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# UNDERPRICING OF VENTURE CAPITAL IPOs: A JOURNEY THROUGH HISTORY

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This article is a review of the available literature regarding the underpricing of IPOs, in general, and the initial first day returns of venture capital backed IPOs, in particular. The various theories detailing the possible causes of underpricing of IPOs has been discussed. In continuation, a detailed analysis of research by various authors regarding underpricing of venture capital backed IPOs is done. These studies shows high diversity regarding the degree of underpricing for venture capital backed IPOs. Initial studies mainly portrayed low underpricing for venture capital backed IPOs in comparison with non-sponsored IPOs whereas many recent studies show a reverse picture. Dwelling into the reasons, leads to related theories which explain the reasons for the difference in underpricing of venture capital backed IPOs and non-sponsored IPOs. But these theories still lack to provide a befitting explanation for both high and low underpricing for venture capital backed IPOs. Due to which, the suitability of a new measure 'offer price to intrinsic value ratio' to analyze the role of venture capital in IPO is also assessed.

**Keywords:** Underpricing, Venture capital backed IPOs, Certification theory, Grandstanding theory, Offer price to intrinsic value ratio

## INTRODUCTION

Underpricing of IPOs is a well-documented phenomenon which extends across markets and over time (Ibbotson, 1975; Ritter, 1984; Sullivan and Unite, 1999; Omran, 2005; and Vong and Trigueiros, 2010, among others). Underpricing occurs when the issues are offered to the public at a price which is lower than its intrinsic value. The IPOs then get listed in the market with a significant premium to issue price. Due to which, investors earn an abnormally high return on the day of listing. Starting from the early 1970s, lots

of research and empirical studies were conducted related to the initial day returns to explain the cause of underpricing. Apart from this, commencing from Barry *et al.* (1990) and Megginson and Weiss (1991), numerous studies were conducted regarding the difference in underpricing shown by Venture Capital (VC) backed IPOs in comparison with non-sponsored IPOs.

Through this article, I try to bring to a single platform the numerous researches conducted related to underpricing, especially, initial day

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returns of VC backed IPOs. Special focus has been put on recent studies in the areas of VC backed IPOs. This review spans myriad areas related to underpricing like the theories related to underpricing, changes in underpricing shown by VC backed IPOs over a period of time and the theories explaining the possible causes of differences in underpricing shown by VC backed IPOs compared to non-sponsored IPOs.

## **UNDERPRICING THEORIES**

Underpricing of IPOs was initially documented by Ibbotson (1975). But he was not able to explain the reason for its occurrence. Lots of ensuing research followed, which has resulted in various theories, the prominent of which are detailed as follows.

### **INFORMATION ASYMMETRY MODEL**

Baron and Holmstrom (1980) and Baron (1982) put forward the argument that underpricing is due to the information asymmetry between the security issuer and the underwriter about market conditions. Normally, the issuer will delegate the pricing of the issue to the underwriter. They use their better knowledge of the market and deliberately underprice to increase the demand for the IPO without much marketing effort. Rock (1986) states that there exists a set of investors who are more informed than other investors. Due to which, if an IPO is issued at the expected price, these group of investors will outrun others while investing in good IPOs and will withdraw from the market in case of bad IPOs. This will create a scenario wherein uninformed investors are affected by a 'winner's curse problem'. They will lose interest to invest in IPOs and will eventually defeat the firm's purpose of generating capital from the market. To avoid such a situation and to

ensure that the uninformed investors also purchase the IPOs, firms prefer to underprice their new issues. Study by Vong and Trigueiros (2010) provide empirical evidence for this theory.

### **SIGNALLING THEORY**

Signalling models by Allen and Faulhaber (1989), Grinblatt and Hwang (1989) suggest that the intrinsically high valued firms underprice to dissuade imitating by lower valued firms in a separating equilibrium. Welch (1992) also supports the signalling model claiming that investors know that only the best firms can recoup the upfront cost of the underpricing signal from subsequent issues. They consider underpricing as a signal to the investors assuring the high quality of the firm.

### **INFORMATION GENERATION COST THEORY**

Chemmanur (1993) and Booth and Chua (1996) have stated that underpricing results from insider's inducing information production in order to obtain a more precise valuation of their firm in the secondary market. Outsiders who do not have detailed information regarding a firm will incur a cost to generate information regarding a firm. For a high valued firm, its true value will be reflected in the stock price only if information generation is done by the outsiders. So, the high value firms will provide a discount to the actual price to promote information generation by outsiders. Datar and Mao (2006) have also suggested that firms adopt underpricing to encourage a wider subscription.

### **INSTITUTIONAL EXPLANATION AND DELIBERATE UNDERPRICING**

Tinic (1988), Hughes and Thakor (1992), Hensler

(1995), Ruud (1993) and Taranto (2003) have suggested that firms deliberately underprice the security to avoid the risk of future litigation. Investors in an IPO have an incentive to seek compensation via tort law and the Securities Act of 1933 if the stock price fall subsequent to their purchase of the IPO. Potential litigation costs motivate the entrepreneur to underprice the IPO in a tradeoff between the litigation cost and the up-front opportunity loss of underpricing. Hunt Mc Cool *et al.* (1996) also proved that firms deliberately underprice through his study of IPOs issued during the period 1975 to 1984. Recently Zhu (2009) has reiterated the relation between underpricing and litigation risk.

Prabhala and Puri (1998) argue that underpricing is deliberately done by the underwriter to reduce the ex-ante uncertainty associated with an offering. They state that underwriters provide price support in the after-market which is equivalent to a put option on the IPO being supported. Since it is beneficial for the underwriter to reduce the value of the put option, they deliberately underprice the IPO.

## BEHAVIORAL MODEL

According to this model, the price of IPOs goes above its fundamental value due to the over enthusiastic investors. Empirical evidence supporting behavioral imperfection theory includes Loughran and Ritter (2002), and Ljungqvist and Wilhelm (2003).

## OWNERSHIP RETENTION THEORY

Underpricing has also been theorized as a means for the original owners to retain control (Brennan and Franks, 1995; Booth and Chua, 1996; Zingales, 1995; Pagano *et al.*, 1998). These

theories hypothesize that underpricing will attract a large array of bidders, such that, the issue can be sold to a disperse group that will not threaten the original owner's control interests.

Among these various models, the information asymmetry model has been the most influential. Some authors like Barry *et al.* (1990) and Megginson and Weiss (1991) have suggested that the presence of a venture capitalist in the ownership structure helps to reduce this information asymmetry. Various researchers have analysed this claim by comparing the underpricing between VC backed IPOs and non-sponsored IPOs.

## UNDERPRICING OF VENTURE CAPITAL BACKED IPOs

The early researches regarding VC backed IPOs were conducted by Barry *et al.* (1990) and Megginson and Weiss (1991). Barry *et al.* (1990) analysed the IPOs in the US market between 1978 and 1987 whereas Megginson and Weiss (1991) studied the IPOs during the period 1983 to 1987. The results of both these studies during different time periods were similar, showing significantly less underpricing for VC backed IPOs compared to non-sponsored IPOs. This results supported their claim that the presence of VC in a firm reduces the information asymmetry. Barry *et al.* (1990) suggested that the few firms in which venture capitalists invested were guaranteed high quality since these firms had gone through meticulous screening and monitoring. This reduced the ex ante uncertainty which was rewarded by the investors through lesser underpricing. Megginson and Weiss (1991) were also of the same opinion regarding the low underpricing of VC backed firms but in a more



formal way. They are credited with the certification hypothesis which stated that since the venture capitalist regularly brought firms in the IPO market, their presence certified the investors of the high quality of the firms and that the firms are not overvalued. The certification was more pronounced in cases where the venture capitalist maintained a high retention ratio in the firm. They also observed that high underwriter prestige and higher institutional holdings were associated with VC backed IPOs.

Further tests were conducted by various researchers around the world to test the sanctity of the certification hypothesis. The results of these studies have been diverse to a great extent. Lin and Smith (1998) found results which supported the certification hypothesis in their study of 2,634 U.S. IPOs between 1979 and 1990. They observed that IPOs with VC backing resulted in less underpricing. Similar results supporting the certification hypothesis were observed by Lowry and Shu (2002) and Li and Masulis (2004). Li and Masulis (2004) found that underpricing was very low for IPOs of firms for which underwriters also acted as the venture capitalists. The underpricing was more pronounced for IPOs in which lead underwriters acted as venture capitalists. The underwriter certification effect is more evident from the substantially greater fall in underpricing when there is greater uncertainty about IPO valuation. Cherrak (2012) found that VC backed IPOs provided less underpricing compared to non-sponsored IPOs in their study about IPOs listed in France during 1991 to 2004.

Studies by Mogilevsky and Murgulov (2012), Lee and Wahal (2004), Francis and Hasan (2001) Franzke (2004), Habib and Ljungqvist (2001), Smart and Zutter (2003) and Loughran and Ritter (2004) have shown that VC backed IPOs are

more underpriced than non-sponsored IPOs which is in contrast to earlier studies.

Mogilevsky and Murgulov(2012) studied regarding underpricing of private equity backed IPOs, VC backed IPOs and non-sponsored IPOs in the US market during the period 2000 to 2009. The study consisted of 572 VC backed IPOs and 806 non-sponsored IPOs. The VC backed IPOs provided a mean initial day return of 23.4% as against 14.3% by non-sponsored IPOs. Lee and Wahal (2004) states that VC firms are ready to bear the costs of higher underpricing to build their reputation in the market which will help them in future, as they get established, to raise funds by making more of their portfolio firms public and thus generate good profits. Franzke (2004) also found that the initial day returns of VC backed IPOs were higher than non sponsored IPOs through his study on 160 non VC-backed and 79 VC-backed IPOs going public at Germany's Neuer Market between March 1997 and March 2002. Francis and Hasan (2001), in their study on IPOs issued in US market during 1990-93 period found that a major portion of the high initial day returns is due to purposeful underpricing in the pre-issue market.

But studies by Arikawa and Gael (2010), Hamao *et al.* (2000), Rosa *et al.* (2003) and Elston and Yang (2010) has found no evidence of a relation between listing day return and VC backing. Elston and Yang (2010) studied regarding underpricing of VC backed IPOs in Germany. They observed that there is no significant difference between underpricing of VC backed and non VC backed IPOs. They point out the reason for this being the late emergence of VC in the German market, due to which there is minimal use of VC financing and ensuing low control for VCs in firms. Arikawa and Gael (2010) found that

the major reason for underpricing of IPOs in the Japanese market is the principal-agent problem. They detected that lower underpricing resulted when the VC was a subsidiary of the lead underwriter and they invested directly in the firm rather than through a limited partnership fund. They also found that higher bargaining power for the underwriter resulted in higher underpricing which was evident in the cases when one of the top three security firms was the underwriter. They noted that these two findings point to the fact that a higher offer price resulted if the underwriter also invested in the issuing firm, which improved the alignment between the underwriter and the issuing firm. Thus they concluded that the principal-agent problem between the underwriter and issuers was one of the major causes for underpricing. Hamao *et al.* (2000) found that Japanese IPO firms backed by VCs whose parent is the lead underwriter do not have lower first-day returns because investors may require more underpricing to compensate for the potential conflict of interest. Still, they found no significant difference in underpricing. Rosa *et al.* (2003) in their study of 333 industrial IPOs on ASX from 1991 to 1999 inclusive, of which 38 are VC-backed IPOs found no statistically significant difference between the underpricing of VC-backed IPOs and non-sponsored IPOs.

## **THEORIES ON UNDERPRICING OF VENTURE CAPITAL BACKED IPOs**

Various theories have been put forward by researchers regarding the underpricing of VCbacked IPOs.

### **Certification Theory**

Megginson and Weiss (1991) observed that the

underpricing of VC backed IPOs is less than that of non-sponsored firms. They put forward the explanation that the low underpricing is due to the recognition of capital markets to the third party certification provided by the venture capital firm regarding the issuing firm's value and the ensuing reduction in information symmetry. The presence of venture capitalists in the issuing firm certifies the quality of the issue through their investment in financial and reputational capital.

### **Grandstanding Theory**

Gompers (1996) and Lee and Wahal (2004) who put forward the theory suggest that VC firms look forward to create a reputation in the market which helps them in generating profits in the future. To achieve this purpose, the venture capitalist is ready to incur the losses due to underpricing. This helps them to bring its portfolio companies public in the future and thus generate higher management fees and more funds.

### **Conflict of Interest Theory**

This theory was put forward by Gompers and Lerner (1999) and Hamao *et al.* (2000). Hamao *et al.* (2000) studied 456 IPOs, of which nearly half had a VC firm as its major shareholder, in the over-the-counter market during 1989 to 1995 in Japan. They found that majority of the venture capitalists in Japan were not independent as was the case in United States, where most of the studies were conducted. Rather, major chunk of the VC firms in Japan were subsidiaries of leading financial institutions like banks or securities firms. In majority of VC backed IPOs with a financial institution as the VC funds' parent, the financial institution also acted as the lead underwriter. Acting as the owner of the issuing firm, the lead underwriter has a financial benefit by setting a high offer price. This leads to a conflict of interest

between the VC firm and the investors. So the investors demand higher underpricing to compensate for the potential conflict of interest.

### **Trade-off Theory**

According to Habib and Lingvist (2001), the firm opting to go public has to make a trade-off between marketing costs and underpricing. If the firm opts for reputed underwriters, it will reduce underpricing, but the marketing cost will be high. On the other hand, if the firm opts for not-so-reputed underwriter, it will reduce the marketing cost, but will result in greater underpricing. So the firms maintains a balance between these opposing costs, which in turn depends on the volume of shares made public. If the volume of shares made public is high, it is better for the firm to reduce the underpricing by choosing a reputed underwriter. This is usually what happens with VC firms, since in most of the cases, the venture capitalist exits from the firm by selling out its majority shares. So, it is better for the venture capitalist to reduce underpricing, by means of their marketing choices, since they sell more shares.

### **Hot Issue Markets Theory**

According to Rossetto (2008), the extent of underpricing shown by a VC backed firm depends on the presence of 'hot issue markets'. Hot issue markets are characterised by clustering of IPOs with increased level of underpricing (Ibbotson and Jaffe, 1975; and Ritter, 1984). During 'hot issue markets', VC backed firms provide more underpricing than ordinary firms. But during other times, the initial day returns provided by VC backed firms are significantly less than non-sponsored firms.

### **Timing Theory**

According to Lerner (1995), the timing regarding when the firms should go public, made by venture

capitalists resulted in the low underpricing. They noted that majority of the venture capitalists, especially the more experienced ones, take the firm public during market peaks. If the market valuation of equity is low, the VC firms prefer private financing rather than making the firm public.

Among these various theories, the certification theory has been the most popular. But just like the grandstanding theory and conflict of interest theory, certification theory is a failure in explaining the reason for higher comparative underpricing of VC backed IPOs. Hot issue market theory has not been able to explain the high underpricing of VC backed IPOs which occurred in many situations other than hot issue markets. Timing theory lags to give a suitable explanation for the high underpricing given by VC backed IPOs during market peaks. Trade off theory provided a successful explanation in many scenarios except in some occurrences in the past where higher underpricing was present in VC backed IPOs even when a reputed underwriter was present. So, no existing theory gives a perfect explanation for both higher and lower VC underpricing and in turn, the involvement of venture capitalists in an IPO.

Considering this scenario, which lacks a suitable explanation for the involvement of venture capitalists in an IPO, it would be worthy to mention a recent study by Chemmanur and Loutskina (2007) which portrays an entirely different picture. They have questioned the suitability of underpricing as a measure to assess the role of intermediaries like venture capitalists. According to them, underpricing becomes a relevant measure for analyzing VC involvement, only if, IPO pricing alone and not the listing day secondary market closing price, is influenced by

venture capital. If both are affected by VC firm, then, underpricing cannot be considered as a relevant measure for assessing the role of VC. The authors suspect that the actual scenario is the latter one.

They suggest using the offer price to intrinsic value ratio to assess the role of venture capitalists in the market. VC backed IPOs have shown lower underpricing before early 1990s after which many of the cases has been on the higher side. Chemmanur and Loutskina (2007) obtained only higher offer price to intrinsic value ratio for VC backed IPOs before and after 1990s, in their research. Based on which they put forward the 'marketing power' hypothesis which states that the role of venture capitalist in an IPO is not of certification, but of marketing the IPO to various financial market players to obtain high valuations.

## CONCLUSION

VC backed IPOs showed lesser underpricing when compared to non-sponsored IPOs before the early 1990s. But this scenario has changed afterwards showing high underpricing in various studies. Many theories like certification theory, grandstanding theory and so on have been put forward to explain the possible causes of underpricing. Even though the trade-off theory and hot issue markets theory give an explanation for both high and low underpricing, a befitting explanation regarding high and low underpricing in all scenarios is still not evident. This embarrassing situation forces to consider the suggestion by Chemanur and Loutskina (2007) that underpricing is not a suitable measure to analyse the role of financial intermediaries like venture capitalists. They put forward another measure, offer price to intrinsic value ratio, based on which they were able to explain the role of

venture capitalists before and after 1990s. The efficiency of this new ratio as a suitable measure for assessing the role of venture capitalists in IPOs is still in dark since further studies on VC backed IPOs based on this new ratio are currently lacking. So, there still remain equal chances for 'offer price to intrinsic value ratio' and new 'venture capital backed underpricing based theories' to give a befitting explanation for the varied initial day returns of VC backed IPOs over the years.

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