Liquidity Benefits from Underpricing Evidence from IPOs listed at KSE

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Introduction

- Capital is the blood stream for any business. It can be generated through debt, selling equity, and retaining profits in business.

- When a business generate capital through selling equity to general public for the first time, this process is called Initial Public Offering (IPO) or the first sale of stocks by private company to general public is called IPO. IPOs involves large sum of capital, there is a lot of research relating this topic but some puzzles are unsolved yet, one of them is "Underpricing" this refers to abnormal initial returns on newly issued stocks on first trading day others are "Hot Issues" and "Long run Underperformance of IPOs".

Introduction

- Selling equity is characterized with generation of capital, more broader ownership structure and liquidity for its shareholders.

- Issuer also look for a desired ownership structure (dispersed) while going public as found by Brenan and Franks (1997).

- Liquidity is characterized with number of shareholders as it is defined to be continual trading by Demsetz (1968).So liquidity is achieved through broader shareholder base and equal shareholder distribution (such that with dispersed ownership structure).

- Liquidity plays an important role in maximizing shareholders wealth evidence from Amihud and Mandelson (1986), it also lowers the transaction costs for future equity offerings by Ibbotson and Ritter (1995). It also impede chances of hostile takeovers argued by Vishny and Shliefer (1986).

Introduction (cont'd)

- Jenson and Meckling (1976), and Demsetz and Lehn (1985) argued that there is a trade-off between liquidity (through dispersed ownership) and agency cost. So firms have different priorities in going for liquid secondary market or to keep concentrated ownership structure to reduce agency cost problems.

- Underpricing is the indirect cost to achieve liquidity through dispersed ownership structure. This underpricing is compensation to successful investors for their information costs.

- This paper used a sample of 59 IPOs listed at Karachi Stock Exchange to check for different firm characteristics which determines underpricing and relationship of underpricing with ownership structure and liquidity.

Research Gap

- Most of the research on this issue is done in developed markets. But in developing markets, this area is still not explored. Especially in case of Pakistan, there is only one study which calculated short-run and long-run performance.

- This study is first to examine underpricing its relationship with ownership and liquidity in case of IPOs listed at Karachi Stock Exchange.

- This study will encourage investors to invest in primary markets as there are high initial returns (underpricing). For Issuer/Firms this study will show benefits of ownership dispersion through underpricing which results in liquid after market for its stocks. For authorities to promote ownership dispersion to have more operational market and to encourage firms to go public.

Objectives

- Main goals of the study are

✓ First check level of underpricing.

✓ How underpricing is used to have broader share holder base and even shareholder distribution.

✓ How broader shareholder base and even shareholder distribution affect after-market liquidity.

✓ Is there any direct relationship between underpricing and after-market liquidity.

Theoretical Model

- Underpricing an IPO can be used to draw more potential investors. The more dispersed ownership dispersion attained through underpricing the IPO would then result in liquid secondary market, as demonstrated by Booth & Chua (1996).Referred as the Ownership Dispersion hypothesis.

- <u>Underpricing and Ownership Structure:</u>

- Assuming equity is offered through firm commitment contract to finance their growth opportunity.

- Firm and Investment bank (Underwriters) produces information for the issue. After due diligence process carried out by investment bankers estimated offer price is set in preliminary prospectus. Then underwriters start marketing the issue to encourage potential investors to incur information costs.

Theoretical Model

- To model it, Assume for an issue *j, an investor, i,* by bearing cost, Y_i, investor get better estimates of the market price of the share, E(V).

- All the investors who incur information costs are part of potential investor base argued by Merton (1987).

- Due to the information produced by issuer and investment banker oversubscription can be achieved.So issuer can achieve initial ownership dispersion through a broad investor base for firm secondary market liquidity.

- Initially investors bear lower information cost but preceding investors have to pay higher information costs. So information cost is increasing function with respect to potential investors.

Theoretical Model

- To show advantages of oversubscription, assuming a ownership base of one shareholder. Assuming that only one bidder will be successful and all have equal chance.

- So final offer price OP is maximized with investors recovering information cost, when

$$OP = EV(i^*) - Y(i^*) \qquad (1)$$

- Here EV (i) is increasing function, but increasing with decreasing rate. Similarly Y (i) is also an increasing function but with increasing rate.

- In equilibrium, maximum proceeds calculates estimated value and setting final OP, keeping in mind the informed investors
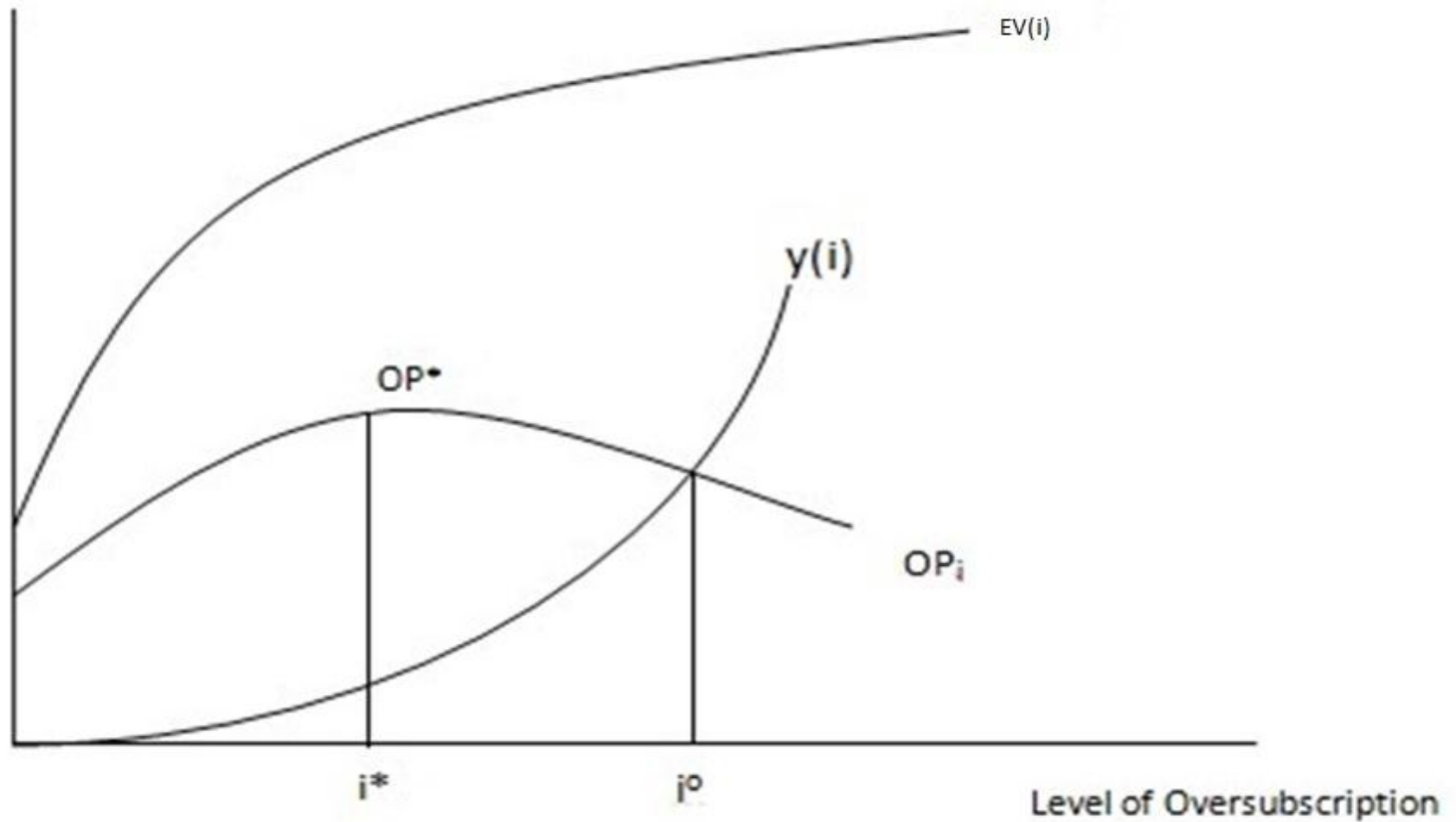
$$[E(i^*) - OP] - Y(i^*) = 0 \qquad (2)$$

- Shows that initial underpricing equals to the information costs.

Information costs per share y(i)

Market value per share EV (i)

Offer Price (OP$_i$)

Source : Booth & Chua (1996)

Theoretical Model

- Figure (1) shows desirable number of potential investor purchasing information i*. As we assumed that estimated value rises with oversubscription i*,it is supported by Merton (1987) argument that more promoted issue induce more potential investors. While Amihud and Madelson (1986) broader marketing increases after market liquidity which is incorporated by the investors in valuation of stocks.

- E(i) is also an increasing function as shown in the figure. Due to change in "i" equation one becomes:

$$\partial OP / \partial i = \partial EV(i) / \partial i - \partial Y(i) / \partial i \qquad (3)$$

- As both EV (i) and Y (i) increases so in equation (1) offer price OP can either increase or decrease, depending on the magnitude of the change in Y (i) an EV (i).

Theoretical Model

- At i* investment banker achieves a level of oversubscription at which expected value of benefits become equal to information costs of an extra investor. Such that marginal benefits equal marginal information costs.

- At i*, Issuer optimize its revenue, assuming investors to retrieve information costs by initial under pricing.

- ## Ownership Structure and Liquidity:

- Liquidity is defined as continual trading, which is characterized with number of shareholders such that there is no mismatch for trading opportunity by Demsetz (1968).Small investors are categorized as liquidity traders.

- Bhide and Holmstrom (1993),Tirole (1993) showed that dispersed ownership structure increases liquidity.

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Development of Hypothesis

- From the above model it is evident that firm's underpricing can help to achieve dispersed ownership structure through oversubscription because due to underpricing there will be oversubscription and how dispersed ownership structure helps to have liquid after-market. In short the following our hypothesis can be formulated as:

- **Hypothesis 1:** Under pricing is positively associated to breadth of stockholder base, and it is negatively associated to inequality of ownership distribution amongst new investor.

- **Hypothesis 2:** Aftermarket liquidity is positively related by breadth of shareholder base, and negatively related to inequality of ownership distribution amongst new investors.

- **Hypothesis 3:** A positive relationship exists between under pricing and aftermarket liquidity.

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Literature Review

Booth and Chua ; (1996)	Size, Best, Urank , Offer Price, Industry Intensity	confirms +ve relation bw UP and oversubscription which in turns promote broad ownership and aftermarket liquidity.
Brennan and Franks;(1997)	Offer size, Ownership, Offer Price, Managers share before and after IPO.	UP is typically associated with oversubscription and is followed with considerable rationing and discrimination in allocation of shares
Gady Jacoby a, Steven Y. Zhang; (2010)	Market Liquidity (Spread, Pin, Depth	Support the notion that a dispersed

Literature Review

Phem et.al. (2003)	Ownership pre and post allocation , Breadth , Institutional ownership , Bid Ask , Turnover.	UP is +vely related to breadth of shareholding base and -vely related to BHO resulting in after market liquidity.
Steven Xiaofan Zheng Mingsheng Li ; (2008)	Initial returns , Offered Shares, Firm size , NOSH, BHO, Inst owner ,change in NOSH ,change in BHO ,Spread , Liquidity Index.	Underpricing also has direct effects on secondary market liquidity after controlling for ownership structure and other factors.

Variables Definition

- <u>Measures of Under pricing:</u>

- Consistent with previous studies underpricing is measured by market adjusted returns of each IPO as:

$$MAR = \left((P_1 - OP)/OP\right) - \left((M_1 - M_0)/M_0\right)$$

$$LnMAR_i = Ln(P_{i1}/OP) - Ln(M_{i1}/M_{i0})$$

- <u>Measures of Ownership Dispersion:</u>

- This study will use breadth and equality of shareholders simultaneously to measure base and shareholder distributions.

- The breadth of shareholder distribution (BREADTH) is calculated by dividing the total number of new investors by the dollar amount of issued shares.

Variables Definition

- This study use different measures to calculate equality of shareholders distribution. For large shareholders having more than 100000 shares we use:

$$LARGE = (\sum_{k=1}^{n} Top\,Category\; - \mathrm{Re}\,tain_i)\,/\,Offer\,Size$$

- Study also used a measure which shows the effect of block holders, block holders are defined as the investor holding more than 5 % of issued equity. It is calculated as:

$$BLOCK = (\sum_{k=1}^{m} Block\,Size - \mathrm{Re}\,tain)\,/\,Offer\,Size$$

Variables Definition

- Another measure is used to check inequality of ownership distribution measure percentage of shares held by top 20 investors.

$$Top20 = (\sum_{k=1}^{20} Top20Shareholders - \mathrm{Re}\,tain)\,/\,OfferSize$$

- Herfindhal-Hirschmann Index (HERF) is measured by summing squared shareholdings of five largest shareholders:

$$HERF = \sum_{i=1}^{5} s^2{}_i$$

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Variables Definition

- <u>Measures of Liquidity:</u>

- Liquidity is been measured by trading turnover and bid-ask spread. Trading turnover is calculated through scaling trading volume of firms:

$$Turnover = \sum_{t=5}^{176} Volume / (176 * Issued\ Capital)$$

- Average bid-ask spread is calculated from daily closing bid and ask quotes as:

$$BID\text{-}Ask = 1/176 \sum_{t=5}^{176} (ASK_t - BID_t)/(ASK_t - BID_t)/2$$

- Time horizon is same for BID-ASK spread as it is for trading turnover.

Variables Definition

- <u>Information Variables:</u>
- Size
- Offer Price
- Intensity
- Retention Ratio
- Total Assets
- <u>Other Control Variables:</u>
- Risk   Times Subscribed
- Market-to-Book Ratio   Inverse Price
- Debt
- Fin

Empirical model:

- **<u>Determinants of Underpricing:</u>**

- This study will use a logit model to capture the effects of firm characteristics that can affect the firm decision to underprice the issue:

$$UNDP = \alpha + \beta_1 LnRisk + \beta_2 LnMB + \beta_3 LnSize + \beta_4 Debt +$$
$$\beta_5 TS + \beta_6 RR + \beta_7 Fin + \beta_8 LnTA + \beta_9 Int + \varepsilon$$

- UNDP takes value of 1 if issue is underpriced and 0 otherwise. This model will show that how higher agency costs effect firm decision to go for dispersed ownership to attain liquidity or for concentrated ownership structure due to agency cost problem.

Empirical model:

- **<u>Ownership Structure and Underpricing:</u>**

- Hypothesis 1 can be tested by using MRM, which shows the correlation between under pricing and ownership structure. Oversubscription, size, risk, leverage also effect ownership structure as we incorporated these factors into our regression(All the proxies of ownership structure will be used as dependant variable seperately):

$$OWNERSHIP = \alpha + \beta_1 LnR + \beta_2 TA + \beta_3 RR + \beta_4 MB + + \varepsilon$$

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Empirical model:

- **Liquidity and Ownership Structure:**

- To check our second hypothesis we will regress both of the proxies for liquidity against each proxy of ownership structure. For trading turnover:

$$TURNOVER = \alpha + \beta_1 OWNERSHIP + \beta_2 Risk + \beta_3 Size$$
$$+ \beta_4 \operatorname{Re} tain + \varepsilon$$

- For bid-ask spread regression model will be following:

$$TURNOVER = \alpha + \beta_1 OWNERSHIP + \beta_2 Risk + \beta_3 Size$$
$$+ \beta_4 \operatorname{Re} tain + \varepsilon$$

Empirical model:

- **<u>Liquidity and Underpricing:</u>**
- Study will proceed for our third hypothesis, which states direct relationship between liquidity and under pricing. For bid-ask spread as dependent variable, this study run following regression model:

$$BIDASK = \alpha + \beta_1 LnR + \beta_2 Risk + \beta_3 Size$$
$$+ \beta_4 Invprice + \varepsilon$$

- For trading turnover as dependent variable, the regression has following specification:

$$TURNOVER = \alpha + \beta_1 LnR + \beta_2 Risk + \beta_3 Size$$
$$+ \beta_4 \operatorname{Re} tain + \varepsilon$$

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DATA

- This study will use sample of 59 IPOs listed on Karachi Stock Exchange from Jan-2000 to July-2012. Data on offer price, offer size, MB ratio, leverage and type of the firm is extracted from prospectuses, Collected from Capital Issuing department of Securities and Exchange Commission of Pakistan. Level of oversubscription is calculated from KSE website. Data on ownership structure is taken from the annual reports of the firms of that year.

Results and Discussion

- ## **Determinants of Underpricing:**

Independent Variables	Dependant Variable :UNDP			
	Coefficient	**t-Statistics**	**p-Value**	**Pseudo R^2**
Risk	1.99**	2.2	0.028	55.54
MB	-1.5111***	-1.84	0.066	
Size	0.7311	0.89	0.375	
Debt	3.5173	1.02	0.306	
TS	1.3723***	1.9	0.057	
RR	-6.3134	-1.07	0.283	
Fin	-2.1952	-1.19	0.233	
TA	-0.6477***	1.8	0.07	
INT	-0.9087***	1.7	0.089	
Constant	1.0201	0.2	0.84	

Effect of Underpricing on Ownership Structure

Independent Variables	Dependant Variable :Breadth			
	Coefficient	t-Statistics	p-Value	R^2=18%
LnR	1.1216*	2.16	0.037	F-Value=4.54
TA	0.1424***	1.8	0.08	p-value=0.003
RR	-0.3649	-0.61	0.547	
MB	-0.0399	-0.25	0.804	
Constant	3.0577*	11.41	0	

Effect of Underpricing on Ownership Structure

Dependant Variable	Independent Variables : HERF			
	Coefficient	t-Statistics	p-Value	R^2=19.53%
LnR	-0.1101***	-1.94	0.058	F-Value=3.00
TA	0.0424*	2.16	0.036	p-value=0.023
RR	-0.2817***	-1.77	0.082	
MB	-0.0282	-1.59	0.117	
Constant	0.3584*	2.6	0.012	

Effect of Ownership Structure on Liquidity

Independent Variables:	Dependant Variable : Trading Turnover				
	(1)	(2)	(3)	(4)	(5)
Breadth	0.2031**				
	0.042				
Large		-0.467**			
		0.035			
Block			-0.669***		
			0.09		
T20				-0.7614	
				0.112	
Herf					-1.79**
					0.034
Retain	0.42	-0.7	-0.748	-0.788	-0.879
	0.68	0.499	0.47	0.47	0.389
Risk	1.71	0.65	0.67	0.7	0.45
	0.145	0.561	0.54	0.525	0.679
Size	0.37*	0.39*	0.35*	0.36*	0.34*
	0.002	0.002	0.005	0.005	0.007
Intercept	-0.95	-0.115	0.107	0.277	0.49
	0.29	0.9	0.9	0.78	0.616
F(4,54)	4.69	3.53	4	4.03	4.7
	0.002	0.012	0.0065	0.0062	0.002
R^2(%)	24.5	21	23	23	25.7

Effect of Underpricing on Liquidity

Independent Variables	Dependant Variable : Trading Turnover			
	Coefficient	t-Statistics	p-Value	R^2=30%
LnR	1.01**	2.03	0.048	F-Value=4.36*
Size	0.36*	3.09	0.003	p-value=0.002
Risk	-5.98**	-2.11*	0.04	
RR	-0.99	-0.99	0.334	
TS	0.08***	1.74***	0.087	
Constant	0.006	0.01	0.994	

Effect of Underpricing on Liquidity

Independent Variables	Dependant Variable : Trading Turnover			
	Coefficient	t-Statistics	p-Value	R=30%
LnR	0.93***	1.87***	0.067	F-Value=4.55
Size	0.41*	3.44*	0.001	p-value=0.0016
Risk	-4.4	-1.66	0.103	
RR	-1.31	-1.24	0.217	
BAS	0.18***	1.93***	0.059	
Constant	-0.41	-0.47	0.638	

Conclusion

- This study found that underpricing anomaly exist in case of IPOs issued at KSE from 2000 to 2012. The level of initial returns is on average 52%.

- Then this study classified the firms characteristics which effects firms decision to underprice the issue by using logit model and found that risk and oversubscription are positively affect underpricing decision while lower growth opportunity, higher assets and intensity negatively affect underpricing decision. These results are significant with Phem et al (2003).

- Underpricing have significant impact on two of the proxies of ownership structure (Breadth, Herf) are similar to those of Brenan and Franks (1997), Phem et al (2003). Other proxies have same directions but are insignificant due to the sample size.

Conclusion

- This study found significant results with of ownership structure proxies except T20, when regressed on turnover. Phem et al. (2003), Jacoby and Zheng (2010) also found similar type of results. Also consistent with Demsetz (1968) who argued that no of shareholders is a factor of liquidity. The results with bid-ask spread is not significant it can be due to the developing nature of the market.

- Finally this study examined the relationship between underpricing and liquidity. Two proxies of liquidity are used in the study trading turnover (trading volume) and bid-ask spread.

Conclusion

- This study supports Booth & Chua (1996) and Brenan and Franks (1997) hypothesis, Such that firms underprice the issue to have broader shareholder base, due to the underpricing, firms have oversubscription which helps them to discriminate in favor of small shareholders. Then this broader shareholding base make a liquid secondary market as according to Domsetz (1968) greater number of shareholders increases market liquidity. Underpricing also have a positive impact on liquidity, as underpricing induces oversubscription such that increases the demand so this demand causes secondary market liquidity.

Policy Implications

- SECP can consider to have a check on underpricing to avoid winner's curse problem as well as to have a check on managers that can take personal benefits on lock up expiration.

- SECP can consider to avoid block holdings and concentrated shareholdings.

- As underpricing is indirect cost of any issue for the firm, so issuer/firm must set a specific range of underpricing to achieve its objective of dispersed ownership and liquid secondary market.

- More investors should be induced to take part in stock markets that will enhance market liquidity.

Future Research Opportunities

- Further research may be carried out as there is not much research on IPOs in emerging markets especially in case of Pakistan. In future researchers can work on:

- Long run underperformance of can be checked with effect managerial ownership. It might be one of the reasons of underpricing. Such that on expiration lock-up expiration the supply of shares increases than its demand that will cause stock price to decrease.

- It will be interesting to check whether benefits from liquidity are greater than the marginal benefits from information cost or not.

- All the other theories of underpricing must be checked empirically.

- To check equity is costlier way to raise capital or the debt.

Thank you!