

The Effect Of Initial Public Offering Valuations On Equilibrium Market Value At Borsa Istanbul

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Abstract: Effective valuation and pricing are vital to reduce the underpricing paradox in public offerings. In this study, 76 initial public offerings (IPO) that were offered in Borsa Istanbul between 2005 and 2015 have been examined. While there has been 4.33% underpricing in sampling period in BIST, and to observe how the valuation with 22.86% average discount rate that has been applied by underwriters have reflected the market equilibrium prices, share prices of all firms in sample have been revalued by historical discounted cash flow analysis that has been based on historical ratios which reflects historical economic track record of the firm. The valuation approaches most commonly preferred by the firms have been compared in terms of explanatory power by univariate regression analysis and it has been found that explanatory power of comparable firms is 84.9%, explanatory power of DCF is 93.7%, fair value is 96% and historical DCF is 98.3%.

Keywords: Initial Public Offering, Valuation, Underpricing.

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I. INTRODUCTION

Public offering is a "direct financing" method which is applied by a joint stock company to meet the resources in need (SPK, 2012: 1). It is a significant process that helps firms to find funding, provide liquidity, be recognized nationally and internationally, institutionalize, increase credibility and ultimately globalize. A general call is made for the capital market instruments and the sale of the shares is carried out afterwards. When it is well managed, it increases the prestige of firms and accelerates their growth.

Significant stages of preparation of a public offering for a company can be summarized as such: setting a working group in the company, selection of the underwriters and consultants, preparation of the financial statements, selection of the independent auditing company, making decision on the general assembly and the amendment of the articles of association, pricing and preparation of documents required for application (Borsa Istanbul, 2012:2). The positive difference between the public offering price and the closing price on the first day has been defined as the first day return or underpricing in the literature. The national and international public offering literature has focused more on underpricing studies after the offering. When looked into the preliminary stages of the public offering process, which results in underpricing, the traces of this problematic can be observed till the valuation process. Therefore, the valuation process which may be regarded as the most significant step of the public offering process has been examined at this study.

II. LITERATURE REVIEW

The price of financial assets constantly fluctuates in accordance with the market conditions. This means that for every speculator on the market, the real value is constantly searched (Gürbüz and Ergincan, 2004: 1). According to Ercan, Öztürk and Demirgüneş, the total benefit of an asset, the intrinsic value and the concept of value can be defined as the amount that can be taken in return of the asset, and this is one of the significant topics that have been continuously researched in traditional and modern finance (Ercan et al., 2006: 1).

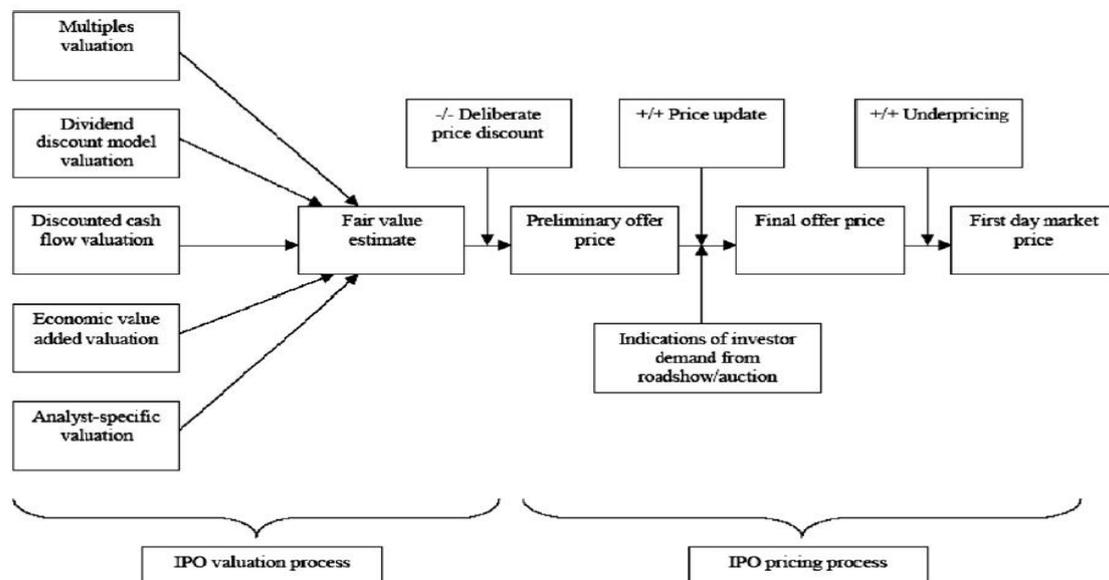
Initial public offering means that stocks are offered to lots of investors by means of call and announcement for the first time. Firms can make initial public offering for various reasons. Risky firms (Pagano, 1993:1101), fast-growing firms (Holmström and Tirole, 1993: 680), firms which have debt with high interest rates (Rajan, 1992: 1367) generally have potential to open to the public. Companies are disposed to enter into capital markets through initial public offerings (Borsa İstanbul, 2012: 3) to increase their prestige and reputation, to create liquidity, to have a more institutional structure, to prepare the environment to grow by buying other companies in the future and to maximize their firm value.

The positive difference between the initial public offering price and the first day closing price has been defined as the first day return or underpricing in the literature (Ritter, 1984: 217). The study of Oran, Aytürk and

Akbaba (2013) which was based on the study of Rosenboom (2012) and Francis, Olsson and Oswald (2000), has searched the level of underpricing and its causes in Borsa Istanbul. The comparable firms approach has been used in the 60 initial public offering valuations of sample of Oran et al. (2013). While valuation with reduced cash flows has been used in 56 of them, both two methods have been preferred together in 55 of them. It has been found out that, there is no consistent variable that affects the level of deviation of valuation for first public offerings. It has been inferred that the higher discount rate in the study, the lower the demand of investors because of their drawback, and as a result underpricing will decrease. In this study, it has been determined that underpricing occurs in 44 public offerings while overpricing occurs in 23 public offerings (Oran et al., 2013: 95). In the study which has examined 61 public offerings between January 2008 and July 2013, 8.3% underpricing has been determined. The result is that there is not a simple model which explains underpricing by itself, a model that is meaningful for a firm over a period may not be meaningful for another firm at another time. In the study of Kıymaz (1996) which analyses initial public offerings of industrial firms in 1990-1995 at Borsa Istanbul, it has been estimated that the average first day return is 12.2% (Küçükçaylı, 2013: 43). In support of the above research, it has been found that the ratio of underpricing is 14.61% in 173 firms which made public offering in Borsa Istanbul between 1990 and 1997 in the study of Durukan (Durukan, 2002: 25).

In another study of Kıymaz, a sample of 163 IPO have been examined between 1990 and 1996 at Borsa Istanbul (BIST), and the average level of underpricing has been determined as 13.6%. The reason behind this underpricing has been explained with the help of size of the company, the market trend and the firm ownership variables (Kıymaz, 2000: 226). Ünlü and Ersoy's (2008) study has examined the 112 firms that were offered to the public between 1995 and 2008 in BIST and the level of underpricing has been found as 6.52%. While there is still underpricing; firms which are older than 20 years, have more uncertainty and have had public offering by means of capital increase have indicated better returns in the short run. Otlu and Ölmez (2011) have examined 53 initial public offerings between January 2006 and June 2011 in BIST and they have found that the ratio of underpricing is 6.99% in the market. Başpınar (2008) has searched 240 initial public offerings between January 1993 and May 2007 and the level of underpricing has been estimated as 9.16%. In this study, it has been reached out that stocks were not calculated on their fair value. If the public offering price is set too high, initial public offering will fall short of the expectations since investors would refrain from purchasing the share, although this seems advantageous for the firm. On the contrary, if the public offering price is set too low for investors to be satisfied, this time the company will give up the offering, because it will have waived most of revenue of public offering. These reasons have indicated that the correct and effective determination of the public offering price is the most important stage in the initial public offering process (Küçükkocaoğlu and Alagöz, 2009: 67). In Figure 1, valuation and pricing processes in initial public offerings have been summarized (Rosenboom, 2012: 1656). In his first work in this field, Ritter has examined 1028 first public offering in the United States market between 1977 and 1982 and calculated the average first day return as 16.3% (Ritter, 1984: 215). In his next study, Ritter has analyzed 1526 public offerings between 1975 and 1988 in the United States and concluded that there are three anomalies (Ritter, 1991: 3). These are as such: underpricing, first-day returns, and overpricing in the long run.

Figure 1: Valuation and Pricing Processes of IPOs



Source: Rosenboom, P. (2012). Valuing and Pricing IPO's. *Journal of Banking and Finance*, s. 1656.

It is possible to mention the existence of the first day return concept, globally. In Table 1, the first day return that observed after the public offerings in 52 countries have been shown (Ritter, 2003: 433). The country which has a large economy and high average first day return is China with 118.4%. Tian has explained this underpricing level as the result of the regulations of the Chinese government on public offerings (Tian, 2011: 89). Rosenboom has analyzed 228 public offerings at Euronext Paris and found that the first-day returns at 12.91% level (Rosenboom, 2012: 1658). An analysis of that study has found a strong negative correlation between firm age and underpricing.

Table 1: Average First Day Returns of 52 Countries

Country	Source	Sample Size	Time Period	Avg. First Day Return
Argentina	Eijgenhuijsen ve van der Valk; Dealogic	26	1991-2013	%4,2
Australia	Lee, Taylor ve Walter; Woo; Pham; Ritter	1562	1976-2011	%21,8
Austria	Aussenegg	103	1971-2013	%6,4
Belgium	Rogiers, Manigart ve Ooghe; Manigart;DuMortier; Ritter	114	1984-2006	%13,5
Brazil	Aggarwal, Leal ve Hernandez; Saito; Ushisima	275	1979-2011	%33,1
Bulgaria	Nikolov	9	2004-2007	%36,5
Canada	Jog ve Riding; Jog ve Srivastava; Kryzanowski ve Rakita; Ritter	720	1971-2013	%6,5
Chile	Aggarwal, Leal ve Hernandez; Celis ve Maturana;Dealogic	81	1982-2013	%7,4
China	Chen, Choi ve Jiang; Jia, Xie ve Zhang	2512	1990-2013	%118,4
Cyprus	Gounopoulos, Nounis ve Stylianides; Chiandriotis	73	1997-2012	%20,3
Denmark	Jakobsen ve Sorensen; Ritter	164	1984-2011	%7,4
Egypt	Omran; Hearn	62	1990-2010	%10,4
Finland	Keloharju	168	1971-2013	%16,9
France	Husson ve Jacquillat; Leleux ve Muzyka; Paliard ve Belletante; Derrien ve Womack; Chahine;Ritter; Vismara	697	1983-2010	%10,5
Germany	Ljungqvist; Rocholl; Ritter; Vismara	736	1978-2011	%24,2
Greece	Nounis vd.;Thomadakis, Gounopoulos ve Nounis	373	1976-2013	%50,8
Hong Kong	McGuinness; Zhao ve Wu; Ljungqvist ve YuFung, Gul, andRadhakrishnan; Dealogic	1486	1980-2013	%15,8
India	MarisettyandSubrahmanyam; Ritter	2964	1990-2011	%88,5
Indonesia	Suherman	464	1990-2014	%24,9
Iran	Bagherzadeh	279	1991-2004	%22,4
Ireland	Dealogic	38	1991-2013	%21,6
Israel	Kandel, Sarig ve Wohl; Amihud ve Hauser; Ritter	348	1990-2006	%13,8
Italy	Arosio, Giudici ve Paleari; Cassia, Paleari ve Redondi; Vismara	312	1985-2013	%15,2
Japan	Fukuda; Dawson ve Hiraki; Hebner ve Hiraki; Hamao, Packer ve Ritter; Kaneko ve Pettway	3236	1970-2013	%41,7
Jordan	Al-Ali ve Braik	53	1999-2008	%149,0
Korea	Dhatt vd.;Ihm; Choi ve Heo;Mosharian ve Ng; Cho; Joh; Dealogic, Lee	1758	1980-2014	%58,8
Malaysia	Isa; Isa ve Young; Yong; Ma; Dealogic	474	1980-2013	%56,2
Mauritius	Bundoo	40	1989-2005	%15,2
Mexico	Aggarwal vd.;Lealvd; Eijgenhuijsen&van der Valk; Villarreal	123	1987-2012	%11,6
Morocco	AlamiTalbi; Hearn	33	2000-2011	%33,3
Netherlands	Wessels; Eijgenhuijsen ve Buijs; Ljungqvist, Jenkinson ve Wilhelm; Ritter	181	1982-2006	%10,2
New Zeland	Vos ve Cheung; Camp ve Munro;Alqahtani; Dealogic	242	1979-2013	%18,6
Nigeria	Ikoku; Achua; Dealogic	122	1989-2013	%13,1
Norway	Emilsen; Pedersen ve Saettern; Liden; Dealogic	209	1984-2013	%8,1
Pakistan	Mumtaz	80	2000-2013	%22,1
Philippines	Sullivan ve Unite; Dealogic	155	1987-2013	%18,1
Poland	Jelic ve Briston; Woloszyn	309	1991-2014	%12,7
Portugal	Almeida ve Duque;Dealogic	32	1992-2013	%11,9
Russia	Dealogic	64	1999-2013	%3,3
SaudiArabia	Al-Anazi, Forster ve Liu; Alqahtani	80	2003-2011	%239,8
Singapore	Lee, Taylor ve Walter; Dawson; Dealogic	609	1973-2013	%25,8
South Africa	Page ve Reyneke; Ali, Subrahmanyam&Gleason; Dealogic	316	1980-2013	%17,4
Spain	Ansotegui ve Fabregat; Otero; Dealogic	143	1986-2013	%10,3
Sri Lanka	Samarakoon	105	1987-2008	%33,5
Sweden	Rydqvist; Schuster; de Ridder	374	1980-2011	%27,2
Switzerland	Drobetz; Kammermann ve Walchli; Dealogic	164	1983-2013	%27,3
Taiwan	Chen; Chiang	1620	1980-2013	%38,1
Thailand	Wethyavivorn vd.;Lonkani vd.; Ekkayokkaya vd.; Vithesso.	500	1987-2012	%35,1
Tunisia	Hearn	32	2001-2013	%24,3
Turkey	Kiyamaz; Durukan; Ince; Kucukkocaoglu; Elma	399	1990-2013	%9,7
Unt. Kingdom	Dimson; Vismara; Levis	4932	1959-2012	%16,0

Country	Source	Sample Size	Time Period	Avg. First Day Return
United States	Ibbotson, Sindelar ve Ritter; Ritter	12702	1960-2014	% 16,9

Source: Ritter, J.R. (2003). Differences between European and American IPO Markets, *European Financial Management*,9 (4), 433. (The data has been updated in 2015 by the same author.)

In the literature, valuation studies related to initial public offerings are based on the price determination reports obtained from underwriters. In a study conducted in Borsa Istanbul, 97.10% of the sample that analyzed has been carried out by underwriters which have applied comparable firms method (Oran et al., 2013: 85). The second most preferred model by underwriters is the discounted cash flow method with a ratio of 88.41%. The net asset value method is the last with a usage rate of 14.49%. In Rosenboom's study in France, the frequency of use is 87.28% for the comparable firms methods and 59.21% for the discounted cash flows model (Rosenboom, 2012: 1657).

The model with the most academic background and accepted as a scientific method is discounted cash flows approach (Fernandez, 2015: 8). When the future cash flows and the discount factor are correctly estimated, this model gives the most accurate results. Analysts often prefer pricing via using their earnings estimates in their valuations as well as historical earnings in the prospectuses that are open to all market participants.

The first day return of public offering has been considered as one of the most important anomalies in capital markets. The studies in this area have forged two theories with regarding where they originated. These are the primary market underpricing theory and the secondary market underpricing theory. The primary market underpricing theory indicates that information asymmetry raises the valuation risk in the IPO process (Ibbotson, 1975: 1027; Rock, 1986: 187, Benveniste and Wilhelm, 1990: 173, Brennan and Franks, 1997: 391, Stoughton and Zechner, 1998: 45; Loughran and Ritter, 2004: 5). According to this theory, in order to make the offering process more stable, companies have to keep the offering price below its actual value. When the shares enter the secondary market, the prices go back to their real values and thus the first day return of the public offering is formed.

The main assumption of the primary market underpricing theory is that the secondary market is active and the share prices are shaped by short term based value-driven information. But this assumption is not always valid. The internet balloon which broke out at the beginning of the 21st century, caused researchers who studied the first day return of public offerings to look at this theory with suspicion (Zhu et al., 2015: 193). Therefore, researchers and academicians who are interested in this issue reevaluated the initial public offerings from the perspective of the pricing mechanism in the secondary market, and as a result the secondary market underpricing theory has been created. This theory implies that the high first day returns in the public offerings are not derived from discounted offer prices but from overly optimistic investment decisions on the first offering day (Purnanandam and Swaminathan, 2004: 811; Ljungqvist et al., 2006: 1667). Derrien (2005) has noted that individual requests for new public offerings are positively related to pre-IPO market returns and IPO first-day returns. Cornelli, Goldreich and Ljungqvist (2006) have used market offer prices to measure investor optimism, and observed that offer prices were positively correlated with first day returns and negatively correlated with long-term returns.

When public offerings are examined under the perspective of behavioral finance, it can be said that the first-day returns are caused by the overly optimistic trading behaviors in the secondary market. Firstly, short-position constraints on public offerings prevent pessimistic investors from trading, even though estimates vary among investors. Thus, the price is only shaped by optimistic behaviors. Secondly, scarcity of resource capitals and historical high returns for new equities accelerate investor optimism. Finally, transaction prices on the first trading day are unilaterally determined by optimistic investors and quickly surpass their real values (Zhu et al., 2015: 193).

One of the most significant reasons for investor optimism is the high level of general market returns. This high level of market attractiveness improves investors' appetite for new shares, as well as allowing investors to overestimate the stability of the market and generate highly optimistic expectations related to the company outlooks (Derrien, 2005: 487).

III. METHOD

There are 150 initial public offerings that were made in Borsa Istanbul during the period of 2005 - 2015. Discounted cash flow analysis that is inspired from historical ratios is used when computing the price of the initial public offerings and tested for underpricing. In the analysis, Aykan Üreten and M. Kamil Ercan's "Determination and Management of Firm Value" (2000) book and with the applications given in this book have been used to determine the initial public offering prices.

The projections have been made for 10 years and the terminal value has been calculated. Considering the historical ratios of the company with the sectorial expectations mentioned in the offering prospectus,

projections have been conducted with regarding the ratios of growth in net sales, cost of goods sold/net sales, operating costs /net sales, cash need, accounts receivables, inventories, other current assets, accounts payables, other short-term debts, net tangible assets/net sales and depreciation/tangible assets of the last year.

Banks, holding companies and real estate investment associations have been excluded from the sample, since they require different valuation methodologies. In addition, companies that do not adopt discounted cash flows in their prospectuses have been excluded from the sample in order to obtain a more homogeneous sample. The crisis in the global financial markets in 2008 and 2009 was also felt in Turkey and there was no initial public offering matching the constraints of this study, although fewer public offerings occurred than in other years. Since 2010, public offerings have increased due to the effect of the public offering mobilization. Thus, final sampling of 76 companies in the manufacturing, technology and service sectors has been analyzed. Table 2 has listed the number of initial public offerings and sample size for the selected years.

Table 2: IPO Numbers According to Years and Sample Size

Year	IPOsperYear	TheReason of BeingOut of theSample		Sample Size
		Insufficient Data	Holding, FinanceFirm, etc.	
2005	9	1	5	3
2006	15	1	7	7
2007	9	-	8	1
2008	2	1	1	-
2009	1	1	-	-
2010	24	2	10	12
2011	25	8	5	12
2012	26	2	5	19
2013	19	3	4	12
2014	14	3	4	7
2015	6	3	-	3
Total	150	25	49	76

Projections have been conducted with financial statements which were obtained from the offering prospectuses of the 76 companies in the sample which were announced at Public Disclosure Platform (Kamuyu Aydınlatma Platformu) with considering sector and company expectations. Weighted average cost of capital (WACC) and infinite growth rates (g) were also obtained from the offering prospectuses. The WACC ratio also means the minimum rate of return that an investor expects from the firm. Therefore, the return on invested capital (ROIC) and WACC have been considered equal in the valuation processes (Damodaran, 2000: 368).

IV. RESEARCH FINDINGS

The average age of initial public offerings in Turkey has been found as 17.46 for the sample as can be seen in Table 3. The public offering prices and the data of first day closing prices have been compared and the average underpricing price has been found as 4.33%. On the other hand, the average discount rate applied by underwriters, which were stated in the companies' offer prospectuses is 22.86%.

Table 3: The Statistics of First Day Closing Prices, Firm Ages, Underpricing and Discount Ratios of the Firms at the Sample

Firms	Value withoutDiscounting (UnderwriterComputed Value)	First DayClosingPrice	Underpricing	DiscountR atio	Firm Age
ANELT	4.39	3.80	1.60%	0.148	2
BIMAS	33	28.25	6.20%	0.194	10
TSPOR	8.44	5.15	-1.90%	0.38	11
ARMDA	4.3	2.80	-6.67%	0.31	13
CCOLA	9.132	8.05	11.03%	0.206	18
DGATE	4.6	4.26	21.71%	0.24	14
KAREL	8.07	4.28	-1.83%	0.46	20
RYSAS	6.66	4.84	21.00%	0.4	17

SELEC	7.68	6.50	21.50%	0.3	28
VESBE	4.82	3.20	0.00%	0.336	9
TAVHL	13.72	11.00	10.00%	0.27	10
KOZAL	46.58	34.75	-5.57%	0.21	21
LATEK	4.26	4.14	4.55%	0.07	11
MANGO	7.2	3.92	8.89%	0.5	10
AKSEN	5.44	4.76	-2.86%	0.1	13
IHGZT	1.8	1.90	15.15%	0.08	10
ANELE	8.66	5.30	0.00%	0.39	24
CEMAS	3.06	2.33	8.88%	0.3	34
EKIZ	8.31	5.50	-17.29%	0.2	31
UYUM	11.7	8.32	-4.91%	0.25	12
KATMR	9.3	5.88	-2.00%	0.355	25
DESPC	9	7.26	1.54%	0.2048	15
HATEK	5.36	5.15	21.18%	0.21	37
LKMNH	5	4.71	14.04%	0.174	15
BRKSN	2.29	1.95	-4.41%	0.11	11
UTPYA	4.49	3.36	-12.95%	0.14	21
BMEKS	5.85	4.53	0.67%	0.2306	21
BLCY	4.5	2.66	-1.48%	0.4	11
DAGI	3.57	2.90	19.83%	0.32	27
ERICO	4.27	4.15	16.90%	0.17	10
MEPET	6.48	5.70	3.64%	0.15	12
SAMAT	3.41	3.87	20.94%	0.13	23
VANGD	2.52	2.02	0.00%	0.2	1
OZBAL	5.83	3.92	-4.39%	0.297	16
ADESE	11.92	7.42	-4.26%	0.35	20
NIBAS	2.55	2.46	20.59%	0.2	43
SANFM	3.125	2.41	-3.60%	0.2	22
BEYAZ	7.28	4.47	-0.67%	0.38	19
OYLUM	2.87	2.79	21.30%	0.2	2
PRZMA	5	3.97	-0.75%	0.2	14
ORGE	4.45	3.27	-8.15%	0.2	14
MEGAP	2.5	2.08	4.00%	0.2	7
MCTAS	4.52	4.02	11.05%	0.2	14
TKNSA	10.31	7.58	-2.19%	0.25	12
ARTOG	1.99	2.29	21.16%	0.05	4
TGSAS	8.02	5.50	-1.79%	0.3	13
FLAP	5.96	5.70	16.33%	0.178	6
AKGUV	15.71	12.35	13.30%	0.306	11
ETILR	3.51	2.66	-5.34%	0.2	2
ULAS	2.29	2.22	16.84%	0.17	27
KRATL	3.55	2.50	0.00%	0.3	7
ATPET	5.29	4.44	-1.33%	0.15	34

TKURU	12.00	8.28	-7.59%	0.25	3
TMSN	6.05	4.02	0.50%	0.339	37
ROYAL	6.23	4.45	0.00%	0.286	13
TACTR	3.80	3.67	7.94%	0.105	16
ODAS	6.87	5.04	0.80%	0.272	3
BAKAN	5.34	5.86	21.07%	0.1	10
AKPAZ	3.42	2.55	-1.92%	0.24	17
SAYAS	2.93	2.28	3.64%	0.25	24
RODRG	2.69	2.61	11.06%	0.128	16
SEKUR	3.36	2.71	0.74%	0.2	16
YAYLA	5.54	5.82	21.25%	0.133	63
IZTAR	3.55	2.74	0.37%	0.23	3
SANEL	6.13	3.86	-3.02%	0.35	8
TMPOL	8.27	6.70	1.21%	0.2	6
POLTK	9.37	8.50	1.67%	0.108	29
RTALB	17.00	12.55	-3.46%	0.235	18
BMELK	2.25	2.14	4.39%	0.088	7
TUCLK	5.14	4.13	3.25%	0.22	26
IZFAS	2.34	1.92	3.78%	0.21	21
PSDTC	9.54	7.20	-4.00%	0.213	13
ULUUN	3.95	3.04	-3.49%	0.2	45
OZRDN	3.43	2.84	4.80%	0.21	57
SENKRN	6.14	5.25	0.00%	0.145	18
SEYKM	3.86	3.00	7.14%	0.197	24
<i>Averages</i>			4.33%	22.86%	17.46

While going public, underwriters did not only use discounted cash flows analysis but also use comparable firms method. Some underwriters have based their prices on only one method because of sectorial and company-specific reasons, even though they computed two different methodologies, while others have made two calculations and take averages of these calculations. Table 4 has shown the percentage of the methods that were used by underwriters.

Table 4: The Percentage of the Methods Used By Underwriters while they are computing the Fair Value of the Firms

<i>Firms</i>	<i>FairValue</i>	<i>TheMethodsUsedbyUnderwriters</i>	<i>Und. DCF</i>	<i>Und. CF</i>
ANELT	4.39	50% C.F.,50% DCF	4.33	4.45
BIMAS	33	50% C.F.,50% DCF	32.84	33
TSPOR	8.44	67% C.F.,33% DCF	9.54	7.89
ARMDA	4.3	50% C.F.,50% DCF	4.35	4.25
CCOLA	9.132	0% C.F.,100% DCF	9.45	8.22
DGATE	4.6	0% C.F.,100% DCF	4.6	4.86
KAREL	8.07	0% C.F.,100% DCF	8.07	6.23
RYSAS	6.66	0% C.F.,100% DCF	6.66	5.73
SELEC	7.68	60% C.F.,40% DCF	6.61	8.37
VESBE	4.82	67% C.F.,33% DCF	4.97	4.75

TAVHL	13.72	0% C.F.,100% DCF	13.72	11.09
KOZAL	46	0% C.F.,100% DCF	46	34.81
LATEK	4.26	50% C.F.,50% DCF	3.95	4.57
MANGO	7.2	50% C.F.,50% DCF	-	-
AKSEN	5.44	100% C.F.,0% DCF	8	5.44
IHGZT	1.8	0% C.F.,100% DCF	1.8	1.575
ANELE	8.66	40% C.F.,60% DCF	9.32	7.69
CEMAS	3.06	70% C.F.,30% DCF	4.28	2.54
EKIZ	8.31	40% C.F.,60% DCF	8.58	7.9
UYUM	11.7	40% C.F.,60% DCF	11.85	11.5
KATMR	9.3	50% C.F.,50% DCF	9.39	9.21
DESPC	9	0% C.F.,100% DCF	9	
HATEK	5.36	50% C.F.,50% DCF	-	-
LKMNH	5	40% C.F.,60% DCF	4.88	5.17
BRKSN	2.29	50% C.F.,50% DCF	2.31	2.27
UTPYA	4.49	50% C.F.,50% DCF	4.95	4.03
BMEKS	5.85	50% C.F.,50% DCF	6.79	4.91
BLCY	4.5	50% C.F.,50% DCF	4.24	4.76
DAGI	3.57	50% C.F.,50% DCF	3.6	3.54
ERICO	4.27	75% C.F.,25% DCF	4.78	4.1
MEPET	6.48	50% C.F., 50% DCF	6.99	5.97
SAMAT	3.41	50% C.F., 50% DCF	3.68	3.13
VANGD	2.52	40% C.F.,60% DCF	2.67	2.3
OZBAL	5.83	50% C.F., 50% DCF	5.76	5.9
ADESE	13.79	55% C.F.,45% DCF	12.91	14.51
NIBAS	2.55	50% C.F., 50% DCF	3.41	1.69
SANFM	3.125	50% C.F., 50% DCF	3.1	3.15
BEYAZ	7.28	50% C.F., 50% DCF	7.26	7.3
OYLUM	2.87	50% C.F., 50% DCF	3.79	1.95
PRZMA	5	50% C.F., 50% DCF	6.96	3.03
ORGE	4.45	65% C.F.,35% DCF	5.89	3.67
MEGAP	2.5	40% C.F., 60% DCF	2.08	3.13
MCTAS	4.52	30% C.F.,70% DCF	4.96	3.5
TKNSA	10.31	50% C.F., 50% DCF	10.64	9.98
ARTOG	1.99	65% C.F.,35% DCF	1.27	2.38
TGSAS	8.02	50% C.F., 50% DCF	12.09	3.91
FLAP	5.96	50% C.F., 50% DCF	7.18	4.74
AKGUV	15.71	50% C.F., 50% DCF	18.47	12.95
ETILR	3.51	50% C.F., 50% DCF	4.06	2.97
ULAS	2.29	50% C.F., 50% DCF	2.76	1.83
KRATL	3.55	50% C.F., 50% DCF	5.09	2.01
ATPET	5.29	50% C.F., 50% DCF	7.38	3.20
TKURU	12.00	30% C.F., 70% DCF	15.74	3.28
TMSN	6.05	0% C.F.,100% DCF	6.05	4.37

ROYAL	6.23	50% C.F., 50% DCF	6.45	6.01
TACTR	3.80	50% C.F., 50% DCF	5.68	1.92
ODAS	6.87	50% C.F., 50% DCF	6.83	6.91
BAKAN	5.34	50% C.F., 50% DCF	9.03	1.65
AKPAZ	3.42	50% C.F., 50% DCF	3.70	3.14
SAYAS	2.93	50% C.F., 50% DCF	3.22	2.64
RODRG	2.69	50% C.F., 50% DCF	2.64	2.75
SEKUR	3.36	50% C.F., 50% DCF	3.70	3.02
YAYLA	5.54	33% C.F., 33% DCF	6.97	6.16
IZTAR	3.55	70% C.F., 30% DCF	4.50	3.14
SANEL	6.13	50% C.F., 50% DCF	6.41	5.85
TMPOL	8.27	50% C.F., 50% DCF	9.74	6.81
POLTK	9.37	50% C.F., 50% DCF	1.75	8.00
RTALB	17.00	50% C.F., 50% DCF	17.02	16.98
BMELK	2.25	50% C.F., 50% DCF	2.26	2.24
TUCLK	5.14	50% C.F., 50% DCF	9.11	1.17
IZFAS	2.34	50% C.F., 50% DCF	2.55	2.13
PSDTC	9.54	50% C.F., 50% DCF	12.23	6.85
ULUUN	3.95	50% C.F., 50% DCF	3.88	4.02
OZRDN	3.43	50% C.F., 50% DCF	3.55	3.31
SENKRN	6.14	50% C.F., 50% DCF	6.01	6.27
SEYKM	3.86	50% C.F., 50% DCF	3.97	3.75

The retail sector is one of the fastest growing sectors in Turkey. BIM Inc., which is one of the significant players in this sector in Turkey, was established in 1995 and entered capital markets in 2005. This company is preferred because the industry it is in is very dynamic, and companies in this sector feed many other sectors.

Projections have been made on the financial statements given in the company's offer prospectus. The WACC has been determined as 13% as stated in the offer prospectus. Since the WACC has been calculated on dollars, projections have been made in dollars. Since the financial statements are expressed in terms of purchasing power in 31.12.2004, the dollar has been converted according to the same exchange rate at the same date. This ratio has been shown as 1.3334 on the date indicated.

Historical rates have been calculated on the financial tables, and these ratios have made the basis for the projections. The historical ratios calculated according to the financial statements obtained from the prospectus of BIM Inc. have been shown in Table 5.

Table 5: Historical Ratios of BIM Inc.

Historical Ratios	2002	2003	2004
Operations			
Growth of Net Sales	-	21.53%	23.78%
Cost of Goods Sold/Net Sales (Without Depreciation)	83.54%	82.06%	81.83%
Operating Costs/Net Sales	16.42%	15.41%	15.38%

EBIT Margin	0.04%	2.53%	2.79%
Depreciations/Net Sales	1.56%	1.42%	1.32%
Operating Profit Margin	-1.52%	1.10%	1.47%
WorkingCapital/Net Sales			
Cash Need	2.33%	1.43%	1.20%
AccountsReceivable	0.59%	1.83%	2.53%
Inventories	5.52%	5.97%	6.38%
OtherCurrentAssets	0.19%	0.11%	0.14%
AccountsPayable	11.26%	10.08%	9.60%
OtherShortTermDebts	1.69%	1.88%	1.50%
Net WorkingCapitalMargin	-4.32%	-2.61%	-0.84%
TangibleAssets			
GrossTangibleAssets/Net Sales	18.39%	16.76%	15.58%
Net TangibleAssets/Net Sales	10.32%	8.82%	7.74%
Depreciations/TangibleAssets of theLastYear	-	9.41%	9.78%

The weighted average cost of capital has been taken as it was given in the offer prospectus and calculations have been made in accordance with these criteria to reach value of the company and share value. The ROIC value has been assumed to be the same as the WACC rate because the invested capital must meet the minimum rate of return (Damodaran, 2000: 368). The historical rates of the company are calculated over the financial statements given in the prospectus and the future rates are determined taking into account the sector and company expectations. These projection ratios have been shown in Table 6.

Table 6: Predicted Future Ratios of BIM Inc. According to Historical Ratios, Sector and Firm Expectations

PredictedRatios	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Term
Operations											
Growth of Net Sales	28.0%	19.0%	18.5%	18.3%	13.7%	11.0%	11.0%	9.0%	7.0%	5.0%	3.0%
CGS/Net Sales (Without Dep)	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%
Opr. Costs./Net Sales	14.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	11.0%
EBIT Margin	3.0%	4.0%	6.0%								
Working Cap./Net Sales											
Cash Need	2.0%	2.0%	2.0%	1.6%	1.6%	1.6%	1.6%	1.2%	1.2%	1.2%	1.2%
Accounts Receivable	3.0%	3.0%	3.0%	2.0%	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%	1.0%
Inventories	7.0%	7.0%	7.0%	6.0%	6.0%	6.0%	6.0%	5.0%	5.0%	5.0%	5.0%
Other Current Assets	0.5%	0.5%	0.5%	0.2%	0.2%	0.2%	0.2%	1.0%	1.0%	1.0%	1.0%
Accounts Payable	12.0%	12.0%	12.0%	10.0%	10.0%	10.0%	10.0%	8.0%	8.0%	8.0%	8.0%
Other Short Term Debts	2.0%	2.0%	2.0%	1.7%	1.7%	1.7%	1.7%	1.5%	1.5%	1.5%	1.5%
Net Working. Cap. Margin	-1.5%	-1.5%	-1.5%	-1.9%	-1.9%	-1.9%	-1.9%	-1.3%	-1.3%	-1.3%	-1.3%
Tangible Assets											
Net Tang. As./Net Sales	11.0%	11.0%	11.0%	9.0%	9.0%	9.0%	9.0%	7.0%	7.0%	7.0%	7.0%
Dep/T.As. of the Last Year	10.0%	9.0%	9.0%	8.0%	8.0%	7.0%	7.0%	6.0%	6.0%	6.0%	6.0%

Net present values for 10 years after the public offering have been calculated according to WACC and ROIC by 13%, and since the lifespan of the company has been considered infinite, the terminal value has been calculated according to the 3% infinite growth rate also given in the offer prospectus. According to these calculations, the firm value has been determined as approximately 562 million dollars. Since exchange rate was taken 1.3337 while determining the price of the company in the offer prospectus of the company, this exchange rate has been taken as basis at this stage of the study. Thus, the value of the company is at the level of 749 million Turkish Liras. The number of shares before the public offering was 25 million 300 thousand before public offering. The company value in TL was divided by the number of shares before the public offering to determine the price that a share should have. In the study, it has been determined that, when the projections according to the historical ratios of BIM Inc. and sector and company expectations are evaluated, price per share should be TL 29.613. The share price is calculated according to the cash flows projected by BIM Inc. with the help of historical ratios have been given in Table 7.

Table 7: The Share Price of BIM Inc

BIM Inc. (2005)					(BIMAS)	
Firms Value of Operations According to FCF, (\$)					Terminal Value (TV), (\$)	
	Free Cash	Disc.	1 / Discount	Net Present	Net Operations Profit	158,220,452
Years	Flows	Factor	Factor	Value	WACC	0.13
2005	-45,651,215	1.13000	0.8850	-40,399,306	ROIC	0.13
2006	9,103,802	1.27690	0.7831	7,129,612	Growth	0.03
2007	11,088,197	1.44290	0.6931	7,684,677	TV	1,217,080,398
2008	69,322,092	1.63047	0.6133	42,516,537		
2009	35,329,730	1.84244	0.5428	19,175,562		
2010	45,908,580	2.08195	0.4803	22,050,741		
2011	50,524,434	2.35261	0.4251	21,475,948		
2012	110,040,270	2.65844	0.3762	41,392,733		
2013	76,896,150	3.00404	0.3329	25,597,562		
2014	83,557,316	3.39457	0.2946	24,615,012		
TV	1,217,080,398	3.39457	0.2946	358,537,704		
Operations Value Before Adjusting				529,776,783		
MidYear Adjusting Factor				1.0630		
Operations Value				563,160,445		
The Value of Owners' Equity of the Firm, (\$)						
Operations Value				563,160,445		
Securities				0		
Firm Value				563,160,445		
Financial Liabilities				0		
Benefit Obligation After Tax				-1,414,054		
The Value of Owners' Equity				561,746,391	1.3337	USD/TL
Number of Shares				25,300,000	Shares	USD
Share Price				29.613	TL/Share	561,746,391.026
						749,201,161.712

In Table 8, the initial public offering prices that are found in price determination reports of all companies have been shown in comparison with the values that are computed with the methodology applied in this research to other companies of the sample just as BIM Inc. above. Historical DCF values, which have been found separately for each company have been added. The lowest and highest prices for the first 5 days have also been included in the table to get a clearer picture

Table 8: Fair Value, Offer Price and Historical DCF Statistics of IPOs

Firms	Fair Value	Offer Price	Lowest price at first 5 days of offering	Highest price at first 5 days of offering	Hist. DCF
ANELT	4.39	3.74	3.80	4.22	4.113
BIMAS	33	26.60	28.00	29.00	29.613
TSPOR	8.44	5.25	5.00	5.15	5.371
ARMDA	4.3	3.00	2.31	2.80	3.507
CCOLA	9.132	7.25	7.70	8.05	7.464
DGATE	4.6	3.50	4.26	5.35	3.981
KAREL	8.07	4.36	4.02	4.18	5.076
RYSAS	6.66	4.00	4.80	5.00	4.679
SELEC	7.68	5.35	6.50	6.85	6.900
VESBE	4.82	3.20	2.96	3.20	4.037
TAVHL	13.72	10.00	9.90	11.00	10.110

KOZAL	46.58	36.80	34.00	36.25	38.782
LATEK	4.26	3.96	4.10	4.38	4.208
MANGO	7.2	3.60	3.76	4.02	3.645
AKSEN	5.44	4.90	4.56	4.76	5.015
IHGZT	1.8	1.65	1.90	3.32	1.762
ANELE	8.66	5.30	5.05	5.35	6.187
CEMAS	3.06	2.14	2.15	2.33	2.751
EKIZ	8.31	6.65	5.40	5.90	6.901
UYUM	11.7	8.75	7.20	8.32	9.138
KATMR	9.3	6.00	5.28	5.76	6.821
DESPC	9	7.15	7.16	7.26	7.580
HATEK	5.36	4.25	6.26	9.68	4.421
LKMNH	5	4.13	4.04	4.71	4.900
BRKSN	2.29	2.04	1.95	2.03	2.158
UTPYA	4.49	3.86	3.01	3.36	4.092
BMEKS	5.85	4.50	4.43	4.64	4.511
BLCY	4.5	2.70	2.44	2.60	2.809
DAGI	3.57	2.42	2.82	3.40	2.544
ERICO	4.27	3.55	4.15	5.08	3.600
MEPET	6.48	5.50	5.70	6.50	5.678
SAMAT	3.41	3.20	3.87	4.30	3.262
VANGD	2.52	2.02	2.02	2.10	2.438
OZBAL	5.83	4.10	3.55	3.92	4.438
ADESE	11.92	7.75	7.42	7.58	8.297
NIBAS	2.55	2.04	2.18	2.46	2.159
SANFM	3.125	2.50	2.19	2.41	2.718
BEYAZ	7.28	4.50	4.45	4.52	4.604
OYLUM	2.87	2.30	2.52	2.79	2.535
PRZMA	5	4.00	3.66	4.00	4.254
ORGE	4.45	3.56	3.18	3.56	3.649
MEGAP	2.5	2.00	2.08	2.15	2.093
MCTAS	4.52	3.62	4.02	4.13	3.746
TKNSA	10.31	7.75	7.30	7.58	8.249
ARTOG	1.99	1.89	2.29	4.03	1.891
TGSAS	8.02	5.60	5.50	6.16	6.031
FLAP	5.96	4.90	5.70	6.40	5.059
AKGUV	15.71	10.90	11.80	12.40	11.409
ETILR	3.51	2.81	2.37	2.66	2.912
ULAS	2.29	1.90	2.22	3.45	2.000
KRATL	3.55	2.50	2.50	2.58	2.650
ATPET	5.29	4.50	4.44	4.44	4.802
TKURU	12.00	8.96	8.28	8.68	9.371
TMSN	6.05	4.00	3.99	4.02	4.833
ROYAL	6.23	4.45	4.38	4.45	4.938

TACTR	3.80	3.40	3.67	3.72	3.549
ODAS	6.87	5.00	4.98	5.60	5.710
BAKAN	5.34	4.84	5.86	8.68	4.956
AKPAZ	3.42	2.60	2.46	2.55	2.931
SAYAS	2.93	2.20	2.26	2.29	2.363
RODRG	2.69	2.35	2.32	2.61	2.466
SEKUR	3.36	2.69	2.71	2.79	2.760
YAYLA	5.54	4.80	5.82	7.24	4.848
IZTAR	3.55	2.73	2.73	2.81	2.876
SANEL	6.13	3.98	3.68	3.86	4.032
TMPOL	8.27	6.62	6.60	6.76	6.783
POLTK	9.37	8.36	8.50	11.05	9.086
RTALB	17.00	13.00	12.10	12.55	13.801
BMELK	2.25	2.05	2.00	2.14	2.202
TUCLK	5.14	4.00	4.13	4.59	4.451
IZFAS	2.34	1.85	1.91	2.01	1.990
PSDTC	9.54	7.50	7.20	7.60	7.530
ULUUN	3.95	3.15	2.73	3.04	3.314
OZRDN	3.43	2.71	2.73	3.07	2.797
SENKRN	6.14	5.25	5.18	5.43	5.273
SEYKM	3.86	2.80	2.98	3.17	3.126

Source: Elma, O.E. (2017) *İlk Halka Arzlarda Değerleme Etkisi: Borsa İstanbul'da Bir Uygulama*. Ph.D. Thesis, Pamukkale University, Denizli.

Fair value is the value of a non-discounted stock that underwriters have calculated using comparable firms analysis and discounted cash flow methods at different rates, as shown in Table 4. In Table 9, the descriptive statistics of different valuation approaches have been given in detail according to 25% quartiles. Since 73 companies have applied the comparable firms approach and 74 companies have applied the discounted cash flows method, fair value and historical DCF calculations have been made to include the entire sample with considering this situation.

Table 9: Discounting Ratios, Underpricing Ratios and Total Firm Values of the Sample according to the Methods of IPO Valuation

		Fair Value (TL)	Comparable Firms (TL)	Discounted Cash Flows (TL)	Historical Discounted Cash Flows (TL)	Disc. Ratio	Underpricing
N	Valid	76	73	74	76	76	76
	Missing	0	3	2	0	0	0
Mean		319,663,532	299,864,750	351,505,750	263,122,802	0.2286	0.0433
Standart Dev.		716,095,069	663,770,220	808,209,057	595,688,461	0.09299	0.09437
Minimum		7,130,000	1,957,110	7,130,000	5,591,488	0.05	-0.17
Maximum		3,189,900,000	2,992,000,000	4,400,000,000	2,758,250,000	0.5	0.217
Percentiles	25	26,068,500	21,945,050	26,165,563	21,158,850	0.17	-0.0197
	50	55,875,000	43,450,000	66,056,010	47,744,581	0.208	0.01
	75	198,950,000	202,275,000	237,796,290	139,288,750	0.2992	0.11

According to fair value estimation, the pre-IPO company values are around 320 million TL. According to the comparable firms approach calculations applied by underwriters, the pre-IPO company value sum is 300 million Turkish liras. Again, according to the discounted cash flow calculations determined by the underwriters, the sum of pre-IPO company values is 351 million Turkish liras. According to the methodology of Historical DCF applied in this study, the pre-IPO company values have been determined as 263 million TL.

As there are serious differences between the above values, it can be concluded that the companies are highly priced. Again, in support of this, the average discount rate for the whole sample is 22.86% while the underpricing level is 4.33% for the same period.

In Table 10, the explanatory power of different valuation approaches has been shown by means of univariate regression analysis. In order to identify the explanatory power of the models, the equilibrium market value (first day closing price) has been accepted as a dependent variable (Oran et al., 2013: 90).

Table 10: The Explanatory Power of Different Valuation Methods

Model	R	R ²	Adj. R ²	St. Error of the Estimate	ChangeStatistics					Durbin-Watson
					R ²	F	df1	df2	Sig. F Ch.	
ComparableFirms	0.849	0.720	0.716	.1322184	0.720	182.690	1	71	0	2.091
Discounted Cash Flows	0.937	0.878	0.876	0.087235	0.878	517.65	1	72	0	1.912
Fair Value	0.960	0.922	0.921	.0688907	0.922	873.128	1	74	0	2.164
HistoricalDiscounted Cash Flows	0.983	0.967	0.967	.0447493	0.967	2170.685	1	74	0	2.181

Explanatory power of comparable firm prices calculated by underwriters is 84.9%. This ratio is 93.7% for the analysis of the discounted cash flows calculated by the underwriters, while 96% is the ratio of fair value. The explanatory power of the methodology applied in this study is 98.3%.

V. CONCLUSIONS AND RECOMMENDATIONS

The financial crises of the past few years have increased the importance of valuation. While investors want to feel more confident in the financial markets in which uncertainty is growing, companies also take advantage of it to make better investment decisions for the foreseeable future. On the valuation axis, the discounted cash flows analysis is more preferred because of the theoretical and practical advantages compared to the other methods mentioned in this study. Among the valuation methods, the discounted cash flow method is considered as the only correct model as a concept (Fernandez, 2015: 8). Even though this model structure requires more predictions, one of the significant factors that companies and underwriters prefer this method is its strong correlation between financial ratios and market data.

In this study, the initial public offering prices of firms other than the finance sector have been analyzed with considering the sector and company expectations and historical ratios indicated in the offer prospectuses, and IPO prices are found to be very close to offer prices without giving any discounts. After the univariate regression analysis, the explanatory power of comparable firm valuation prices calculated by the underwriters is found to be 84.9%, while the same ratio has been determined as 93.7% for discounted cash flows analysis and 96% for the fair value. The explanatory power of the methodology which has been applied in this study has been determined as 98.3%. From this point, it can be said that the discounted IPO prices of the companies reflect the company values more accurately rather than the non-discounted IPO prices. Another data supports this is that, although there is 4.33% underpricing in BIST at the period, the average discount ratio that underwriters had implemented is found to be 22.86%.

As a result of the study, it has been found that there is underpricing in Borsa Istanbul, but it cannot be explained only by price discount. In the formation of the first day's return, there is a significant emphasis on how effectively the IPO has been valued and priced. For this purpose, the firm values that are calculated with historical discounted cash flows that is applied in this study is an important tool in calculating the firm value closer to its real value, confirmed by correlation and regression analysis.

This study has been conducted on companies in the manufacturing, service and technology sectors. Future studies can be extended to include banking, finance, real estate investment trusts and conglomerates in order to see the market equilibrium price in a larger sample. In addition, this study, which searched the effectiveness of valuation methods on the sample of Turkey, could be extended to include many countries in order to determine the effectiveness of the valuation methods for the initial public offerings of different countries via cross-country analysis.

The investor's interest has played a leading role in getting information. In addition, companies' historical performances are significant indicators for their future. It will be more accurate for companies and investors to shape future forecasts with a forecasting scale that does not fall far from past performance in value calculations. Strengthening of investor knowledge and keeping investors updated to follow the right investment concepts are among significant steps to be taken to improve capital markets. At this point, investors will improve the information environment and reduce information asymmetry in the decision-making phase, increase information efficiency on the market, and reduce the effect of possible investor sentiment on initial public offerings by expanding the value based information for speculators in the market.

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