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How underwriters price Initial Public Offerings in China?

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ABSTRACT

This paper investigates how underwriters set the IPO firm's issuance price in China. This paper details the complete processes of setting issuance price of IPO firm's equity by underwriters. The paper investigates how fair value estimate is subsequently used as a basis for IPO pricing. The pricing process of underwriters is divided into three subprocesses: deliberate price discount, price update, and underpricing. This paper documents that underwriters deliberately discount the fair value estimate when setting the preliminary offer price. Part of the intentional price discount can be recovered by higher price updates. When controlling for other factors such as investor demand, part of the underpricing stems from this intentional price discount.

KEYWORDS

Underwriter; Reputation; Pricing; Underpricing; IPO.

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INTRODUCTION

After underwriters estimate IPO equities' fair value, they will set these equities' price. In 2006, Houston et al. studied target price estimated by analysts one month after IPO, and found that the offer price is given a discount of 10% compared with the mean comparable firm multiple used to set the target price[1]. This discount is not significant different from 0.

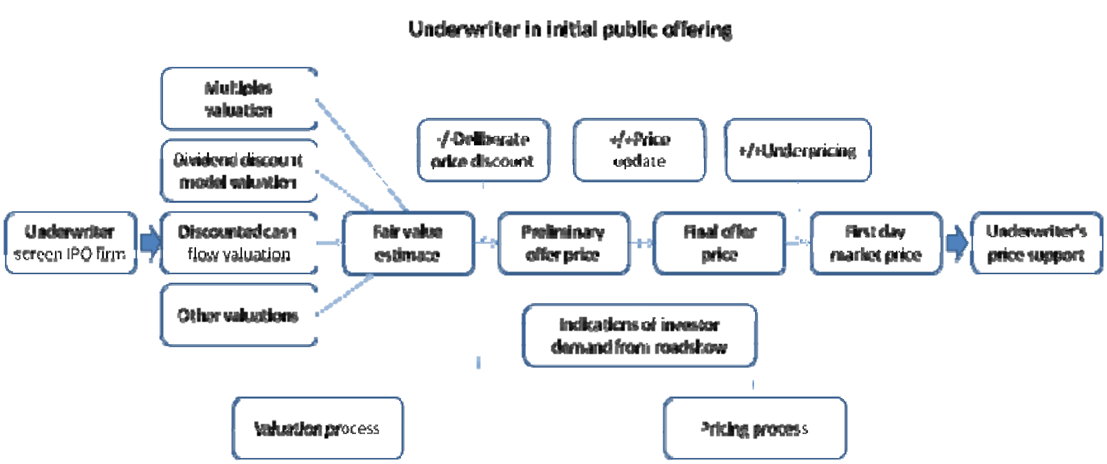
When preliminary offer price is set, the IPO pricing process commences. Underwriters start with canvassing investor demand for the shares during a road show. Whatsoever positive, information of investor demand is used to modulate preliminary offer price to final offer price[2]. However underwriters merely adjust part of the offer price for the sake of tempting investors to reveal their private demand. Such selling behavior at low price rewards investors for revealing favorable private information. It has been widely documented by Benveniste, Spindt, et al.

IPO underpricing is still a mystery. Some scholars infer that IPO underpricing cannot simply be explained by primary market misevaluation or asset-pricing risk premia[3]. Why investors who buy shares on the first day of trading need such premium, while they will not need it from the second day of trading? It is not clear yet. Ritter and Welch in 2002 doubt the opinion of Benveniste and Spindt, that underpricing is an equilibrium remedy for private information reveal. Ritter and Welch conclude that the solution to underpricing puzzle is to explore the IPO price setting. Shiller in 1990 suggested that it is important to look at the IPO price setting, because most investors seldom extensively research the company they plan to invest in but instead rely on the reputation of the underwriter to certify fundamental value.

This paper explores the reason for the IPO underpricing that underwriters apply the intentional price discount to the fair value estimate of IPO shares when setting preliminary offer price. This deliberate price discount allows underwriters pay less market effort to cater buyer client e.g. the institutional investor, and improves investor demand in excess of the normal level it should be in[4]. Because issuers cannot monitor underwriters without cost, they believe in underwriters' price decisions and regard IPO underpricing as a necessary cost of public issue. This viewpoint has not been verified yet by existing literature, as it needs to gain the data of the intentional price discount. This paper aims to go further here and explore whether underwriters apply the intentional price discount to the fair value estimate of IPO shares for the sake of tempting investors to reveal their private demand. Also the paper will explore to what extend the deliberate price discount explain the IPO underpricing after control other factors including investor demand.

THE COMPLETE PRICING PROCESS OF UNDERWRITER IN IPO

As the equilibrium market price of public issue cannot be made sure before issuer's shares go public, the estimate of IPO market price is often inaccurate for issuers and investors, issuers will employ underwriters responsible for their security issuance[5]. Underwriters are reiterant participators in IPO market. They make the equilibrium market price of public issue shape by four subprocesses: screen, fair value estimation, IPO pricing, and price support, as shown in the following TABLEure.



Underwriters screen issuers. Reputed underwriters can choose IPO issuers of high quality to successfully public issue equities with low risk, gain higher issue price, and finally receive higeher commission[6]. IPO issuers of low quality are willing to pay great price to choose underwriters of high reputation in order to gain higher issue price. Therefore screen behavier will influence the equilibrium market price.

Fair value of issuers is seen as the base of IPO equities' pricing. Underwriters use multiples valuation method, dividend discount model valuation method, discount cash flow valuation method, and other valuation methods to estimate issuers' fair value. The estimation will also influence the equilibrium market price.

Underwriters set the IPO issuers' equities price. This is the entire price adjustment process from post-estimation of issuers' fair value to the form of equilibrium market price on first day of trading. It is how fair value estimate is subsequently used as a basis for IPO pricing. The pricing process of underwriters is divided into three subprocesses: deliberate price discount, price update, and underpricing.

Deliberate price discount

When underwriters set the IPO issuers' priliminary offer price, they will deliberately apply a discount to the fair value estimate. Underwriters use the intentional price discount to gain priliminary offer price before investors participate in pricing process.

Price update

According to the investor' road show demand, it is underwriters' adjustment of priliminary offer price. It also includes offer price adjustment of China Securities Regulatory Commission. Underwriters advertise before-mentioned price discount during the road show trying to increase the investors' participation in book-building process[7]. It will result in higher price update of priliminary offer price, which will partly make up deliberate price discount. This is not the complete adjustment but part adjustment of deliberate price discount.

Underpricing

Existing IPO underpricing theory is build on that issuers deliberately sell their equities at lower price than its fair value to encourage investor participation and price discovery[8]. In fact, it is hard to measure which part of IPO underpricing is due to intentionally setting lower price. This paper goes further in this direction. It will explore the contribution that deliberate price discount make to IPO underpricing after controlling other factors e.g. investor demand.

Underwriters support the price of IPO. When underwriters see that their underwrote IPO equities' fist-day trading is far from optimistic, they will participate in market and support equities' price[9]. It will greatly influence IPO equilibrium market price. Underwriters will take various kinds of measures to support IPO market price to insure that the first day returns of new shares is positive in order to maintain their reputation and their client relationship.

Data and sample description

The data is come from 118 pricing reports by domestic underwriters. These reports detailed pricing process from 2010 year to2012 year. The data are main from underwriters' website and CSMAR database. Software Excel and R are used here to analyze the data. We dropped 2 financial services firms because their reports are very different from those of other firms. Also we excluded 3 domestic firms with no underwriter reports available. The filters resulted in 113 samples. TABLE 1 and TABLE 2 detail the data and sample description.

TABLE 1 : Sample selection criteria

Year	universe	Exclusions because of		In sample
		Financial services	Lack of data	
2010	12	0	1	11
2011	49	1	2	46

2012	57	1	0	56
Total	118	2	3	113

Empirical analysis

TABLE 3 documents how deliberate price discount influences price update and underpricing. Reputed underwriters are relative to lower deliberate price discount.

TABLE 2 : Statistical description of pricing IPOs

Variable	Mean	Min	Percentiles			Max	Std. dev.	N
			25th	50th	75th			
Deliberate price discount (%)	19.79	-8.09	13.65	19.79	25.76	49.21	9.07	113
Preliminary offer value (millions)	294.21	67.73	101.56	164.90	312.30	2169.89	367.92	113
Price update (%)	5.56	-13.37	1.04	3.52	5. 97	51.05	7.86	113
Final offer value (millions)	278.39	77.85	100.96	158.27	292.66	1060.00	309.03	113
Equilibrium market value (millions)	355.78	66.86	102.35	178.10	405.37	2455.65	384.91	113
Underpricing (%)	28.18	-11.79	2.37	12.03	38.26	132.36	35.84	113

Notes: Table shows the distribution of valuation and pricing variables. The deliberate price discount is computed as (fair value estimate-preliminary offer value)/fair value estimate. Preliminary offer value is computed as the number of shares outstanding after the IPO times the preliminary offer price. The preliminary offer price equals the midpoint of the price range for 113 IPOs that use the book building procedure. The price update is defined as (final offer value - preliminary offer value)/preliminary offer value. Final offer value is calculated as the number of shares outstanding after the IPO times the final offer price. Underpricing is calculated as (equilibrium market value - final offer value)/final offer value.

TABLE 3 : IPO Pricing

Column	(1)	(2)	(3)	(4)	(5)
Dependent variable	**Deliberate price discount**	**Price update**	**Underpricing**	**Underpricing, 10 days**	**Underpricing**
Underwriter-	-0.198	-0.079	0.421	0.310	0.167
-reputation	(-1.996)**	(-0.803)	(1.130)	(0.498)	(0.432)
Dilution factor	-0.049	-0.052	-0.191	-0.262	0.011
	(-0.980)	(-1.497)	(-1.623)	(-1.407)	(0.153)
Participation ratio	0.016	-0.041	-0.082	-0.204	-0.165
	(0.312)	(-0.798)	(0.643)	(-0.776)	(-1.210)
Technology-	0.020	0.025	0.079	0.076	0.051
-dummy	(1.331)	(1.764)*	(2.217)**	(1.325)	(1.923)*
Average absolute-	1.266				
-prediction error	(2.304)**				
Pre-valuation-	-0.098				
-market return	(-0.271)				
Pre-valuation-	2.032				
-market volatility	(0.813)				
Pre-pricing-		0.095			
-market return		(3.040)***			
Pre-pricing-		-2.031			
-market volatility		(-2.438)**			
Deliberate price-		0.203	0.272	0.230	0.315
-discount		(3.976)***	(2.034)**	(1.997)**	(2.356)**
Price update			0.375	0.498	0.693
			(2.016)**	(2.045)**	(2.312)**
Post-pricing-			1.302	1.201	1.254
-market return			(2.314)**	(2.506)**	(2.167)**
Post-pricing-			0.910	0.698	0.573
-market volatility			(0.419)	(0.967)	(0.212)
Oversubscription-					0.567
-rate					(2.531)**

Intercept	0.171	-0.046	0.242	0.523	0.220
	(4.204)***	(-1.425)	(2.048)**	(2.437)**	(1.621)
Adjusted R2	0.109	0.373	0.180	0.156	0.312
F-statistic	3.515***	8.109***	4.421***	3.642***	4.360***

CONCLUSIONS

Underwriters deliberately discount their biased fair value estimate to arrive at the preliminary offer value when setting the preliminary offer price. According to TABLE 3, price update is positively relative to underpricing. Deliberate price discount positively influences underpricing. This shows that part of underpricing comes from the intentional discount underwriters apply to increase investors' interest. Athough part of the deliberate price discount is made up by higher price update. It is still one of reasons of underpricing. This paper also found that the decision of the underwriter and issuer to offer price discounts is associated with higher underpricing.

To avoid self-correlation between independent variables, we therefore test for these potential endogeneity problems using the Davidson and MacKinnon (1993) test. The test statistic indicates no evidence for an endogenous relation between underpricing and the intentional price discount, between underpricing and the price update, between the intentional price discount and the price update.

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