

The Effect of Structural Embeddedness on Earnings Manipulation  
A Study of Venture Capital Backed Initial Public Offerings

Brandon E. Fleming

Michael G. Foster School of Business

University of Washington, Seattle

Seattle, WA 98195-3200

Dissertation Committee

Warren Boeker (Chair)

Kevin Steensma

Shivaram Rajgopal

Corey Phelps

Lan Shi

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## Extended Abstract

Venture capital (VC) firms have competing incentives for bringing firms public at an initial public offering (IPO). The IPO event is a critical and dominant vehicle for cashing out on an investment for a VC (Gompers and Lerner 2001). VC partners typically do not liquidate their holdings in firms until more than a year after the IPO, which means that VCs have an incentive to bring only high quality firms public. However, VCs also have an incentive to bring firms to market quickly and to produce higher post IPO valuations, i.e. to “grandstand” (Gompers 1996).

This dissertation demonstrates how these competing incentives cause VCs to affect earnings manipulation and firm performance. I specifically examine how powerful VCs, identified through their social networks, use board control to opportunistically manipulate reported earnings using R&D expenses and accruals to alter the market’s perception and evaluation of the new venture. VCs’ ownership positions in start-up firms give them extraordinary control rights since they can prevent future rounds of funding, fire the entrepreneur, and veto strategic decisions. Additionally, VCs participate in the hiring of certified public accountants to provide accounting data from the firm to the VC, which places them in a unique situation to monitor accounting information quality. Therefore the VC, as an important controlling member of the board and monitor of the firm’s accounting information, will determine the amount of earnings management and manipulation that occurs in the IPO.

The interlocking boards of IPO firms represent an important social network of actors with a common purpose: to bring private firms public. Past research that has tied networks of VC firms to investment decisions indicates that VC networks act as information conduits (Podolny 2001), and a VC’s position in the network will determine investment opportunities (Sorenson and Stuart 2001). Other research has demonstrated that the VC firm reputation, determined by their network position, influences the rate of IPO and the market capitalization at IPO (Stuart, Hoang, and Hybels 1999). As members of this network, VCs as directors are also embedded in the board network of the new venture. Either as an information conduit or as an indicator of reputation, the social networks of VCs act as an information diffusion mechanism that discloses the dominant incentives of VCs.

My study explores how social networks exert influence on these powerful directors, which then determines the amount of earnings manipulation that occurs through direct intervention or control over top management. To test my hypotheses I use firm data and executive board member characteristics from SEC filings of all IPO firms over the period 1997 to 2006 (2,724 observations). I use the evolving networks of VCs over the 5-year period prior to IPO to predict earnings manipulation in all VC backed IPOs in the pre-IPO year for the years 2002 to 2006.

## **Introduction**

The occurrence of accounting manipulation over the last several years has highlighted the importance of oversight in public firms. The catastrophic losses suffered by investors and employees from managerial malfeasance in companies such as Enron and WorldCom have resulted in broad changes in the institutional environment for public enterprises. Prior research has explored the relationship between the corporate governance structure and relevant incentives, and there is an opportunity for research on how the characteristics of the relationships of economic actors within firms lead to instances of malfeasance. Individuals are embedded in social groups that exert pressure on decisions and affect behavior (Granovetter 1985). While scholars have examined such behavior in large public firms (Baker and Faulkner 1993), we don't know much about how this works in small firms in critical periods such as IPO. By establishing the social context of powerful directors in IPO firms I examine the effect of embeddedness on behavior. My study explores how structural embeddedness exerts influence on powerful directors, which, in turn, determines the amount of earnings manipulation that occurs either through direct intervention or control over top management.

Manipulation of accounts such as accruals can have a dramatic affect on reported earnings. For example, in 2003 Halliburton Co. reported earnings of \$339 million, despite the fact it had spent \$775 million more than it actually took in from customers. The company had enormous unpaid expenses related to U.S. Army contracts for work in Iraq in 2003. However, Halliburton Co. recorded part of the revenues from the Army contracts in 2003 that were related to work done that year. According to Generally Accepted Accounting Principles (GAAP) Halliburton executed legitimate discretion on the matching of accrued income with realized expenses, but it does not necessarily mean that investors were clear on Halliburton's financial position. Managers at Halliburton were able to disguise a negative operating cash balance, in the order of hundreds of

millions of dollars, through accounting manipulation. The managers responsible for accounting manipulation are embedded in social groups such as board networks, and the extent to which managers are connected to one another will limit this behavior. Structural embeddedness refers to the extent to which mutual contacts are connected to one another and how this influences behavior (Granovetter 1992). To study the effect of structural embeddedness on manipulation, however, a group of actors with common incentives in a position to manipulate accounting information needs to be identified. Firms undergoing initial public offerings (IPO) with VC backing represent a unique situation where a set of actors with control of firms has a set of common incentives. Understanding how social embeddedness influences the incentives of powerful actors in small firms going public will help explain behavior in large public firms.

### **The Structural Embeddedness of VCs**

New ventures with VC investment create a setting that presents a potential clash between distinct short-term and long-term incentives. As VCs invest in firms prior to IPO, they place their own members on the board of directors of the new firm to monitor the performance and strategic direction of the firm. VCs then often invite partners of other VC funds to invest in entrepreneurial firms, and these syndicates are particularly interesting for the commonality of incentives among the parties to the syndicate.

VCs have an incentive to both bring firms to IPO quickly and to “Grandstand”, i.e. visibly demonstrate their ability to generate returns (Gompers 1996). However, VC investors maintain their equity holdings in IPO firms long after the IPO date, and in many cases Investment banks require that the early stage investor retain equity positions for at least 6 months after the IPO (Gompers and Lerner 2001). In particular, the long-term holding of IPO equity shares by VCs and the continued board membership by VCs after the IPO create incentives for ensuring the longer-term performance of the firm with these long-term incentives are seemingly at odds with short-term

incentives to “Grandstand”. Across a broad class of firms at a critical event (IPO) I am able to examine the effects of VC directors who have competing incentives to influence accounting manipulation in order to increase IPO returns.

Economic actors are embedded in social networks that can act as pipes or prisms (Podolny 2001). Networks acting as pipes represent information flows to and from the actors within the network, while networks acting as prisms reflect the endorsement, status, or legitimacy of an actor (Podolny 2001). VCs as board members are nested within the network of shared board members (the board interlock network). In the board interlock network among VCs, the network as a pipe or information conduit reflects the relative liability for engaging in manipulation or self-dealing such as “Grandstanding” through earnings management. An actor at the center of the director interlock network is highly visible, and over time any self-dealing will be discovered by the network as information on activities (Baker and Faulkner 1993) such as earnings management is passed through board interlocks. This leads to my centrality hypothesis that actors at the fringe of the network will have less visibility and thus a lower liability associated with earnings management.

Contrary to this hypothesis, the board interlock network can signify the status or prestige of members in the network (Scott and Davis 2006). Actors at the center of the network have higher status than actors at the periphery. If we view the board interlock network as a measure of status, we can derive implications for how structurally embedded actors, contingent upon their status, will influence earnings management. Actors will conform contingent upon their relative status position: inside, outside, or in the middle (Phillips and Zuckerman 2001). Actors in the “middling” social position are striving to solidify their social standing by adopting conforming practices, wherein conforming behaviors are patterns of conduct viewed as socially acceptable by the social network (Phillips and Zuckerman 2001). I argue that if the board network is a status network then earnings management is not socially acceptable and is non-conforming behavior. High status actors do not

need to solidify their standing and have little incentive to conform. Low status actors are outsiders and have no incentive to conform. In this light, actors at the extreme of high and low status will not conform to reducing levels of earnings management at IPO. It is only at the center of the distribution of network position where conformity exists, in this case reduced earnings management.

The board interlock network of IPO companies can be seen as a prism reflecting the status of the directors to the market. Earnings management can be viewed as a non-conforming behavior, as it impacts the payoffs for the limited liability partners who have a powerful influence on capital for future investments. VC directors will be sensitive to their overall status in the network and this will reflect in the allowance or forbearance for earnings management behavior. VC directors at the outskirts of the interlock network will have low status, and will be more likely to allow earnings management. Because their status is low the repercussions for earnings management will have no meaningful affect on position in the interlock network. Middle status VC directors are more sensitive to repercussions on their network position, since these individuals are attempting to move to a high status position. For middle-status VC directors the connection to firms with poor performance reduces their status. High status VC directors will not suffer the effects of earnings management as they can maintain their high status position despite poor IPO performance: they rest upon their past history of good performance to allow for future poor performance at IPO. This leads to my middle status conformity hypothesis that VCs with high and low centrality have higher levels of earnings management than those in the center of the distribution.

## **Data and Methods**

To test my hypotheses I collected firm data and board member characteristics from SEC filings of the 2,724 IPO firms over the period 1997 to 2006. I capture the structural embeddedness of VC's at IPO by tracking their board memberships on IPO firms within all IPO boards over the previous five-year period. Using the IPO board network in the five-year span prior to the IPO year

eliminates potential endogeneity between my measures of centrality and my dependent variable manipulation at IPO. I also capture the years on the board for VC's allowing me to assess directionality of ties for IPO boards with multiple VCs. I measure the VC's centrality by eigenvector (number of an actor's ties that have many ties), in-degree (number of ties flowing into the actor), and out-degree (number of ties flowing out of the actor). I control for the centrality of the other members in my analysis by including the summed centrality of the non-VC board members across all measures of centrality. Using eigenvector and out-degree centrality I am able to test my centrality hypothesis. Using in-degree centrality I am able to test my middle status conformity hypothesis.

To measure my dependent variable, I use two proxies of earnings management. The earnings management proxies are: 1) abnormal accruals using the Dechow, Richardson, and Tuna (2002) cross-sectional accrual model to estimate abnormal accruals for the pre-IPO year, and 2) the change in R&D expense used by Darrough and Rangan (2005). I use COMPUSTAT and hand collected data to estimate the value of abnormal accruals and R&D expense for the IPO firm in the year of the IPO. I use the evolving networks of VCs over the five-year period prior to IPO to predict earnings management in the IPO year for the years 2002 to 2006. There are a total of 2,724 IPO's over the period 1997 to 2006, of which 961 have VC backing according to SDC. In order to measure VC centrality I must use the five-year period prior to IPO to construct the IPO board network, leaving 241 VC-backed IPO observations for the period 2002 to 2006.

There are a number of important potential confounds that must be accounted for in analyzing the structural embeddedness of VCs and the incentives to manipulate accounting information at IPO. To account for differing short-term incentives at IPO, I capture the degree of insider share sales at IPO, which includes manager and VC share sales. To account for differing long-term incentives at IPO, I capture the amount of post IPO shares outstanding for managers and VCs. For the R&D proxy estimation model, I control for intertemporal changes in R&D (lagged

R&D), firm liquidity (e.g. change in operating cash flows), R&D alternative spending (e.g. sales, general, and administration expense), firm growth prospects (e.g. three year post-IPO return on assets), and firm life-cycle effects (firm age). For the abnormal accrual proxy estimation model, I control for firm liquidity (operating cash flows).

### **Additional Hypotheses**

In addition to my core hypotheses I look at other relationships such as the effect of long-term firm performance on manipulation. Earnings manipulation should straightjacket the firm by eliminating flexibility and lead to firm poorer performance in the years after manipulation.

Additionally, I look at the effects of decreasing VC ownership (as a % of total ownership) and the structure of the VC ownership (number of VCs and ownership concentration) on manipulation at IPO. Decreasing VC ownership and increasing fragmentation of VC ownership should reduce the incentives and ability to manipulate at IPO. The board representation of VC firms only partially captures VC involvement in new ventures, and I therefore explore all VC investments in the IPO firm. VC syndication networks represent the primary investment network for start-ups and while not all VC members to the syndicate take board seats, the syndication network provides an important constraint on manipulation at IPO. Increasing VC syndication network centrality will lead to decreasing earnings manipulation at IPO.

### **Contribution**

My research uses network analysis in combination with economic theory to distinguish the effects of social structure from economic incentives on misconduct in new ventures. The contribution of my dissertation is a combination of the predictions of economic and sociological theories with regard to the effect of incentives and embeddedness on entrepreneurial behavior. Economic models, such as principal-agent, capture divergence in incentives and the resultant behavior. Sociological models, such as structural embeddedness, capture the extent to which mutual



contacts are connected to one another and how this affects behavior. In utilizing models from sociology and economics, I examine the ways in which social structures impact new venture activities such as accounting disclosure and resource acquisition.

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