supplementary Material, available online) lists the trading volume (adjusted for inflation, 2018 USD) through time for IMKKB in Panel A and for IMKB in Panel B. Trading volume on IMKKBdeclined from 21.5 million USD in 1973 to 4.3 million USD in 1983. Fertekligil (1983) states that after the passing of the Capital Markets Law 2499 in 1981, the anticipation for the new exchange affected trading volume. The trading volume on IMKKB fluctuated wildly, and most of the trades reflected bloc sales. As a case in point, two-thirds of the trading volume in 1981 involved trades on a single firm. Hence, even though there was some trading experience that the new exchange, IMKB, inherited from IMKKB, it was limited. Most stocks were very illiquid.

The trading volume in the new exchange, IMKB, totaled 29 million USD in its first year of operation, 1986, and skyrocketed to 11 billion USD at the end of 1990. This exponential growth in trading reflects the investor and corporate interest in the new exchange. The deregulation in 1989 that enabled international investors to trade on IMKB is also a driving factor for the increase in trading volume (Borsa İstanbul, 2021c). The exponential increase in trading volume also reflects the experience that intermediaries, firms, and investors gained in the early years of the exchange. Trading

[1] Borsa Guide (1928) provides a detailed description of the history of these early exchanges.

volume reached 137 billion USD in 2003. Eighty firms with a total market capitalization of 2 billion USD traded on IMKB at its inception in 1986, and the number of firms listed increased to 285 with a total market capitalization of 94 billion USD in 2003.[2]

3. Sampling frame

We start the sampling period with the opening of the exchange Borsa Istanbul, formerly IMKB. The first trading date for the 650 firms that currently list or at one time listed on Borsa İstanbul range from January 3, 1986 to December 24, 2020 (Borsa İstanbul, 2019, 2021a). We filter out 37 exchange-traded funds, six firms whose listing involves shares other than common stock, and 26 firms that did not offer shares to the public.[3] The remaining sample covers 581 initial public offerings (IPOs) on Borsa İstanbul. We pull data on the specifics of the deals (such as the offer price, closing price on the first trading day, the percent of shares offered, the underwriting method, the pricing mechanism, the IPO proceeds) from the Borsa İstanbul Datastore database (Borsa İstanbul, 2020) and Public Disclosure Platform (Kamuyu AydınlatmaPlatformu, 2021).[4]

The first four years of operation for IMKB was a fast-paced period for change where many innovations such as the introduction of new trading systems, the deregulation that allowed international investors to trade in the exchange, and the foundation of a central depository, Istanbul Settlement and Custody Bank, paved the way for growth. These are also the years in which data is scarce. Borsa İstanbul Datastore does not provide information on any of the deals from 1986 to 1989, the first four years of operations for IMKB. As a result, we lose 98 IPOs before 1990. Borsa İstanbul Datastore also does not provide any information on 27 IPOs after 1990. It is likely that these 27 IPO's were smaller, and after the IPO less successful than the IPO's that we cover. After removing these IPOs, the resulting sample of 456 IPOs constitutes the most comprehensive sample of Turkish IPOs that has been analyzed to date. Fig. 1 plots the annual IPO volume using the full sample of 581 IPOs and our sample of 456 IPOs. Fig. 1 shows that the number of firms undertaking IPOs is pro-cyclical, with the number bottoming in the crisis years of 2001−2002, 2008−2009, and in the year of the failed coup, 2016.[5]

Table 1 reports descriptive statistics on first-day returns and IPO deal terms such as IPO proceeds, the percentage of post-issue outstanding shares offered in the IPO, post-issue market capitalization of IPO firms, whether existing shareholders offer shares in the IPO, and whether the underwriting method firm commitment. Post-issue market capitalization is valued at the offer price and calculated as proceeds adjusted for inflation in 2020 million USD (US Bureau of Labor Statistics, 2021) divided by the percentage of post-issue shares offered in the IPOs. The proceeds from the IPOs in which 28 percent of outstanding shares are offered for sale average 61 million (adjusted for inflation, in 2020 USD). In 75 percent of deals, underwriters purchase at least some of the issue directly from the IPO firm and assume the risk of insufficient demand from the public. At least some of the shares on offer are from existing shareholders in 59 percent of the IPOs.[6]

The first-day returns are the difference between the closing price on the first trading day and the offer price, divided by the offer price.[7] First-day returns average 9 percent in the full sample. Kıymaz (2000), Güner et al. (1999), Durukan (2002), Kucukkocaoglu (2008), and Ünlü and Ersan (2008) report that first-day returns in Turkish IPOs range from 7 to 15 percent in different sub-periods ranging from 1990 to 2008. Bildik and Yilmaz (2008) calculate buy-and-hold returns of IPO firms relative to an index (value-weighted ISE-100 index) and report average first-day excess returns of 6 percent, first-year excess returns of 2.34 percent, and three-year excess returns of −84.50 percent between 1990 and 2000. First-day returns in developed and developing countries range from 18.4 percent in the USA, 30 to 79 percent in Brazil, 7 to 9 percent in Chile, 12 percent in Poland, 35 to 84 percent in India, 108 percent in Bangladesh, 170 percent in China (Aggarwal et al., 1993; Celis & Maturana, 1998; Hasan & Quayes, 2008; Krishnamurti & Kumar, 2002). The mean first-day return of 9% that we report in Turkey are within the lower range documented in other developing market countries Ritter (2021).

[2] Appendix Table SA1 (See the Supplementary Material, available online) includes summary statistics on the exchange and how it evolved from its start in 1985 to today.

[3] Borsa Istanbul Datastore reports that 11 of the 26 listings were not offered to the public. Newspaper search revealed that 9 of the 26 listings involved the introduction of a new share following mergers. One listing was the introduction of a new share following the unification of two share classes of the same company. Four listings were ticker name changes. One listing was the move to a sub-trading market on Borsa Istanbul. The sample includes dual-class issues of common stock.

[4] Borsa Istanbul Datastore is our primary source of data. Borsa Istanbul Datastore provides data on only 3 of the 14 IPOs in 2019 and 2020. We look through prospectuses and IPO results statements sent to Public Disclosure Platform to compile data on the remaining 11 IPOs. Public Disclosure Platform (Kamuyu Aydınlatma Platformu in Turkish) is an electronic system that publicly discloses electronically signed notifications required by Capital Markets and Borsa Istanbul regulations.

[5] After 1989, 2012 is the year in which our sample coverage of the listings is lowest. There are 38 listings in 2012. Borsa Istanbul does not provide deal-level data on 12 of these 38 listings. We searched information on these 12 listings on Public Disclosure Platform (KAP, 2021) and found that 11 of these listings were on a newly formed trading platform named “Serbest İşlem Platformu”. Borsa Istanbul established this trading platform to encourage firms that are not yet ready to conduct IPOs. The companies in this platform were subject to less restrictive regulation than main market companies. Interested readers may refer to SPK Communique Series: IV, Number 58 for more detailed information on the platform.

[6] There are overallotment options in some of the sample IPOs. To the best of our knowledge, the proceeds and shares offered in the IPO (as reported in Borsa Istanbul Datastore) do not include the shares sold through the over-allotment options.

[7] We used the highest offer price as the offer price in two IPO firms where there was more than one offer price. There was a lower offer price for employees, but we set the highest offer price that was for institutional customers as the offer price.

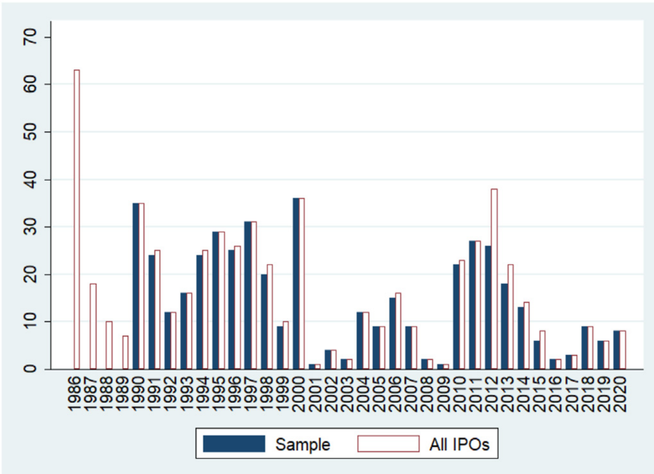

Fig. 1. IPO volume. The figure plots all 581 firms that start trading on Borsa İstanbul (*all IPOs*) and the *sample* 456 firms from 1986 to 2020.

We investigate whether the size of the IPO firm (measured using post-issue market capitalization) affects the characteristics of the IPOs and first-day returns. Panel B of Table 1 classifies the sample into two according to the post-issue market capitalization of IPO firms, valued at the inflation adjusted offer price. We find that the first-day returns of smaller IPO firms (whose market capitalization is lower than the sample median) prove significantly larger. Furthermore, shares of existing shareholders are offered up for sale in 49 percent of smaller IPO firms and in 69 percent of larger IPO firms.

4. IPOs in a changing regulatory and economic environment

Fig. 2 plots the mean of first-day returns annually from 1990 to 2020. First-day returns are lower in the crisis years of 1994 (at 5.5%), 2001 and 2002 (at 4.8% and −3.9%, respectively), and in 2016 (at −0.25%), the year of the attempted coup. There is only one IPO in the global financial crisis period in 2009. First-day returns are highest in 1990 (at 24.9%), the first year in which Borsa İstanbul starts reporting deal-level data on IPOs. Table 2 reports the annual means of IPO proceeds, post-issue market capitalization, first-day returns, and annually aggregated IPO proceeds. The plots of IPO volume in Fig. 1 and first-day returns in Fig. 2 highlight the importance of investigating IPOs in the context of the changes in the regulatory and economic environment.

The evolution of the regulations governing pricing and allocation of initial public offers affects first-day returns and shapes the deal characteristics of sample IPOs. Figure S1 (See the Supplementary Material, available online) shows the timeline for these crucial regulations. Borsa İstanbul Datastore provides data on the pricing method of IPOs starting in 1993.1993 is also the year in which the SPK issued the "Communique on Principles Regarding Sales Methods of Capital Market Instruments Through Public Offering" (SPK Communique Series: VIII, Number: 22, 1993). The Communique states that issuers can use two pricing methods in the public offerings of newly issued shares and existing shares. The first method requires the underwriter to collect and record indications of interest from investors (referred to as "Talep Toplama Yöntemi," Rule 4 of SPK Communique Series: VIII,

Table 1
Describing the sample of IPOs.

Panel A - Descriptive statistics					
	Mean	Standard deviation	Minimum	Maximum	N
IPO proceeds, USD million	61.05	230.06	0.25	2665.72	453
Float, %	28.36	19.30	0.99	100.00	454
Market capitalization. USD million	318.20	1541.27	0.48	25,484.94	452
Shareholder sale	0.59	0.49	0	1	454
Firm commitment	0.75	0.43	0	1	350
First day return, %	8.88	20.68	−30.00	233.33	439

Panel B−IPO terms and First-day returns in subsamples split according to market capitalization						
	Shareholder sale		**Firm commitment**		**First day returns**	
	Mean	**N**	**Mean**	**N**	**Mean**	**N**
Market capitalization below the sample median	0.49	226	0.75	167	11.10	206
Market capitalization above the sample median	0.69	226	0.75	183	6.44	215
Difference	−0.19***		−0.01		4.65**	

Panel A reports the mean, standard deviation, minimum, maximum, and number of observations for First-day returns, IPO proceeds, shares offered in IPO, market capitalization, firm commitment indicator, and shareholder sale indicator. *IPO proceeds* is the IPO proceeds in million USD adjusted for inflation using 2020 CPI. *Float* is the percentage of shares offered in the IPO. Post-issue *market capitalization* (valued at the offer price) is inflation adjusted proceeds (in 2020 million USD) divided by the percentage of shares offered in the IPO. *Firm commitment* takes on the value 1 if at least one of the underwriters partially or fully take on the risk of insufficient demand in a firm commitment contract and 0 otherwise. *Shareholder sale* takes on the value 1 if shares of existing shareholders are offered up for sale in the IPO and 0 otherwise. *First day returns* are the difference between the closing price on the first trading day and the offer price divided by the offer price (in percent). Panel B reports the mean of IPO terms (such as whether shares of existing shareholders are offered for sale and whether at least one of the underwriters partially or fully sign on for a firm commitment contract) and First-day returns in subsamples classified according to market capitalization. The sample is split into two based on whether the firm's market capitalization is above or below the sample median. *, **, *** denote the significance of the difference in the subsamples at 10, 5 and 1 percent, respectively.

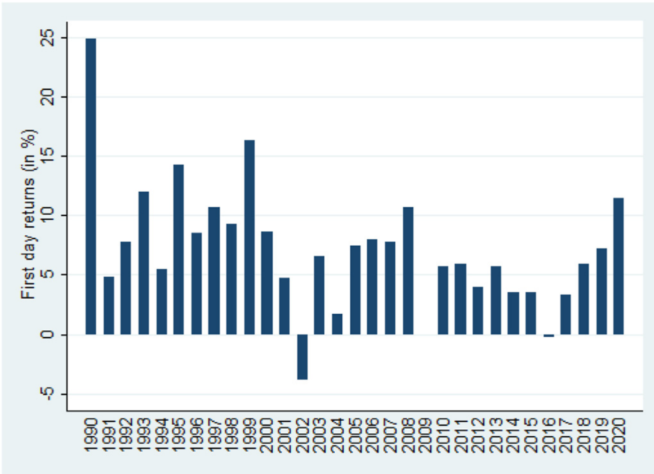

Fig. 2. First-day returns for IPO firms. The figure plots the mean of first-day returns for IPO firms from 1990 to 2020. First-day returns are closing day price on the first trading day minus the offer price, divided by the offer price.

Number: 22, 1993). The second method requires the underwriter to offer the IPO shares to investors on IMKB with a pre-determined minimum acceptable offer price, henceforth *sales at exchange* method (referred to as "Borsa'da Satış Yöntemi," Rule 6 of SPK Communique Series: VIII, Number: 22, 1993; and Istanbul Stock Exchange Bylaw, 1990). According to the IMKB Bylaw Rule 43, issuers and underwriters must announce the characteristics of the issuer and the issue, the first trading day, the number of shares offered and the minimum acceptable offer price at least one week before in the Exchange Bulletin ("Borsa Bülteni").

Underwriters may use three methods to collect indications of interest, which differ based on how they determine the offer price. In the first approach, underwriters ask investors to submit the quantity they would demand at a pre-determined fixed price, henceforth *fixed-price* method (referred to as "Sabit Fiyatla Talep Toplanması Yöntemi"). Underwriters determine a minimum acceptable offer price in the second approach and ask investors to submit their price offers and

Table 2
IPO proceeds, market capitalization, first-day returns across the years.

Year	IPO proceeds			Float		Market capitalization		First-day returns	
	Mean	Aggregated	N	Mean	N	Mean	N	Mean	N
1990	57	1824	32	17	34	381	32	24.87	35
1991	31	740	24	29	23	200	23	4.79	24
1992	13	158	12	18	12	110	12	7.77	12
1993	17	272	16	18	16	101	16	11.93	16
1994	18	443	24	23	24	95	24	5.51	23
1995	14	419	29	33	29	86	29	14.22	27
1996	10	241	25	28	25	67	25	8.55	22
1997	23	713	31	24	31	162	31	10.69	31
1998	30	609	20	26	20	150	20	9.28	19
1999	15	135	9	41	9	62	9	16.34	7
2000	117	4207	36	20	36	950	36	8.61	36
2001	0.4	0.4	1	49	1	0.7	1	4.76	1
2002	20	81	4	25	4	100	4	−3.87	4
2003	8	16	2	35	2	21	2	6.53	2
2004	55	660	12	33	12	202	12	1.65	12
2005	257	2309	9	51	9	901	9	7.46	8
2006	80	1201	15	49	15	329	15	7.98	10
2007	387	3482	9	47	9	1517	9	7.70	8
2008	1163	2326	2	57	2	7738	2	10.72	2
2009	8	8	1	25	1	33	1	0.00	0
2010	114	2500	22	28	22	524	22	5.67	22
2011	36	972	27	31	27	139	27	5.88	27
2012	15	399	26	25	26	91	26	3.99	26
2013	47	844	18	29	18	152	18	5.69	18
2014	27	349	13	27	13	115	13	3.56	13
2015	11	63	6	40	6	24	6	3.54	6
2016	63	127	2	25	2	252	2	−0.25	2
2017	317	952	3	41	3	589	3	3.26	3
2018	157	1417	9	32	9	545	9	5.89	9
2019	8	47	6	35	6	23	6	7.16	6
2020	18	141	8	33	8	57	8	11.41	8
All years	61	27,656	453	28	454	318	452	8.88	439

Table reports annual mean of post-issue market capitalization, first-day returns, float, IPO proceeds and annual aggregated IPO proceeds across sample years. IPO proceeds and market capitalization are adjusted for inflation in 2020 million USD. First-day returns and float are in percent.

quantity demands, henceforth *bookbuilding with price bids* ("Fiyat Teklifi Alma Yoluyla Talep Toplanması Yöntemi"). The amendment to the Communique (SPK Communique Series: VIII, Number: 37, 2003) introduced a third approach for underwriters to collect indications of interest from investors. In the third approach, underwriters determine a range for the offer price where the maximum price cannot exceed the minimum by more than 20 percent, henceforth *bookbuilding with a price range* ("Fiyat Aralığı Yoluyla Talep Toplanması Yöntemi"). The underwriters ask investors to submit quantity demand at the maximum price.

The *sales at exchange, fixed-price, bookbuilding with price bids,* and *bookbuilding with a price range* methods differ in the information about the demand level that underwriters and issuers have when setting the offer price. On the one hand, underwriters set the offer price before they learn about the demand level when using the fixed-price method. Issuers and underwriters also decide on the minimum acceptable offer price before observing the demand level when they use the *sales at the stock exchange* method and *bookbuilding with a price range* On the other hand, underwriters set the offer price after learning about the demand level when using *bookbuilding with price bids*.

The *sales at exchange, fixed-price, bookbuilding with price bids,* and *bookbuilding with a price range* methods also differ in the discretion that underwriters have in allocating shares when there is excess demand for the IPO. At one end of the spectrum is the *sales at exchange* method where the trading and settlement rules set forth in the Bylaw of IMKB govern how IPO shares are distributed. At the other end of the spectrum, underwriters collect indications of interest using the *fixed-price, bookbuilding with price bids,* and *bookbuilding with a price range* methods where the underwriters and issuers, in line with the rules set forth in the Communique (Rule 4.1.1.4, 4.1.1.7, 4.1.2.1.1.4, 4.1.2.1.1.7 of SPK Communique Series: VIII, Number: 22, 1993), can exercise some discretion in allocating shares. The control in allocation lies in determining the percentages of IPO shares that different investor classes can receive. The Communique allows the issuers to give a portion of IPO shares to employees of the issuer, investors that have trade relations with the issuer, or investor classes of the issuer's choice. The Communique also states that the allocation scheme should not benefit any investor group with managerial, monitoring, or ownership relations with the issuer. The amendment to the Communique (SPK Communique Series: VIII, Number: 28, 1996) restricts the issuer from allocating more than 20 percent of IPO shares to investment funds and the amendment to the Communique (SPK Communique Series: VIII, Number: 37, 2003) requires issuers to allocate at least 50 percent IPO shares to "small individual investors" ("küçük bireysel yatırımcı"). These amendments aim to protect retail investors from preferential allocation schemes that would benefit large institutional investors. The new Communique (SPK Communique Series II-5.2, 2013 revised 2017) further requires underwriters to allocate at least 10 percent of IPO shares to individual domestic investors and 10 percent to domestic institutional investors. The Communique also allows underwriters to reallocate the portion of IPO shares that each investor class will receive after the bookbuilding period.[8]

SPKset the rules on how underwriters distribute IPO shares to investors. If underwriters use *fixed-price* and *bookbuilding with a price range* methods, in case of excess demand, they must divide the number of shares offered in the IPO by the number of investors who submit a bid. If an investor's demand is lower than this average demand, it is fully met. Underwriters divide the remaining IPO shares by the number of investors with unmet demand and distribute the remaining shares. Compared to a pro-rata distribution, this distribution method favors small investors at the expense of large investors. In amendments to the Communique, underwriters can choose between this distribution method and pro-rata distribution (SPK Communique: VIII, Number: 37, 2003; and SPK Communique: VIII, Number: 66, 2010). If underwriters use *bookbuilding with price bids*, in case of excess demand, underwriters and issuers set the offer price as the price at which they can sell all IPO shares. The demand of all investors whose price bids are higher than the offer price is fully met. Underwriters allocate shares pro-rata if the quantity demand at the offer price is greater than the remaining IPO shares.

Amendment Communique (SPK Communique: VIII, Number: 33, 1998) increases the discretion that underwriters and issuers enjoy when distributing shares in investor classes with pre-set allocation quotas as long as the prospectus states the procedures for allocation and distribution. The new Communique of 2013 (Communique Series II-5.2, 2013 revised 2017) (Rule 10 of Communique Series II-5.2, 2013) further clarifies the discretion in allocation. The Communique explicitly requires underwriters to treat investors, except for "qualified investors" and "institutional investors,"[9] equally and fairly regarding the allocation and distribution of IPO shares. The Communique states that underwriters and issuers may treat qualified investors and institutional investors as they see fit if they disclose the treatment (allocation and distribution scheme) in the prospectus.

Fig. 3 categorizes the sales methods according to the two dimensions. The first dimension relates to whether underwriters collect and record investor interest in the IPO before setting the offer price. The second dimension relates to the level of discretion underwriters enjoy in allocating IPO shares. On the one end of the continuum, in the bookbuilding with a price range and bookbuilding with price bids, underwriters enjoy more discretion in allocation since they control the proportion of shares distributed to investor classes *and* they have collected information on the level of interest. On the other end of the continuum, the exchange rules govern the pricing and the allocation of shares in the *sales at*

[8] Domestic individual and domestic institutional investor classes should still receive at least 10 percent of IPO shares each. The decrease in allocation to any investor class should not exceed 20 percent of the initial allocation. The allocation rules do not apply to IPOs conducted through sales at the exchange.

[9] "Qualified investor" refers to professional customers as defined in the regulations of the Capital Markets Board.

		Information on demand available when setting offer price	
		Yes	No
Discretion in share allocation	More	Bookbuilding with a price range Bookbuilding with price bids	Fixed price
	Less		Sales at stock exchange

Fig. 3. IPO sales methods. Table categorizes IPO sales methods according to whether underwriters have collected the level of interest in the IPO prior to setting the offer price (yes versus no) and the level of discretion underwriters enjoy in allocating IPO shares (high versus low).

exchange method. Between these two ends lies the *fixed-price* method. Underwriters exert discretion over allocation but do not know the level of interest in the IPO before setting the offer price.

The criteria for firms to be quoted on the exchange also evolved with changing regulations. IMKB Bylaw (1985) introduced the rules and regulations that govern the operations of the new exchange. Rule 9 of the Bylaw requires firms whose securities are to be quoted on the exchange: (1) to have more than 100 shareholders, (2) to offer at least 15 percent of paid-in capital to the public, (3) to be established more than three years ago (2 years if more than 100 shareholders hold at least 25 percent of paid-in capital), (4) to be deemed financially healthy by the exchange, (5) to have realized profits in the last two years, (6) to have more than 200 million TL (approximately 352,000 USD) in paid-in capital and capital. The Bylaw also states that all rules and regulations set forth by the exchange (Rule 46) shall govern public offerings of shares. The minimum offer price and the quantity supplied in public offerings must be announced in the Exchange Bulletin at least one week before (Rule 43). Amendments to the Bylaw (IMKB Bylaw Amendment, 1990) and new Bylaws that expressly set forth the rules for a quotation on the exchange (IMKB Quotation Bylaw, 1995) changed the level of minimum capital requirements. They introduced the necessity for independently audited financial statements. The new Borsa İstanbul Quotation Bylaw (Borsa İstanbul Quotation Bylaw, 2015, revised in 2019 and 2021) changed the minimum capital requirements and introduced restrictions on minimum equity-capital ratio required.

We divide the sample into four periods in line with changes in the economic and regulatory environment. Turkey pursued a domestic market-oriented, high tariff protected, import-substitution growth strategy before 1980. The newly elected officials adopted a new export-led growth strategy based on the free market notion of competition (Cecen, 1994; Selçuk and Ertuğrul, 2001; Tanyeri, 2010). The early years of deregulation from 1986 (founding of IMKB) to 2001 proved volatile both politically, with 14 coalitions ruling, and economically, with three economic crises in 1994, 1998, and 1999−2001 (Kibritçioğlu, 2001).

The rules and regulations governing initial public offerings also changed during the sample period. SPK released the first directive (SPK Communique Series VIII Number 22, 1993) that set the rules on pricing, marketing, allocation, and distribution of IPOs on October 27, 1993. The first subsample covers these early years of the sample from 1990 to 1993. The second subsample covers the years from 1994 to 2002. The years from 1994 to 2002 were marked by significant economic and political volatility, and Fig. 1 shows that IPO volume bottomed out during the crisis years 2000−2002. The third subsample starts in 2003 when SPK released a significant amendment to the Communique (SPK Communique Series VIII Number 37, 2003) and ends in 2009. The years from 2003 to 2009 that start in the aftermath of a crisis and end with the global financial crisis were politically more stable, with the same political party winning all general elections and remaining in power. Fig. 1 shows that IPO volume starts low at the beginning of the subsample in 2003, picks up pace over

Table 3
Sales methods across the subsamples.

	1990−1993	1994−2002	2003−2009	2010−2020	Full Sample
Panel A − Use of different sales methods across the subsamples					
Fixed price	1 (1%)	137 (76%)	16 (33%)	22 (16%)	176 (39%)
Bookbuilding with price range	0	1 (1%)	16 (33%)	32 (23%)	49 (11%)
Bookbuilding with price bids	0	25 (14%)	0	0	25 (5%)
Sale at stock exchange	0	18 (10%)	16 (33%)	85 (61%)	119 (26%)
Direct sales	15 (17%)	0	0	0	15 (3%)
Data not available	71 (82%)	0	0	1 (1%)	72 (16%)
Total	87 (19%)	181 (40%)	48 (11%)	140 (31%)	456 (100%)
Panel B - First-day returns according to the sales method and subsample period					
Fixed price	10 (1)	7.67 (137)	4.24 (16)	1.91 (22)	6.65 (176)
Bookbuilding with price range		5.68 (1)	8.94 (15)	3.06 (32)	4.95 (48)
Bookbuilding with price bids		19.33 (25)			19.33 (25)
Sale at stock exchange		10.34 (9)	4.49 (9)	7.10 (85)	7.16 (103)
Direct sales	12.06 (15)				12.06 (15)
Data not available	15.19 (71)			10.00 (1)	15.12 (72)
Total	14.59 (87)	9.49 (172)	6.06 (40)	5.38 (140)	8.88 (439)

Panel A tabulates the number of IPOs that use the fixed price, bookbuilding with price bids, and bookbuilding with price range, sales at exchange, and direct sales methods in four periods, from 1990 to 1993, 1994 to 2002, 2003 to 2009, and 2010 to 2018. The frequency relative to each subperiod is in parenthesis. Panel B reports the mean first day return (in percent) according to the type of sales method and the period. The number of IPOs is in paranthesis.

Table 4
IPO contracting terms and first-day returns.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1990−1993	9.21 (3.29)***	8.15 (2.85)***	9.01 (3.22)***	8.25 (2.88)***	9.12 (1.94)*	8.01 (1.72)*	8.68 (0.52)
1994−2002	4.11 (1.76)*	3.62 (1.56)	4.10 (1.79)*	4.32 (1.88)*	6.36 (2.53)**	9.44 (3.46)***	6.24 (1.90)*
2003−2009	0.67 (0.18)	2.05 (0.55)	1.69 (0.47)	1.24 (0.34)	3.51 (1.05)	4.36 (1.31)	3.10 (0.90)
Proceeds		−2.02 (3.00)***					
Float		0.01 (0.23)					
Log (market capitalization)			−1.90 (3.21)***	−2.04 (3.37)***	−1.61 (2.88)***	−1.58 (2.84)***	−1.82 (2.76)***
Shareholder sale				2.50 (1.19)	1.46 (0.76)	0.76 (0.40)	0.57 (0.29)
Firm commitment					−5.13 (1.99)**	−4.47 (1.74)*	−3.65 (1.40)
Fixed price						−6.06 (2.75)***	−2.59 (0.15)
Bookbuilding, price bids							8.44 (0.49)
Bookbuilding, price range							2.25 (0.13)
Sales at stock exchange							−0.01 (0.00)
Constant	5.38 (3.11)***	10.52 (3.26)***	13.07 (4.45)***	12.24 (4.06)***	13.69 (4.28)***	14.99 (4.68)***	14.52 (0.83)
Adjusted R^2 (%)	1.96	3.37	3.74	3.83	3.36	5.27	5.40
N	439	435	435	435	333	333	333

Table regresses first-day returns on deal characteristics. *Proceeds* is the log of IPO proceeds. Log *market capitalization* is the log of market capitalization. *1990−1993, 1994−2002, 2003−2009* are indicators that are 1 if IPO firm lists respectively from 1990 to 1993, from 1994 to 2002, and from 2003 to 2009, and 0 otherwise. Fixed price, bookbuilding price bids, bookbuilding price range, sales at stock exchange are indicators that take on the value 1 if the sales method named is used and 0 otherwise. Firm commitment takes on the value 1 if at least one of the underwriters partially or fully signs on for a firm commitment contract and 0 otherwise. *t*-statistics are in parentheses.*,**,*** denote significance at 10, 5 and 1 percent, respectively.

time, and decreases with the global crisis of 2008−2009. The fourth subsample starts in 2010 when SPK released a new directive (SPK Communique Series VIII Number 66, 2010) to replace the previous Communiques that govern the IPO process and ends at the end of the sample period, 2020.

Panel A of Table 3 tabulates the pricing methods underwriters use across the subsamples. The changing regulations shape how underwriters price, allocate and distribute IPO shares. Underwriters use bookbuilding (with a price range or with price bids) in 16 percent, fixed price in 39 percent and sales at stock exchange method in 26 percent of IPOs. Furthermore, after SPK allows underwriters to use the third bookbuilding method, bookbuilding with a price range, the use of bookbuilding with price bids disappears (SPK Communique Series VIII Number 37, 2003). Borsa İstanbul Datastore starts reporting the pricing method that underwriters use beginning in 1993, and data on pricing method is not available in 16 percent of IPOs. SPK issues the first Communique on IPO pricing in October 1993 (SPK Communique Series VIII Number 22, 1993). Before the passing of the first Communique, in 15 out of 16 IPOs in 1993, underwriters use the direct sales method.

Panel B of Table 3 reports first-day returns according to different pricing methods across the subsamples. First-day returns decrease across the sampling period. Mean first-day returns are higher (at 15 percent) in the earliest subsample from 1990 to 1993 than in the from 2010 to 2020 (at 5 percent). First-days returns when underwriters use bookbuilding (at 10 percent) are not significantly different from when they use sales at exchange (at 7 percent) or when they use fixed price method (at 7 percent). However, when we look at the use of different sales methods in each sample period, we observe significant differences in first-day returns. When underwriters use fixed price, the first-day returns prove significantly lower (at 8 percent) than when they use bookbuilding with price bids (at 19 percent) in the subsample from 1994 to 2002. Furthermore, first-day returns when underwriters use fixed price also prove significantly lower (at 2 percent) than when they use sales at exchange methods (at 7 percent) in the subsample from 2010 to 2020.

Table 4 reports the results of regressing first-day returns on IPO terms. First-day returns prove significantly lower in IPOs where the underwriters signed on for firm commitment and assumed the risk of not selling the entire offering, and when they used fixed offer price method. IPOs, where the investment banker was willing to assume the risk of insufficient demand and fixed the offer price, are firms that are prone to less information asymmetry. Furthermore, first-day returns are decreasing in IPO proceeds and post-issue market capitalization of IPO firms. It seems that larger firms that are prone to less information asymmetry can get away with smaller price discounts.

5. Conclusion

Underpricing (first-day returns) in 439 Turkish IPOs listed on Borsa Istanbul from 1990 to 2020 averages 9 percent. The underpricing of 9 percent is within the lower range of underpricing documented in other developing market countries with underpricing declining from 1990 to 2002 to 2003−2020. The changing economic and regulatory environment in Turkey affects the underpricing and IPO deal terms. Furthermore, the higher underpricing in the early years of the stock exchange point to the importance of learning by investors, intermediaries, and firm insiders. As shown in Table 4 the method by which the IPO is priced and allocated is not reliably related to average first-day returns. Information on the earliest years of Borsa Istanbul in 1986−1989 is scarce. Future work that investigates how investors, intermediaries, and firm insiders valued firms in the initial years of the stock exchange's operations will contribute to the literature on learning in financial markets.

Conflict of interest:

There is no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bir.2021.06.006.

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