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Top VC IPO Underpricing

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Abstract

Before the IPO bubble burst, the first day return for IPOs backed by top VCs firms was double that of non-top VCs IPOs. Top VC IPOs were also twice as likely to receive all-star analyst coverage and suffered twice as large negative returns upon lockup expiration. We argue that this was not a coincidence. Underwriters benefited from underpricing vis-à-vis allocation strategies whereas VCs gain from information momentum which allows them to cash-out at higher prices at lockup expiration. All-stars are a scarce resource underwriters allocate to their best clients (Top VCs) who bring them repeat business. Post-bubble, regulatory shocks restricted preferential IPO allocations and reduced the value of all-star coverage. Consequently, these relations disappeared indicating that regulatory changes likely had the desired effect.

Keywords: Initial public offering; all-star analyst coverage; venture capital; underpricing

JEL Classification: G14; G24

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1. Introduction

Since the mid-1990's, nearly 40% of IPOs were venture-capital (VC) backed. VC backing is important in that VCs provide not only money, but also ancillary services such as mentoring, hiring executives, formulating strategies, and "professionalizing" companies (Hellmann and Puri (2002)). Clearly however, not all VC firms are the same.[1] Some bring more experience to the table than others. Since the mid-1990's the average top VC brought over 37 deals to IPO compared to only 5 deals for all other VCs. As repeat players in the IPO game, top VCs bring a wealth of knowledge and experience to the negotiations with investment banks and thus should be able to exert significant influence on the IPO process.

While top VC firms play a significant role in bringing firms public, we still do not fully understand their incentives with regard to IPO pricing. At an elementary level, as pre-IPO investors, top VCs should want to issue shares at as high a price as possible with minimal underpricing. Further, if an IPO is highly underpriced (leaving significant money on the table), VCs should punish the lead investment bank by excluding them from future IPO business. However, this is not the case. During the internet bubble of the late 1990's, underpricing of Top VC-backed IPOs averaged over 100%. For comparison, IPOs backed by lower ranked VCs had underpricing averaging only 27% over the same period. It appears that high underpricing by investment banks engenders loyalty from top VCs. They tend to concentrate their business with a select group of underwriters, regardless of IPO pricing. In this paper, we examine the unique relationship that exists between top VC firms and investment banks which fosters an environment where top VC firms appear to value extreme underpricing.[2] We also examine the impact that changes in the regulatory environment following the bursting of the internet bubble had on the role of top VCs in IPO underpricing.

[1] For example, see Chemmanur and Loutskina (2006), Nahata (2008), Krishnan, Ivanov, Masulis and Singh (2010).
[2] It is well established in the literature that investment banks benefit from underpricing. For example, see Loughran and Ritter (2004).

Top VCs by definition are frequent players in the IPO market. As such, they are uniquely positioned to provide a source of consistent deal flow to investment banks with whom they choose to work. Therefore it is incumbent upon the investment banks to keep the top VC firms happy. This begs the question of how to keep top VCs happy. What matters to the VC is the return they earn on their investment. However, as early stage investors, VC's are typically restricted from cashing out of their investment until the lockup expiration when they distribute shares to the limited partners. Thus, the price they care about is not the price at the time of the IPO per se, but the price at the expiration of the lockup. Investment banks, through the provision of post-IPO analyst coverage, play a large role in sustaining the price until VCs cash out.

The research coverage that is most coveted is "all-star" research coverage.[3] All-star coverage is scarce. Only 3 analysts in an industry get this distinction. Given that there is a limit to the workload any one analyst can handle, these analysts are likely reserved for the best clients. Cliff and Denis (2004) and Loughran and Ritter (2004) suggest that issuing firms pay for all-star coverage through underpricing. Aggarwal, Krigman and Womack (2002) suggest that underpricing generates information momentum which attracts additional valuable research coverage. The combination of underpricing and research coverage helps keeps the stock price high until the expiration of the lockup. Liu and Ritter (2011) recognize the importance of research coverage to VC firms and put forth the analyst lust theory of underpricing. They argue that VCs are willing to use underpricing to pay the lead underwriter for all-star analyst coverage that is bundled with IPO underwriting. We argue however, that akin to underwriter quality, there is a big difference between top and non-top VCs. Top VCs bring consistent deal flow and are the investment banks best clients and thus are likely to get the best service from underwriters. In fact, we contend that an investment bank may provide all-star coverage to an IPO to curry favor with a VC

[3] It is well documented in the literature that issuing firms seek underwriters that have *Institutional Investor* "all-star" analysts. Each year, *Institutional Investor* polls buy-side institutional investors and selects the top analysts in each industry along with a runner-up. See Clarke, Khorana, Patel, and Rau (2007), Fang and Yasuda (2009), and Liu and Ritter (2011).

firm even though they may not be a lead underwriter on the current IPO to reap rewards in the future. Thus, in this paper we focus on the entire managing underwriting syndicate—lead and co-managers.

Our empirical evidence is consistent with our hypotheses. Prior to and during the internet bubble, top VC-backed IPOs were more likely to receive all-star coverage and they were significantly more underpriced. Conditional on having top VC backing and receiving all-star coverage this effect was compounded. We find no relationship between non-top VCs, research coverage and underpricing. Upon lockup expiration, Top-VC backed IPOs suffered double the declines as non-top-VC-backed IPOs. These effects largely disappear in the post-bubble period.

When the bubble burst, two important regulatory shocks disrupted the underpricing all-star coverage relationship. First, Regulation FD (Reg FD) prohibited selective disclosure of information to analysts, which in turn presumably reduced the value of information flow from analysts to institutional investors. Confirming this we show that following the bursting of the internet bubble, the market no longer placed the same value on research coverage by all-star analysts. Perhaps more importantly, the passage of Global Research Settlement in 2003 aimed to completely separate investment banking from research. For instance, research analysts are now prohibited from participating in road shows of firms going public, analyst compensation cannot be tied to IB business, and investment bankers cannot dictate what firms an analyst covers. It also restricts investment banks from allocating 'hot' shares to executives and directors. Thus, on both sides of the equation, the ability of investment banks to extract rents from issuing firms through preferential allocations and the reduced value of analyst coverage to issuers, these regulatory changes presumably reduced incentives to engage in quid pro quo behavior.

The remainder of the paper proceeds as follows. Section II reviews the literature and formulates our hypotheses. Section III describes the data and provides descriptive statistics. Section IV presents empirical results and section V offers concluding remarks.

2. Literature Review and Hypothesis Development

Existing theories of IPO underpricing are not able to fully explain why top VCs are willing to accept high levels of underpricing. Lee and Wahal (2004) argue that VC grandstanding most likely explains why VC firms have higher IPO underpricing. They demonstrate that when endogeneity is controlled for, VC-backed IPOs are significantly more underpriced than non-VC backed IPOs. The future flow of capital into VC funds is positively related to underpricing and thus they argue that the ability to raise future capital is a benefit that offsets the cost of underpricing. They point out however, that grandstanding should be most valuable for young, less-established venture capital firms. If this is so, top VCs should be less willing to bear the cost of underpricing. Thus, grandstanding does not seem to offer an explanation for the magnitude of underpricing in top VC-backed IPOs relative to lower tier VC deals.

Payment for research coverage has also been suggested in the literature as a reason for VC-backed IPOs to be significantly underpriced. VC's are typically restricted from cashing out of their investment until the lockup expiration when they distribute shares to the limited partners. Thus, the price they care about is not the price at the time of the IPO per se, but the price at the expiration of the lockup. Aggarwal, Krigman and Womack (2002) demonstrate that underpricing can generate information momentum and attract analyst coverage post-IPO which leads to a higher stock price at the expiration of the lockup. In this context, VCs should be more than willing to pay for research coverage with underpricing.

Studying the relationship between issuing firms and investment banks, Cliff and Denis (2004) find evidence supportive of the notion that issuing firms pay for all-star analyst coverage through IPO underpricing. They find that firms are more likely to switch underwriters for follow-on offerings if the lead investment bank does not provide the expected coverage post-IPO. Krigman, Shaw and Womack (2001) also show that issuing firms switch underwriters in SEOs subsequent to an IPO to acquire all-star research coverage.[4] The value of research coverage has also been explored in the literature for issuing

[4] Degeorge, Derrien, and Womack (2007) question why so many IPO firms choose the bookbuilding underwriting method over auctions when the direct fees and indirect costs vis-à-vis underpricing are so much higher with bookbuilt deals. They argue that analyst coverage can explain this puzzle. In their sample of French IPOs, issuers

firms and investment banks in the context of future underwriting of SEOs, debt offering and mergers and acquisitions activity by Ljungqvist, Marston, and Wilhelm (2006), Ljungqvist, Marston, and Wilhelm (2009), and others.

More recently, Liu and Ritter (2011) put forth the analyst lust theory of underpricing. They consider the relationship between VC-backed IPOs and lead investment banks in providing all-star coverage post-IPO. They argue that VCs are willing to use underpricing to pay the lead underwriter for all-star analyst coverage that is bundled with IPO underwriting. They show that VC-backed IPOs are more underpriced when the lead underwriter provides all-star analyst coverage. Liu and Ritter's (2011) analyst lust hypothesis and most other IPO studies rely on issuer-lead underwriter relationships to explain underpricing. For instance, their theory predicts a positive relationship between underpricing and the interaction of VC and all-star coverage because the issuing firm is paying the lead underwriter for all-star coverage through underpricing. Since the lead has allocation discretion, any rents received from doling out valuable underpriced shares to favored clients accrue to the lead bookrunner.

We depart from the literature and focus on the power of top VCs in the IPO market. We focus on top VC firms because they have the ability to direct the most business in a repeated game sense to banks that treat them well. Further, top VC firms bring the most firms public repeatedly and thus offer the greatest potential for future business to investment banks. We show that Top VCs tend to match with top underwriters and to concentrate their business among a small group of underwriters. In fact, for each of the top 25 VC firms in our sample, all almost exclusively use the highest ranked underwriters (Carter-Manaster rank of 9).

The literature has mainly focused on the relationship between investment banks and issuing firms. For example, Krigman, Shaw and Womack (2001) and Cliff and Denis (2004) each examine why issuing firms switch underwriters. They find that firms are more likely to retain a lead underwriter for the first SEO if they have provided research coverage. We examine the provision of all-star analyst coverage as a

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receive more lead underwriter recommendations that tend to be more optimistic. They do not find this pattern for auction led IPOs.

"good" for the venture capital firm rather than the issuing company. Thus, when an investment bank provides all-star coverage to an IPO, they are doing so to curry favor with the venture capital firm who will likely be bringing more IPOs to market and has substantial bargaining power in a repeated game framework.

We conjecture that banks may allocate all-star coverage to top VCs even when they are a co-manager because of future IPO mandates. Thus we consider all-star coverage by the managing syndicate, lead and co-manager banks. Typically, when a firm hires an investment bank as the lead underwriter, it is often with the implicit understanding that if the investment bank has an all-star analyst in the industry, it will cover the IPO. Note that Cliff and Denis (2004), Liu and Ritter (2011) and others that focus on IPO bundling of underwriter services including all-star coverage posit that payment for such services are directed to the lead underwriter through underpricing. There is no prediction for *non-lead* underwriters because the hypotheses are explicitly deal-contingent. This is a key difference in our paper. Our explanation is not deal contingent and instead relies on continuous deal flow between the investment bank and the VC firm.

This line of thought leads to several empirical predictions. Investment banks want repeat business and top VCs are the best source of continuous deal flow. Thus, IPOs backed by top VC firms are more likely to be allocated their most prized commodity – all-star analysts. Because of the repeat nature of the IPO market, investment banks are willing to allocate all-stars to top VC-backed firms even if they are not the lead underwriter on the current deal. We predict top VC-backed IPOs will be allocated more all-star analyst coverage post-IPO from the managing IPO underwriting syndicate.

Top VCs are experienced deal makers and understand IPO pricing decisions. Their objective function is to maximize the stock price not at the IPO per se, but rather at the end of the lockup period when they can exit. The analyst lust hypothesis of Liu and Ritter (2011) suggests that underwriters bundle IPO services and issuers pay for lead all-star coverage through underpricing. The information momentum hypothesis suggests that issuers (in our context VCs) desire underpricing because it attracts analyst coverage. Analyst coverage intensifies price momentum so investors can cash out at higher prices at

lockup expiration. Coupling these two hypotheses, we expect a positive relation between top VC backing and underpricing.

If investment banks are trying to curry favor with top VCs in order to assure future deal flow, we expect top VC-backed IPOs to be more underpriced. Underpricing should also be positively related to Lead and Co-manager all-star coverage, as well as to the interactions between top VC backed IPOs and all-star coverage. Further, if VC firms are primarily concerned with the stock price at the lock up expiration when they can cash out, we should find evidence of selling, particularly by top VC firms around the lockup expiration if they engage in the most aggressive information momentum strategies.

3. Data and descriptive statistics

To test the importance of the relationship between top VC firms and all-star analyst provision, we collect data from several sources. We identify IPOs through the Thompson Financial Securities Database Corporation (SDC) New Issues Database over the period 1994-2011 (analyst data are from 1994 to 2012). Our starting point coincides with the first full year of analyst recommendations on I/B/E/S. We delete unit offers, spinoffs, ADRs, closed-end funds, REITs, financial institutions, and issues with offer prices below $5.00.

Analyst data are gathered from I/B/E/S. The main advantage of using the I/B/E/S database in this study is that it identifies the specific analyst making the recommendation. Therefore, we are able to determine whether or not the analyst in question is an all-star. Consistent with Dunbar (2000), Cliff and Denis (2004) and others, we use *Institutional Investor's* all-star research team to define all-stars. Stock price data are from the Center for Research in Security Prices (CRSP). We hand-collect the names of venture capitalists from the IPO prospectus. For data pre-1996 that is not captured on the SEC's Edgar database, we use hardcopies of each firm's S-1 filing.[5]

Panel A of Table 1 presents firm and offering characteristics. Of the 4,180 firms in the sample, the average IPO has assets of $804 million and raises $116.8 million. The average firm is about 15 years

[5] We are very grateful to Jay Ritter for providing us access to this data.

old at the time of its public debut. The average price revision, the percentage difference from the midpoint of the file range to the offer price is 2%, and the average IPO is underpriced by 25%. Finally, half of the sample is tech-related.

As discussed earlier, due to the significant changes in the IPO market through time, particularly the regulatory changes that coincided with the bubble bursting, we split our sample into two periods. We refer to the pre-bubble period as the period corresponding to 1994-2000, which includes the bubble, and the post-bubble period for IPOs after this period. Firm age, proceeds, and firm size are much greater during the post-bubble period. This is consistent with more established firms being able to IPO compared to during the bubble period. Not surprisingly, the high underpricing for the overall sample is skewed upwards by the extraordinary underpricing in the bubble period. Post-bubble, underpricing is a more 'normal' 12%. The average price revision, the percentage difference from the midpoint of the file range to the final offer price pre-IPO is 3.9% during the pre-bubble period but declines significantly in the post bubble period to -3.7%.

Insert Table 1 about here

Panel B of Table 1 provides descriptive statistics on underwriter, VC and all-star analyst coverage characteristics. We define top underwriters as those with a *CM-rank* of 8 or 9. *CM-rank* is a ranking measure of underwriter prestige, developed by Carter and Manaster (1990) and updated by Loughran and Ritter (2004). We use the top 25 VC firms identified in Table 3 of Gompers, Kovner, Lerner, and Scharfstein (2010) to define top VCs, which ranks the frequency of serial entrepreneurs for the 40 most active VCs in their sample. A casual look at their definition of top VC suggests that these are clearly the most successful VC firms.[6] For each VC-backed deal, we identify all of the venture capitalists participating in the deal and if a top VC has more than a 5 percent ownership stake, we code it as a top

[6] We include an analysis of Top VC - Investment Bank loyalty in Appendix A.

VC deal.[7] About 40% of IPOs are VC-backed and top VCs bring approximately 16% of all firms to market. The percentage of IPOs using a top underwriter increased through time. This likely reflects consolidation in the industry due to bank failures and acquisitions. The percentage of IPOs that had VC backing moderately declined between the two periods.

The final variables in Table 1 are related to all-star coverage. *Lead Star Analyst* and *Co-Manager Star Analyst* are the percentage of IPOs that receive all-star analyst coverage within the first year of going public from the lead underwriter and co-managing underwriter, respectively. Approximately 18% of IPOs have a lead all-star covering them after the IPO. Interestingly, about 13% of IPOs have an all-star analyst covering their firm from a co-managing underwriter. All-star coverage from these analysts has largely been neglected in the literature yet co-managers appear to frequently allocate star coverage to IPOs as well. The percent of IPOs with Lead all-star coverage increased over time. This is likely because the number of IPOs decreased in the post-bubble period and thus the competition for all-star analysts declined as well. The percentage of IPOs receiving all-star coverage from a co-manager has declined slightly over time.

Insert Table 2 about here

In Table 2 we partition the data by VC representation. Panel A contains summary statistics across VC-backing categories and Panel B contains tests of differences between the VC categories. We find that large differences exist between VC categories. The average underpricing for top VC-backed IPOs is 54%, compared to 27% for non-top VC-backed IPOs and 17% for non-VC IPOs. Medians, while lower, reveal the same pattern. The differences among categories in IPO underpricing are all highly significant (see

[7] In over 70% of top-VC-backed deals, top VCs have the greatest ownership position in the IPO. We also follow Krishnan, Ivanov, Masulis and Singh's (2010) definition of top-ranked VCs. They measure VC reputation based on a venture investor's past market share of completed venture-backed IPOs for where they are the lead investor. The measure is similar to the Megginson and Weiss (1991) underwriter reputation measure and captures a VC's IPO success rate relative to other VCs. However, with this measure, we lose the first two years of our sample. Nonetheless, our results are similar throughout the paper regardless of the definition of top VC. We also use the top 20, 30 and 40 VC firms in Gompers, Kovner, Lerner, and Scharfstein (2010). Our results remain unchanged. We also redefine top VC deals as only deals where the top VC has the largest ownership concentration. Again, our results remain qualitatively the same.

Panel B, row 1). The price revision pre-IPO reveals the same pattern as underpricing across the categories. Revision is significantly higher for top VC-backed IPOs (12%) relative to both no VC (-0.6%) and non-top VC-backed (1.8%) IPOs. Top VCs are more likely to match with top underwriters. Consistent with Fernando, Gatchev, and Spindt (2005), who argue that higher quality firms naturally pair with higher quality underwriters, we find that Top VCs are more likely to match with top underwriters. The magnitude of the lockup expiration return increases monotonically as we move from no VC to top VC-backed IPOs. Top VC-backed IPOs have the largest negative abnormal return at lockup expiration, suggesting that top VCs are exiting their positions more aggressively than other VCs or insiders in non-VC-backed IPOs. Consistent with our first hypothesis, all-star coverage is highest for top VCs regardless of affiliation. Interestingly, all-star coverage is the lowest for non-top VCs no matter the affiliation of the analyst.

An important component of our argument revolves around the repeat nature of business between investment banks and underwriters. To provide some evidence regarding this notion, in Appendix A, we show the concentration of the top 3 underwriter-VC pairs for all top VCs in our sample. There are 11 banks that appear in the possible 75 slots (25 VCs and top 3 banks each). We provide a concentration ratio, which is essentially a market share of the top 3 investment banks used by each VC and the percentage of all-star coverage provided to each VC firm's IPO. Note that this is at the firm-level, so it is possible that multiple VCs participate in the same deal.

Averaging across all top VCs, we find the top 3 underwriters secure 38% of the overall underwriting business. These IPOs receive all-star coverage 58% of the time. This compares to the remaining IPOs led by 12 underwriters whom provide 7% all-star coverage, on average. This illustrates that top venture capitalists repeatedly use similar investment banks for their IPOs. And when they do, all-star coverage rates are significantly higher than when they use other non-concentrated underwriters. We turn to multivariate tests in the next section.

4. Empirical Results

4.1 Beyond summary statistics: Do Top-VC IPOs garner more all-star coverage?

Our first empirical prediction is that top VC-backed IPOs should receive more all-star analyst coverage than other IPOs. Based on simple statistics in Table 2 and Appendix A, we show that top VC-backed IPOs have significantly more all-star analyst coverage than other IPOs. However, averages do not control for other factors that would reasonably be expected to determine the level and quality of analyst coverage.

In Table 3, we present a series of two-stage regressions modeling all-star analyst coverage post-IPO as a function of type of VC backing. As not all firms have access to top VC backing, we control for this bias using the Inverse Mills Ratio calculated from a bivariate probit model capturing the probability of being top VC-backed. We instrument top VC-backing using an indicator variable equal to "1" if the firm is located in California. Firm location has been used as an instrument variable in other studies (i.e., Krishnan et al. (2010)). In the context of our paper, we need a variable(s) that is related to the probability of receiving financing from a top VC, but unrelated to the probability of receiving all-star coverage.[8] Since many technology-related firms that receive VC-backing are located in Silicon Valley as are many top VCs, it is likely that top VC status is correlated with firms headquartered there. However, the location of the issuing firm is unlikely to determine all-star coverage.[9] Consistent with these arguments, we find that the California dummy is highly correlated with top VC status, but uncorrelated with all-star coverage. In addition to the California instrument, we also include a size-related variable (Log Assets), an indicator for tech-status, a top underwriter dummy, and firm age.

Insert Table 3 about here

[8] A legitimate concern with this instrumental variable is that non-top-VCs are likely headquartered in California as well. We find that 52% of top VCs are headquartered in California compared to only 16% for non-top-VCs. This difference is highly statistically significant.

[9] Although Malloy (2005) shows that analysts geographically closer analysts have an informational advantage over more distant analysts, location is unlikely to impact the choice of coverage by all-star analysts. That is, even if distance influences the coverage decision, it is likely to impact stars and non-star analysts equally.

In the second stage, the dependent variable is equal to one if the IPO received all-star coverage ("lead" or "co-manager"), and zero otherwise. The independent variables of interest are two indicator variables. The first, *VC* is equal to 1 if the firm is backed by a non-top VC and zero otherwise. The second, *top VC* is equal to 1 if the IPO is backed by a top VC and zero otherwise. In addition to the variables in the first stage, we also control for proceeds raised, underpricing, and include the Inverse Mills Ratio calculated from the first stage estimation. All variables are formally defined in Appendix B. The model is estimated for the full sample and is also estimated by sub-period.

In the full sample model, we find that top VC status is positively related to being headquartered in California, internet and tech status, and associated with a top underwriter, yet negatively related to firm age and assets. In the second stage, we find that the probability of receiving all-star coverage is positively related to having a top underwriter, firm size, proceeds raised in the IPO and the type of VC backing. The coefficient on *VC-Backed*, which represents non-top VC-backed IPOs is not significant, indicating IPOs backed by non-top-VC firms are not more likely to receive all-star analyst coverage post-IPO. This is consistent with the univariate results shown in Table 2. In contrast, representation by a top VC is positive and highly statistically significant indicated that top VC backing is related to the likelihood of receiving all-star analyst coverage.

When we partition our results by time period, we find that the strong top VC all-star coverage result in the full sample is driven by the 1994-2000 period. In the post-bubble period, top VC-backed IPOs are no more likely to receive all-star analyst coverage than IPOs without top VC backing. However, VC-baked IPOs in general remained more likely to be covered by an all-star than IPOs without VC backing. This is consistent with the view that regulatory changes may have had a significant impact on the allocation of all-star analyst coverage to issuing firms.

4.2 The relationship between VC status, all-star coverage and underpricing

As a first examination of the relationship between VC type, all-star coverage and underpricing we provide a graphical illustration. Figure 1 plots mean underpricing for IPOs with no VC, non-top-VC, and

top VC conditional on the type of all-star coverage received. There are two points to emphasize. First, in each category, VC-backed IPOs are more underpriced (in magnitude) than IPOs without VC funding. Likewise and more importantly, top VC-backed IPOs are more underpriced than non-top VCs in all categories. Second, for IPO firms without VC-backing, underpricing is roughly the same regardless of analyst coverage. For VC-backed (and top VC) firms, underpricing is higher if they receive all-star coverage regardless of which underwriter provides it. This is consistent with our second hypothesis—top VC-backed firms have higher underpricing if they receive all-star coverage.

Insert Figure 1 about here

To formally test our hypothesis rather than rely on graphical interpretation, we build on Liu and Ritter's (2011) model of IPO underpricing. We are interested in how VC quality and all-star analyst coverage independently and jointly are related to IPO underpricing. Table 4 presents our baseline model. The variables of interest are VC, Top VC, Lead-Mgr Star and Co-Mgr Star. These are indicator variables equal to one if the IPO is backed by a VC, Top VC or gets coverage from a lead or co-managing all-star analyst, respectively. The control variables are guided by the extant literature. We control for price revision pre-IPO, underwriter quality, proceeds raised in the IPO, assets, technology and internet-related firms, and firm age. All variables are described fully in Appendix B.

Consistent with previous research, Model 1 indicates that IPO underpricing is positively related to the pre-IPO price revision, being underwritten by a top investment bank, and being an internet-related firm, while negatively related to the size of the IPO and firm age. Consistent with Liu and Ritter (2011) and others, being backed by a VC is also positively related to IPO underpricing.

Model 2 introduces one of our main variables of interest, Top VC. The coefficient on Top VC is positive and highly significant, indicating that top-VC-backed deals are 12% more underpriced than non-VC-backed deals. Interestingly, the coefficient on VC is insignificant, suggesting that non-top-VC backed deals are no more underpriced than non-VC-backed deals. Model 3 introduces lead all-star coverage. Consistent with Cliff and Denis (2004), IPOs with lead all-star coverage are more underpriced. However,

in Model 4 where we interact lead star coverage with VC and Top VC, we find that this result is driven by Top VC-backed firms. The interaction between top VC and lead-star coverage indicates that top VC IPOs receiving all-star coverage from the lead investment bank IPOs are 16.4% more underpriced. Interestingly, for top-VC IPOs that do not receive all-star coverage, underpricing is only 8% higher. Non-top VC-backed IPOs have no more underpricing than non-VC IPOs and all-star coverage does not alter the relationship.

In models 5 and 6 we consider co-manager all-star coverage. It largely has the same effect on IPO underpricing as lead star coverage. In fact, top VC IPOs receiving all-star coverage from a co-managing investment bank IPOs are nearly 25% more underpriced. Since the co-manager typically does not get allocation discretion and thus does not reap the rewards from doling out underpriced shares, we contend that the underwriter may use co-managing all-stars to curry favor with the Top-VC for future IPO mandates.[10]

Insert Table 4 about here

4.3 Endogeneity

It could be argued that our tests are not properly controlling for firm observable characteristics in the type of firms receiving top VC backing. Additionally, it is likely that all-star coverage and IPO underpricing are endogenously determined. To mitigate these concerns, we use two distinct methodologies to control for endogeneity. First, following Lee and Wahal (2004), we use the Propensity Score Matching (PSM) technique to measure the impact of all-star coverage and VC quality on IPO underpricing. Second, we employ a two-stage model that estimates all-star coverage and uses predicted values in the underpricing regression.

The propensity score matching technique matches top VC backed-IPOs with non-top VC-backed IPOs that have similar characteristics. It is a one-to-one matching that relies upon a nearest neighbor approach. For *only* VC-backed IPOs, we run a binary choice model that estimates the propensity of the

[10] See Kim and Ritter (1999) for an explanation of how profits in an IPO get allocated within the IPO syndicate.

firm to be backed by a top VC. This model is similar to the model used in Table 3. Details are presented in Table 5. In model (1), the pre-match estimation shows that top VC-backed IPOs are more likely to have greater assets, be tech-related, younger and match with a top underwriter. This model generates propensity scores that are used to match top VC-backed IPOs with non-top-backed VC IPOs that have the closest scores. We allow for replacement and use a one-to-one match. Once a match is found, we re-estimate the model. Model (2) shows that there are no significant differences between our sample top VC IPOs and the non-top VC IPO firms which were selected in the matching procedure. This suggests that our matching technique was successful and there are no statistical differences between these top VC and non-top VC firms based on these observable characteristics.

Insert Table 5 about here

We conduct a similar series of estimations for lead and co-manager star coverage. Because we want to isolate the impact of all-star coverage on top VC-backed IPOs, this analysis is confined to *only* those IPOs where top VCs participate. Therefore, in these models we hold top VC constant and estimate the incremental impact of all-star coverage. Again, this matching technique eliminates observable differences between top VC IPOs with and without all-star coverage.

The third stage of the propensity matching method is to use the matched samples in underpricing estimations. The underpricing regressions are presented in Panel B of Table 5. Recall, that this sample consists of *only* VC-backed IPOs, so it is not directly comparable to the full sample results. Pre-match refers to the sample before the PSM match and Post-Match provides results after matching on observable characteristics. As shown in Post-match (2), we continue to find that top VCs are 20% more underpriced. Before the PSM, the economic impact was approximately 17.5%.

In models 3-6, we isolate the impact of all-star coverage for top VC-backed IPOs *only* after matching on observables. In model 4 we document that Top VC-backed IPOs that receive all-star coverage have 29.2% more underpricing than comparable top VC-backed IPOs that do not receive all-star coverage. Overall we find that holding top VC backing constant, lead and co-manager star coverage

results in significantly more underpricing. Overall, these results strongly support our contention that IPO underpricing, VC quality and all-star analyst coverage are jointly related.

As a final robustness check on our results, we consider a two-stage instrumental variable approach. All-star analyst coverage is not known with certainty at the time of the IPO, so we use a two-step procedure and use estimates of the probability of receiving "lead" and "co-manager" all-star analyst coverage in our model of IPO underpricing.[11] Panel A of Table 6 presents two logistic regressions used for calculating an estimate of the probability of receiving all-star analyst coverage from either a lead or co-managing investment bank. We instrument all-star coverage with the number of managing underwriters participating in the IPO.[12] The more managing underwriters that participate in the IPO, the more ex-post coverage that the IPO firm should receive (Bradley, Jordan, and Ritter (2003)), which should increase the probability that one will be an all-star. Typically, more underwriters are associated with larger deals.

Consistent with our conjecture that more managing underwriters lead to more all-star coverage, in Panel A of Table 6 we show that the number of managing underwriters is positively related to all-star coverage. We use the estimated probabilities from these models as inputs into the models of IPO underpricing.

Insert Table 6 about here

In Panel B of Table 6, we present a series of OLS second-stage regressions where the dependent variable is IPO underpricing. We also control for the IPO price revision, underwriter quality, proceeds raised, firm size, technology and Internet firms, underwriter and VC expertise, and time period. Year and industry fixed effects are included, but not reported. Heteroskedasticity-corrected *p*-values and standard errors clustered by year are reported in parentheses. The results in this two-stage model are very similar to

[11] Some papers such as Cliff and Denis (2004) assume that if a bank was chosen to lead the IPO and they have an all-star analyst in that industry the IPO received lead all-star coverage. Rather than making this assumption, we code all-star coverage only if it is observable. If we use actual rather than predicted values we get similar results.

[12] We find the number of managing underwriters is not related to underpricing thus making it an attractive instrument. We also estimate lead and co-managing all-star coverage jointly and get similar results in the 2nd stage regression.

the baseline OLS results. Top VC-backed IPOs that receive all-star coverage are significantly more underpriced than comparable IPOs that do not receive all-star coverage. Across the various models presented, what seems to matter is top VC ownership coupled with all-star coverage. Non-top VC backing is not related to IPO underpricing.

4.4 Regulatory impact on IPO underpricing

An important dimension of the analyst lust hypothesis of IPO underpricing is the non-stationary nature of the IPO market. Loughran and Ritter (2004) document that underpricing has increased through the 1990s peaking in the bubble period, and then reverting back to more normal levels following this period. They attribute this time series pattern to a change in the issuer's objective function. They argue that excessive underpricing was caused by two institutional mechanisms at work. First, issuers placed high demand for quality analyst coverage (i.e., all-star) and were willing to pay for it through underpricing. Second, underwriters and issuers mutually benefit from underpricing vis-à-vis side payments (see Loughran and Ritter (2004) and Liu and Ritter (2011)).

After the bubble burst, these two mechanisms largely disappeared. First, the value of analyst coverage was diminished likely because of scrutiny and regulatory changes to curb analyst biasness particularly for affiliated analysts. Second, allocation strategies used by underwriters to profit from underpricing were explicitly banned post-bubble. Thus, holding all else constant, while top VCs would still like to garnish all-star coverage, if the regulatory reforms have been successful, we should not expect the underpricing relationship to hold in the post-bubble period. In Table 3, we already showed that top VCs were no more likely to receive all-star coverage post-bubble. Here, we are interested if the full sample underpricing results also disappear once the bubble burst.

In Table 7, we provide a sub-period analysis of the relationship between underpricing, VC quality and all-star coverage. We replicate the analyses in Table 4 for two sub-periods. To conserve space, we only report the coefficients of interest in the second stage OLS models for the sub-period analysis. In Panel A we focus on the pre-bubble period. Consistent with the full sample results, we find that the

interaction between *top VC* and all-star analyst category is positive and significant. Prior to the bubble bursting, Top VC-backed IPOs that received all-star coverage were significantly more underpriced.

Insert Table 7 about here

In Panel B our analysis examines the 2001-2011 post-bubble period. We find that Top VC IPOs had marginally more underpricing but it was unrelated to all-star analyst coverage. Interestingly non-top VC IPOs were more underpriced but it is also unrelated to research coverage. Consistent with the notion that regulatory scrutiny eliminated rent-seeking practices with respect to underpricing, none of the interaction terms with *VC* or *top VC* are significant. This result is consistent with Liu and Ritter (2011) who also find that the impact of all-star coverage on underpricing vanished in the post-bubble period. They argue that it may be partly attributed to the declining value of analyst coverage during this period.

To investigate this, we turn to an examination of the perceived value of all-star research coverage. If all-star coverage is valuable to investors, they should react positively when an all-star analyst initiates coverage on an IPO firm. To this end, we examine the cumulative abnormal return (CAR) relative to the CRSP NYSE/Nasdaq/Amex value-weighted index for all research coverage initiations in the first year following the IPO. We estimate an OLS model where the dependent variable is the 3-day CAR starting on the date of analyst coverage initiation. We include all research coverage initiations and control for firm and IPO characteristics that have been discussed in previous models and as defined in Appendix B. We also control for the strength of the recommendation by including an indicator variable equal to 1 if the analyst initiated coverage with a 'Strong Buy'. The variable of interest is an indicator variable equal to 1 if the research coverage is initiated by an all-star analyst. We run the model for the full time period and partitioned by time.

Insert Table 8 about here

Model 1 in Table 8 covers the full time period 1994 through 2011. During this time, 7,080 analyst research initiations occurred for our sample of IPOs. We find that the CAR is higher when analysts

initiate coverage with a strong buy, underpricing is higher, and when the analyst is an all-star. This is consistent with the market valuing all-star coverage. When we partition the sample by time period in Models 2 and 3, we find that the perceived value of all-star coverage declined following the regulatory reforms. In the post-2000 period, the CAR is not related to either Strong Buy recommendations or to all-star coverage. However market participants respond positively when research coverage is initiated at the end of the Quiet Period. Thus the regulatory reforms appear to have been effective.

4.5 Lockup expiration, top VC status and all-star coverage

Under the information momentum model of Aggarwal, Krigman and Womack (2002), firms wish to attract analyst coverage to drive momentum long enough until insiders can cash out at the end of the lockup expiration. Assuming that top VCs strategically pursue this strategy, we would expect heavy selling when insiders are free of lockup restrictions. Because venture capital firms distribute shares to limited partners that are not required to file with the SEC upon selling, it is not possible to directly examine the trading behavior of venture capital firms. Bradley, Jordan, Roten, and Yi (2001) and Field and Hanka (2001) find that VC-backed firms suffer the largest price decline on lockup expiration. This is consistent with the view that these IPOs have aggressive selling. We too examine the market reaction around lockup expiration to proxy for selling aggressiveness. We conjecture that top VC-backed firms will experience the largest negative abnormal returns as top VCs most aggressively exit their positions.

Insert Figure 2 about here

In Figure 2, we graphically illustrate the market reaction around lockup expiration [(-2, +2) day centered on calendar day 180] for non-VC, non-top VC, and top VC-backed companies conditional on the type of all-star coverage.[13] Lockup expiration is a non-event for firms not backed by a VC. All VC-

[13] We use a 180-day lockup reported by SDC. For firms issuing SEOs, Karpoff, Lee, and Masulis (2013) suggest that lockups are oftentimes released early if the share prices increases. If this happens frequently for IPO firms, this would only systematically mitigate the lockup effect around the published lockup date. In other words, it biases any results against us finding anything.

backed firms suffer negative market responses, but top VCs clearly take a bigger hit across all analyst categories. We next examine the robustness of these results.[14]

Insert Table 9 about here

In Table 9, the dependent variable in the regression is the 5-day market adjusted return surrounding the lockup expiration. The independent variables of interest are indicators for VC coverage (indicator = '1' if any VC backing, '0' otherwise), top VC backing, and variables related to all-star coverage. The remaining control variables have been discussed in previous models and are defined in Appendix B. In the full sample model, the price reaction surrounding the lockup is strongly related to both VC and top-VC backing. Consider the economic interpretation of the results. Holding all else constant, VC-backed firms experience an incremental -1.6% abnormal return relative to non-VC-backed firms. Top VC-backed firms suffer an additional -1.7% abnormal return relative to non-top-VC-backed firms. Thus, top VC backed IPOs suffer an aggregate -3.3% abnormal return at the expiration of the lockup. All-star coverage does not mitigate this price drop. [15]

The overall VC effect is persistent across the full period, however post-bubble, we find no incremental effect for top VCs. Our results suggest that at the end of the lockup, venture capitalists unload their shares and the incremental selling puts pressure on the stock price of the IPO firm. This was particularly acute for top VCs before the bubble burst.

5. Concluding thoughts

Our primary objective in this paper was to examine the relationship that exists between venture capital firms and investment banks. Liu and Ritter (2011) introduce the analyst lust theory to explain

[14] In unreported results we find similar results examining share turnover. That is, top VC-backed IPOs experience significantly higher abnormal turnover at lockup expiration. We also use propensity score matching and find top VC IPOs had excess returns -1.75% greater than non-top VC IPOs at lock-up expiration. During the bubble period, this difference increased to over -2.5% and to over -6% greater than non-VC backed IPOs.

[15] We also examine the interaction of VC quality and all-star status and do not find significant results. That is, all-star coverage does not mitigate the lockup period return for top VCs.

underpricing of VC-backed IPOs. They posit that VCs are particularly sensitive to all-star coverage from the lead underwriter and willing to pay for it through underpricing. They suggest that this explains why VC-backed IPOs have been severely underpriced in recent years. On the other hand, Lee and Wahal (2004) also show that VC-backed IPOs have become more underpriced. However, they conjecture that the reason is because of grandstanding—VCs are bringing firms public early, and underpricing more, so that they can build reputation and help with fundraising efforts in future funds.

Our paper departs from these papers in an important way. We focus on a critical aspect of the IPO market that has been relatively ignored—VC reputation. Liu and Ritter (2011) argue that the IPO market is characterized as an oligopoly with only the top underwriters that possess all-star analysts competing for IPO mandates. They find that VCs are particularly sensitive to all-star coverage because of their intermediate horizon. We don't dispute their findings, but argue that all of the action is confined to the IPOs backed by top venture capitalists. We focus on top venture capital firms because they have the ability to direct the most business to banks that treat them well. We find the average top VC brings an IPO firm public on average 37 times during our 18-year sample. This compares to only 5 times for the average non-top VC.

We find that top VCs are much more likely to receive all-star coverage. This coverage is not contingent on bank affiliation at the time of the IPO because all banks wish to make top VCs happy to potentially reap future business. We find that non-top VCs are no more likely to garnish all-star coverage than non-VC backed IPOs. We demonstrate that IPOs backed by top venture capital firms that receive all-star coverage are significantly more underpriced, regardless of the affiliation of the underwriter. This finding is supportive of Liu and Ritter's (2011) analyst lust hypothesis and consistent with Aggrawal, Krigman, and Womack's (2002) information momentum generation model. This result disappears in the post-bubble period, consistent with the view that both the incentives created by allocating hot IPO shares largely vanished as these practices were banned by regulators and the value of all-star coverage declined.

At lockup expiration, consistent with the previous literature, we document that all VCs experience negative abnormal returns throughout the entire sample period. However, top VC IPOs suffer

significantly larger price declines, consistent with the view that top VCs are selling more aggressively. All-star coverage does not mitigate this reaction.

Taken together, our results suggest that top VC firms play a critical role in the IPO market. Their stature gives them bargaining power over underwriters and the firms they back. However, when VCs, especially top VCs, have a large equity position in a firm, it is important to recognize their main goal is to exit as quickly as possible at the highest possible price, whereas the firm founders are likely focused on a much longer-term horizon. To this end, they do not care about the IPO price per se, but rather the price at which they can exit their position. Firm founders should be aware that these conflicts may lead to suboptimal pricing decisions at the time of the IPO.

References

Aggarwal, Rajesh K., Laurie Krigman, and Kent L. Womack, 2002, Strategic IPOs Underpricing, Information Momentum, and Lockup Expiration Selling, *Journal of Financial Economics* 66, 105-137.

Bradley, Daniel J., and Bradford D. Jordan, 2002, Partial adjustment to public information and IPO underpricing. *Journal of Financial and Quantitative Analysis,* 37, 595-616.

Bradley, Daniel J., Bradford D. Jordan, Ivan C. Roten, and Ha-Chin Yi, 2001, Venture Capital and IPO Lockup Expiration: An Empirical Analysis, *Journal of Financial Research* 24.

Bradley, Daniel J., Bradford D. Jordan, and Jay R. Ritter, 2003, The Quiet Period Goes out with a Bang, *The Journal of Finance* 58, 1-36.

Carter, Richard, and Steven Manaster, 1990, Initial Public Offerings and Underwriter Reputation, *The Journal of Finance* 45, 1045-1067.

Chemmanur, Thomas J., and Elena Loutskina, 2006, The Role of Venture Capital Backing in Initial Public Offerings: Certification, Screening or Market Power? *Boston College working paper*.

Clarke, Jonathan, Ajay Khorana, Ajay Patel, and P. Raghavendra Rau, 2007, The Impact of All-star Analyst Job Changes on their Coverage Choices and Investment Banking Deal Flow, *Journal of Financial Economics* 84, 713-737.

Cliff, Michael T., and David J. Denis, 2004, Do Initial Public Offering Firms Purchase Analyst Coverage with Underpricing?, *The Journal of Finance* 59, 2781-2901.

Degeorge, Francois, Francois Derrien, and Kent Womack, 2007, Analyst Hype in IPOs: Explaining the Popularity of Bookbuilding, *Review of Financial Studies* 20, 1021-1058.

Dunbar, Craig G., 2000, Factors Affecting Investment Bank Initial Public Offering Market Share, *Journal of Financial Economics* 55, 3-41.

Fang, Lily and Ayako Yasuda, 2009, The Effectiveness of Reputation as a Disciplinary Mechanism in Sell-side Research, *Review of Financial Studies* 22, 3735-3777.

Field, Laura Casares, and Gordon Hanka, 2001, The Expiration of IPO Share Lockups, *The Journal of Finance* 56, 471-500.

Fernando, Chitru S., Vladimir A. Gatchev, and Paul A. Spindt, 2005, Wanna Dance? How Firms and Underwriters Choose Each Other, *The Journal of Finance* 60, 2437-2469.

Gompers, Paul, Anna Govner, Josh Lerner, and David Scharfstein, 2010, Performance Persistence in Entrepreneurship, *Journal of Financial Economics* 96, 18-32.

Hanley, Kathleen Weiss, 1993, The Underpricing of Initial Public Offerings and the Partial Adjustment *Journal of Financial Economics* 34, 231-250.

Hao, (Grace) Qing, 2007, Laddering in Initial Public Offerings, *Journal of Financial Economics* 85, 102-122.

Hellmann, Thomas, and Manju Puri, 2002, Venture capital and the professionalization of start-up firms: Empirical evidence, *The Journal of Finance* 57, 169-197.

Hoberg, Gerard, and Hasan Nejat Seyhun, 2010, Do Underwriters Collaborate with Venture Capitalists in IPOs? Implications and Evidence, *AFA 2006 Boston Meetings Paper*.

Karpoff, Jonathan, Gemma Lee, and Ronald Masulis, 2013, Lockup agreements in seasoned equity offerings: Evidence of optimal contracting, Forthcoming, *Journal of Financial Economics*.

Krigman, Laurie, Wayne H. Shaw, and Kent L. Womack, 2001, Why Do Firms Switch Underwriters?, *Journal of Financial Economics* 60, 245-284.

Krishnan, C. N. V., Vladimir I. Ivanov, Ronald W. Masulis, and Ajai K. Singh, 2010, Venture Capital Reputation, Post-IPO Performance and Corporate Governance, *Journal of Financial and Quantitative Analysis (JFQA), Forthcoming*.

Lee, Peggy M., and Sunil Wahal, 2004, Grandstanding, certification and the underpricing of venture capital backed IPOs*, Journal of Financial Economics* 73, 375-407.

Liu, Xiaoding, and Jay R. Ritter, 2010, The Economic Consequences of IPOs Spinning, *Review of Financial Studies* 23, 2024-2059.

Liu, Xiaoding, and Jay R. Ritter, 2011, Local underwriter oligopolies and IPO underpricing *Journal of Financial Economics* 102, 579–601.

Ljungqvist, Alexander, Felicia Marston, and William J. Wilhelm Jr, 2006, Competing for Securities Underwriting Mandates: Banking Relationships and Analyst Recommendations, *The Journal of Finance* 61, 301-340.

Ljungqvist, Alexander, Felicia Marston, and William J. Wilhelm Jr, 2009, Scaling the Hierarchy: How and Why Investment Banks Compete for Syndicate Co-Management Appointments, *Review of Financial Studies* 22, 3977-4007.

Loughran, Tim, and Jay R. Ritter, 2004, Why Has IPOs Underpricing Changed over Time?, *Financial Management* 33, 5-37.

Malloy, Christopher J., 2005, The Geography of Equity Analysis, *The Journal of Finance* 60, 719-755.

Megginson, William L., and Kathleen A. Weiss, 1991, Venture Capitalist Certification in Initial Public Offerings, *The Journal of Finance* 46, 879-903.

Nahata, Rajarishi, 2008, Venture Capital Reputation and Investment Performance, *Journal of Financial Economics* 90, 127-151.

Nimalendran, M., Jay R. Ritter, and Donghang Zhang, 2007, Do today's trades affect tomorrow's IPO allocations?, *Journal of Financial Economics* 85, 87–109

Table 1
Descriptive Statistics

This table provides summary statistics for our sample of 4,180 IPOs during 1994-2011. Panel A presents firm and IPO characteristics. Panel B presents underwriter, VC, and analyst characteristics. See the Appendix for a list of variable definitions. IPO data are from Thomson Financial's SDC database. Analyst data are from I/B/E/S. VC affiliations are collected from the IPO prospectus. All-star analyst data are from *Institutional Investor's* annual analyst poll.

	Full Sample (N=4,180)		(1994~2000) (N=3,123)		(2001~2011) (N=1,057)	
	Mean	Median	Mean	Median	Mean	Median
Panel A						
Assets	804.07	54.01	491.61	41.70	1727.26	184.25
Proceeds	116.81	48.38	76.93	38.94	234.63	105.60
Firm Age	14.85	8.00	12.74	7.00	21.07	10.00
Revision	1.97%	0.00%	3.88%	0.00%	-3.69%	0.00%
Underpricing	25.07%	10.71%	29.56%	11.96%	11.83%	6.61%
Tech	50.50%	100.00%	51.75%	100.00%	46.83%	0.00%
Panel B						
Back by Top UW	66.34%		64.65%		71.33%	
Backed by VC	39.43%		40.54%		36.14%	
Backed by Top VC	15.62%		16.14%		14.10%	
Lead -mgr Star	18.68%		16.52%		25.07%	
Co-mgr Star	13.16%		13.64%		11.73%	

Table 2
Descriptive Statistics Partitioned by VC status

This table provides sample characteristics for 4,180 IPOs partitioned by venture capital backing type. See the Appendix for a list of variable definitions. IPO data are from Thomson Financial's SDC database. Analyst data are from I/B/E/S. VC affiliations are collected from the IPO prospectus. All-star analyst data are from *Institutional Investor's* annual analyst poll. Numbers in parentheses are the two-sided *p*-values.

Panel A. Key variables based on VC affiliation

	Top VC		VC		No VC	
	Mean	Median	Mean	Median	Mean	Median
Full Sample	N = 653		N= 995		N = 2,532	
Underpricing	53.95%	23.08%	26.94%	12.50%	16.89%	8.57%
Revision	12.44%	7.69%	1.78%	0.00%	-0.66%	0.00%
Lock Up Expiration CAR	-4.61%	-4.34%	-2.55%	-2.30%	-0.58%	-0.64%
Lead-mgr Star	24.20%		15.18%		18.64%	
Co-mgr Star	12.40%		9.25%		14.89%	
Top UW	84.99%		71.76%		59.40%	
1994~2000	N =504		N= 762		N = 1,857	
Underpricing	64.74%	27.18%	30.82%	13.28%	19.49%	9.69%
Revision	17.54%	10.73%	3.61%	0.00%	0.29%	0.00%
Lock Up Expiration CAR	-5.00%	-4.80%	-2.73%	-2.42%	-0.78%	-0.81%
Lead-mgr Star	23.81%		13.78%		15.67%	
Co-mgr Star	14.09%		9.71%		15.13%	
Top UW	87.30%		71.92%		55.52%	
2001~2011	N = 149		N= 233		N = 675	
Underpricing	17.45%	12.13%	14.24%	10.00%	9.75%	5.77%
Revision	-4.81%	0.00%	-4.22%	0.00%	-3.25%	0.00%
Lock Up Expiration CAR	-3.30%	-2.28%	-1.99%	-1.75%	-0.02%	-0.11%
Lead-mgr Star	25.50%		19.74%		26.81%	
Co-mgr Star	6.71%		7.73%		14.22%	
Top UW	77.18%		71.24%		70.07%	

Panel B. Tests in mean and median values

	Top VC vs. No VC		Top VC vs. VC		Vc vs. No VC	
	Mean Diff.	Median Diff	Mean Diff.	Median Diff	Mean Diff.	Median Diff
Full Sample						
Underpricing	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(0.001)
Revision	(<.001)	(<.001)	(<.001)	(<.001)	(0.006)	(0.014)
Lock Up Expiration CAR	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Lead-mgr Star	(0.003)		(<.001)		(0.012)	
Co-mgr Star	(0.092)		(0.047)		(<.001)	
Top UW	(<.001)		(<.001)		(<.001)	
1994~2000						
Underpricing	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(0.002)
Revision	(<.001)	(<.001)	(<.001)	(<.001)	(0.001)	(<.001)
Lock Up Expiration CAR	(<.001)	(<.001)	(0.001)	(<.001)	(<.001)	(<.001)
Lead-mgr Star	(<.001)		(<.001)		(0.210)	
Co-mgr Star	(0.553)		(0.021)		(<.001)	
Top UW	(<.001)		(<.001)		(<.001)	
2001~2011						
Underpricing	(<.001)	(0.009)	(0.165)	(0.345)	(0.004)	(0.040)
Revision	(0.333)	(0.912)	(0.802)	(0.653)	(0.555)	(0.457)
Lock Up Expiration CAR	(<.001)	(0.009)	(0.129)	(0.753)	(0.001)	(0.001)
Lead-mgr Star	(0.741)		(0.195)		(0.024)	
Co-mgr Star	(0.003)		(0.708)		(0.003)	
Top UW	(0.068)		(0.193)		(0.735)	

Table 3
Probability of Receiving All-Star Coverage

This table presents a bivariate probit analysis where the probability of receiving all-star coverage is modeled. In the first stage, the dependent variable is 1 if the IPO is backed by a top VC. Independent variables include a dummy variable equal to one if the firm is headquartered in California, a dummy variable equal to one if the IPO is internet-related, the natural log of assets at the time of the IPO, a dummy variable equal to one if the IPO is technology-related, a dummy variable equal to one if the IPO is backed by a top underwriter, and firm age. In the second stage, the dependent variable is a dummy variable equal to one if the IPO firm received all-star coverage. In addition to the independent variables in the first stage, the inverse mills ratio from the first stage is included, the natural log of IPO proceeds, and indicator variables equal to one if the IPO is backed by a venture capitalist (VC-backed) or a top venture capitalist (top VC-backed). See the Appendix for a list of variable definitions. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis. Industry and year dummies are included, but coefficient estimates are suppressed for brevity. ***, **, and * indicate significance at the 1% and 5% levels, respectively.

	Full Sample		(1994~2000)		(2001~2011)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Pr(topvc=1)	Pr(star=1)	Pr(topvc=1)	Pr(star=1)	Pr(topvc=1)	Pr(star=1)
California	0.666***		0.657***		0.599***	
	(<.001)		(<.001)		(<.001)	
Ln (Assets)	-0.065***	0.125***	-0.057**	0.117***	-0.125***	0.151***
	(0.001)	(<.001)	(0.011)	(<.001)	(0.001)	(0.003)
Top UW	0.647***	0.913***	0.752***	1.029***	0.387***	0.525***
	(<.001)	(<.001)	(<.001)	(<.001)	(0.003)	(<.001)
Internet	0.428***	0.053	0.408***	-0.044	0.579***	0.370**
	(<.001)	(0.535)	(<.001)	(0.651)	(<.001)	(0.045)
Tech	0.546***	-0.034	0.525***	-0.106	0.592***	0.048
	(<.001)	(0.702)	(<.001)	(0.315)	(<.001)	(0.794)
Ln(Firm Age)	-0.182***	-0.002	-0.155***	-0.002	-0.340***	0.005
	(<.001)	(0.955)	(<.001)	(0.947)	(<.001)	(0.930)
Ln(Proceeds)		0.497***		0.503***		0.642***
		(<.001)		(<.001)		(<.001)
VC		0.078		0.026		0.276**
		(0.222)		(0.720)		(0.047)
Top VC		0.636***		0.769***		0.625
		(0.002)		(0.002)		(0.121)
Inverse Mills		-0.245**		-0.306**		-0.292
		(0.032)		(0.030)		(0.189)
Constant	-1.480***	-10.303***	-1.645***	-10.391***	-0.605**	-13.131***
	(<.001)	(<.001)	(<.001)	(<.001)	(0.018)	(<.001)
Year FE	YES		YES		YES	
Industry FE	YES		YES		YES	
N	4,180		3,123		1,057	
P-values for Chi.sq	0.000		0.000		0.000	

Table 4
Underpricing Regression

This table provides OLS results where dependent variable is underpricing. Independent variables include a set of firm characteristics, and VC, Top VC, Lead-Mgr Star and Co-Mgr Star as well as their interaction terms. See the Appendix for a list of variable definitions. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis. Industry and year dummies are included, but coefficient estimates are suppressed for brevity. ***, **, and * indicate significance at the 1% and 5% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Underpricing					
Revision	0.957***	0.939***	0.933***	0.916***	0.939***	0.922***
	(<..001)	(<..001)	(<..001)	(<..001)	(<..001)	(<..001)
Top UW	4.751***	3.998***	3.276**	3.695***	3.660***	3.864***
	(0.001)	(0.005)	(0.022)	(0.010)	(0.010)	(0.006)
Ln(Proceeds)	-5.019***	-4.722***	-5.018***	-4.580***	-5.335***	-4.768***
	(0.001)	(0.002)	(0.001)	(0.002)	(<..001)	(0.002)
Ln(Assets)	1.647**	1.508**	1.367*	1.323*	1.355*	1.382*
	(0.028)	(0.041)	(0.065)	(0.073)	(0.069)	(0.065)
Tech	-0.664	-1.010	-1.037	-0.664	-1.117	-0.904
	(0.748)	(0.624)	(0.616)	(0.748)	(0.588)	(0.659)
Internet	17.948***	17.254***	17.143***	16.784***	17.144***	16.516***
	(<..001)	(<..001)	(<..001)	(<..001)	(<..001)	(<..001)
Ln(Firm Age)	-1.886***	-1.776***	-1.726***	-1.606***	-1.851***	-1.615***
	(<..001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)
VC	4.826***	0.581	0.705	-0.059	0.660	-0.329
	(0.002)	(0.703)	(0.642)	(0.970)	(0.664)	(0.828)
Topvc		12.222***	11.899***	8.127***	12.103***	9.149***
		(<..001)	(<..001)	(0.001)	(<..001)	(<..001)
Lead-mgr Star			5.557***	0.362		
			(0.003)	(0.836)		
VC*Lead-mgr Star				4.556		
				(0.281)		
Topvc*Lead-mgr Star				16.428**		
				(0.034)		
Co-mgr Star					6.959***	-0.427
					(0.006)	(0.843)
VC*Co-mgr Star						9.066
						(0.140)
Topvc*Co-mgr Star						24.835**
						(0.033)
Constant	93.528***	89.874***	94.859***	87.842***	100.521***	90.839***
	(<..001)	(<..001)	(<..001)	(<..001)	(<..001)	(<..001)
Industry	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES
N	4,180	4,180	4,180	4,180	4,180	4,180
Adj. R^2	0.428	0.433	0.435	0.438	0.435	0.441

Table 5
Propensity Score Matching

This table presents results of propensity score matching regressions. In model (1), we retain only VC-backed IPOs obtain the propensity score. We then match non-top-VCs with top VCs based on the score using the nearest neighborhood with replacement and a maximum difference of 1%. See the Appendix for a list of variable definitions. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis. Industry and year dummies are included, but coefficient estimates are suppressed for brevity. ***, **, and * indicate significance at the 1% and 5% levels, respectively.

Panel A. Determinants of Top VC-backed IPO and all-star Coverage

	(1)	(2)	(3)	(4)	(5)	(6)
	VC-backed IPOs only		Top VC-backed IPOs only			
	Pr (Top VC=1)		Pr (Lead-mgr Star=1)		Pr (Co-mgr Star=1)	
	Pre-match	Post-match	Pre-match	Post-match	Pre-match	Post-match
Top UW	0.663***	-0.047	1.039***	-1.531	1.150**	-0.672
	(<.001)	(0.781)	(0.007)	(0.232)	(0.038)	(0.551)
Ln(proceeds)	0.019	-0.082	0.809***	0.080	1.124***	-0.168
	(0.867)	(0.511)	(<.001)	(0.856)	(<.001)	(0.680)
Ln(assets)	0.091	0.026	0.294**	0.223	0.113	-0.038
	(0.124)	(0.685)	(0.011)	(0.264)	(0.355)	(0.847)
Tech	0.521**	-0.185	-0.683	0.291	-0.154	-0.440
	(0.013)	(0.439)	(0.116)	(0.715)	(0.771)	(0.527)
Internet	0.367**	0.062	0.036	-0.246	0.333	-0.215
	(0.023)	(0.712)	(0.896)	(0.611)	(0.331)	(0.683)
Ln(firm age)	-0.173**	-0.120	-0.094	-0.075	0.082	-0.102
	(0.041)	(0.214)	(0.629)	(0.793)	(0.717)	(0.769)
Constant	-2.740	0.367	-16.356***	-1.273	-21.580***	3.176
	(0.143)	(0.861)	(<.001)	(0.863)	(<.001)	(0.667)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
N	1,648	1,306	608	304	653	152
Pseudo R^2	0.112	0.020	0.170	0.056	0.151	0.056

Panel B. Underpricing Regression with only matched firms of a sample

	(1)	(2)	(3)	(4)	(5)	(6)
	VC-backed IPOs only		Top VC-backed IPOs only			
	Dependent variable: Underpricing					
	Pre-match	Post-match	Pre-match	Post-match	Pre-match	Post-match
Top VC	17.567***	20.018***				
	(<.001)	(<.001)				
Lead-mgr Star			21.493***	29.205**		
			(0.010)	(0.018)		
Co-mgr Star					27.094**	26.414*
					(0.022)	(0.061)
Top UW	-2.405	2.559	7.336	7.737	8.075	11.069
	(0.420)	(0.544)	(0.213)	(0.709)	(0.171)	(0.723)
Ln(proceeds)	21.638***	24.319***	27.847***	49.322**	27.249***	23.875
	(<.001)	(<.001)	(<.001)	(0.019)	(0.001)	(0.206)
Ln(assets)	1.485	3.065	2.632	-5.409	3.393	10.561
	(0.482)	(0.230)	(0.536)	(0.527)	(0.424)	(0.295)
Tech	4.832	9.002	14.420	0.927	12.818	22.245
	(0.297)	(0.117)	(0.219)	(0.972)	(0.269)	(0.525)
Internet	18.673***	19.292***	20.053*	44.794**	19.401*	36.595
	(0.001)	(0.002)	(0.057)	(0.012)	(0.066)	(0.239)
Ln(firm age)	-3.108*	-4.363*	-4.015	-7.505	-4.611	-15.895
	(0.086)	(0.066)	(0.365)	(0.308)	(0.288)	(0.155)
Constant	-361.274***	-430.314***	-535.795***	-803.133**	-528.559***	-513.565
	(<.001)	(<.001)	(<.001)	(0.023)	(<.001)	(0.114)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
N	1,648	1,306	653	304	653	152
Adj. R^2	0.310	0.310	0.358	0.313	0.358	0.310

Table 6
Two-Stage Regressions

This table provides a two-stage analysis where underpricing is modeled. In the first stage, a probit regression models the probability of all-star coverage from lead, co-manager or unaffiliated analysts. Independent variables include the number of syndicated underwriter(s), indicator variables equal to one if the IPO is backed by a venture capitalist (VC) or a top venture capitalist (top VC), a top underwriter, the natural log of IPO proceeds, the natural log of assets at the time of the IPO, a dummy variable equal to one if the IPO is technology-related, firm age. In the second stage, OLS regressions are used to model underpricing. We also include the pre-IPO price revision, a dummy variable equal to one if the IPO is internet-related, the predicted values from the first stage model (Pr (Lead-Mgr Star and Co-Mgr Star) and interactions between VC, top VC and the predicted all-star coverage variables See the Appendix for a list of variable definitions. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis. Industry and year dummies are included, but coefficient estimates are suppressed for brevity. ***, **, and * indicate significance at the 1% and 5% levels, respectively.

Panel A. Stage 1: Probit Estimation of All-Star Coverage

	(1) P(Lead-mgr star=1)	(2) P(Co-mgr star=1)
N of syndicated UWs	0.610**	1.466***
	(0.014)	(<.001)
Revision	0.008***	0.002
	(<.001)	(0.412)
Top UW	1.746***	1.541***
	(<.001)	(<.001)
Ln(Proceeds)	0.339***	0.700***
	(<.001)	(<.001)
Ln(Assets)	0.155***	0.129**
	(<.001)	(0.016)
Tech	0.050	0.062
	(0.750)	(0.747)
Internet	0.156	0.189
	(0.291)	(0.303)
Ln(Firm Age)	-0.090*	0.066
	(0.080)	(0.267)
Constant	-9.367***	-17.587***
	(<.001)	(<.001)
Year FE	YES	YES
Industry FE	YES	YES
N	4180	4180
Pseudo-R^2	0.182	0.257

Panel B. Stage 2: OLS Regression of IPO Underpricing

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Underpricing					
Revision	0.957***	0.939***	0.894***	0.818***	0.939***	0.880***
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Top UW	4.751***	3.998***	-1.729	-0.646	3.954***	3.465**
	(0.001)	(0.005)	(0.410)	(0.750)	(0.007)	(0.019)
Ln(Proceeds)	-5.019***	-4.722***	-7.220***	-5.331***	-4.777***	-4.072**
	(0.001)	(0.002)	(<.001)	(<.001)	(0.004)	(0.012)
Ln(Assets)	1.647**	1.508**	0.437	0.572	1.493**	1.378*
	(0.028)	(0.041)	(0.591)	(0.479)	(0.045)	(0.063)
Tech	-0.664	-1.010	-1.326	-1.019	-1.019	-0.635
	(0.748)	(0.624)	(0.522)	(0.619)	(0.623)	(0.756)
Internet	17.948***	17.254***	16.091***	13.420***	17.245***	14.984***
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Ln(Firm Age)	-1.886***	-1.776***	-1.424***	-0.928*	-1.783***	-1.213**
	(<.001)	(0.001)	(0.007)	(0.069)	(0.001)	(0.017)
VC	4.826***	0.581	1.251	-1.391	0.591	-1.460
	(0.002)	(0.703)	(0.420)	(0.515)	(0.699)	(0.394)
Topvc		12.222***	12.205***	-11.871**	12.222***	-3.645
		(<.001)	(<.001)	(0.011)	(<.001)	(0.278)
Lead-mgr Star			43.517***	17.518*		
			(<.001)	(0.061)		
VC*Lead-mgr Star				16.505		
				(0.232)		
Topvc*Lea-mgr Star				123.512***		
				(<.001)		
Co-mgr Star					0.713	-9.910
					(0.919)	(0.117)
VC*Co-mgr Star						17.954
						(0.202)
Topvc*Co-mgr Star						146.133***
						(<.001)
Constant	93.528***	89.874***	131.250***	101.029***	90.856***	79.949***
	(<.001)	(<.001)	(<.001)	(<.001)	(0.001)	(0.002)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
N	4,180	4,180	4,180	4,180	4,180	4,180
Adj. R^2	0.428	0.433	0.436	0.451	0.433	0.446

Table 7
Underpricing OLS Regression by Time Period

This table provides OLS regressions where the dependent variable is IPO Underpricing. Regressions are partitioned by time period. Panel A includes the pre-bubble and the bubble period (1994 to 2000). Panel B includes the post-bubble period (2001-2011). To conserve space, we only present the variables of interest. See Table 4 for a full description of the independent variables. All Estimations control for year and industry fixed-effects. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Underpricing					
Panel A. Period from 1994 to 2000						
VC	5.115***	0.223	0.423	-0.619	0.489	-0.731
	(0.007)	(0.904)	(0.819)	(0.744)	(0.791)	(0.691)
Top VC		14.205***	13.732***	9.309***	13.964***	10.652***
		(<.001)	(<.001)	(0.004)	(<.001)	(0.001)
Lead-Mgr Star			8.064***	0.545		
			(0.002)	(0.830)		
VC*Lead-Mgr Star				7.028		
				(0.228)		
Top VC*Lead-Mgr Star				19.938**		
				(0.050)		
Co-Mgr Star					9.062***	0.573
					(0.004)	(0.840)
VC*Co-Mgr Star						9.900
						(0.189)
Top VC*Co-Mgr Star						24.682*
						(0.064)
N	3,123	3,123	3,123	3,123	3,123	3,123
Adj. R^2	0.434	0.440	0.442	0.447	0.442	0.448
Panel B. Period from 2001 to 2011						
VC	5.135***	3.976**	3.978**	3.585**	3.928**	3.278**
	(0.001)	(0.014)	(0.014)	(0.036)	(0.015)	(0.043)
Top VC		3.231*	3.226*	3.573	3.255*	3.076
		(0.094)	(0.096)	(0.117)	(0.091)	(0.115)
Lead-Mgr Star			0.100	-0.352		
			(0.934)	(0.789)		
VC*Lead-Mgr Star				2.031		
				(0.531)		
Top VC*Lead-Mgr Star				-1.683		
				(0.696)		
Co-Mgr Star					1.210	-1.238
					(0.492)	(0.452)
VC*Co-Mgr Star						8.212
						(0.136)
Top VC*Co-Mgr Star						3.750
						(0.679)
N	1,057	1,057	1,057	1,057	1,057	1,057
Adj. R^2	0.263	0.264	0.264	0.263	0.264	0.268

Table 8
OLS Regressions of Market Reaction to Analyst Coverage Initiation

This table provides OLS regressions where the dependent variable is the market-adjusted return over the 3-day (0, +2)-day window using the CRSP NYSE/Nasdaq/Amex value-weighted index. Independent variables include indicator variables equal to one if research coverage is initiated with a Strong Buy, the analyst is an all-star, the IPO is backed by a top underwriter, and if the research coverage was initiated at the end of the Quiet Period. We also include the natural log of proceeds raised in the IPO, the natural log of total assets at the time of the IPO, an indicator variable equal to one if the IPO is technology-related, firm age, and underpricing. See the Appendix for a list of variable definitions. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis. Industry and year dummies are included, but coefficient estimates are suppressed for brevity. ***, **, and * indicate significance at the 1% and 5% levels, respectively.

	(1)	(2)	(3)
		CAR [0, +2]	
	All Sample	1994~2000	2001~2011
Strong Buy	0.011**	0.017***	-0.005
	(0.013)	(0.001)	(0.518)
All-star	0.012**	0.013**	0.007
	(0.022)	(0.041)	(0.456)
Quiet	0.000	-0.007	0.021***
	(0.969)	(0.123)	(0.002)
Before 2000 dummy	-0.013		
	(0.656)		
Top UW	0.022***	0.028***	0.007
	(<.001)	(<.001)	(0.447)
Ln(proceeds)	-0.019***	-0.019***	-0.016***
	(<.001)	(<.001)	(0.004)
Ln(assets)	0.006***	0.007***	0.001
	(0.003)	(0.004)	(0.798)
Tech	0.013*	0.013	0.011
	(0.061)	(0.122)	(0.350)
Internet	0.019*	0.017	0.030
	(0.055)	(0.141)	(0.115)
Ln(FirmAge)	-0.002	-0.003	0.002
	(0.257)	(0.189)	(0.568)
Underpricing	-0.015**	-0.013*	-0.032
	(0.024)	(0.051)	(0.221)
Constant	0.309***	0.286***	0.279***
	(<.001)	(<.001)	(<.001)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	7,080	5,076	2,004
Adj. R^2	0.0183	0.0113	0.0466

Table 9
OLS Regressions of Lockup Expiration Return

This table provides OLS regressions where the dependent variable is the 5-day market-adjusted return over the 5-day (-2,+2)-day window using the CRSP NYSE/Nasdaq/Amex value-weighted index. Independent variables include indicator variables equal to one if the IPO is backed by a venture capitalist (VC) or a top venture capitalist (top VC), a top underwriter, and all-star coverage provided by a lead, co-manager, or unaffiliated analyst (Lead Star Coverage, Co Mgr Star Coverage, or Unaffiliated Star Coverage). We also include the natural log of proceeds raised in the IPO, the natural log of total assets at the time of the IPO, an indicator variable equal to one if the IPO is technology-related and firm age. See the Appendix for a list of variable definitions. Standard errors are adjusted for heteroskedasticity. *P*-values are in parenthesis. Industry and year dummies are included, but coefficient estimates are suppressed for brevity. ***, **, and * indicate significance at the 1% and 5% levels, respectively.

	(1)	(2)	(3)
	Market Adjusted CAR [-2,+2] at Lock Up Expiration		
	(1994~2011)	(1994~2000)	(2001~2011)
VC	-0.016***	-0.017***	-0.014*
	(<.001)	(0.002)	(0.069)
Top VC	-0.018***	-0.020***	-0.011
	(0.002)	(0.005)	(0.211)
Top UW	-0.007*	-0.006	-0.011*
	(0.069)	(0.257)	(0.051)
Lead-Mgr Star	-0.003	-0.002	-0.004
	(0.477)	(0.687)	(0.399)
Co-Mgr Star	-0.000	-0.004	0.013**
	(0.986)	(0.542)	(0.041)
Ln(Proceeds)	0.008***	0.008**	0.010***
	(0.001)	(0.016)	(0.008)
Ln(Assets)	-0.001	-0.001	-0.003
	(0.500)	(0.718)	(0.342)
Tech	-0.005	-0.004	-0.008
	(0.363)	(0.532)	(0.310)
Internet	-0.009	-0.008	-0.010
	(0.269)	(0.404)	(0.293)
Ln(Firm Age)	-0.001	0.000	-0.004
	(0.657)	(0.951)	(0.109)
Constant	-0.128***	-0.124**	-0.160***
	(0.001)	(0.013)	(0.008)
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
N	4,167	3,114	1,053
Adj. R^2	0.024	0.020	0.031

Figure 1
IPO Underpricing by All-Star Analyst Coverage and VC Status

This figure plots average and underpricing by all-star coverage received post-IPO (No star, Lead star, and Co-manager star coverage) and VC status (No VC, VC, and Top VC). IPO data are from Thomson Financial's SDC database. Analyst data are from I/B/E/S. VC affiliations are collected from the IPO prospectus. All-star analyst data are from *Institutional Investor's* annual analyst poll.

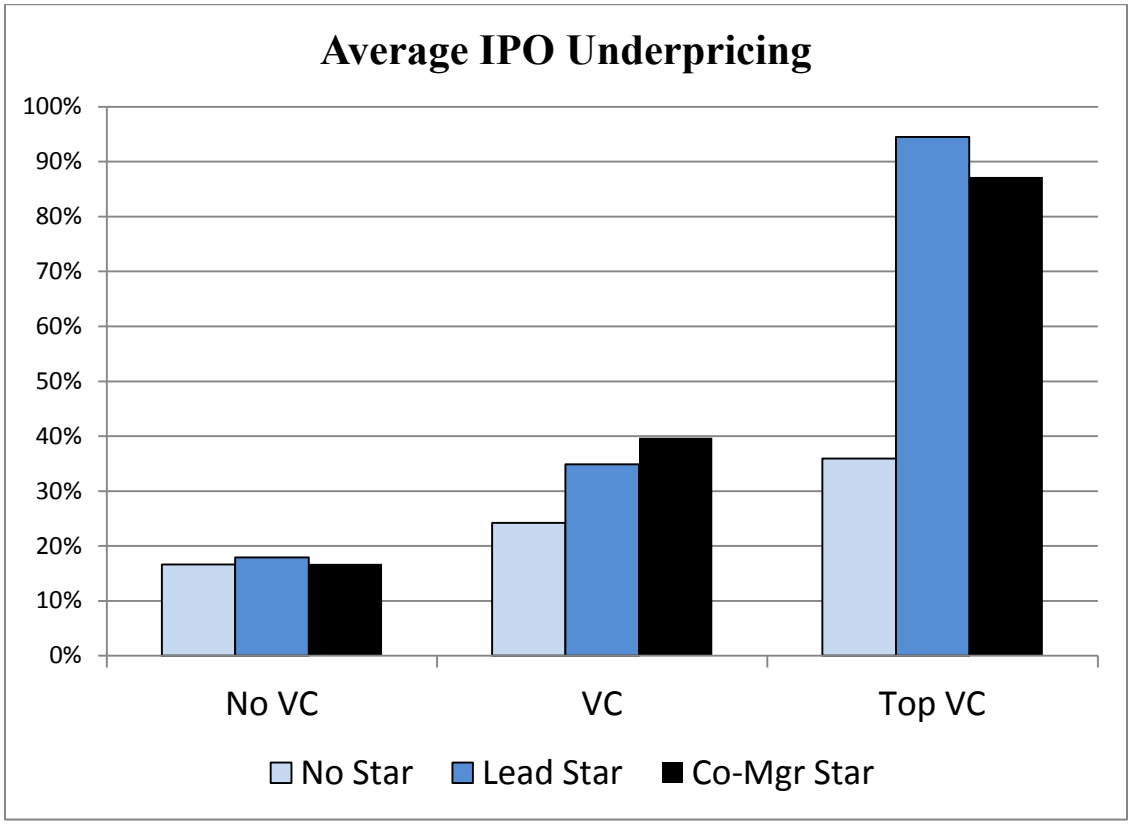
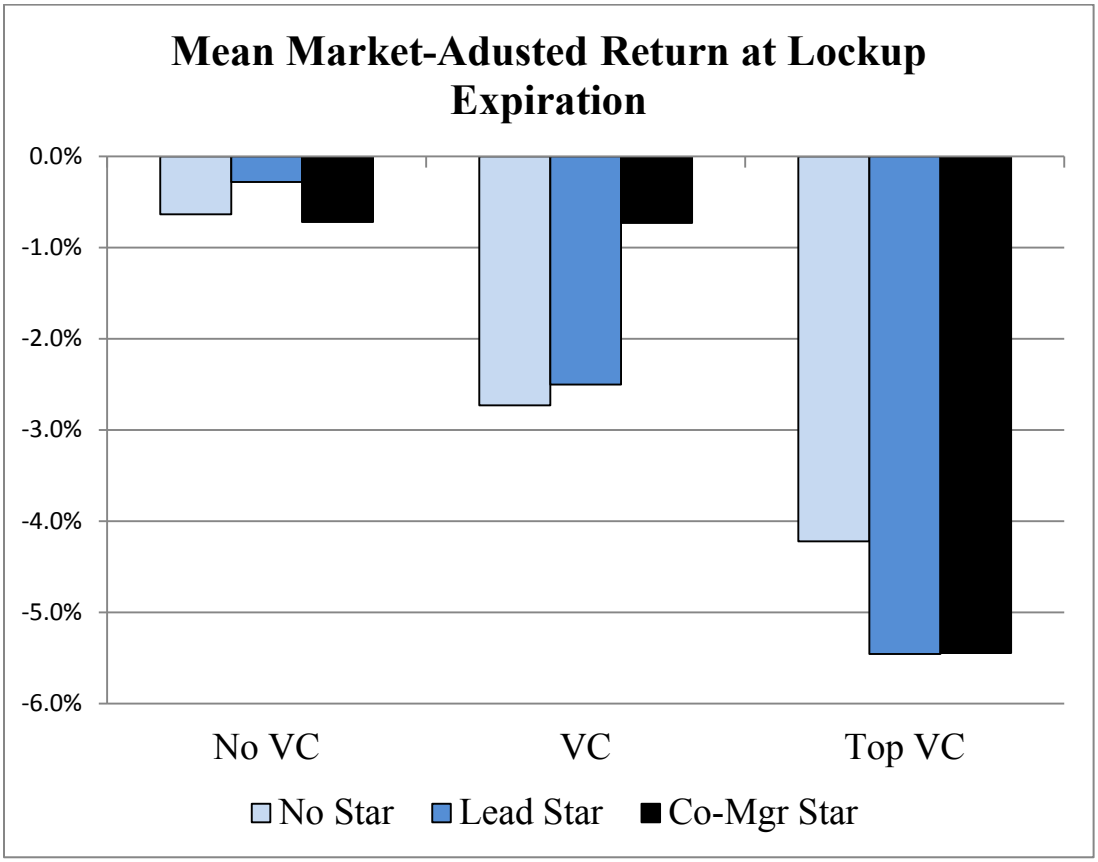


Figure 2
Lockup Expiration Return

This figure plots the return surrounding the lockup expiration, defined as the market-adjusted return over the 5-day (-2,+2)-day window surrounding the lockup date using the CRSP value-weighted index. Firms are grouped by all-star coverage received post-IPO (No star, Lead star, and Co-manager star coverage) and VC status (No VC, VC, and Top VC). IPO data are from Thomson Financial's SDC database. Analyst data are from I/B/E/S. VC affiliations are collected from the IPO prospectus. All-star analyst data are from *Institutional Investor's* annual analyst poll.



Appendix A

Repeated Business between Top VCs and their Top 3 UWs

This table presents information of the concentration of underwriters and all-star coverage provided to the top 25 VCs used in this paper. IPO data are from Thomson Financial's SDC database. Analyst data are from I/B/E/S. VC affiliations are collected from the IPO prospectus. All-star analyst data are from *Institutional Investor's* annual analyst poll. We show the concentration of the top 3 underwriter-VC pairs for all top VCs in our sample. There are 11 banks that appear in the possible 75 slots (25 VCs and top 3 banks each). We provide a concentration ratio, which is essentially a market share of the top 3 investment banks used by each VC and the percentage of all-star coverage provided to each VC firm's IPO.

Rank	VC Name	Top 3 Underwriters (UWs)				Other Underwriters				
		Deals	Deal (%)	All-star	All-star (%)	# of UWs	Deals	Deal (%)	All-star	All-star (%)
1	Kleiner Perkins Caufield & Byers	47	52%	29	62%	17	44	48%	5	11%
2	New Enterprise Associates	41	48%	15	37%	25	45	52%	7	16%
3	Oak Investment Partners	22	41%	12	55%	16	32	59%	5	16%
4	Mayfield Associates	17	38%	7	41%	13	28	62%	2	7%
5	U.S. Venture Partners	22	58%	14	64%	13	16	42%	0	0%
6	Accel Partners	23	49%	12	52%	14	24	51%	6	25%
7	Sequoia Capital	29	49%	14	48%	15	30	51%	5	17%
8	Crosspoint Venture Partners	11	42%	5	45%	11	15	58%	0	0%
9	Sprout Capital	14	35%	6	43%	18	26	65%	1	4%
10	Venrock Associates	21	49%	9	43%	15	22	51%	4	18%
11	Institutional Venture Partners	16	40%	6	38%	7	24	60%	0	0%
12	Battery Ventures	5	24%	4	80%	9	16	76%	0	0%
13	Menlo Ventures	9	29%	4	44%	11	22	71%	2	9%
14	Bessemer Venture Partners	10	29%	9	90%	10	24	71%	4	17%
15	InterWest Partners	12	33%	4	33%	12	24	67%	1	4%
16	Mohr Davidow Ventures	11	42%	8	73%	8	15	58%	1	7%
17	St. Paul Venture Capital	4	20%	3	75%	10	16	80%	0	0%
18	Austin Ventures	3	21%	2	67%	7	11	79%	0	0%
19	Greylock Partners	23	48%	10	43%	17	25	52%	5	20%
20	Sevin Rosen	5	36%	3	60%	8	9	64%	0	0%
21	Matrix Partners	15	56%	6	40%	8	12	44%	0	0%
22	Warburg Pincus Private Equity	11	31%	8	73%	13	24	69%	1	4%
23	Advent International	16	25%	6	38%	23	48	75%	0	0%
24	Enterprise Partners Venture Capital	4	27%	3	75%	8	11	73%	2	18%
25	HealthCare Ventures	4	24%	4	100%	12	13	76%	0	0%
	Mean Value	15.80	37.80%	8.12	56.71%	12.80	23.04	62.20%	2.04	7.69%

Appendix B
Variable definitions

Variable	Definition
Assets	Book value of assets at the IPO year t-1 [Source: Compustat]
Proceeds	Offer price times shares offered at the IPO (in $millions) [Source: SDC]
Firm age	Calendar year at the time of the IPO minus the firm's founding year [Source: Jay Ritter's Web site]
Revision	([offer price – midprice of original file range]/ midprice of original file range) [Source: SDC]
Underpricing	([first day close – offer price]/offer price) [Source: SDC, CRSP]
Tech	An indicator that equals 1 if the two-digit SIC code is equal to 28 (Biotechnology and drugs), 35 (computer and related), 36 (electronics and communications), 38 (medical equipment), and 73 (software); (Bradley and Jordan, 2002) [Source: CRSP]
Internet	An indicator that equals 1 if an issuing firm is internet-related [Source: Jay Ritter's Web site]
Lock-up CAR	The market-adjusted 5-day CAR centered around the lock-up expiration (180 calendar days after the IPO) [Source: CRSP]
Top UW	Carter-Manaster ranking of 8 or 9; (Loughran and Ritter, 2004) [Source: Jay Ritter's Web site]
VC	An indicator that equals 1 if an issuing firm is backed by venture capital [Source: SDC, Prospectus]
Top VC	Top 25 venture capital firms in the period between 1986 and 2000; (Gompers et al. 2010) [Source: Prospectus]
Star Coverage (Lead-Mgr, Co-Mgr)	An indicator that equals 1 if a lead (Co-manager) underwriter provides all-star coverage (top3 plus a runner-up) for an issuing firm within 1 year of the IPO; (Fang and Yasuda, 2009 and Liu and Ritter, 2011) [Source: I/B/E/S]
California	An indicator that equals 1 if the firm is headquartered in California [Source: SDC]
Quiet	An indicator that equals one if the analyst recommendation was issued at the end of the Quiet Period. The rule of the Quiet period change over time so for the years 1994 through 2002 we use days 25 through 30, for years 2003 through 2011, we use days 40 through 45.