NOTE TO USERS

THE RELATIONSHIP AMONG OWNERSHIP, BOARD COMPENSATION, VENTURE CAPITALISTS, AND THE QUEST FOR VALUE WITHIN HEALTHCARE IPOS: AN AGENCY PERSPECTIVE

by

DAVID RAYMOND WILLIAMS

A DISSERTATION
Submitted to the graduate faculty of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

BIRMINGHAM, ALABAMA

2003

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRIMINGHAM

Degree Ph.D. Program Administration–Health Services

Name of Candidate David Raymond Williams

Committee Chairs W. Jack Duncan and Peter M. Ginter

Title The Relationship Among Ownership, Board Compensation, Venture Capitalists, and the Quest for Value Within Healthcare IPOs: An Agency Perspective

This study is concerned with two general aspects of new healthcare ventures that go public: (a) characteristics related to ownership interests and (b) venture capitalists. The venture capital/entrepreneur dyad presents two key risks that must be managed: (a) the new venture's business risk and (b) the new venture's agency risk. The study proposes that venture capital involvement and specific characteristics associated with the healthcare venture's ownership, specifically at the board level, help alleviate both of these risks and lead to wealth creation as measured by return on equity, return on assets, and economic value added.

DEDICATION

For Amy. . . Yes because se' di speranza fontana vivace.

It is not products that 'influence,' but creators that 'absorb.'

Osward Spengler

Only those willing to risk going too far can possibly find out how far one can go.

T. S. Eliot

If you believe in the absolute superiority of the new, can you learn and teach anything identifiable as old?

Wendell Berry
SDG

ACKNOWLEDGMENTS

I express my gratitude to the co-chairs of my committee, Drs. Peter M. Ginter and W. Jack Duncan, for guiding me through this process. It was through conversations with Dr. Duncan that I first came to study governance, ownership, and equity issues in entrepreneurial firms. I appreciate his support, confidence, and encouragement to "take on" these complex issues. I also thank Dr. Ginter, who endured my daily musings, ramblings, and incessant questions; he handled it with grace, tact, and succinctness, and I appreciate and admire that ability. I thank both gentlemen for teaching me how to "map the literature." I view this proficiency as one of the most valuable skills learned at this level.

I also thank Dr. S. Robert Hernandez, not only for serving on my committee, but also for taking an interest in my studies from the beginning. His early insights as to areas needing improvement–"Dave, you need to work on theory development"–went a long way in my preparation for this dissertation. Dr. Jeffrey Burkhardt provided guidance to the financial aspects of this dissertation and a much-needed second pair of eyes, for which I am forever grateful. Also, sincere thanks go to Dr. Richard M. Shewchuk, whose suggestion of structural equation modeling and efforts to make this dissertation a true learning experience are greatly appreciated, as are his kind words of encouragement that got me over the hump of dissertation self-doubt.

Finally, I thank the faculties and staffs in the School of Business, School of Health Related Professions, and School of Public Health. Although there are too

many people to mention, I thank in particular Dr. Stephen J. O'Connor for all his efforts.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Page

Page

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

GLOSSARY OF COMMONLY USED TERMS

Aftermarket: secondary market in which securities are exchanged (i.e., once the initial public offering issues have been exchanged).

Healthcare IPOs: new healthcare ventures that register with the Securities and Exchange Commission (SEC) and issue securities in an open, public market for the first-time. (For the present study from 1996 and 1999).

Initial Public Offering (IPO): refers to the firm or the first time selling or issuance of a firm's securities (e.g., stock) in an open, public market.

Open, Public Market: refers to the regulated arena in which securities are exchanged (e.g., New York Stock Exchange, NASDAQ).

Pratt's Guide to Venture Capital Sources (1996 edition): periodical listing of venture capital resources including company names, addresses, managers, and venture preferences, referred to herein as *Pratt's Guide*.

Pre-initial Public Offering Ownership: refers to the intended equity position by the entrepreneurs and venture capitalists in the venture after the initial public offering as stated in the initial public offering form.

S1 Form: initial registration form required by the Securities and Exchange Commiss-ion. Firms cannot publicly trade until the Securities and Exchange Commission deems this form effective. Firms may also file either an SB-1 or an SB-2 form in place of an S1 form if they meet certain criteria as described herein.

10-K Form: annual filing with the Securities and Exchange Commission that provides audited financial statements and other pertinent information reflecting the business of the firm.

Venture Capital Firm or Venture Capitalists: a private independent organization that is professionally managed and is listed in *Pratt's Guide to Venture Capital Sources*. A Healthcare IPO is deemed to have engaged a venture capital firm if the firm is listed as a principal shareholder as stated in the IPO's initial registration form filed with the Securities and Exchange Commission.

Venture Capital Investment: the process and activity by which private equity is provided by a venture capital firm to an organization or venture that is not publicly traded. Venture capital investment is viewed as "active" investment.

LIST OF ABBREVIATIONS

CEO	Chief executive officer
EVA	Economic value added
IPO	Initial public offering
LLP	Limited liability partnership
MGA	Multigroup analysis
R & D	Research and development
RMSEA	Root mean square error of approximation
ROA	Return on total assets
ROE	Return on equity
SEC	Securities and Exchange Commission
VCI	Venture capital involvement

CHAPTER 1

INTRODUCTION

Healthcare is the second-largest industry in the United States with expenditures totaling $1.3 trillion in 2000 and projected to grow to $2.8 trillion by 2011, or from 13.2 percent to 17.0 percent of the gross domestic product (Health Care Financing Administration, 2002). Blendon and Benson (2001) noted that over the years experts and commentators have expressed concern over the high levels of spending on healthcare, and that the general population has not shared this concern, with no more than 9 percent of the American public believing that the nation has been spending too much on healthcare at any time over the past 25 years. In a similar study, Blendon, Scoles, DesRoches, and Young (2001) noted that Americans' perceptions about healthcare costs stem from their own "out-of-pocket" spending and that the public supports more spending in the aggregate (but not out of pocket) for healthcare services and research. In another study, Kim, Blendon, and Benson (2001) found that Americans have a greater interest in and support for medical innovations than do Europeans. Kim et al. (2001) noted that this difference may be caused by Americans' expectation for these innovations. As Inglehart (2001: 6) has written, "most Americans believe that the frontier of medical miracles is endless."

Whether this frontier is endless is unknown. What is known is that the federal government and private equity markets are spending record amounts on healthcare research and development (R & D) (Neumann & Sandberg, 1998; Zinner, 2001). To

support this rationale, Cutler and McClellan (2001) found that spending on new medical technologies has produced a positive net benefit for Americans' health in the aggregate. Lichtenberg (2001) reported similar results with respect to the introduction of new drugs. It has been noted that the spending surrounding these medical innovations is taking place in both existing companies and new ventures (Read and Lee, 1994).

New venture creation within healthcare continues to grow (O'Connor, 2001). As Jaklevic (2001) noted, the number of healthcare initial public offerings (IPOs) in 2000 was triple the number in 1999. Total venture capital investment in the United States for 2000 equaled $103 billion but dropped to $36.5 billion in 2001 (its third-best year). The life sciences sector, which includes biotechnology, medical devices and equipment, and healthcare services, accounted for 18.5 percent of all venture capital investment in the last quarter of 2001 (National Commission on Entrepreneurship, 2002).

Figures 1 and 2 illustrate venture capital activity in the 1990s. Figure 1 depicts venture capital investment in new companies within all sectors and life cycles (i.e., not limited to healthcare or IPOs). The sources for Figure 1 are Pricewaterhouse/Cooper, Venture Economics, and the National Venture Capital Association. Figure 2 illustrates the number of all IPOs and venture capital involvement (VCI). The source for Figure 2 is the National Venture Capital Association. Table 1 presents the historical spending by venture capitalists by industry. The source for Table 1 is the National Venture Capital Association. Biotechnology has a different set of capital requirements (National Commission on Entrepreneurship, 2002) and other attributes and therefore is viewed as an industry or market sector separate from than other healthcare firms.

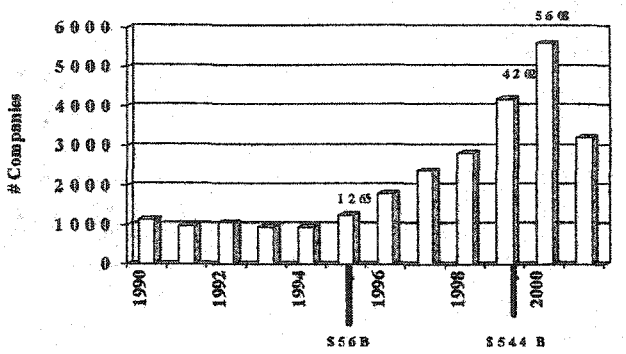


FIGURE 1

Venture Capital Investment – All Sectors

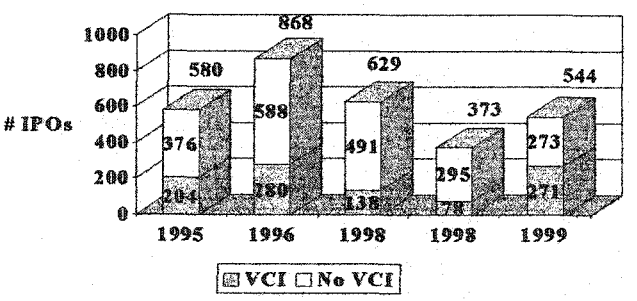


Figure 2

Venture-Backed IPOs – All Sectors

TABLE 1

Venture Capital Investment By Industry

Industrial Sector	1997 Percentage	1998 Percentage	1999 Percentage
Computer software & services	33.9[a]	20.0	15.5
Communications	17.3	17.3	17.3
Internet specific	[a]	17.1	38.3
Other products & services	10.1	12.5	9.4
Healthcare	13.9 ($2.2B)	12.5 ($2.3B)	5.1 (2.4B)
Semiconductor/Electronics	5.2	4.3	3.6
Consumer related	6.8	5.6	3.5
Computer hardware	4.5	2.9	2.7
Biotechnology	6.4 ($1.0B)	5.4 ($1.0B)	2.4 ($1.1B)
Industrial/Energy	1.9	2.3	1.6

[a] Includes Internet.

However, new venture creation itself is not synonymous with innovation (Begley & Boyd, 1987; Carland, Hoy, Boulton, & Carland, 1984) or wealth creation (Drucker, 1985; Schumpeter, 1976). For example, Reinhardt (2000) noted that an entire, new industry within healthcare had risen and fallen–the physician practice management companies' segment–and this may be indicative of the high failure rate of new ventures in general (Amit, Glosten, & Muller, 1990a; Stancill, 1981). Given these expectations and activities, it is imperative to better understand the characteristics associated with these new ventures.

Drucker's (1985: 30) definition of innovation as "the act that endows resources with a new capacity to create wealth" is utilized. Innovation and entrepreneurship have been linked by many (Schendel, 1990; Stevenson & Jarillo, 1990). The coupling of innovation and entrepreneurship is consistent with the view of innovation as "the specific instrument of entrepreneurship" (Drucker, 1985: 30). The present study takes the perspective that many entrepreneurs create new ventures as instruments to bring innovations (e.g., services, products, or processes) to market,

with entrepreneurship being defined as "a process by which individuals–either on their own or inside organizations–pursue opportunities without regard to resources they currently control" (Stevenson & Jarillo, 1990: 23).

The pursuit of opportunity without regard to the control of resources leads many entrepreneurs to seek alternative financing via debt, venture capital, and/or IPO Amit, Glosten, & Muller, 1990b; Fiet, 1997). By seeking external financing, entrepreneurs relinquish ownership and control (to varying degrees) of their ventures (McConaughy, Dhatt, & Kim, 1996; Sapienza, 1992). Relinquishment of ownership and control is consistent with Schumpeter's (1969; 1976) view of entrepreneurs as risk takers but not risk bearers. The separation of ownership and control is the central issue underlying agency theory (Fama, 1980; Jensen & Meckling, 1976).

Agency theory describes the relationship in which one party (the principal) delegates work to another party (the agent) on the principal's behalf. An agency problem arises when these cooperating parties have different attitudes toward risk; thus, the parties have varying preferences toward different courses of action (Eisenhardt, 1989; Fama & Jensen, 1983a).

Agency theory is pertinent to this discussion because the new (partial) owners of the organization may have goals conflicting with the goals of the original entrepreneur/manager (Amit et al., 1990a). The alignment of goals between managers and owners has been the topic of considerable research (see Alchian & Demsetz, 1972; Arrow, 1964; Demetz, 1983; Lewellen, 1969; Ofek & Yermack, 2000). Much of this literature is concerned with established, large firms (Dalton, Daily, Certo, & Roengpity, 2003). The study of small firms from an agency perspective has received little attention (Daily & Dalton, 1992).

Also receiving little attention in the agency literature has been the study of boards of new ventures (Dalton et al., 2003).[1] From an agency theory perspective, boards may be used as monitoring devices (Eisenhardt, 1989). Mace (1971) found boards' roles to include the establishment of basic objectives, corporate strategies, and broad policies. However, as Fama and Jensen (1983b: 343) observed, "the common apex of the decision control system of organizations, large and small, in which decision agents do not bear a major share of the wealth effects of their decisions, is a board of directors." To address the alignment issue, stock options became a part of the compensation package for many companies' directors beginning in the early 1990s, with some packages basing the granting of these options on firm performance (Halloran, 2001).

A recent study of 1,100 firms noted that from 50 to 60 percent of all remuneration to directors was in the form of equity (either stock options or grants), with from 68 to 76 percent of firms offering equity compensation (Directorship, 2001). Alignment of incentives at the board level is parallel to the alignment at the management level. As several researchers (Daily, Dalton, & Rajagopalan, 2003; Finkle, 1998; Zahra & Pearce, 1989) have noted, agency theory has been among the most recognized approaches to studying boards. Agency theory suggests that an attempt at alignment of goals at the board level should lessen the agency problem. However, this phenomenon is recent and has not been studied in sufficient detail (Coles, McWilliams, & Sen, 2001; Daily et al., 2003).

---

[1] Zald (1969: 99) observed that "[w]e usually think of boards of directors as agents of the 'owners,' but legally they are servants of the corporation vested with corporate control." See also Fama and Jensen (1983b), Klein (1983), and Williamson (1983) with respect to residual claimants.

The presence of venture capitalists and their roles have been studied in detail. These studies on venture capitalists, however, have conflicting results. For example, Amit et al., (1990a: 105) postulated that "less able entrepreneurs will choose to involve venture capitalists, whereas the more profitable ventures will be developed without external participation." In contrast, Brav and Gompers (1997) found that venture-capital-backed firms performed better than non-venture-capital-backed firms.

Further research is needed as venture capital involvement continues to grow (Bartlett, 1999; Swartz, 1991). More specifically, the current study is concerned with the alignment of venture capitalists' goals (specifically at the board level) with the goals of the common shareholder. Agency theorists have viewed shareholder wealth maximization is viewed as the central goal of the organization (Berle & Means, 1932; Eisenhardt, 1989). Studies show that venture capitalists perform vital roles (Elango, Fried, Hisrich, & Polonchek, 1995; Tyebjee and Bruno, 1984), provide discipline (Sapienza, 1992), and thus at times receive preferential treatment (Norton, 1996). However, there is very little in the literature specific to healthcare IPOs.

The present study examines the content of the entrepreneur's strategic choices related to venture capitalists, board characteristics, and compensation mechanisms of new healthcare ventures. As Goodstein and Boeker (1991: 310) observed, "[w]hen an organization is young . . . or encountering crises in its evolution . . . its board of directors may play a particularly important and direct role in influencing strategic change."

Because the agency theory and innovation issue of wealth creation is of interest in the current study, the financial measures of economic value added (EVA), return on total assets (ROA), and return on equity (ROE) may be used as proxies for

wealth creation. ROE and ROA have been widely used as performance measures. ROE depicts the owner's percentage return on investment, with ROA illustrating productivity of assets (Gapenski, 1999). EVA has been shown specifically to be a proxy for wealth creation (Stewart, 1991). The focus of the current study is on public companies; therefore, wealth creation is measured after the initial public offering (controlling for size [e.g., total assets]), with the assumption that there is a positive correlation between wealth creation and ROE, ROA, and EVA. The sample consists of 190 healthcare firms that registered for initial public offerings from 1996 to 1999. The relevant research questions are as follows:

1. Do healthcare IPOs that engage venture capitalists create wealth to a greater extent in terms of EVA, ROA, and ROE than such IPOs that do not engage venture capitalists;
2. Do healthcare IPOs with pre-initial public offering owners who retain a relatively greater proportion of equity in the firm create wealth to a greater extent in terms of EVA, ROA, and ROE than such IPOs create that retain a lesser proportion of equity;
3. Do healthcare IPOs in which there is no preferred stock outstanding at or about the time of the IPO create wealth to a greater extent in terms of EVA, ROA, and ROE than those healthcare IPOs create that have outstanding preferred stock;
4. Do healthcare IPOs that compensate board members via stock options create wealth to a greater extent in terms of EVA, ROA, and ROE than those firms create that do not provide stock options;
5. Does wealth creation in terms of EVA, ROA, and ROE vary between market sectors.

The research questions are types of strategic choices (Child, 1972) that entrepreneurs must make. It has been argued that strategic choices at this stage of an enterprise's life cycle not only affect the immediate survival status of the enterprise but also set its direction for years to come (Eisenhardt, 1988; Stinchcombe, 1965). Therefore, research in this area and at this stage is critical. These research questions and the background for the inclusion of the questions are discussed in greater detail in Chapter 2.

Summary

There has been a consistent desire for new medical innovations provided by entrepreneurs. As Carland et al. (1984: 357) stated, the "critical factor . . . to distinguish entrepreneurs from non-entrepreneurial managers, and, in particular, small business owners is innovation." Innovation and entrepreneurship have been viewed as benefiting the firm, industry, and general economy (Baumol, 1968; Low & MacMillan, 1988; Shane, 1996; Stevenson & Jarillo, 1990) and have "come to be viewed as the dominant strength of the United States in its international competitive battle" (Stevenson & Sahlman, 1986: 32). However, this seemingly "endless" medical frontier does not come without risks or costs. As Low and MacMillan (1988: 140) stated, "the list of potential pitfalls associated with starting a new venture appears limitless." Therefore, a better understanding of the characteristics of new ventures in healthcare is important to both researchers and practitioners.

The present study is concerned with two general aspects of new healthcare ventures: (a) characteristics related to ownership and (b) venture capitalists. The current study views these aspects through an agency theory lens and notes the potential

for agency-related problems. The reduction of these agency-related problems involves strategic choices (Child, 1972) for the entrepreneur and subsequently the venture capitalist. The venture capitalist/entrepreneur dyad presents two key risks that must be managed: (a) the new venture's business risk and (b) the new venture's agency risk (Sapienza & Timmons, 1989).

It has been noted that further research in these areas is needed. New ventures present unique opportunities to study agency theory issues. As Marino, Castaldi, and Dollinger (1989: 51) stated, "many IPOs have no performance history–therefore, subsequent performance can be more directly attributed to incumbent rather than previous management decisions." Stinchcombe (1965) has asserted that organizations are "imprinted" at their birth. The study of new firms provides a unique opportunity with regard to the study of organizations, boards, and their associated strategic choices.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the literature on entrepreneurship and agency theory. Particular attention has been given to the theoretical underpinnings and the related literature. Maps of the entrepreneurship and agency streams of literature are provided to act as synoptic guides illustrating the relationships and context of their respective literature streams and associated research questions. The maps and discussion illustrate: (a) the breadth and depth of the literature streams, (b) the gaps in the literature, and (c) the relationships and context of the research questions to other associated research. Because of the overlap of some of the literature within these two streams, the statement of hypothesis appears in the section most relevant to the issue (e.g., board compensation and agency theory). Only those substreams closely associated with the research questions receive significant elaboration in the present study.

Entrepreneurship

Contemporary entrepreneurship research originated with the works of the economist Joseph Schumpeter (1969; 1976) in the 1930s and 1940s (Barringer & Bluedorn, 1999). Schumpeter (1969; 1976) extended the work of J. B. Say (1880) who coined the term entrepreneur (Drucker, 1985). Before Schumpeter (1969; 1976), entrepreneurs were mainly seen as the providers of risk capital (a role today played

by investment bankers and some venture capitalists)[2] or as the business owner/manager who was not necessarily associated with innovative activity. Schumpeter (1969; 1976) viewed the entrepreneur as the agent that introduced innovations (via new products, services, or processes) into the market, thus stimulating economic activity. For Schumpeter, the entrepreneur was characterized as promoting a disequilibrium or systematic change in the market in what he termed the "creative destruction" process (Schumpeter, 1976: 81)–a nonstatic process that moves away from the equilibrium specified in microeconomic theory (Cheah, 1990).

At about this same time, the economists Hayek (1948) and Mises (1949) also began to view the market as being entrepreneurially driven (Kirzner, 1997). However, the view of these economists was one in which the entrepreneurs' action promotes equilibrium and functions as a change within the existing system (Cheah, 1990). In Hayek's (1948) and Mises's (1949) view, the entrepreneurs' innovations "fill in" gaps within the existing system. Schumpeter's (1976), Hayek's (1948), and Mises's (1969) perspectives (known as the Austrian school) are seen as acts of entrepreneurial discovery leading to supra-normal profits for the entrepreneur (Jacobson, 1992; Schumpeter, 1969). Thus, the entrepreneur (who is missing in microeconomic theory [Baumol, 1968; Coase, 1937]) is viewed not only as moving the economy forward but as being the "driving force for the entire market process" (Kirzner, 1973: 8), "the recognized 'central figure' of the system" (Knight, 1965: 5), and "[h]e [who] has long been recognized as the apex of the hierarchy that determines the behavior of the firm and thereby bears a heavy responsibility for the vitality of the free enterprise society" (Baumol, 1968: 64).

---

[2] Indeed, Schumpeter (1969: 137) stated that "[t]he entrepreneur is never the risk bearer. . . The one who gives credit comes to grief if the undertaking fails."

As a result, most of the research from the 1940s to the mid-1980s regarding entrepreneurship focused on the individual characteristics of the entrepreneur (Gartner, 1985; Schendel, 1990; Wortman, 1987). Gartner (1985) noted that the major thrust of that research studied the differences in entrepreneurs and nonentrepreneurs and that entrepreneurial firms were different from nonentrepreneurial firms. Wortman (1987) stated that there has been "little balance" in the research, with almost half dedicated to the study of individuals.

Thus, the study of entrepreneurship continues to lack a cohesive theory (Amit & Glosten, 1993; Bygrave & Hofer, 1991; Sandberg, 1992; Shane & Venkataraman, 2000; Ucbasaran, Westhead, & Wright, 2001). The lack of theory may be caused in part by the relative newness of entrepreneurship as a field of study (Bygrave & Hofer, 1991), with most of the empirical research beginning in the 1980s (Wortman, 1987).

Nevertheless, researchers today continue to grapple with definitional issues (Gartner, 1990; Sharma & Chrisman, 1999), appropriate units of analysis (Covin & Slevin, 1991; Shane, 1995) and research methods (Chandler & Lyon, 2001; Smith, Gannon, & Sapienza, 1989), and establishing boundaries (Minkes & Foxall, 1982; Sandberg, 1992). Entrepreneurship research continues to expand (Brazeal & Herbert, 1999; Chandler & Lyon, 2001), in terms of both the number of articles published–as evidenced by new journal creation (Stevenson & Jarillo, 1990)–and the varying conceptual lenses or perspectives (Amit & Glosten, 1993) that continue to be applied.

There exists a need to clarify what is known today about the competing paradigms (Kuhn, 1962) that are evolving within entrepreneurship research. Wortman (1986, 1987) provided a research typology for the study of entrepreneurship based on previous research. An expanded version of this typology is included as Table 2 (Map

1).[3] The additions to this typology are based on the expansions that have occurred in the field since the publication of Wortman's (1987) typology. In addition, Map 1 presents a selected bibliography. This bibliography is not inclusive of all the literature or streams but instead presents a representative sample of the relevant research that has occurred in the field.

Wortman (1987) divided the entrepreneurship literature into six major streams: Theoretical, Historical, Environmental, Organizational, Functional, and the Future of Entrepreneurship. These divisions are depicted in the first column of Map 1. The next two columns (except where indicated) are Wortman's (1987) substreams to the six major streams. Wortman's (1987) major criterion for stream development is inclusiveness. Additional substreams are added to reflect the breadth and depth of the research since the time of his work in the mid-1980s. The major difference between his criteria for research inclusion and the works in Map 1 is that Map 1 includes research that is not limited to data-oriented research. Non-data-oriented research is included to support the theoretical underpinnings of some of the new, relevant substreams that are emerging and that are critical to the subject matter of the present study.

Particular attention in this map is paid to the areas of most concern in the current study (i.e., those areas associated with the Functional stream). Therefore, there may be a richness within other research streams that is not reflected here. Finally, the placement of research within a stream of literature is in the end subjective. Many of the works of research could very well be placed in numerous streams or categories.

---

[3] The terms Map 1 and Table 2 are used interchangeably thoroughout this study, as are the terms Map 2 and Table 4.

TABLE 2

Map of Entrepreneurship and New Ventures[a]

Literature Streams				Bibliography
Entrepreneurship				
	I. Theoretical			
	A. Theories of Entrepreneurship			Amit & Glosten (1993); Brazeal & Herbert (1999); Bygraves & Hofer (1991); Guth (1995); Sandberg (1992)
		Social Entrepreneurship[b]		Deeds et al. (1998); Williams & Hernandez (2002)
		Individual		Baumol (1968)
		Corporate		Zahra et al. (1999)
	B. Frameworks			Minkes & Foxall (1982)
				Low & MacMillian (1988); MacMillian & Katz (1992); Schendel (1990); Shane & Venkataraman (2000); Stevenson & Gumpert (1985); Ucbasaran et al. (2001)
		Comprehensive		
		Psychological		
		Sociological		Aldrich & Martinez (2001); Van de Ven et al. (1984)
		Economic		Brophy & Shulman (1992)
		Political		
		Social		
	C. Definitions			Gartner (1990); Sharma & Chrisman (1999) Chandler & Lyon (2001); Covin & Slevin (1991); Schwartz & Teach (2000); Singh (2001); Smith et al. (1989); Wortman (1986, 1987)
	D Models of Entrepreneurship			
	Innovation[b]			Foster (1986); Foster & Kaplan (2001)
		Disruptive[b]		Christenson (2000); Christenson et al. (2000)
	II. Historical			
	A. Corporate			
	B. Individual			Cheah (1990); Jacobson (1992); Kirzner (1997)
	III. Environmental			
	A. Macroenvironment			Say (1880); Schumpeter (1976); Kirzner (1973)
		International		
		National		Drucker (1984); Shane (1995,1996)
	B. Microenvironment			Hayek (1948); Mises (1949)
	IV. Organizational			
	A. Business			
	B. Government			
	C. Nonprofit			
	D. International			
	V. Functional			
	A. Corporate (Intrapreneurship)			Stevenson & Jarillo (1990): Stopford & Baden-Fuller (1994)
		Structure		
			New Venture Formation	
			Venture Management	

TABLE 2 (Continued)

Literature Streams									Bibliography
Entrepreneurship			Innovation						
				Location					Porter & Stern (2001)
			Technology						
			Public Policy						
			Governance						
			Mechanisms[b]						Zahra et al. (2000)
		Behavior							Drucker (1985); Pinchot (1985); Ahuja & Lampert (2001)
			Opportunity-Based[b]						Brown et al. (2001)
			Strategy[b]						Barringer & Bluedorn (1999); Dess et al. (1997); Murray (1984)
	B. Individual								
		Structure							
			New Ventures						Gartner (1985); VanderWerf (1993)
				Emerging					Katz & Gartner (1988)
				Private					Ford (1988); Wruck (1989)
					Gov't. Privatization				Andrews & Dowling (1998)
				Public					
					Initial Public Offerings				
						Ownership Interest			Marino et al. (1989)
									Mikkelson et al. (1997)
						Timing			
									Ibbotson & Jaffe (1975); Jain & Kini (1994); Loughran & Ritter (1995); McConaughy et al. (1996); Ritter (1984); Ritter (1991);
							Hot Markets		
								Flipping	Krigman et al. (1999)
							Speed		Shepard & Zacharakis (2001)
						Resource Dependence			Deeds et al. (1998)
							Size		Finkle (1998)
						Voting Rights			Stulz (1988)
						Costs			Aggarwal & Rivoli (1991); Stoll & Curley (1970)
							Spreads		Chen & Ritter (2000)
							Valuation		Kim & Ritter (1999)
							Underpricing/ Overpricing		Baron & Holmstrom (1980); Ritter (1991); Rock (1982); Tinic (1988)
								Boards	Howton et al. (2001)
								Conflict of Interest	Gompers & Lerner (1999)
								Moral Hazard	Stoughton & Zechner (1998)
								Controlling	
								Block/Discriminating	
								Pricing	Mello & Parsons (1998)
						Options			
							Stock Prices		Sorescu (2000)

TABLE 2 (Continued)

Literature Streams						Bibliography
Entrepreneurship						
	VC Involvement					Amit, et al. (1990a,b); Bygraves & Timmons (1991); Brav & Gompers (1997)
		No VC Involvement				Fiet (1997)
		With VC Involvement				
			Multiple VCs Involvement			
			VC Firm Specific[6]			
				Review		Barry (1994); Fried & Hisrich (1988); Swartz (1991)
				Portfolio of VC Firms[6]		Elango et al. (1995); Gompers & Lerner (1998)
				Investment Decision[6]		Bouillet-Cordonnier (1992); Fried & Hisrich (1994); Gupta & Sapienza (1992); Norton (1996); Steier & Greenwood (1995); Tyebjee & Bruno (1984);
				Operations[6]		Barry et al. (1990); Fried et al. (1998); Gompers (1996); Sahlman (1990, 1994); Sapienza (1992); Sapienza & Timmons (1989); Sapienza et al. (1996)
					CEO Dismissal	Bruton et al. (1998)
					Professionalization	Hellman & Puri (2002)
				Strategy[6]		MacMillian et al. (1985); Robinson (1987)
				Impact on Entrepreneur[6]		Kirilenko (2001)
				Public Policy[6]		
			New Venture Firm Specific			
				Management Ownership		Morck et al. (1988); Daily & Dalton (1992)
					Board Ownership	**Williams (2003)**
				Oversight/CEO Turnover		Lerner (1995)
				Industry Stages		McDougall et al. (1994); Vinnell & Hamilton (1999)
					Posture	Covin & Slevin (1990); Covin (1991)
					Strategy/ Structure	McDougall et al. (1992)
Operations						
External Groups						

TABLE 2 (Continued)

Literature Streams		Bibliography
Entrepreneurship		
Behavior		
	Careers	
	Personal Characteristics	Begley & Boyd (1987); Carland et al. (1984); Duchesneua & Gartner (1990); McGrath et al. (1992)
	Job Characteristics	
VI. Future of Entrepreneurship		Davidson & Wiklund (2001)

[a] Based on Fried & Hisrich (1988)

[b] Addition

The overriding criterion for placement was uniqueness or newness at the time of publication.

For example, Drucker's (1985) work could be placed in any number of streams or substreams, including new ventures, government, nonprofit, or innovation. However, his contribution to the literature with this work (Drucker, 1985) was viewed with respect to corporate entrepreneurship and the behavior of the organization. Furthermore, Drucker's (1985) statements regarding entrepreneurship as a practice that is applicable (indeed, critical) to the management of all firms was unique at the time.[4]

The Functional Literature Stream

Wortman (1987) noted that most of the entrepreneurship literature falls into the stream of Functional (and the substream Individual). Wortman (1986) divided the Functional literature stream into two broad categories: Corporate and Individual. Corporate refers to the entrepreneurial activity within an existing organization. This activity is sometimes called intrapreneurship (Pinchot, 1985). This area of research has been of growing interest to researchers (see Guth, 1995; Schendel, 1990; Zahra, Kuratko, & Jennings, 1999). Wortman (1987) further divided the Corporate stream into the sub-streams of Structure and Behavior. Within the substream of Structure he added: New Venture Formation, Innovation, Technology, and Public Policy. To these substreams, the substream of Governance Mechanism has been added to reflect the work of Zahra, Neubaum, and Huse (2000).

---

[4] For example, Vesper writing in 1982 (xxxi), stated that "[t]he overall field of entrepreneurship is loosely defined as the creation of new business enterprises by individuals or small groups."

The other major substream within the corporate stream is Behavior. The substream of Behavior relates to the actions of the entire firm and not just to the actions of the individual. Two of the most influential writers in all of the entrepreneurship literature are in this stream–Drucker (1985) and Pinchot (1985), whose works laid the foundation for research and practice to go beyond the bounds of the individual entrepreneur. The view of these authors (Drucker, 1985; Pinchot, 1985) was that firms must continually re-create themselves (via innovations) in the market.[5] Unlike previous researchers (see Mintzberg, 1990, as it relates to planning), Drucker (1985) and Pinchot (1985) believed that this re-creation was not only possible but also critical to long-term firm success. This belief is congruent with and an extension of the works of Schumpeter (1969, 1976) and is the advice given in several recent books (see Foster, 1986; Foster & Kaplan, 2001).

The substream of Structure within the streams of the Individual and Functional encompasses the majority of the entrepreneurial research that is of interest in the current study. As a result, the selected bibliography has been expanded. Note that within Map 1 the direct lines for the research questions are bolded. Bolding is used to illustrate the fit of the two major research areas (e.g., boards and venture capitalists).

New Ventures

New ventures are comprised of two streams: Private and Public. The current study is concerned with firms that have become publicly owned through the issuance

---

[5] Others have previously written on this subject (see Kaysen, 1957) but have not developed the concepts of innovation and entrepreneurship within the existing firm to the extent that Pinchot (1985) and Drucker (1985) have done.

of publicly traded stock within an open market (e.g., New York Stock Exchange and NASDAQ)–this activity is associated with the IPO stream. Entrepreneurs have three basic means of raising capital: internal operations, debt, or the issuance of stock. For most new ventures, the option of raising capital through internal operations is non-existent (Kirilenko, 2001). With respect to debt, Jensen and Meckling (1976) noted that the costs associated with this obligation are expensive in terms of monitoring, bankruptcy, and limitations on growth. These debt costs are greater than the costs associated with the issuance of stock. Therefore, there is a positive net benefit to the public corporate form of organization (Jensen & Meckling, 1976).

The literature in the IPO stream is primarily concerned with firm performance surrounding timing issues, costs, and venture capitalists' involvement. Timing issues and costs (including underpricing) are addressed with the literature regarding venture capital involvement (or the lack thereof). Timing issues and costs are not included in the research questions because most research has viewed these elements as pricing anomalies (Ritter, 1991), with stock price acting as the dependent variable (Jain & Kini, 1994; McConaughy et al., 1996). Additionally, costs are primarily the result of pre-market or pre-initial public offering negotiations and do not necessarily directly affect the wealth creation ability of the firm after the initial public offering.

Timing issues relate to stock issuance relative to the performance of the average existing publicly traded firms (Ibbotson & Jaffe, 1975; Loughran & Ritter, 1995). The relevant question for both researchers and practitioners is as follows: "Is there a best time to issue stock based on the overall performance of the market and/or IPO market?" In other words, does the overall performance of the market (or the IPO market) affect IPO performance? The timing issue receiving the most attention stems

from the concept of "hot markets" (Ibbotson & Jaffee, 1975; Ritter, 1984). Hot markets usually refer to a time in which the price of initial stock offerings rise to a greater degree in the aftermarket than the historical average price of initial stock offerings (e.g., New York Stock Exchange) (Ibbotson & Jaffee, 1975). The findings of this literature are mixed. For example, Ibbotson and Jaffe (1975: 1038) suggested that "it is quite possible that companies going public in a cold issue market are better off." Ritter (1984), however, found the hot market phenomenon to exist but also noted that this market was segmented.

Issues surrounding IPO costs include direct cash expenses such as legal and accounting cost (Aggarwal & Rivoli, 1991); the investment bank's commission (Aggarwal & Rivoli, 1991; Chen & Ritter, 2000); and mispricing (Aggarwal & Rivoli, 1991; Krigman, Shaw, & Womack, 1999; Ritter, 1991). Research on the costs surrounding the mispricing of new issues has received a great deal of attention. Mispricing of new issues research is concerned with establishing a price at which to sell the shares on the common market and involves a "multi-round negotiation among the firm going public, the underwriter, and investors" (Krigman et al., 1999: 1023). Pricing is especially important to the new venture because residuals from the sale of common stock may not go to the new venture itself. Once a new venture has sold its stock, either to investors (e.g., venture capitalists and investment banks) or on the open market, the venture no longer directly receives benefits or loss from additional sales of issued stock.

For example, if a company issues stock at $10 per share (e.g., its offering price), the company then receives $10 for this sale. Commissions and other costs are excluded for simplification purposes. However, if in the aftermarket (or open mar-

ket) the stock price increases to $20 per share, the firm does not directly receive the benefit of the difference between the offering price and aftermarket price. This is fact important for three reasons: (a) The firm does not want to leave "money on the table" (Krigman et al., 1999: 1015); (b) it affects how much stock the firm may need to sell in the future to raise capital for future growth; and (c) if the firm's stock underperforms, the company's ability to issue or sell stock in the future may be affected. Initial pricing plays a crucial role in establishing and maintaining a firm's value.

Research on the pricing issue has been extensive and inconclusive. For example, Tinic (1988) stated that IPOs are typically underpriced. Krigman et al., (1999) found that the market underreacts in choosing the initial trading price of an IPO. However, Ritter (1991) found underpricing to be a short-term phenomenon. Potential reasons for underpricing vary and include adverse selection (Rock, 1982), conflict of interest (Gompers & Lerner, 1999), asymmetric information (Baron & Holmstrom, 1980), moral hazard (Stoughton & Zechner, 1998), and insurance against legal liability (Tinic, 1988).[6] Brav and Gompers (1997) found that IPOs backed by venture capitalists outperform non-venture-backed IPOs. Research similar to the present study by Howton, Howton, and Olson (2001) found board ownership correlated positively with firm performance in the long run. However, the study (Howton et al., 2001) was concerned with underpricing and firm performance (the relation between opening stock price and a defined future stock price in relation to other stock prices) and thus does not specifically address the value-creating ability of a firm.[7]

---

[6] It should be noted that these issues are all agency theory issues.

[7] Stock price is viewed as only part of the total return to shareholder equation (with dividends being the other part). It is argued here that total return to shareholders may be a limited measure of value creation by managers because it may not reflect the

Venture Capital

This stream of research is specific to venture capitalists and the venture capital firm. Sahlman (1994: 35) defined venture capital as "active investment in private companies with high growth potential." The term venture capital firm refers to organizations having the predominant purpose of financing the founding or early growth of new companies that do not yet have access to the public securities market or to institutional lenders (Gupta & Sapienza, 1992). Venture capitalists are active investors who seek to "add value" through ongoing, long-term involvement with developing businesses (Barry, Muscarella, Peavy, & Vetsuypens, 1990). The engagement of venture capitalists is consistent with the study's definition of entrepreneurship as "a process by which individuals . . . pursue opportunities without regard to resources they currently control" (Stevenson & Jarillo, 1990: 23).

Historically, venture capitalists have been viewed in their financial intermediation roles (Hellman & Puri, 2002). However, a growing body of research illustrates the limitedness of this view (see Barry, 1994; Bruno et al., 1998; Sahlman, 1990a; Sapienza, 1992; Tyebjee & Bruno, 1984). Venture capitalists also provide a multitude of services from acting as a "sounding board" for the entrepreneur (Sapienza, Manigar, & Vermeir, 1996: 439) to actively participating in the dismissal of the chief executive officer (CEO) via board involvement (Bruton, Fried, & Hisrich, 1997).

Entrepreneurs come from varied backgrounds with varying levels of business expertise (Drucker, 1985). Amit et al., (1990a,b) asserted that entrepreneurs have asymmetrical information regarding their skill levels. The authors (Amit et al.,

---

true actions specific to the firm but may mirror the movement of the market or a particular market sector (see Copeland, Koller, & Murrin, 2000).

1990a,b) argued that asymmetrical information leads to both moral hazard and adverse selection problems, with mainly less able entrepreneurs choosing to involve venture capitalists. This issue is clearly an agency issue. However, the costs of debt may also outweigh the associated costs of engaging venture capitalists.

Wealth maximization is the primary goal of the organization, according to agency theorists, but is not necessarily the focus of the entrepreneur. As Pinchot (1985: xvi) stated,

"the primary motivation for most entrepreneurs is not the acquisition of wealth. Many do become wealthy, but they do so almost by accident in the course of pursuing some vision of what their customers, and the rest of the world, might need or want. Since their ventures must be financially successful if they are to satisfy their customers' needs, money becomes an important way to measure progress–but in and of itself, it is rarely the purpose of the venture."

Thus, entrepreneurs may engage venture capitalists to gain access to resources in pursuit of their goals, with their risk and control reduction a byproduct of their need for additional resources and not a product of concealment or shirking. Within this setting, entrepreneurs will retain control to the extent that they maximize stockholder wealth.

There is growing evidence that venture capitalists do add value, especially in highly innovative firms operating on the frontier of emerging technologies and markets (Sapienza, 1992; Tyebjee & Bruno, 1984). Sahlman (1990a: 473) stated that "[t]he venture capital industry has evolved operating procedures and contracting practices that are well adapted to environments characterized by uncertainty and information asymmetries between principals and agents." In addition, entrepreneurs recognize the fact that venture capitalists represent expertise and experience in monitoring their investments and the entrepreneur's actions (Barry et al., 1990), with the staging of finance acting to reduce agency problems and costs. Thus, venture capital-

ists are seen as bringing the expertise and discipline that are expected by the market to the new venture that may be lacking within the entrepreneurial venture itself. Therefore, the following hypothesis is offered:

Hypothesis 1. Healthcare IPOs that engage venture capitalists create wealth to a greater extent in terms of EVA, ROA, and ROE than the healthcare IPOs that do not engage venture capitalists.

There is a growing body of evidence that views venture capitalists as value-adding agents. However, most of this research is nonindustry specific, with no known studies examining healthcare IPOs specifically. Therefore, whether venture capitalists add value to new healthcare ventures remains unknown.

Venture capital typology. Fried and Hisrich (1988) noted that the venture capital literature can be segmented into six major topics: Portfolio of Venture Capital Firms; Investment Decisions; Operations; Strategy; Impact on Entrepreneur; and Public Policy. These six classification schemes are presented in Map 1 with the addition of a Review/Future Research section. Like the map on agency theory given before, Fried and Hisrich (1988: 16) stated that "[m]ost studies deal with more than one of these six topics."

Table 3 depicts the findings and implications for the Investment decisions and Operations segments. These two streams are most pertinent to the research questions addressed in the current study and, as noted by Fried and Hisrich (1988), are the two areas that have generated the most research. The study of venture capitalists is important to researchers and practitioners. As Elango et al. (1995: 158) have written, "[b]y understanding what VCs [venture capitalists] are looking for in an investment,

TABLE 3

Studies Examining Venture Capitalists and Their Firms

Study	Data	Resources	Findings or Implications
		Investment Decisions	
Bouillet-Cordonnier (1992)			Addressed the legal provisions within the contract between the venture capital firm and the new venture. It noted that there is some flexibility within these contractual arrangements.
Fried & Hisrich (1994)	18 VC firms; personal interviews followed by follow-up evaluation of model		Proposed a six-step process that venture capital firms undergo to reduce the risk of adverse selection: (a) origination, (b) venture capital firm-specific screen, (c) generic screen, (d) first-phase evaluations, (e) second-phase evaluation, and (f) closing.
Gupta & Sapienza (1992)	169 VC firms	Pratt's Guide	Found venture capital firms to be nonhomogenous in the intended product-market scope of their portfolios. Results indicated (a) VCFs specializing in early stage ventures prefer less industry diversity and narrower geographic scope, (b) corporate VCFs (i.e., those owned by nonfinancial firms) prefer less industry diversity but broader geographic scope relative to noncorporate VCFs, (c) larger VCFs prefer greater industry diversity and broader geographic scope than smaller VCFs, and (d) provision of small business investment companies financing the VCF has no impact on industry diversity but is associated with a preference for narrower geographic scope.
Norton (1996)			Found that venture capital involves a five-step process: (a) obtaining funds from limited partners, (b) identifying, analyzing, and selecting appropriate entities in which to invest, (c) structuring the terms of the investment, (d) implementing the deal and monitoring the portfolio, and(e) achieving returns and ultimately exiting from the investment.
Steier & Greenwood (1995)	Case method of one firm over a 3-year period		Central findings of the study included the following points: (a) penetrating the venture capital network is a significant first step in securing financial resources, with relationships superseding business plans in securing resources, (b) venture capitalists establish milestones and tight timelines yet inadvertently contribute to delays, (c) the [illegible]perating logic of VC networks, constrained by the hierarchical structuring and post investment stages are more dynamic, and iterative than current models suggest, and (d) staged financing requires clear knowledge of each party's role.
Tyebjee & Bruno (1984)	Two studies: (a) telephone survey of 46 VCFs and (b) survey of 41 VCFs	Pratt's Guide	Found that the venture capi[illegible] process involved five sequential steps: (a) deal origination, (b) deal screening, (c) deal eva[illegible], (d) deal structuring, and (e) post investment activities.

TABLE 3 (Continued)

Study	Data	Resources	Findings or Implications
		Operations	
Barry et al. (1990)	433 VC-backed IPOs & 1,123 non-VC-backed IPOs for 1978-1987	Venture Capital Journal; Pratt's Guide	Found that venture capitalists specialize their investments in firms to provide monitoring services. Consistent with this finding, venture capitalists take concentrated equity positions and maintain these positions beyond the IPO. Markets appear to recognize this fact because there is a lowering of underpricing for firms with venture capital partners.
Fried et al. (1998)	51 VC firms were surveyed by mail and compared with results of Judge & Zeithaml (1992)		Findings show that VC-backed firms' boards are active and demonstrates that these boards are more active than traditional boards.
Gompers (1996)	433 VC-backed IPOs from 1978-1987	Venture Capital Journal; Pratt's Guide	Evidence suggests that companies backed by young venture capital firms are younger and more underpriced at their IPO than are companies backed by established VC firms.
Sahlman (1990b)		Venture Economics, Inc. & Venture Capital Journal	Described and analyzed the structure of venture capital organizations, focusing on the relationships between investors and venture capitalists and between venture-capital firms and the ventures in which these firms invest.
Sahlman (1994)			Description of the relationship between venture capitalists and entrepreneurs.
Sapienza (1992)	Questionnaire to 51 firms-two sets: one to entrepreneur and one to VC firm		Found that (a) the value of involvement varies with circumstances, (b) the most effective venture capitalists are those who maintain frequent, open communications while minimizing conflict, (c) opportunities exist for adding value in all venture stages, and (d) both experienced and inexperienced CEOs can benefit. Also, VC involvement was particularly rewarding for innovative, high growth firms.
Sapienza & Timmons (1989)	Questionnaire to 51 firms-two sets: one to entrepreneur and one to VC firm	Pratt's Guide	Entrepreneur's experience, stage of venture, and VC ownership are found to be related to the importance of the VCs' roles.
Sapienza et al. (1996)	Surveyed VC firms in US, UK, Netherlands, and France		Found that venture capitalists see strategic involvement as their most important role (i.e., providing financial and business advice and functioning as a sounding board.)

the entrepreneur increases his/her chances of finding capital. By understanding how VCs behave after an investment, the entrepreneur increases his/her chances of selecting the right VC investor."

Investment decision. This area concerns topics such as factors influencing whether a project is funded and the effects of such criteria on performance (Fried & Hisrich, 1988). Tyebjee and Bruno's (1984) article is indicative of this stream of literature because the article mainly focuses on modeling the venture capitalists' decision-making process as to whether to invest. From the venture capitalists' perspective, the purpose of venture capital is to create value and generate wealth for the entrepreneur and the venture capital pool investors (Norton, 1996); however, this objective may not be the entrepreneur's purpose as previously discussed. Pricing or valuation of the new venture is one of the most subjective and controversial topics to be negotiated by the entrepreneur and the investors (Bouillet-Cordonnier, 1992). Therefore, the investment decision and its subsequent set of negotiations are important aspects for both the researcher and persons in practice.

To address the nonalignment of purpose, at least three practices are common for venture capitalists: coinvesting, staged financing (Steier & Greenwood, 1995), and specialization. Norton (1996: 24) stated that "[s]everal venture capitalists may compete to invest in an especially attractive-looking entrepreneurial team," with several venture capitalist firms entering into contracts with a single new venture to share capital, expertise, and risk (Barry et al., 1990; Steier & Greenwood, 1995). As Barry et al. (1990: 454) observed, the "presence of multiple venture capitalists allows the

originating venture capitalists to obtain independent assessments about the likely success of the venture."

The second practice is that of "staged" financing. Venture capitalists rarely provide all the capital necessary to bring the new venture to market all at once (Sahlman, 1990a), but instead "stage" their investment into distinct phases, with each new phase allowing for a reassessment of the team, the environment, and the project as a whole (Fried & Hisrich, 1994; Sahlman, 1994). Staging is viewed as more effectively aligning the goals of the entrepreneur with the goals of the venture capitalist investor and thus reducing agency costs (Sahlman, 1994; Steier & Greenwood, 1995).

Similar to the staged financing by the venture capitalists is an overall valuation and staging of finance through an initial public offering. Because both the venture capitalists and the entrepreneurs believe that the overall value of the firm will increase with time and effort, the two groups will not wish to sell 100 percent of their equity at the time of the IPO. Barry et al. (1990) found that venture capitalists' and nonventure capitalists' shareholders sell only 6.6 percent and 5.2 percent, respectively, of their pre-initial public offering shares in the initial offering. The retention of ownership sends a strong signal to potential investors about the firm's prospects (Barry et al., 1990). Therefore, the following hypothesis is proposed:

> *Hypothesis 2. Healthcare IPOs in which the pre-initial public offering owners retain a greater percentage of equity in the venture after the initial public offering create wealth to a greater extent in terms of EVA, ROA, and ROE than healthcare IPOs create that retain a lesser percentage equity.*

The third practice is specializing, which includes industry, geographic location, and stage in the venture's life cycle (Gupta & Sapienza, 1992). Barry et al.

(1990) found that venture capitalists tend to specialize to provide expertise and increase their monitoring ability. Lerner (1995: 316) observed that specialized firms might be "less prone to agency problems," and Norton (1996: 21 & 24) noted that

> "specialization can help reduce search costs and agency costs of identifying and selecting attractive venture capital investments. . . More so than in any other current organizational form, the monitoring function of venture capitalists and their ability to function as expert consultants helps to increase return potential, lower risk, and reduce agency cost concerns."

Operations. This section focuses on venture capitalists' activities (Fried & Hisrich, 1988). Tyebjee and Bruno (1984) presented a model of activity based on five decision processes: deal origination, screening, evaluation, structuring, and post investment activity. The first four of these activities could easily belong in the literature stream of Investment decision. The fifth stream (e.g., post investment activity) is applicable to this section. Within this stream, once the deal has been consummated, the "role of the venture capitalist expands from investor to collaborator" (Tyebjee & Bruno, 1984: 1054).

At this stage, value is truly added by the venture capitalist (Sapienza, 1992) and in part justifies the management fees and percentage of profits (Sahlman, 1990a). Venture capital firms are generally organized as limited liability companies (LLCs) or limited liability partnerships (LLPs) with a predefined lifespan (Gompers, 1996).

Figure 3 illustrates a typical set of relationships. The figure is based upon the writings of Sahlman (1990a, 1994), Barry et al. (1990), Bygrave and Timmons (1992), and Bartlett (1999), and upon the experience of the current author.

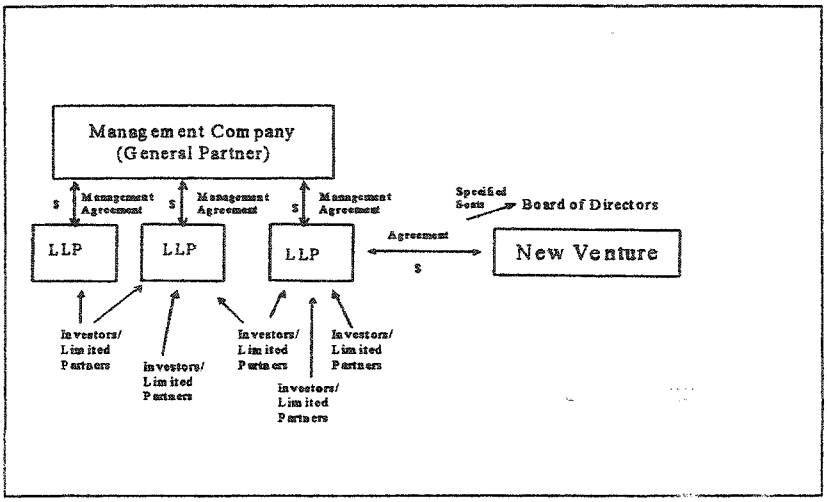


FIGURE 3

The Venture Capital Arrangement

As depicted in Figure 3, there is a series of contractual and monetary relationships. Each corporate entity (e.g., Management Company, LLP, and New Venture) has its own set of articles of incorporation, bylaws, and other legal documents. The venture capital firm is represented as the Management Company and acts as the general partner. Each venture capital firm may set up multiple LLPs to invest in numerous new ventures. The investment typically involves an equity position in the new venture. Barry et al. (1990) found that, on average, venture capital firms own 34.3 percent of the pre-initial public offering equity of the firms in which they invest. For this equity position, the venture capital firm typically invests very little (usually 1 percent) in the LLP (Sahlman, 1990a). The majority of funds come from investors (limited partners). The LLP has a management agreement with the General Partner. Typically, there is also a board of directors composed of limited partners and representatives from the general partnership. The management agreement between the LLP

and the General Partner generally involves a nominal fee for management services. This fee is typically around 2.5 percent of committed capital (Sahlman, 1990a). There is also an agreement between the LLP and the New Venture, with some arrangements allowing for board participation by the LLP members. Investment in the New Venture is usually staged. The LLP usually seeks a high return on its investment (typically 20 percent of the new venture's profits) (Sahlman, 1990a). These funds are then distributed to the limited and general partners based upon predefined rights. If the new venture goes public, then the shares can be distributed to the partners in accordance with the ownership interest of the partners.

The creation and monitoring of the arrangements consume a substantial portion of the venture capitalist's time and energy. The venture capitalist's success in carrying out duties to a large extent dictates whether this organization will attract additional investors or limited partners (Sahlman, 1994). Barry et al. (1990) found that 85 percent of venture capitalists participate in governance of the new ventures, with a significant proportion having more than one board seat. Board participation can act as a signal to investors with respect to the monitoring that has occurred by the venture capitalists. Sapienza, Manigart, and Vermeir (1996) found that venture capitalists view strategic involvement as their most important role. Sapienza et al., (1996) also found that boards with venture capitalists were more involved with strategy formation and evaluation. Because these activities are viewed as positive functions of the board's role (Mace, 1971), it would be informative to know whether venture capi-

tal board involvement contributed to wealth creation. However, this line of research is beyond the scope and means of the present study.[8]

There are other streams and substreams related to venture capital specifically (e.g., strategy and public policy) and entrepreneurship in general (e.g., the Future of Entrepreneurship research). However, these streams are not directly relevant to the present discussion and are not addressed.

The role and characteristics of the entrepreneur and venture capitalists in relation to new venture creation have been of primary interest. Following a direct path within the entrepreneurship literature, several hypotheses have been stated based on previous research. These hypotheses have their foundation not only in research related to entrepreneurship but also in research related to agency theory.

Agency Theory

Agency theory is rooted in Berle and Means's (1932) *The Modern Corporation and Private Property* (Fama, 1980; Jensen & Meckling, 1976). Berle and Means (1932) noted the transference of industrial wealth from the individual to large, publicly financed corporations that began with the industrial revolution and equated this transference with a new social system that they call the corporate system, which is similar in magnitude to the feudal system. From the rise of these new public corporations emerge a "divorce of ownership from control" and thus a new organization

---

[8] Initially, testing the hypothesis that venture capital board involvement leads to wealth creation was considered. However, it was discovered that the variables for venture capital involvement and venture capital board involvement essentially measured the same factor because there were only eight firms with venture capital involvement that did not have venture capital board involvement; thus, this small number of firms would cause a multicollinearity issue (which was confirmed via variable influence factor (VIF) analysis).

of society. This new organization brings with it a management of the firm "theoretically distinct from ownership" (Berle & Means, 1932: vii).

This separation of ownership from control is the central issue of agency theory. Eisenhardt (1989) noted that agency theory is concerned with resolving two problems that can occur in an agency relationship. An agency relationship exists when one party (the principal) delegates work to another party (the agent). The first agency problem arises when these cooperating parties have different attitudes toward risk and thus variant preferences toward different actions (Eisenhardt, 1989; Fama & Jensen, 1983a). As Berle and Means (1932: 7) stated, "[t]he separation of ownership from control produces a condition where the interests of owner and of ultimate manager may, and often do, diverge, and where many of the checks which formerly operated to limit the use of power disappear."

A second problem exists in that it is often difficult and expensive to determine what the manager is doing (i.e., whether the manager's action is in the best interest of the stockholder). Thus, there is asymmetric information between the owner and the manager (Ross, 1973). This issue of asymmetric information may lead to concealment (Abrahamson & Park, 1994) and/or shirking (Alchian & Demsetz, 1972) on the part of the manager. There are two distinct means of addressing this issue: (a) surveillance or behavior control and (b) output control (Ouchi & Maguire, 1975). Agency costs arise whenever there is a need to monitor the agent and the cost of doing such exceeds the benefit (Jensen & Meckling, 1976). Thus, agency costs are the sum of the cost of bonding, structuring, and monitoring contracts between agents (Jensen, 1983).

Central to agency theory is Coase's (1937) view of the firm as a nexus of contracts (Fama, 1980; Fama & Jensen, 1983; Jensen, 1983a,b) and by extension Williamson's (1981) transaction cost approach (Kochhar, 1996; Oviatt, 1986). Also, part of this agency discussion is Williamson's (1996) concept of contracting hazards, which includes the costs of planning, adapting, and monitoring these contractual relationships (Coles et al., 2001). As Ross (1973: 134) observed, "[e]ssentially all contractual arrangements, as between employer and employee or the state and the governed, for example, contain important elements of agency."

Also central to agency theory (and the current study) is the notion of shareholder wealth maximization. As Berle and Means (1932: 310) noted, "[b]y tradition, a corporation 'belongs' to its shareholders, or, in a wider sense, to its security holders, and theirs is the only interest to be recognized as the object of corporate activity." A classic example of the agency issue is Baumol's (1958, 1962) sales maximization hypothesis. Baumol (1958: 187) stated "that oligopolists typically seek to maximize their sales subject to a minimum profit constraint." By oligopolists, he is referring to the managers of an oligopololistic firm and not to its shareholders. This statement is similar to Simon's (1961) concept of satisficing in which the firm's manager's aim is for the "stream of profits which allows for the financing of maximum long-run sales" (Baumol, 1958: 188). As Tosi, Werner, Katz, Gomez-Mejia (2000: 303) stated, "CEOs can exert more influence over firm size than performance." Therefore, "profits compete with sales" (Baumol, 1968: 1086). Within this example, the notion of sales maximization and satisficing by the managers (i.e., managerial self interest) strikes at the heart of the agency problem.

From the above example, it may be extrapolated that profit maximization has been associated with the interests of the shareholders and that sales maximization has been linked with the interests of the managers. Managers are viewed as seeking to reduce their risk by maximizing sales rather than profits. Eisenhardt (1989) noted that an agency problem can occur when the agent and principal have different attitudes toward risk. Agency theory usually proposes that managers are more adverse to risk than shareholders are because shareholders can diversify their risk through multiple stock holdings (Markowitz, 1959), whereas managers cannot diversify their employment risk (Alchian & Demsetz, 1972; Eisenhardt, 1989).

Ross (1973: 134) also points out that "[e]xamples of agency are universal." Perhaps because of the broad nature of the agency topic and literature, there has not been an adequate typology or classification system for the agency literature. Jensen (1983) and Eisenhardt (1989) noted that the agency literature could be divided into two streams: (a) positivist and (b) principal/agent.

Eisenhardt (1989) noted the positivist stream is less mathematical and deals mainly with the principal-agent relationship between owners and managers of large, public organizations. Eisenhardt's (1989) examples of this stream include Jensen and Meckling (1976); Fama (1980); and Fama and Jensen (1983b). This stream has been interested in describing governance mechanisms to solve the agency problem (Eisenhardt, 1989).

The principal-agent stream is concerned with a broader, more general theory of principal-agent relationships such as buyer-supplier and then with determining via modeling and empirical research the optimal contract (Eisenhardt, 1989; Jensen, 1983).

As with the entrepreneurship literature, the agency theory literature has grown immensely in the 13 years since Eisenhardt's (1989) survey of the two research streams. With this growth have also come an overlap and blurring of significant portions of the two identified research streams (e.g., positivist and principal-agent). Specifically, much of what might be considered principal-agent research is an extension or testing of the positivist research (e.g., Ang, Cole, & Lin, 2000). Rather than separate direct extensions and observations from theory, similar areas of research have been combined in Map 2 (Table 4). Additionally, research linking or separating other theories or models (e.g., Preston, 1998) to agency theory has been included. Map 2 illustrates this integrative approach. As with the entrepreneurship literature, particular attention has been given to those streams or classifications in proximity and relation to the previously specified research questions and their related hypotheses.

The complementary concepts of information asymmetry and goal alignment act as the demarcation point for the positivist and principal-agent streams. These two streams are complementary because, without an asymmetric information issue, the need for goal alignment would not be as great; however, as noted, there is an agency cost associated with monitoring and goal alignment (Jensen & Meckling, 1976).

The literature associated with the information asymmetric stream is largely positivist, whereas the literature associated with goal alignment is largely principal-agent. The principal-agent, goal alignment literature can be further segmented into two major streams: top management and governance. The top management literature is focused on aligning incentives of the managers with the shareholders (Stroh, Brett, Baumann, & Reilly, 1996). Like Map 2 in general, this substream has both theoreti-

TABLE 4
Map of Agency Theory

Literature Streams							Bibliography
Agency Theory							
	Theory						
		Review					Eisenhardt (1989); Hutchinson (1999); Shleifer & Vishny (1997)
		Private Property					Berle & Means (1932)
			Commentary and Extension				Stigler & Friedland (1983); North (1983)
			Corporate Control				Arrow (1964); Demsetz & Ricardo-Campbell (1983); Fama & Jensen (1983a)
				LBO/MBO			Jensen & Ruback (1983); Manne (1965)
				Division of Labor			Ross (1973)
				Org. Form/Costs			Jensen & Meckling (1976); Ang (2000); Fama & French (1999)
					Capital Structure		Kochhar (1996)
					Residual Claims		Fama & Jensen (1983b); Klein (1983); Williamson (1983)
						Free-Cash Flow	Brush et al. (2000); Jensen (1986)
					Economic Competition		Fama (1980);
			Wealth Max. Principles				Cooper & Petry (1994)
	Positivist	Stakeholders					Freeman (1984); Preston (1998)
		Stewardship					Davis et al. (1997a,b); Donaldson & Davis (1991); Preston (1998)
			Diversification				Fox & Hamilton (1994)
			Ethics				Bohren (1998)
			Citizenship				Deckop et al. (1999)
			Agent Morality				Quinn & Jones (1995)
		Equity					Brandes et al. (2003); Duncan (2001)
		Organization					
			Organizational Design				Eisenhardt (1985)
			Institutional				Carpenter (2000): Eisenhardt (1988); Judge & Zeithaml (1992)
			Cooptation				Pfeffer (1972)
		Resource Dependence					Hillman et al. (2000)
		Transaction Cost					Grossman & Hart (1986); Kochhar (1996); Madhok (1996); Oviatt (1986); Williamson (1996)
			Org. and Methodology				Jensen (1983)
		Strategy					Baysinger & Hoskisson (1990a)
		Life Cycle					Bulmash (1986)
	Information						
		Concealment					Abrahamson & Park (1994)
		Shirking/Detection Cost					Alchian & Demsetz (1972)
Complements		Moral Hazard Monitoring					Spence & Zeckhauser (1971)
		Auditing					Watts & Zimmerman (1983)
		Knowledge Asymmetry					Sharma (1997)
			Inside Information				Carpenter & Remmers (2001)
	Goal Alignment						
		Top Management					Dalton et al. (2003)
			Incentives/Comp.				
				Comp. Theory/Practice			Baker et al (1986); Brenner (2000); Demsetz (1983); Finkelstein & Hambrick (1988, 1989); Gomez-Mejia & Wiseman (1997); Kesner (1992); Lewellen (1969); Lippert & Moore (1995); Ofek & Yermack (2000); Sanders et al. (1995); Stroh et al. (1996); Tosi et al. (2000); Yermack (1995)
					Contracts		Kole (1997)
					Symbolism		Westphal & Zajac (1994)
				Contingency Theory			Balkin & Gomez-Mejia (1987); Shaw et al. (2000)

TABLE 4 (Continued)

Literature Streams							Bibliography
Agency Theory							
			Performance				Core et al. (1999); Hermalin & Wallace (2001); Hubbard & Palia (1995); Jensen & Murphy (1990); Mehran (1995)
				Monitoring			Beatty & Zajac (1994); Hermalin & Wallace (1998); Morck et al. (1989); Tosi & Gomez-Mejia (1994); Tosi et al. (1997); Wright et al. (2002)
						Owner Controlled	Tosi & Gomez-Mejia (1989)
				Environmental Dynamism			Li & Simerly (1995, 1998)
Principal/Agent				Risk			Bloom & Milkovich (1998)
						Option Exercise	McGuire & Matta (2003)
						Stock Repurchase	Sanders & Carpenter (2003)
						Conglomerate Mergers	Amihud & Lev (1981); Lane et al. (1998)
				Valuation			Morck et al. (1988)
			Employment Variability				Gerhart & Trevor (1996)
			Risk				Gray & Cannella (1997)
				Sensitivity of CEO Wealth			Guay (1999)
			Ownership Structure				Hambrick & Finkelstein (1995); Himmelberg et al. (1999)
				Private Equity Financing			Wruck (1989)
			Human Capital				Harris & Helfat (1997)
			Downsizing				Dial & Murphy (1995)
			Competitive Strategy				Montemayor (1996); Nandini (1997)
		Innovation					Balkin et al. (2000)
		Turnover					Kang & Shivdasani (1995)
		Power					Daily & Johnson (1997); Pearce & Zahra (1991)
		Venture Capital					
			Uncertainty				Sapienza & Gupta (1994)
			Value Added				Sapienza et al (1995)
		Conflict					
			Divestment				Wright & Ferris (1997)
	Governance						
							Dalton et al. (1998); Dailyet al. (2003); Johnson & Daily (1996); Herzel (1990); Molz (1985); Zahra & Pearce (1989)
		Review					Baysinger & Hoskisson (1990b); Denis & Sarin (1999); Molinari et al. (1995)
		Composition					Fiegener (2000); Govindarajan & Fisher (1990); Mizruchi (1983); Pfeffer & Salancik (1978); Zald (1969)
			Control				Bailiga et al. (1996); Daily & Dalton (1997); Rechner & Dalton (1991); Worrell et al. (1997)
				Duality			Boyd (1995); Finkelstein & D'Aveni (1994)
					Contingency		Davidson et al. (1998); Harris & Helfat (1998)
					Succession Planning		
				Independence			Hermalin & Weisbach (1998); Molz (1988)
							Baysinger & Hoskisson (1990a); Kaplan & Reishus (1990); Rosenstein & Wyatt (1990, 1997); Vance (1955, 1968, 1978)
						Insider vs. Outsider	Coles & Hesterly (2000)
						Chairperson	Schellenger et al. (1989)
						Dividend Policy	Cheganti et al (1985); Daily & Dalton (1994); Hambrick and D'Aveni (1992)
						Bankruptcy	Wright et al. (1996)
				Risk Taking			Hill & Snell (1988)
				Strategy			Stearns & Mizruchi (1993)
				Financing			Schulze et al.(2003)
					Family Firm		

TABLE 4 (Continued)

Literature Streams					Bibliography
Agency Theory					
	Characteristics			CEO Compensation	Gomez-Mejia et al. (2003)
				Group Affiliated	Chang (2003)
		Board Ownership			Halloran (2001); Kesner (1987)
			Stock Options		Coles et al. (2001)
				Industry Specific	
				New Ventures	**Williams (2003)**
	Structure				
		Committees			Kesner (1988); Klein (1998)
			Comp. Committee		Daily et al. (1998)
				CEO Compensation	Boyd (1994)
		Board Size			Eisenberg et al. (1998)
	Process				
		Substitution Effects			Rediker & Seth (1995)
		Strategy			Stiles (2001)
			R & D		Baysinger et al. (1991)
				Institutional Ownership	Tihanyi et al. (2003)
				International Differences	Lee & O'Neill (2003)
		Reforms			Zahra & Zay (1996); Zay & Zahra (1995)
		Industry Tech. Opportun.			Zahra (1996)
		Provisions			Sundaramurthy & Rechner (1996)
			Anti-Takeover		McWilliams & Sen (1997)

cal and mathematical elements. The substream is primarily focused on testing propositions related to top management (with particular attention paid to the CEO) compensation.

The current study is concerned with goal alignment at the board level and thus does not discuss the top management research area further, except to note that (a) this area has received much attention by researchers (Tosi et al., 2000); (b) dismissal of the CEO is not viewed as an effective managerial incentive by many (Jensen & Murphy, 1990; Morck, Schleifer, & Vishny, 1989); (c) in firms with attentive monitors, returns will explain changes in CEO compensation, whereas, in firms with lax monitors, increased corporate size via acquisition explains compensation changes (Wright, Kroll, & Elenkov, 2002); (d) there has been increased diffusion of stock options throughout the firm (Duncan, 2001; Ofek & Yermack, 2000), with limited correlation to firm performance; (e) it has been noted that shareholders, employees, and the firm may have different perspectives on the granting of stock options and that varying tactics reflecting these perspectives may need to be considered when deciding how to best administer these options and who should administer them (Brandes, Dharwadkar, & Lemesis, 2003); (f) the incentive contracts for top management in practice look very different from the contracts predicted by economic theory (Baker, Jensen, & Murphy, 1986; Jensen & Murphy, 1990); and (g) there appears to be a relationship between firm size, CEO incentive pay, and firm performance (Baker, Jensen, & Murphy, 1986; Jensen & Murphy, 1990), with McGuire and Matta (2003: 255) noting the "financial attractiveness in start-up firms" of granting stock options.

Governance

Corporate governance and its role have received much attention by researchers (Daily et al., 2003). Molz (1985: 86) stated that "it is the board that has the ultimate internal authority within the corporation." Mizruchi (1983: 433) asserted that it is the board of directors that is the "ultimate center of control." Zald (1969: 107) proposed that the board is most active during "strategic decision points." Zahra and Pearce (1989) noted that the research on boards can be segmented into four attributes: Composition, Structure, Characteristics, and Process. As illustrated in Map 2, the agency literature on boards of directors has been researched extensively (Johnson & Daily, 1996) and appears to be primarily concerned with the issue of board composition. Board composition is further segmented. The present study is concerned with three areas: Duality, Independence, and Financing. Table 4 utilizes the Zahra and Pearce (1989) attributes[9] and illustrates the literature and its implications related to governance from an agency perspective. The rest of this section addresses the literature within the Composition and Characteristics streams.

Composition

This stream is concerned with the size and mix of types of board of directors. Denis and Sarin (1999) found that a substantial portion of firms exhibit significant changes in ownership and board structure in any given year and that these changes are related to turnover at the CEO level and prior firm performance. Therefore, studying the composition of boards is relevant and relates to the control issue. Agency theorists view con-

[9] As in the discussion of the entrepreneurship literature, a Review substream has been added.

trol as the most important board task (Zahra & Pearce, 1989). Research on control primarily deals with the independence of the board of directors and duality.

Duality refers to the situation where one person "wears two hats" (Baliga, Moyer, & Rao, 1996)–the hats of CEO and chairperson of the board. Proponents of duality argue that duality allows for clear-cut leadership at the strategy level and lessens competition between the CEO and chairperson. Opponents of duality view duality as a constraint on the board's independence, leading to entrenchment (Finkelstein & D'Aveni, 1994) and signaling the absence of separation of decision management from decision control (Baliga et al., 1996). Agency theorists typically are opponents of duality (Boyd, 1995).

Closely associated with duality is the notion of independence of the board. The phenomenon of insider- versus outsider-dominated boards has been a topic of debate for some time, with Dalton, Daily, Ellstrand, & Johnson (1998: 270) stating that there is "near consensus in the conceptual literature that effective boards will be comprised of greater proportions of outside directors." The extent to which total independence is ever achieved is questionable. Berle and Means (1932: 78) observed that management control is possible when ownership "is so widely distributed that no individual or small group has even a minority interest large enough to dominate the affairs of the company." In addition, Hermalin and Weisbach (1998: 96) asserted that "shareholders almost always vote for the slate [of directors] proposed by managers," with contested elections "a rarity" (Vance, 1978: 203).

Others observe another side of information asymmetry and write that outside directors lack the knowledge to make the critical decisions necessary to operate a firm and thus rely on inside board members to guide them in their decision making

(Baysinger & Hoskisson, 1990a,b; Molinari, Alexander, Morlock, & Lyles, 1995). Mace (1971: 127) viewed reasons for having inside board members as "essentially fallacious and specious." Still, the early research by Vance (1955, 1968, 1978), for one, shows that firms with managerial control also had superior performance. However, as Dalton et al. (1998) point out, the overall empirical work on this subject-matter is inconsistent. The conflicting findings of this literature stream are also illustrated in Table 5.

Another control-related area concerns financing the organization. Stearns and Mizruchi (1983) noted the importance of interlocks and cooptation (Pfeffer, 1972) between organizations and board members with respect to financing. Interlocks are mechanisms by which managers' deal with uncertainty via coopting resources (Pfeffer & Salancik, 1978). Agency theorists view interlocks to be a form of governance structure (Eisenhardt, 1989; Stearns & Mizruchi, 1993). Stearns and Mizruchi (1993), who studied large manufacturing firms, found that the amount and type of funds borrowed by firms was positively associated with the presence of board members who were also financial institution representatives.

Cooptation and interlocks may be similar to venture capital involvement. Like other financial intermediaries, venture capitalists sit on IPO boards and take an equity position in these firms. Venture capitalists also receive preferential treatment in that they often receive preferred stock (Norton, 1996). [10] Also, although somewhat

[10] Funding for new ventures by venture capitalists before an initial public offering often takes the forms of preferred stock. However, as noted in a firm's initial registration (S1) form, preferred stock is also often converted into common stock at or around the time of the IPO.

TABLE 5

Studies Examining the Relationships between Agency Theory and Governance

Study	Data	Findings or Implications
	Review	
Dalton et al. (1998)	54 empirical studies of board composition	Meta-analysis of 54 studies related to board composition, board leadership structure, and firm financial performance. Found little consistency in the results of the studies as well as little evidence of systematic governance structure/financial performance relationship.
Johnson & Daily (1996)	Management, financial, & sociological articles afterZahra & Pearce (1989)	Literature review (post-1989) addressing board of directors from the perspective of control, service, and resource dependence.
Herzel (1990)	Three statistical studies	The fruitfulness of the purely statistical approach to governance research is questioned.
Molz (1985)	Early, descriptive work	Seven typologies of organization for board of directors and their resulting control implications are reviewed.
Zahra & Pearce (1989)	Review of empirical research published on the boards of directors influence on performance	The review is structured around four research perspectives: legalistic, resource dependence, class hegemony, and agency theory.
	Composition	
Baysinger & Hoskisson (1990a)	Theory development	The theory developed here suggests that it is important to understand why managers may have developed preferences for unrelated diversification.
Denis & Sarin (1999)	583 firms over a 10-year period	Ownership and board changes are strongly related to top executive turnover, prior stock performance, and corporate control threats but only weakly related to changes in firm-specific determinants of ownership and board structure.
	Control	
Fiegener (2000)	2,365 small firms	The results affirm that CEOs with greater ownership and family stakes tend to have smaller boards with less representation by outside directors and greater representation by dependent directors, particularly family directors.
Govindarajan & Fisher (1990)	24 SBUs of Fortune 500 companies	The results lend support to the theory that strategy, resource sharing, and control systems have an interactive impact on SBU effectiveness.
Mizruchi (1983)	Descriptive	The board of directors is the ultimate center of control, but it is proposed that it is the failure of management to work within this framework that may provoke the board's response.

TABLE 5 (Continued)

Study	Data	Findings or Implications
	Duality	
Baliga et al. (1996)	[Subsets of] Fortune 500 firms	Results indicate virtually no evidence of significant announcement effects associated with changes in a firm's duality status. Results also indicate a lack of significant differences in longer-term firm performance between duality and nonduality structure.
Daily & Dalton (1997)	90 firms from Business Week's 1992 Executive Compensation Scoreboard	Analysis reveals that there are no significant differences in any of six factors when comparing companies with CEOs holding the chairman of the board position to companies with CEOs who did not hold that position.
Rechner & Dalton (1991)	141 of Fortune 500 companies over a 6-year period	Results indicate significant differences in performance between firms that have a CEO/chair duality situation and companies that do not have this situation. Specifically, firms opting for independent leadership outperform businesses that have a CEO/chairman duality situation.
Worrell et al. (1997)	Business Week's 1,000 most valuable publicly held companies	The more complete the position consolidation, the more negative were the shareholder responses became.
	Contingency	
Boyd (1995)	192 firms in 12 industries	Found support for both an agency and stewardship perspective of duality.
Finkelstein & D'Aveni (1994)	41 printing/publishing firms, 35 chemical firms, and 32 computer industry firms	Integrative organization/agency theories model. Both board vigilance and informal CEO power strongly influenced CEO duality.
	Succession Planning	
Davidson et al. (1998)	Commentary	
Harris & Helfat (1998)	Commentary	
	Independence	
Hermalin & Weisbach (1998)	Theory Development	Develops model in which board effectiveness is a function of its independence, which is a function of negotiations.
Molz (1988)	50 firms from 1983 Fortune 500	Develops scale to measure the degree of managerial domination and pluralism in any Fortune 500 board of directors and shows via use of this scale that the argument for managerially dominated boards are associated with superior financial performance is weakened.

TABLE 5 (Continued)

Study	Data	Findings or Implications
	Insider/Outsider	
Kaplan & Reishus (1990)	Fortune 500	The relationship between a company's performance and its top executives' service on other boards of directors is examined. The probability that top executives will resign from or lose outside directorships they already hold is negatively but significantly related to the performance of their own firms.
Rosenstein & Wyatt (1990)	Fortune 500	Stock market reaction to announcement of inside director appointments show significantly negative when inside directors own less than 5 percent of the firm's common stock and significantly positive when their ownership is 5-25 percent and insignificantly different from zero when ownership exceeds 25 percent.
Rosenstein & Wyatt (1997)	Fortune 500	The stock market reaction to inside director appointments is significantly negative when inside directors own less than 5 percent of the firm's common stock, significantly positive when the ownership level is 5-25 percent and insignificantly different from zero when ownership exceeds 25 percent.
	Chairperson	
Coles & Hesterly (2000)	247 firms adopting "poison pills."	Looks at leadership structure and board composition in the context of "poison pill" adoption. Results suggest that there is an important interaction effect between board composition and the independence of the board chairman.
	Dividend Policy	
Schellenger et al. (1989)	526 firms randomly selected from Compustat Industrial	Finds a direct relationship between outside directors' representation on the board and corporate performance. In addition, the correlation between board composition and the firm's 2-year average dividend payout ratio is positive.
	Bankruptcy	
Chaganti et al. (1985)	Match-pair design of 21 failed and nonfailed retail firms.	The results indicated that the nonfailed companies tended to have larger boards, with percentage of insider/outsider statistically insignificant.
Daily & Dalton (1994)	Match-pair design of 57 manufacturing, retail, and transportation failed and nonfailed firms	Bankrupt firms are more likely to have CEOS serving simultaneously as board chairperson, and these firms also have higher proportions of affiliated directors.

TABLE 5 (Continued)

Study	Data	Findings or Implications
	Bankruptcy	
Hambrick & D'Aveni (1992)	Match-pair design of 57 manufacturing, retail, and transportation failed and nonfailed firms	The results suggest that deterioration of the top management team is a central element of the downward spiral of large corporate failures.
Wright et al. (1996)	358 firms for 1986 and 514 firms for 1992	Results support the premise that the wealth portfolios of corporate insiders may influence firm risk taking. Institutional owners exerted a significant, positive influence on risk taking, but the role of blockholders was negligible.
	Strategy	
Hill & Snell (1988)	94 Fortune 500 firms	Research largely confirms hypotheses in research intensive industries, when stockholders dominate, innovation strategies are favored; when managers dominate, diversification strategies are favored.
	Financing	
Stearns & Mizruchi (1993)	22 large U.S. manufacturing companies	The types of financial institutions represented on firms' boards were associated with the amounts and types of financing the firms obtained.
	Board Ownership	
Halloran (2001)	Fortune 1000 companies	Close to 20 percent of the companies in the sample have adopted annual incentive plans, in which a portion of the annual cash retainer or specified cash award is based on the company's financial performance during the year.
Kesner (1987)	Fortune 500 companies	The "financial dependence" model suggests that the greater the directors' stock ownership in a company is, the better the firm's performance will be. This perspective was supported in part by the research findings.
	Stock Options	
Coles et al. (2001)	150 large firms (Stern Stewart)	Examine CEO compensation, CEO tenure, board composition, leadership structure, and ownership structure, as well as their contribution to both market performance, Market Value Added, and risk-adjusted accounting performance, Economic Value Added. Control for blockholders, industry performance, and firm size. Results indicate that, although some of the agency variables do affect performance; industry performance is a strong and significant driver of performance in this sample.

TABLE 5 (Continued)

Study	Data	Findings or Implications
	Committees	
Kesner (1988)	250 Fortune 500 companies	The directorial characteristics of occupation, type, tenure, and gender were examined in relationship to membership on the four most influential and powerful board committees: the audit, nominating, compensation, and executive committees. The results show strong evidence that the composition of those committees does differ in rather significant ways from the composition of corporate boards in general.
	Compensation Committee	
Daily et al. (1998)	Random sample of 200 Fortune 500 firms (1992 data)	Found no evidence that "captured" directors led to greater levels of or changes in CEO compensation. Findings suggest consideration of theories other than agency theory.
	CEO Compensation	
Boyd (1994)	193 firms	CEO salaries were greater in firms with lower levels of control but were not significantly related to firm size or profitability.
	Board Size	
Eisenberg et al. (1998)	785 healthy and 94 bankrupt Finnish firms	Results indicate a significant negative correlation between board size and profitability.
	Substitution Effects	
Rediker & Seth (1995)	81 bank holding companies	The results provide evidence consistent with the substitution hypothesis.
	Strategy	
Stiles (2001)	51 directors of UK public companies and 121 company secretaries	By establishing the business definition, gatekeeping, selecting directors, and confidence building, the board influences the boundaries of strategic action. Evidence for the managerial domination of boards was slight, but the results showed support for a number of theoretical frameworks.

TABLE 5 (Continued)

Study	Data	Findings or Implications
	R & D	
Baysinger et al. (1991)	176 Fortune 500 companies	High insider representation on a board and a concentration of equity among institutional investors positively affected corporate R & D spending.
	Reforms	
Zay & Zahra (1995)	Theoretical	Examines the seven most popular approaches to board directorship reform and presents corresponding recommendations.
Zahra & Zay (1996)	Descriptive	Analysis of different studies addressing governance reforms and firm performance.
	Industry Technology Opportunity	
Zahra (1996)	138 manufacturing firms on the Fortune 500 list (Compustat & survey data)	The results show an inverse but significant association between the proportion of outside directors on a board and corporate entrepreneurship. As outside directors' ownership may mitigate the negative association of a high proportion of outsiders with corporate entrepreneurship, companies should consider providing incentives through stock ownership to outside directors.
	Provisions	
Sundaramurthy & Rechner (1996)	192 S&P 500 firms	Examines the impact of corporate governance and ownership context on a particular instance of board entrenchment: adoption of classified board provisions (the division of boards into three classes, with only one class of directors standing for election each year). Institutional stock ownership is found to be the most significant factor associated with decreased rate of adoption.
McWilliams & Sen (1997)	265 firms proposing antitakeover provisions from 1980-1990-CRSP data	The stock price reaction to antitakeover amendments is more negative when the board is dominated by insiders, with the reaction becoming increasingly negative when the CEO is also chairman of the board

aligned with the common shareholders, this equity position is not perfectly aligned. Thus, the following hypothesis is offered:

> *Hypothesis 3. Healthcare IPOs that have no preferred stock outstanding at or about the time of the initial public offering create wealth to a greater extent in terms of EVA, ROA, and ROE than those healthcare IPOs create that do have preferred stock outstanding.*

Characteristics

This stream of literature is concerned with the directors' background and the board's "personality" (Zahra & Pearce, 1989). The present study is not concerned with the directors' background but is particularly interested in the "board's personality." Zahra and Pearce (1989) place Kesner's 1987 study on directors' stock ownership within this stream. Daily, Dalton, and Rajapolan (2003) note the lack of documented evidence for this practice. Kesner's (1987) article is the first of its kind to empirically test whether the stockholdings of the board of directors would correlate with firm performance; findings show board stockholdings to be unrelated in the aggregate. However, her findings also suggest that "[d]irectors' personal financial stakes influence performance when firms are in rapid growth industries" (Kesner, 1987: 505).[11] Kesner (1987) also found that stock options were not available for most outside directors, with inside directors being granted options as part of their management compensation. Halloran (2001) supports this last finding by reporting that awarding options did not occur at the board level until the early 1990s.

---

[11] This study takes the position that healthcare is a growth industry because overall national health expenditures are projected to reach $2.8 trillion in 2011, growing at an average annual rate of 7.3 percent from 2001-2011 (Health Care Financing Administration, 2002).

Coles et al., (2001) also studied board stock ownership and hypothesized that firms with a higher proportion of stock ownership at the board level would have better financial performance. The authors (Coles et al., 2001) found no evidence to support this hypothesis. However, the main limitation in Kesner's (1987) and Coles et al.'s (2001) studies is that large firms were studied. Kesner's (1987) sample was composed of 250 of the Fortune 500 companies, and Coles et al.'s (2001) sample was composed of 144 firms from the SternStewart Performance 1000 database. In essence, the focus was on large, well-established firms.

Similarly, Jensen and Murphy (1990) have found that the efforts of managers, in terms of rewards, have not coincided with overall shareholder wealth creation; in other words, managers have not proportionately reaped the rewards of their efforts. The results of the study (Jensen & Murphy, 1990), however, were not consistent across all firm size groupings (ranked by market value). Indeed, it was found that the CEOs associated with smaller groups have over four times the pay sensitivity of CEOs in larger groups; that is, the former CEOs. The authors (Jensen & Murphy, 1990) also noted that CEOs in smaller firms have greater incentive-based compensation and tend to own more stock than CEOs in large firms do. There does appear to be a difference in managerial behavior at the firm level with respect to incentives and firm size. It is worthy to question whether this discretion applies at the board level, as well. Because the current study takes an agency perspective, the hypothesis given below is proposed:

Hypothesis 4. Healthcare IPOs that compensate board members via stock options create wealth to a greater extent in terms of EVA, ROA, and ROE than healthcare IPOs create that do not compensate board members via stock options.

It is expected that firm performance in different market sectors will vary. The National Commission on Entrepreneurship (2002: 9) noted that, unlike most industries, the biotechnology industry "has capital requirements that preclude any of the bootstrapped efforts found in most other sectors," with Robbins-Roth (2000: 136) stating that "[t]he cost of the research and the need for specialized facilities is so great that entrepreneurs simply cannot move the concept forward without outside sources of funding." The firms in the biotechnology industry sector must accelerate their growth from the start because it may take a decade or more for a company to go from concept to first product, with much of the firm's resource consumption dedicated to product development. Thus, industries such as biotechnology must "get big, get niche, or get out" (National Commission on Entrepreneurship, 2002: 9).

The life cycle of biotechnology firms is different from the life cycle of companies in the healthcare market sector. Biotechnology firms tend to develop new products (e.g., innovations) that require lengthy approval processes, with "most product candidates never reach[ing] the market" (Robbins-Roth, 2000: 9). Because of these differences, many organizations and publications (e.g., National Commission on Entrepreneurship, National Venture Capital Association, Pratt's Guide to Venture Capital, Securities and Exchange Commission) bifurcate the healthcare industry into two categories: (a) healthcare firms (e.g., facilities, services, medical equipment) and (b) biotechnology firms. Thus, the following hypothesis is offered:

Hypothesis 5. Wealth creation (in terms of EVA, ROA, and ROE) varies by market sector.

Dependent Variables

The purpose of financial measures is to help management make value-creating decisions (Copeland et al., 2000; Hamel, 1998). Historically, companies have relied upon accounting approaches such as Earnings to assist them with these decisions (Barney, 2002). Barney (2002) lists three shortcomings of accounting measures: (a) managerial discretion (e.g., valuing inventory, counting revenues, and rates of depreciation), (b) short-term bias, and (c) valuing intangible resources and capabilities.

In addition, the accounting measure of Earnings specifically does not take into consideration the entire financial performance of a business (Barney, 2002; Copeland et al., 2000; Stewart, 1991). As a valuation method, Earnings does consider debt but does not consider the cost of equity. Earnings are also subject to being manipulated by "accretive acquisitions," where a company grows by acquiring another company and by paying for that company with its own stock. In this manner, the value of the acquiring company increases if the acquiring company pays less for the earnings of the acquired company in terms of the acquired company's price earnings ratio being lower than the market values of the acquiring company's stock (Copeland et al., 2000; Reinhardt, 2000; Stewart, 1991). Reinhardt (2000) has stated that this approach has led to the demise of the physician practice management industry.

Using Earnings is an incomplete and limited approach because this measure does not consider the cost of capital or return on investment to the acquiring company that is of importance to the shareholder. Therefore, the current paper is interested in measures that better reflect shareholder wealth creation. Three measures are ROE,

ROA, and EVA. Although none of these measures taken alone can be viewed as a complete proxy for wealth creation, taken together, the measures yield a fuller understanding of the wealth creation/destruction activities of the firm.

Return On Equity

ROE is important to for-profit firms because the owners are concerned with how well the managers are using the owner-supplied capital (Gapenski, 1999). Without an adequate return on the owners' investment, it is questionable whether the venture will be able to continue to receive the necessary additional capital from the investors to grow the business. Because of this issue, and because of ROE's simple calculation, this measure is one of the most widely used (Peterson, 2000).

The formula for ROE is net income/total stockholder's equity.

However, ROE has several limitations. First, it is an accounting measure that can be manipulated and therefore is sensitive to the selection of accounting methods. Second, the measure looks backward in that it uses historical data. Third, ROE fails to adjusts for risk. For these reasons, ROE is also an incomplete measure (Peterson, 2000).

Return on Assets

ROA, like ROE, is a financial ratio or indicator that measures the profitability of the firm. In this case, ROA tells managers how productively the firm is using its assets (Gapenski, 1999). Also like ROE, ROA suffers from the same limitations of being derived from historical accounting data and does not consider risk.

The formula for ROA is net income/total assets.

Economic Value Added

EVA (also known as economic profit) has been offered as an alternative and more appropriate approach to measuring value or wealth creation than accounting measures provide (Appleby, 1997; Chen & Dodd, 1997; Cleverley, 1993, 2000; Colvin, 2000; Copeland et al., 2000; Gapenski, 1996; Grant, 2000; Mills, Rowbotham, & Roberts, 1998; Peterson, 2000; Stewart, 1991). In addition, EVA has also been shown to correlate with stock market values (Chen & Dodd, 1997; Lehn & Makhija, 1996; Stewart, 1991). EVA is related to the discounted cashflow and net present value approach. EVA is based on the concept that an investment adds value or creates economic rents if it generates a return equal to or greater than one that can be earned on an investment of a similar risk. As Drucker (1995: 59) has stated,

"[u]ntil a business returns a profit that is greater than its cost of capital, it operates at a loss. Never mind that it pays taxes as if it had a genuine profit. The enterprise still returns less to the economy than it devours in resources. . . Until then, it does not create wealth; it destroys it."

EVA in part addresses the limitations associated with ROE and ROA. EVA deals with economic profit and not accounting profit. Accounting profit is the difference between revenues and costs based on accounting principals. EVA represents profit in these same terms but also takes into consideration the cost of capital in these costs. EVA also converts accounting profit (which is usually reported on an accrual basis) into economic profit (a quasi-cash-basis approach) by making adjustments to the financial statements (which are discussed in Chapter 3).

The formula for EVA is invested capital x (ROIC – WACC)

where ROIC is the return on invested capital and WACC is the weighted average cost of capital.

EVA also has two main pitfalls: (a) the use of accounting data in its calculation and (b) the estimation of the cost of capital (Peterson, 2000).

Summary

This chapter seeks to provide a framework for viewing the research questions within the broad research fields of entrepreneurship and agency theory. Sources for these two research streams include the disciplines of administrative sciences, economics, entrepreneurship, finance, sociology, and strategic management. Through the creation of maps and tables, the chapter illustrates the linkages and fit of the research questions to those questions and issues of previous research. This chapter is also intended to depict those areas where future research is needed and to provide theory-driven hypotheses for those areas.

CHAPTER 3

METHODOLOGY

The present study focuses on two general aspects of new healthcare ventures: (a) characteristics related to the board of directors and (b) venture capitalists. It has been shown in Chapter 2 that there exists a need for further study of this area within the general agency and entrepreneurship literature. Furthermore, it has also been noted that the study of healthcare IPOs has drawn little attention from researchers within any field, with "[t]he financial aspects of business-level market entry strategies such as . . . venture capital investment . . . [being] largely ignored" (Ginter & Duncan, 2000: 58). Therefore, the current study is pertinent to researchers in the fields of agency theory, entrepreneurship, and healthcare.

Sample

The sample consists of healthcare firms that registered to go public from January 1, 1996 through December 31, 1999 (and had initial registration forms available via the SEC (2002) internet website), with the exception of those firms that either withdrew their offer and/or subsequently filed for bankruptcy within 3 years of their initial public offering.[12] The sample is composed of approximately 190 companies and is listed in Appendix A.

[12] Bankruptcy is defined here as those firms that notified the SEC of their filing for Chapter 11 or Chapter 13 protection. Oftentimes, bankruptcy is easily recognized by the lack of subsequent SEC filings.

General Questions and Associated Hypotheses

Below are the general questions as discussed in Chapter 1 and the associated hypotheses as developed in Chapter 2.

1. Do healthcare IPOs that engage venture capitalists create wealth to a greater extent in terms of EVA, ROA, and ROE than such IPOs that do not engage venture capitalists?

   Hypothesis 1. Healthcare IPOs that engage venture capitalists create wealth to a greater extent in terms of EVA, ROA, and ROE than the healthcare IPOs that do not engage venture capitalists.

2. Do healthcare IPOs with pre-initial public offering owners who retain a relatively greater proportion of equity in the firm create wealth to a greater extent in terms of EVA, ROA, and ROE than such IPOs create that retain a lesser proportion of equity?

   Hypothesis 2. Healthcare IPOs in which the pre-initial public offering owners retain a greater percentage of equity in the venture after the initial public offering create wealth to a greater extent in terms of EVA, ROA, and ROE than healthcare IPOs create that retain a lesser percentage equity.

3. Do healthcare IPOs in which there is no preferred stock outstanding at or about the time of the IPO create wealth to a greater extent in terms of EVA, ROA, and ROE than those healthcare IPOs create that have outstanding preferred stock?

   Hypothesis 3. Healthcare IPOs that have no preferred stock outstanding at or about the time of the initial public offering create wealth to a greater extent in terms of EVA, ROA, and ROE than those healthcare IPOs create that do have preferred stock outstanding.

4. Do healthcare IPOs that compensate board members via stock options create wealth to a greater extent in terms of EVA, ROA, and ROE than those firms create that do not provide stock options?

   Hypothesis 4. Healthcare IPOs that compensate board members via stock options create wealth to a greater extent in terms of EVA, ROA, and ROE than healthcare IPOs create that do not compensate board members via stock options.

5. Does wealth creation in terms of EVA, ROA, and ROE vary between market sectors?

   Hypothesis 5. Wealth creation (in terms of EVA, ROA, and ROE) varies by market sector.

Figure 4 illustrates the relationships postulated in the hypotheses.

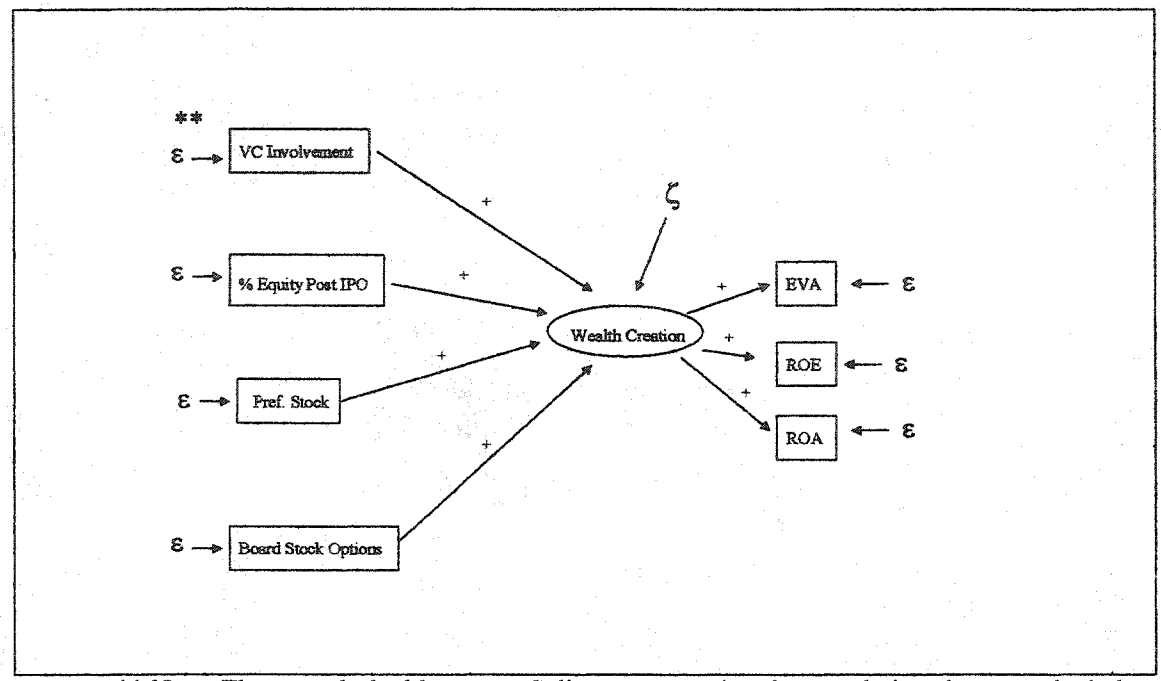
Independent Variables

Venture Capital Involvement

Healthcare IPOs either engage or do not engage venture capital firms; and therefore, VCI is represented as a binary variable coded zero for no involvement and 1 for involvement. VCI was primarily found in the Principal Shareholders and in the Managers & Directors sections of the IPO registration statement. All venture capital firms were verified/cross-matched using *Pratt's Guide*[13]. Appendix B lists all venture capital firms associated with firms in the current study.

---

[13] For a few firms (less than six) *Fitzroy Dearborn International Directory of Venture Capital Funds 1998-1999* (1998) was used to supplement *Pratt's Guide* (1996) when an international firm was identified in the S-1 form but not found in *Pratt's Guide*. These international firms all supplemented firms listed in *Pratt's Guide* (1996); that is, there were no IPOs coded as having venture capital involvement unless a venture capital firm was found in *Pratt's Guide* (1996).



** Note: The curved (double-arrowed) lines representing the correlations between the independent variables have been omitted for visual simplicity purposes.

FIGURE 4

Model

Percentage Equity After Initial Public Offering

The percentage of equity after the initial public offering is a continuous variable that represents the stated percentage equity of the IPO that the pre-IPO owners intended to retain. This information was primarily found in the Dilution section of the IPO registration statement.

Preferred Stock

Often, pre-initial public offering owners maintain their ownership interest in the firm via preferred stock. This type of stock is preferable to debt but not perfectly aligned with that of the common shareholder (with many firms converting this equity into common stock). Therefore, this variable was represented by a dichotomous vari-

able coded zero for firms with preferred stock outstanding and 1 for firms without preferred stock outstanding at or about the time of the initial public offering. This information was primarily found in the Description of Capital Stock section of the IPO registration statement.

Board Stock Options

The Healthcare IPO's board of directors is usually compensated by either all cash or a combination of cash and stock options, with this being represented by a dichotomous variable coded 1 for stock options included in compensation and zero for the absence of stock options. This information was primarily found in the Directors Compensation section of the IPO registration statement.

Moderator

Pratt's Guide (1996), the SEC (2002), and the National Venture Capital Association view healthcare as divided into two large, general categories: biotechnology and healthcare (e.g., supplies, services, and facilities). This moderator is represented by a dichotomous variable coded 1 for biotechnology and zero for healthcare. This variable is determined by the Standard Industry Classification code and verified within the Company Description section of the initial registration statement.

Control Variable

In comparing firms, firm size has long been viewed as a moderator of firm performance. The present study measured firm size in terms of total assets as reported in the firm's first available 10K form. The variable is continuous.

Specific Procedures

An initial listing of potential firms for inclusion in the sample was generated by using Edgar Online's (2002) (www.edgar-online) search engine for the years 1996 through 1998. This search produced a list of 252 firms. This database supposedly included all firms that had registered with the SEC within the industry sectors of medical services & devices, healthcare facilities, and biotechnology & drugs. These industry sectors are derived by Standard Industrial Classification (SIC) codes. Appendix C lists the primary SIC codes.

The Securities Acts of 1933 requires firms to register with and have their registration deemed "effective" by the SEC before selling securities in an open, public market. Registration for initial public offerings is through one of three forms: S1, SB-1, or SB-2. The selection and use of the form is dependent on the size of the assets of the company and the number of owners of the securities. Any firm can use the S-1 form to register securities offerings; however, smaller firms may choose to be viewed as a "small business issuer" and use a simplified form (either SB-1 or SB-2).

To be considered a small business issuer, a firm must have had less than $25 million in revenues in its last fiscal year, with the outstanding publicly held stock of the firm worth less than $25 million. Small business issuers offering up to $10 million worth of securities in any 12-month period may use the SB-1 form. A small business issuer may register an unlimited dollar amount of its securities by using the SB-2 form. Regardless of the form chosen, information provided in the registration must include the IPO's business and associated business risks (including its competition), audited financial statements, the firm's officers' and directors' identity and compensation, material transactions between the company and the firm's officers and

directors, material legal proceedings involving the company or the firm's officers and directors, the firm's securities distribution plan; and the intended use of the proceeds of the initial public offering.

The SEC's (2002) website (www.sec.gov) was used to verify that (a) an S1, SB-1, or SB-2 form was filed; (b) the firms did not withdraw their filing; and (c) the firms survived at least 3 years after the initial public offering. Both the Edgar-Online (2002) and the SEC (2002) search engines had also listed registration forms of firms that had previously "gone public" and were registering additional stock. In addition, some firms that registered in 1996 did not provide electronic copies of their filings to the SEC. The combination of these three issues reduced the number of firms to 122. Subsequently, firms from the year 1999 were added.

In addition, upon further research, it was discovered that neither the SEC (2002) nor Edgar-Online (2002) search engines listed all the firms that had registered with the SEC. This finding was ascertained by reviewing the list of all IPOs (i.e., not limited to healthcare) from 1996 through 1998 provided by Ivo Welch of the University of California at Los Angeles at www.iporesources.org. Tthe source of this list was the CRSP database. After thorough review and following the procedures above, the number of firms increased. However, this list did not include IPOs from 1999. Numerous sources were then reviewed to ensure that all healthcare firms that went public during this time were included. Additional IPOs were found from three Internet sources: (a) Ernst & Young's Healthcare Sector (2003) (www.ey.com); (b) Bio.-org (2003) (www.bio.org); and (c) Biospace.com (2003) (www.biospace.com). The same procedures described above were performed, with the total number of firms in this study equaling 190. In total, for the years 1996 through 1999, 161 firms were

listed as filing an initial registration form that were found to have previously registered, 34 firms terminated or withdrew their registration (with bankruptcy being cited as a reason for some but not all), 28 firms were listed as filing initial registration statements but were not found within the SEC's (2002) listings; and 17 other firms were deleted from the study for various reasons such as merger or consolidation with another firm.

The 190 initial registration forms were accessed through the SEC's (2002) website to glean the pertinent information related to the independent variables. It is assumed that this information is accurate because the "SEC can refuse or suspend the effectiveness of any registration statement if it concludes that the document is misleading, inaccurate, or incomplete" (Securities and Exchange Commission, 2002).

This information was extracted and entered into a database created by the author of the current study. Information related to venture capitalists was crossmatched with *Pratt's Guide* (1996) which is "one of the most comprehensive sources of detailed archival data on VCFs [venture capital firms] in the United States" (Gupta & Sapienza, 1992: 351) and is widely used by researchers (see Chapter 2, Table 1). The 1996 version of *Pratt's Guide* was used because that year is the relevant period for firms in our study. Data within *Pratt's Guide* (1996) include information such as names of managers, funding preferences by industry, typical investment amounts, regional preferences, and venture stage of investment.

Next, information related to the dependent variables was collected. All firms with stock registered on a national securities exchange (i.e., in an open, public market) must report information related to the firm to the SEC pursuant to the Securities Exchange Act of 1934. This Act gives the SEC broad power to regulate open, public

markets such as the New York Stock Exchange and the National Association of Securities Dealers, which operates the NASDAQ exchange, and requires that companies that utilize these exchanges provide periodic reporting. Firms generally file 10-K annual reports, although small business issuers may file a 10-KSB annual report that is slightly less detailed. These reports contain the audited financial statements that include the data necessary to calculate the dependent variables (e.g., EVA, ROA, and ROE).

For the calculation of ROA and ROE, only three variables are necessary: net income, total assets, and total shareholder's equity. This information was taken directly from the firm's 10K forms. Twenty of the 190 firms had reported negative total shareholder's equity. This negative total shareholder's equity combined with a negative net income, produced a positive ratio, which is meaningless. Five of the 20 firms had this issue in 2 or more years. These five firms were deleted, and 2-year averages were used for the remaining 15 firms.

In calculating EVA, certain adjustments are made to alter accounting profit to better reflect economic profit. Stewart (1991) notes that there are potentially 194 adjustments to a firm's financial statements that can be made to calculate a firm's EVA. However, as several researchers (Ehrbar, 2000; Peterson, 2000) note, there is no one preferred way to apply such adjustments to all firms; also, not all adjustments apply to all firms. As Ehrbar (2000: 53) observes, "the correct answer [as to how many adjustments to make] is far fewer than you might expect, though one could make EVA numbingly complex by insisting on a plethora of unnecessary accounting adjustments." This statement appears to be true because most descriptions and research articles make but a handful of adjustments (see Copeland et al., 2000; Grant, 2000; Pe-

terson, 2000; Roztocki & Needy, 2000). Thus, the present study pays particular attention to the major adjustment suggestions of Ehrbar (2000), which include research and development; strategic investments (including goodwill); depreciation; restructuring charges; and taxes.

The formula for EVA is net operating profits less adjustments for taxes minus the product of invested capital times the weighted average cost of capital.

Table 6 illustrates the EVA calculation for King Pharmaceutical. Three items are noteworthy with regard to the calculation of EVA. First, unlike ROA and ROE, income statement and balance sheet data are not taken from the same year. For example, in calculating the 1998 ROE for a company, both the net income (derived from the income statement or statement of operations) and total shareholder equity (derived from the balance sheet) are taken from the same year (1998). In calculating EVA, the income statement information (net operating profit less adjusted taxes) is taken for a given year (1998); however, the balance sheet information used to calculate Invested Capital is taken from the previous year (1997). Thus, Invested Capital is measured at the beginning of the period. The intent is to reflect how productive with its resources the firm has been over the course of the year.

Second, R & D expenses were added back to the calculation of net operating profit less adjusted taxes. Typically, accountants are required to expense R & D outlays as if the outlays were consumed in the period incurred. However, R & D is expected to have a future enduring value and thus was capitalized on the balance sheet and then amortized (5 or 8 years) against earnings (Stewart, 1991). It should be noted that biotechnology IPOs typically have a greater amount of R & D expense

than healthcare IPOs experience, and this greater expense may have an overall effect on the EVA value of these IPOs relative to healthcare IPOs.

TABLE 6

EVA Calculation Example

Adjustments to GAAP		**Years**		**Average**
Presented In Thousands				
Year ending	1998	1999	2000	Average
Net Operating Profit/Loss After Taxes				
Total revenues	$294,421	$512,465	$620,243	$475,710
Less: cost of revenues	$86,316	$136,473	$133,500	$118,763
Selling, general, & admin. Expenses	$76,562	$114,574	$206,560	$132,565
R & D amortization	$1,358	$3,566	$6,665	$3,863
Depreciation	$15,566	$33,864	$41,942	$30,457
Add: Amortization	$0	$0	$0	$0
Research and development	$10,866	$17,659	$24,791	$17,772
Earnings before income tax adj (EBITA)	$125,485	$241,647	$256,368	$207,833
Tax (expense) benefit on EBITA	$4,389	($19,035)	($24,117)	($12,921)
Chg in deferred tax asset (add decr & less incr)	($4,662)	($11,523)	($8,535)	($8,240)
Chg in deferred tax liab (add incr & less decr)	$11,250	$15,748	($10,009)	$5,663
Net operating profit/loss after taxes (NOPLAT)	$136,461	$226,837	$213,707	$192,335
Research and development amortization years	8			
Tax calculation:				
Tax rate				
Provision for taxes (benefit)	$0	$0	$0	$0
+ Interest expense (times tax rate)	$14,866	$55,371	$36,974	$35,737
- Interest income (times tax rate)	$7,746	$10,507	$11,875	$10,043
- Other/Nonoperating inc (exp) (times tax rate)	$18,373	($3,944)	($36,739)	($7,437)
Tax expense (benefit)	($4,389)	$19,035	$24,117	$12,921
Deferred tax liability				
Current year taxes (liab)	1998	1999	2000	Average
Less: Prior year taxes (liab)	$11,250	$26,998	$16,989	$18,412
Chg in def taxes (positive = incr, negative = decr)	$0	$11,250	$26,998	$12,749
	$11,250	$15,748	($10,009)	$5,663
Deferred tax asset				
Current year taxes (asset)	$6,675	$18,198	$26,733	$17,202
Prior year taxes (asset)	$2,013	$6,675	$18,198	$8,962
Chg in def taxes (positive = incr, negative = decr)	$4,662	$11,523	$8,535	$8,240
Invested Capital Funds	$17,772			
As of month, day, year	1997	1998	1999	Average
Equity	$29,334	$101,436	$495,012	$208,594
+ R & D expense less R & D amort	$15,551	$9,508	$14,093	$13,051
+ Quasi equity/def income tax liab (asset)	($2,013)	$4,575	$8,800	$3,787

TABLE 6 (Continued)

Adjustments to GAAP Presented In Thousands	Years			Average
Year Ending	1998	1999	2000	Average
Adjusted equity	$42,872	$115,519	$517,905	$225,432
+ Interest bearing debt	$57,289	$527,796	$569,357	$384,814
Invested capital	$100,161	$643,315	$1,087,262	$610,246
Cost of capital				
Target weight equity	0.4280	0.1796	0.4763	0.3694
Target weight debt	0.5720	0.8204	0.5237	0.6306
Cost of equity	0.0895	0.0786	0.0825	0.0835
Beta	0.5200	0.5200	0.5200	0.5200
T-bond rate	0.0635	0.0526	0.0565	0.0575
Cost of debt	0.1583	0.0640	0.0396	0.0566
Tax rate	0.3900	0.3900	0.3900	0.3900
1 – tax rate	0.6100	0.6100	0.6100	0.6100
Pretax debt cost	0.2595	0.1049	0.0649	0.0929
Weighted average cost of equity	0.0383	0.0141	0.0393	0.0309
Weighted average cost of debt	0.0905	0.0525	0.0207	0.0357
Weighted average cost of capital	0.1288	0.0666	0.0600	0.0666
EVA	$123,556	$183,981	$148,425	$151,704

Third, in calculating the weighted cost of capital, the capital asset pricing model was used to calculate the opportunity cost of equity financing. Although there are other methods of calculating the cost of equity such as the arbitrage pricing model, the dividend yield model (dividend per share/stock price), and the earnings-to-price ratio model, the capital asset pricing model remains one of the most widely used and recommended methods (Copeland et al., 2000; Stewart, 1991). The equation for the cost of equity can be simply written:

Cost of equity = riskless rate of interest + market risk premium x beta.[14]

[14] Or $k_s = r_f + [E(r_m) - r_f](\text{beta})$, where k_s = cost of equity, r_f = risk-free rate of return, $E(r_m) - r_f$ = the market risk premium, beta = the systematic risk of the equity.

The current study used the 10-year bond rate for each specified year as reported by the Federal Reserve (2003) (ttp://www.federalreserve.gov/releases/h15/data/a/tcm10y.txt) for the riskless rate of interest. The present study also used 5 percent as the market risk premium following Copeland et al.'s (2000) recommendation.[15] *Weiss Ratings' Guide to Common Stocks Fall 2001* (2001) listed the betas for 110 of the 190 firms. These 110 betas were averaged by sector (e.g., healthcare and biotechnology), with the averages used for the remaining 80 firms.

The first three annual reports (e.g., 10-K or 10-KSB) filed for each firm were used. For example, if a firm registered in 1996, this firm usually will have filed its first three annual reports in 1997, 1998, and 1999. A firm registering in 1997, usually will have filed its first three annual reports in 1998, 1999, and 2000. Firms are required to file their annual reports 90 days after the end of the firms' fiscal year. Thus, the information reflects fiscal-year data. Figure 5 depicts this activity.

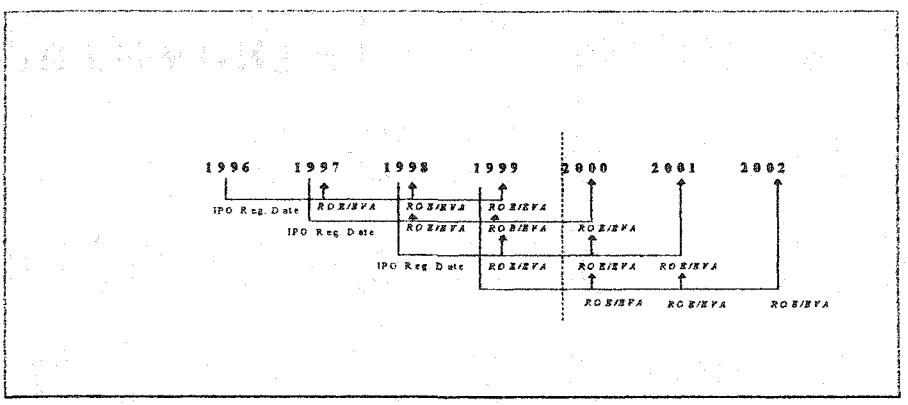


FIGURE 5

Timeline

[15] And reflecting the average U.S. market risk premium from 1974 to 1998 (Copeland et al., 2000).

All data related to the independent variables and the moderator variable (e.g., market sector) are derived from either the firms' initial registration forms (e.g., S1, SB-1, or SB-2) or *Pratt's Guide* (1996). All data related to the dependent variables (e.g., ROE, ROA, and EVA) and the control variable (e.g., 1st-year total assets) are derived from the firms' 10-K forms. The interest of the present study is in how these variables that are in place "at birth" correlate with future wealth creation as measured by EVA, ROA, and ROE. It has been noted that in the short-term board characteristics are predominantly stable, with VCI averaging 4.9 years and more than a third averaging more than 6 years (Sahlman, 1990b). Table 7 presents the variables, measures, and data sources for the model.

TABLE 7

Variables, Measures, and Data Sources

Variable	Measure	Data Source
ROA	Net income/total assets	10-K annual report
ROE	Net income/total equity	10-K annual report
EVA	Invested capital x (return on invested capital less weighted average cost of capital)	10-K annual report
1st-year total assets	Total assets 1st year	10-K annual report
VCI	1 = Involvement 0 = No Involvement	S1, SB-1, SB-2, and *Pratt's Guide* (1996)
Percentage of Equity after initial public offering	Percentage equity	S1, SB-1, or SB-2
Preferred stock outstanding	1 = no PS Outstanding 0 = PS outstanding	S1, SB-1, or SB-2
Board stock options	1 = stock options 0 = no stock options	S1, SB-1, or SB-2
Market sectors	1 = biotechnology firms 0 = healthcare firms	S1, SB-1, or SB-2

Analysis

Structural equation modeling is the appropriate method of analysis. Structural equation modeling is a method of representing, estimating, and testing a theoretical construct of mainly linear relationships among variables, where those variables may be either observable or unobservable and may only be measured imperfectly. This method of analysis is generally viewed as "provid[ing] a flexible and powerful means of simultaneously assessing the quality of measurement and examining predictive relationships among constructs" (Kelloway, 1998: 2). Thus, structural equation modeling is a confirmatory technique used to test a theory (Tabachnick & Fidell, 2001).

In the current study's model, all relationships are viewed as linear, and there is an unobservable (or latent) variable–wealth creation–that is measured imperfectly by the variables ROE, ROA, and EVA. Also because of the proposed moderation effects of the market sectors, this analysis requires a two-step process: (a) estimation of the overall model fit with respect to the proposed relationships and (b) testing the moderator (e.g., interaction) hypothesis. The first step can be done via multiple indicators and multiple causes analysis, whereas the second step involves performing a multigroup analysis (MGA). Both of these methods are forms of structural equation modeling. These analyses will be performed by using the statistical computer program LISREL.[16]

[16] The PRELIS statistical program is also used as a preprocessor for LISREL because PRELIS both provides descriptive statistics and is capable of addressing issues associated with nonnormal data and data that are both continuous and categorical.

Multiple Indicators and Multiple Causes

As Joreskog and Goldberger (1975) note, the multiple indicators and multiple causes analysis model draws on a mixture of econometric and psychometric themes. The model involves a single unobserved latent variable "caused" by several observed x-variables and indicated by two observed y-variables. The model equations[17] are as follows:

$$y = \lambda\eta + \varepsilon, \quad \text{measurement model (relationship [path] between wealth creation and ROE, ROA, and EVA)} \tag{3.1}$$

$$\eta = \gamma' x + \zeta, \quad \text{structural model (relationship [path] between the independent variables and wealth creation)} \tag{3.2}$$

where $y' = (y_1, y_2, y_3)$ which are indicators of the latent variable η, and $x' = (x_1, x_2, x_3, x_4, x_5)$ which are "causes" of η. From the LISREL perspective, one can view Equation 3.1 as the measurement model for η and Equation 3.2 as the structural equation for η, with the ε's and ζ (disturbance) assumed to be mutually uncorrelated. Equation 3.1 indicates that the y's are congeneric measures of η and Equation 3.2 says that η is linear in the x's plus a random disturbance term. Viewing the model as a multivariate regression model involves two applicable constraints: (a) The regression matrix must have a rank 1, and (b) the residual covariance matrix must satisfy the congeneric measurement model.

This can be depicted by substituting Equation 3.2 into Equation 3.1, which yields

---

[17] The model equation language is taken in large part from Joreskog and Sorbom (2000).

$$y = \lambda \gamma' x + \lambda \zeta + \varepsilon ,$$

$$= \Pi x + z ,$$

which shows that $\Pi = \lambda \gamma'$ and Cov $(z) = \lambda \lambda' \psi + \Theta_\varepsilon$, where ψ = var (ζ) and Θ_ε is the diagonal covariance matrix of ε.

Thus, the current study's model can be depicted as follows:

$$\eta = \gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_5 + \zeta ,$$

$$y_1 = \lambda_1 \eta + \varepsilon_1, \; y_2 = \lambda_2 \eta + \varepsilon_2 , \; y_3 = \lambda_3 \eta + \varepsilon_3$$

where the y's (ROE, ROA, and EVA [λ = confirmatory factor analysis loadings]) may be viewed as independent indicators of the latent variable η (wealth creation), which is caused by the x's (x_1 = total assets, x_2 = venture capital firm involvement, x_3 = percentage of equity after the initial public offering, x_4 = preferred stock, x_5 = board stock options [γ's = regression weights]). Another way of looking at this is to view the x's as determining

$$\xi = \gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_5 = \text{Independent Variables} ,$$

$$\eta = \xi + \varepsilon = \text{wealth creation.}$$

The basic idea of the model is that η is the single latent variable that accounts for the intercorrelations of the y's. Once the effects of the $x_1, x_2 \ldots x_5$, and ε via η are removed, there is no longer any correlation among the y's. The y_1, y_2, y_3 are assumed to be indicators (e.g., measurements) of the same thing–η (Joreskog & Goldberger, 1975).

Multigroup Analysis

The sample contains various moderators classified as market sectors (e.g., biotechnology and healthcare firms). Hypothesis 5 states that wealth creation varies (or is moderated) by market sectors. Thus, the null hypothesis in this MGA model is that the data from each group are from the same population.

The MGA method depicted by Tabachnick and Fidell (2001) is as follows. First, the analysis begins by developing good-fitting models (such as the maximum likelihood model, which is the most frequently used in structural equation modeling [Kelloway, 1998; Pedhazur & Schmelkin, 1991]) in separate runs for each group. These models are then tested in one run, with none of the parameters across models constrained to be equal. This unconstrained multiple group model acts as the baseline against which more restricted models are judged. After the baseline model estimation, ever more stringent constraints are specified by limiting various parameters across all groups. When constrained, these parameters are forced to equal each another. After each set of constraints is added, a chi-square difference test is carried out for each group between the less constrained and more constrained models. The goal is to not degrade the models by restraining parameters across the groups because the null hypothesis seeks to obtain a nonsignificant Chi-square. If a significant difference in Chi-square is found between the models at any stage, the Lagrange Multiplier test is examined to find the exact parameters that are different in the groups; these parameters are estimated separately in each group.

The next step is to test the hypothesis that the factor structure is the same in the different market sectors. This testing is done by constraining the factor loadings between factors and indices to equality across market sectors. If the constraints are

reasonable, the Chi-square difference test between the restricted model and the baseline model should be nonsignificant for the market sectors. The more the parameters that differ across market sectors, the less alike the groups are.

If the equality of factor structure is established, the next step is to see whether the factor variances and covariances are equal. In other words, are the variances between wealth creations equal for each market sector? Then, the last step is to look at the equality of the residual variance across groups. If all of the regression coefficients, variances, and covariances are the same across groups, it can be assumed that the market sectors are representative of the same population. If this case proves true, the null hypothesis cannot be rejected, and Hypothesis 5 can be rejected.

Assumptions

Because the sample size is approximately 182, the current study meets the criteria for small to medium models (Kelloway, 1998; Tabachnick & Fidell, 2001). At this point it is assumed that the model will meet the suggestions of ten subjects per estimated parameter (Kelloway, 1998; Tabachnick & Fidell, 2001). Multivariate normality is assumed, with the measured values to be screened for outliers, skewness, and kurtosis.

CHAPTER 4

FINDINGS

Chapter 4 reports the findings of the present study. First, the data analysis process for deriving the firms included in the current study is explained. Next, descriptive statistics are presented. The descriptive statistics are provided for all firms within the present study and for each market sector (e.g., biotechnology and healthcare firms). After the descriptive statistics, the results are given for the model estimate and fit with respect to the proposed relationships and the individual hypotheses (Hypotheses 1-4). It is noted within the Model Assessment section that neither model provides a good fit for the data, which in turn affects the overall model (all firms). Therefore, MGA was not performed as proposed in Chapter 3. Additionally, the control variable of total assets had the effect of "washing out" the influence of the independent variables; therefore, this variable was not included in the structural equation model but was included in the secondary analysis (regression).

Data Analysis

One hundred ninety healthcare firms met the established criteria of filing an initial public offering with the SEC between the years of 1996 and 1999 and subsequently surviving 3 years. There are 112 (58.9%) healthcare firms and 78 (41.1%) biotechnology firms. However, as Yuan and Bentler (2001: 36) stated, "[w]ith real data obtained under typical testing situations, nonstandard samples that contain miss-

ing data, nonnormal data and data with outliers are almost inevitable." The present study was no exception to the above phenomenon.

As noted in Chapter 3, 20 firms reported negative total shareholder equity that when divided by negative net income produced a positive ROE–a meaningless measure. Five of the 20 firms had negative net income and negative total shareholder equity for 2 years. These five firms were deleted from the current study. A 2-year average ROE was substituted for the remaining 15 firms. Also, the five continuous variables (ROA, ROE, EVA, total assets, and percentage equity) had extreme values several standard deviations from their means, resulting in nonnormal distributions. To address this issue, each variable was subtracted from a positive constant value, producing a distribution with all positive values. The values for EVA, ROA, percentage equity, and total assets were log transformed. The distribution for ROE did not necessitate a log transformation. Next, three extreme values associated with ROE, the log of ROA, and the log of EVA were identified and trimmed from the sample. The data were then normalized by using PRELIS. The final number of firms in the present study equaled 182 (96 percent) of the 190 original firms. Of the 182, there were 106 (58.2 percent) healthcare firms and 76 (41.8 percent) biotechnology firms.

Descriptive Statistics

Dependent Variables

Tables 8-10 illustrate the means, medians, and standard deviations for the (untransformed) dependent variables. The dependent variables are shown separate from other statistics to emphasize four issues: (a) the inability of the firms to generate in-

ternal funds as represented by negative ROE and ROA values, (b) the wide dispersion around the mean as depicted by the standard deviation for all variables in both sectors and for all firms, (c) the differences between mean and median for all variables in both sectors and for all firms, and (d) the positive mean value for EVA for both sectors and all firms. The inability of a firm to generate internal funds sufficient to grow an organization is considered the primary reason for an organization to pursue an initial public offering.

TABLE 8

Descriptive Statistics–All Firms[a]

Variable	Mean	Median	s.d.
ROE	-.62	- .38	1.49
ROA	- .31	- .24	.43
EVA	$6,123	- $1,162	$23,815

[a] N = 182

TABLE 9

Descriptive Statistics–Healthcare Firms[a]

Variable	Mean	Median	s.d.
ROE	- .72	- .30	1.8
ROA	- .29	- .17	.46
EVA	$607	- $899	$10,637

[a] N = 106

TABLE 10

Descriptive Statistics–Biotechnology Firms[a]

Variable	Mean	Median	s.d.
ROE	- .49	- .39	.95
ROA	- .35	- .32	.39
EVA	$13,817	$4,955	$33,277

[a] N = 76

As noted in Chapter 3, the three dependent variables may measure slightly different aspects of wealth creation. This possibility is suggested by the differences between ROE and ROA, with leverage (e.g., debt) suspected of having an effect, as well as by the differences in direction (e.g., positive/negative) between EVA and the two other dependent variables. The adjustments to the EVA calculation specifically R & D may have had an effect on EVA. Table 11 presents the nonnormalized correlations among the continuous variables for the 182 firms (both market sectors).[18] Tables 12 and 13 show the nonnormalized correlations among the continuous variables for the healthcare firms (Table 12) and biotechnology firms (Table 13).

TABLE 11

Correlations–All Firms[a]

	LNROA	LNEVA	ROE	LNTA	LNEQUITY
LNROA	-				
LNEVA	.192*	-			
ROE	.423*	.147*	-		
LNTA	.392*	.305	.332*	-	
LNEQUITY	.111	.181*	.150*	.202*	-

[a] N=182
* $p < .05$

[18] Log-transformed coefficients have opposite signs than presented; correlations were performed with all variables (e.g., ROE) being log transformed elsewhere, with similar results being found.

TABLE 12

Correlations–Healthcare Firms[a]

	LNROA	LNEVA	ROE	LNTA	LNEQUITY
LNROA	-				
LNEVA	.181	-			
ROE	.479*	.115	-		
LNTA	.408*	.148	.289*	-	
LNEQUITY	.109	.188	.219*	.227*	-

[a] N=106
* $p < .05$

TABLE 13

Correlations–Biotechnology Firms[a]

	LNROA	LNEVA	ROE	LNTA	LNEQUITY
LNROA	-				
LNEVA	.294*	-			
ROE	.312*	.204	-		
LNTA	.388*	.454*	.470*	-	
LNEQUITY	.135	.150	.035	.167	-

[a] N=76
* $p < .05$

As noted, there was a difference between market sectors in the strength of the linear associations among the continuous variables that may have affected the moderator hypothesis. Biotechnology firms have statistically significant correlations among all dependent variables except ROE and LNEVA, whereas the correlation coefficients of the healthcare firms suggest that there is not a significant statistical relationship between LNROA and LNEVA or between LNEVA and ROE. In addition, for the biotechnology firms, there is not a statistically significant correlation between LNEQUITY and any other continuous variable.

Control Variable

The typical IPO [N = 182] had 1st-year total assets of $59,310,392 (s.d. = $79,404,697). The range of total assets was from $551,591 to $668,171,000. The median was $32,680,450. The typical healthcare firm [N = 106] had 1st-year total assets of $55,978,093 (s.d. = 68,274,882). The range of total assets was from $1,280,470 to $342,839,000. The median was $31,488,250. The typical biotechnology firm [N = 76] had 1st-year total assets of $63,958,073 (s.d. = 93,019,869). The range of total assets was from $551,591 to $668,171,000. The median was $39,413,500

Independent Variables

All independent variables, except percentage equity, were dichotomous. The Pearson Chi-square test was used to test the hypothesis that the dichotomous variables were independent. All dichotomous variables were found to be independent. Overall, of the 182 firms, 55.5 percent had VCI. Additionally, 83.0 percent of the firms did not have preferred stock outstanding and 73.0 percent granted stock options to their board members.

For the 106 healthcare firms, 50.9 percent had VCI. Eighty-four percent of the firms did not have preferred stock outstanding and 72.0 percent granted stock options to their board members. For the 76 biotechnology firms, 61.8 percent had VCI. Eighty-two percent of the firms did not have preferred stock outstanding, and 75.0 percent granted stock options to their board members.

The percentage equity variable was continuous. The typical firm (N = 182) retained 70.7 percent (s.d. = 10.5) of the ownership equity of the firm; that is, the stated intent of the owners was to sell 29.3 percent of the equity of the firm at the time of the initial public offering. The range for percentage equity was from 24.4 percent to 88.0 percent. The typical healthcare firm (N = 106) retained 69.7 percent (s.d. = 9.9) of the ownership equity of the firm. The range for percentage equity was from 40.9 percent to 88.0 percent. The typical biotechnology firm (N = 76) retained 72.2 percent (s.d. = 11.2) of the ownership equity of the firm. The range for percentage equity was from 24.4 percent to 87.5 percent.

Model Assessment

Healthcare Firms

Of primary concern to structural equation modeling is the extent to which the hypothesized model "fits" or adequately describes the data (Byrne, 1998). Table 14 presents goodness-of-fit indices for the model and both market sectors. Several indices can be used to determine goodness-of-fit. The Chi-square and the Root Mean Square Error of Approximation (RMSEA) tests are appropriate measures of goodness-of-fit. The healthcare model has a low Chi-square value, with a *p*-value of 0.25 A model with a Chi-square *p*-value greater than .2 is considered a good fitting model. In addition, RMSEA values less than .05 indicate good fit, with values as high as .08 representing reasonable errors of approximation in the population. The RMSEA value for the healthcare IPO model is .049. In addition, it is helpful to view the confidence intervals to assess the precision of the RMSEA value. The confidence inter-

val ranged from .0 to .13 and the *p*-value for the closeness of fit was equal to .45. This means that the confidence interval indicated that over all possible randomly sampled RMSEA values, 90 percent of these values will fall within the bounds of .0 to .13. Given reasonable Chi-square and RMSEA values but an RMSEA confidence interval with a wide range, there is not a clear indication that the model provides a good fit for the data.

Table 14

Goodness-of-Fit Indices

Model	X^2	*df*	P	RMSEA	C.I.
Overall	26.23	8	.00096	.11	.06; .16
Healthcare	10.22	8	.25	.049	.00; .13
Biotechnology	16.59	8	.035	.11	.0031 .19

Biotechnology Firms

The biotechnology model does not fit the data reasonably well, as is seen by an RMSEA value for the biotechnology IPO model of .11 and a confidence interval range of .0031 to .19 ($p = 0.11$). Because neither the biotechnology model, health-care model, nor model for all firms provided a good fit for the data, it was not appropriate to perform MGA. At this point, the analysis that had been confirmatory in nature became exploratory.

Hypotheses 1-5

Because both market sector samples contained data that were of a mixed scale type (i.e., both continuous and ordinal [and dichotomous]), it was important to estimate the polychoric and polyserial correlations associated with these variables. Analysis of the matrix of these correlations by the weighted least squares method is one method. The weighted least squares method method requires a large sample. Given the relatively small sample, an alternative approach is to use the maximum likelihood method with normalized data. Therefore, the maximum likelihood method was used.

Healthcare IPOs

Table 15 illustrates the covariance matrix for healthcare IPOs.

TABLE 15

Healthcare Covariance Matrix[a]

	LNROA	LNEVA	ROE	VCI	LNEQUITY	PREFER	OPTIONS
LNROA	0.25						
LNEVA	0.14	0.43					
ROE	0.81	0.51	3.14				
VCI	-0.02	0.01	-0.02	0.25			
LNEQUITY	0.01	0.05	0.05	0.03	0.22		
PREFER	0.00	-0.03	-0.01	0.05	0.00	0.14	
OPTIONS	-0.01	0.01	-0.06	0.05	0.01	0.03	0.20

[a] N=106

Table 16 depicts the healthcare structural equations. It should be noted that none of the predictor variables was found to be statistically significant, the measurement variables loaded on the latent variable, and the model explained 1 percent (.01) of the variance of wealth creation.

TABLE 16

Healthcare Structural Equations[a]

	LNROA	ROE	LNEVA	WEALTH
VCI	-.04	-.13	-.02	-.04
	(.10)[b]	(.37)	(.06)	(.10)
	-.36	-.36	-.36	-.36
LNEQUITY	.07	.24	.04	.07
	(.10)	(.37)	(.06)	(.10)
	.65	.65	.65	.65
PREFER	.02	.09	.02	.02
	(.13)	(.49)	(.08)	(.13)
	.19	.19	.19	.19
OPTIONS	-.07	-.26	-.04	-.07
	(.11)	(.39)	(.07)	(.11)
	-.67	-.67	-.67	-.67
WEALTH	1.00	3.69	.62	-
		(.35)	(.13)	
		10.41	4.86	
R^2				0.01

[a] N = 106

[b] Values in parentheses are standard errors, with those values below representing *t*-values

* $p < .05$

Biotechnology IPOs

Table 17 illustrates the covariance matrix for Biotechnology IPOs.

TABLE 17

Biotechnology Covariance Matrix[a]

	LNROA	LNEVA	ROE	VCI	LNEQUITY	PREFER	OPTIONS
LNROA	.18						
LNEVA	.05	.12					
ROE	.31	.11	.91				
VCI	-.04	.02	-.03	.24			
LNEQUITY	.05	.07	.10	.06	.37		
PREFER	.01	.03	-.01	.05	.05	.15	
OPTIONS	-.01	.04	-.00	.01	.04	.03	.19

[a] N = 76

Table 18 depicts the biotechnology structural equations. Percent equity was found to be statistically significant. VCI was found to be influential, but not statistically significant at the .05 level. The measurement variables loaded on the latent variables. Neither preferred stock outstanding nor board stock options were found to be statistically significant. The model explained 10 percent of the variance of wealth creation.

All Firms

For the overall model (182 firms), it should be noted that the model did not provide a good fit for the data (RMSEA = .11), none of the predictor variables were found to be statistically significant, and the measurement variables loaded on the latent variable. Also, the model explained 3 percent (.03) of the variance of wealth creation.

TABLE 18

Biotechnology Structural Equations[a]

	LNROA	ROE	LNEVA	WEALTH
VCI	-.18	-.37	-.06	-.18
	(.10)[b]	(.20)	(.04)	(.10)
	-1.87	-1.81	-1.61	-1.87
LNEQUITY	.17*	.34*	.05	.17*
	(.08)	(.16)	(.03)	(.08)
	2.13	2.04	1.76	2.13
PREFER	.05	.10	.02	.05
	(.13)	(.25)	(.04)	(.13)
	.40	.40	.40	.40
OPTIONS	-.02	.03	.00	-.02
	(.11)	(.22)	(.03)	(.11)
	-.15	.15	.15	-.15
WEALTH	1.00	1.99	.32	
		(.40)	(.11)	-
		5.00	2.90	
R^2				.10

[a] N = 76
[b] Values in parentheses are standard errors, with those values below representing *t*-values
* $p < .05$

Control Variable

The total assets control variable had an overriding effect on the model and thus was deleted from the model. Regression analysis was performed on each dependent variable for this set of data with and without total assets to demonstrate this effect. Tables 19 and 20 depict the univariate regressions for healthcare firms without and with the inclusion of total assets. Tables 21 and 22 depict the univariate regressions for biotechnology firms without and with the inclusion of total assets. Of note was the fact that only the variable LNROA within the biotechnology market sector had a statistically significant result when total assets were included in the regressions.

TABLE 19

Healthcare Univariate Regressions without Total Assets[a]

Dependent Variables	Independent Variables	R^2
LNROA = 65.662 - .324*VCI + .613*LNEQUITY + .245* PREFER - .180*OPTIONS + ERROR,		R^2 = .0176
(4.118) (.319) (.0969) (.427) (.341)		
15.945 -1.016 .633 .573 - .529		
LNEVA = 49.461 + .0868*VCI + .113*LNEQUITY - .357* PREFER + .0677*OPTIONS + ERROR,		R^2 = .0414
(2.947) (.228) (.0694) (.305) (.244)		
16.783 .381 1.633 -1.171 .278		
ROE = - 3.426 - .0577*VCI + .0686*LNEQUITY + .0455* PREFER - .0506*OPTIONS + ERROR,		R^2 = .00884
(4.851) (.375) (.114) (.503) (.401)		
-.706 - .154 .600 .0905 - .703		

[a] N = 106
* $p < .05$

TABLE 20

Healthcare Univariate Regressions with Total Assets[a]

Dependent Variables	Independent Variables	R^2
LNROA = 59.200 + .632*LNTA - .398*VCI - .0306*LNEQUITY - .105* PREFER - .453*OPTIONS + ERROR		
(3.810) (.155)* (.281) (.0869) (.381) (.304)		R^2 = .246
15.538 5.509 -1.418 -.352 -.277 -1.492		
LNEVA = 47.337 + .208*LNTA + .0624*VCI +.0830*LNEQUITY - .473* PREFER - .0221*OPTIONS + ERROR		
(1.022) (.102)* (.0820) (.130) (.113) (.304)		R^2 = .0885
15.594 2.273 .279 1.199 -1.557 -.0912		
ROE = - 10.859 + .728*LNTA - .143*VCI - .0371*LNEQUITY - .357* PREFER - .596*OPTIONS + ERROR		
(1.022) (.102)* (.0820) (.130) (.113) (.360)		R^2 = .229
-2.403 5.342 -.430 -.360 -.791 -1.654		

[a] N = 106
* $p < .05$

TABLE 21

Biotechnology Univariate Regressions without Total Assets[a]

Dependent Variables	Independent Variables	R^2
LNROA = 20.622 - .220*VCI + .165*LNEQUITY + .0510* PREFER + .0192*OPTIONS + ERROR,		R^2 = .100
(1.022)	(.102)* (.0820)* (.130) (.113)	
20.181	-2.156 2.017 .391 .170	
LNEVA = 8.906 + .0215*VCI + .145*LNEQUITY + .133* PREFER + .141*OPTIONS + ERROR,		R^2 = .170
(1.792)	(.0791) (.0635)* (.101) (.0872)	
11.248	.272 2.285 1.314 1.617	
ROE = - 4.389 - .190*VCI + .315*LNEQUITY + .0401* PREFER - .0506*OPTIONS + ERROR,		R^2 = .0421
(2.370)	(.237) (.190) (.302) (.261)	
-1.852	- .802 1.654 .133 - .194	

[a] N = 76
* $p < .05$

TABLE 22

Biotechnology Univariate Regressions with Total Assets[a]

Dependent Variables	Independent Variables	R^2
LNROA = 19.394 + .133*LNTA - .206*VCI + .0859*LNEQUITY + .0211* PREFER - .0435*OPTIONS + ERROR		
(1.049)	(.0438)* (.0968)* (.0820) (.124) (.109)	R^2 = .204
18.487	3.030 -2.129 1.048 .171 -.401	
LNEVA = 7.915 + .107*LNTA + .0329*VCI + .0810*LNEQUITY + .109* PREFER + .0904*OPTIONS + ERROR		
(.808)	(.0337)* (.0746) (.0632) (.0954) (.0836)	R^2 = .274
9.792	3.174 .441 1.282 1.139 1.081	
ROE = - 7.968 + .386*LNTA - .149*VCI + .0828*LNEQUITY - .0469* PREFER - .233*OPTIONS + ERROR		
(1.022)	(.102)* (.0820) (.130) (.113) (.360)	R^2 = .217
-3.407	3.961 -.689 .453 -.170 -.964	

[a] N = 76
* $p < .05$

Minor Findings[19]

Specialization

Specialization by the venture capital firm should act to diminish agency costs. One hundred twenty-two venture capital firms invested in the initial 190 IPOs. Of these 122 firms, only 18 firms limited their investing preferences to healthcare and/or biotechnology firms, as was noted in *Pratt's Guide* (1996). In addition, only 10 IPOs were considered to have engaged specialist venture capital firms; that is,the remaining 8 firms either coinvested with other specialist firms or did not take the "lead" role (i.e., board seats and/or primary venture capital investor). It is noteworthy that VCI was dominated by generalists and that the label of specialization may not apply to the majority of those venture capital firms included in the current study that invested in IPOs.

Venture Capital Board Involvement

Venture capital board involvement has been used as an explanation for wealth creation. Venture capital investment is active investment, with many venture capitalists also being involved at the strategic or board level of the firm. Venture capital board involvement was found to be the case with regard to both the healthcare and biotechnology firms in the current study. Unfortunately, the linear functional relationship between VCI and venture capital board involvement was believed to be sufficiently strong to significantly affect the estimation of the coefficients of the variables. Hence, this variable was not included in the present study.

---

[19] For the Minor Findings section the original 190 IPOs were used because it was at this point that these variables were eliminated from further study.

For example, of the 190 IPOs, there were 102 firms (53.7 percent) with VCI. Of these 102 firms, 94 firms (92.2 percent) also had venture capital board involvement. Of the 112 healthcare IPOs, 55 firms (49.1 percent) had VCI. Of these 55 firms, 51 firms (92.7 percent) had venture capital board involvement. Forty-seven of the 78 biotechnology firms (60.3 percent) had VCI, with 43 of the 47 biotechnology firms (91.5 percent) also having venture capital board involvement. Because of the close linear relationship between these two potential independent variables, multicollinearity was suspected and then later detected by way of the variance inflation factor method, which method has gained in popularity for the detection of multicollinearity (Studenmund, 2000).

CHAPTER 5

IMPLICATIONS, FURTHER RESEARCH, LIMITATIONS, AND CONCLUSION

The purpose of the current study was to evaluate the relationships and effects that VCI and other characteristics related to the firm and the firm's board at the time of its IPO have on the firm's overall wealth creation ability as measured by 3-year averages of ROE, ROA, and EVA. As Daily, McDougall, Covin, & Dalton, (2002: 390) stated, "[a]n implicit assumption in governance/strategic leadership/performance relationships is that the choice of various governance structure options and leaders *could* be associated with firm performance"; also "such relationships might be more pronounced in entrepreneurial firms" (Daily et al., 2002: 387). The present study's results neither support nor reject this assertion.

Implications, explanations (including alternative explanations) of the findings, and proposals for further research are discussed separately for each market sector and variable. Although not statistically significant, VCI was found to be negatively related to wealth creation in biotechnology IPOs and therefore is discussed as such below. Additionally, because biotechnology and healthcare firms had similar results with respect to preferred stock outstanding and board stock options, explanations and implications for these variables are discussed together (i.e., under Biotechnology Firms). A general Further Research section follows that proposes areas for further

study. Sections addressing the limitations and conclusions of the study also are included.

Biotechnology Firms

The hypothesized model did not provide a good fit for the data. However, percentage equity was found to be statistically significant. VCI was found to be relatively influential but not statistically significant.

Percentage Equity Implications/Explanations

Results indicated that IPOs that state that the owners are retaining a greater percentage of the common equity of the firm at the time of the initial public offering create wealth to a greater extent than IPOs create that state that the owners are retaining a lesser percentage of the equity in the IPO. This result is consistent with the hypothesis and implies that the IPO is a means to raise additional capital (perhaps beyond the means of the venture capital firm) for growth reasons and is not an exit strategy for the pre-initial public offering investors. The finding may imply that the pre-initial public offering owners believe that the new venture's ability to create wealth in the future is greater than the present value of the stock at the time of the initial public offering and that the equity is worthy of "holding onto" as opposed to "cashing-out."

Percentage Equity Further Research

The stated total amount and percentage equity to be sold are known. A distinction was not made between venture capitalists and the entrepreneurs in terms of who or what entities sold their equity at the time of the IPO. Further research is required to know the distribution of the equities offered (i.e., whether the equities primarily came from the venture capitalists' equity or from the entrepreneurs') and whether there was a difference in financial performance when one party sold a greater percentage of its holdings than the other sold. Such research may also indicate whether the initial public offering is an exit strategy for one or the other party.

The dilution section of the initial registration form also states the total dollar amount currently invested by the pre-initial public offering owners, as well as the amount expected to be raised by the initial public offering. Additional research is needed to know the total dollar amount raised at the time of the initial public offering and compare this amount to the percentage equity sold to see whether there was a correlation with this result. It would be informative to know the typical spread between the amounts the initial investors paid and the amount the new (IPO) investors paid for their equity. It may be informative also to know whether IPOs in which the pre-initial public offering owners were recouping the entire amount of their investment performed worse or better than IPOs in which such owners did not recoup their total investment (i.e., whether the pre-initial public offering owners recouped 100 percent or more of their investment in, which case the performance of the firm after the initial public offering is of lesser importance).

Venture Capital Involvement Implications/Explanations

Results indicated that VCI was negatively related to wealth creation but not statistically significant. The implications of the findings within this market sector are that (a) venture capitalists may not "add value," but "destroy value," (b) venture capitalists may not "pick" better opportunities or have the opportunity to do so, and (c) venture-capital-backed IPOs may not be better "positioned." The three explanations, taken individually or together (as in the possibility that venture capitalists may "pick" firms with worse opportunities *and* their activity may also destroy value), may help explain part of why venture-capital-backed biotechnology IPOs performed worse than non-venture-capital-backed IPOs.

The concept of venture capitalists "adding value" is congruent with the definition of VCI as "active investment." The vast majority of IPOs with venture capital investment also had venture capital board involvement. Although this variable was not tested, the prevailing literature, combined with the Minor Findings section of the present study, suggests that this type of investment is indeed active and that such activity may play a negative role in the wealth creation (destruction) of biotechnology firms. The literature supports this assertion because venture capitalists are viewed as acting both as "sounding boards" and as advisors to the original entrepreneurs. However, VCI and board involvement may be indicative of a firm in need of activity.

The results may also indicate that venture capital firms selected worse opportunities in which to invest. Another implication may be that venture capital firms did not have access to firms with better than average potential. The venture capital firms themselves may have "picked" the firms they viewed as the most likely to succeed,

but the pool of potential firms from which the venture capital firms selected may not have had the potential to perform at or above the overall biotechnology IPO average in terms of wealth creation.

A third implication is that venture-capital-backed IPOs may not be better positioned for post-initial public offering performance, which means that venture-capital-backed IPOs may not have been able to develop further than non-venture-backed IPOs before the initial public offering. The venture-backed IPOs may have had to enter the IPO market to raise capital at a stage in their development different from the stage at which the non-venture-capital-backed IPOs entered this market. This difference may have led to less wealth creation for venture backed IPOs. This implication seems counterintuitive, but corporations such as pharmaceutical companies owned several of the biotechnology firms; these firms may have been able to raise internal funds to a greater extent than the venture capital firms could achieve.

Venture Capital Involvement Further Research

The three explanations need to be further investigated before it can be determined why the venture-capital-back IPOs did not create wealth to the same extent as the non-venture-capital-backed IPOs after the initial public offering. Other questions involving venture capitalists include analyzing venture-backed IPOs to discover whether there is a difference in firm performance based on their activities. These activities may include behavior of the venture capitalists (i.e., whether the venture capitalists replaced the CEO and whether the firms performed better or worse than firms with nonreplaced CEOs), board role (i.e., whether IPOs with venture capitalists act-

ing as either CEO or chairman of the board performed better than IPOs without venture capitalists in these roles), timing of the venture capital engagement (i.e., whether firms that engaged venture capitalists at an earlier stage of their development performed better or worse after the initial public offering), staging of venture capital investment (i.e., the typical dollar amount that venture capital firms invested prior to the initial public offering and whether there a difference in terms of performance after the initial public offering), and multiple VCI (i.e., whether IPOs with multiple venture capitalists performed better than IPOs with fewer venture capital firms).

Preferred Stock Outstanding Implications/Explanations

Results indicated that there was not a statistically significant difference between biotechnology firms that had preferred stock outstanding at or about the time of the initial public offering and biotechnology firms that did not have such stock outstanding at that time. This result was not as hypothesized. It was hypothesized that firms without preferred stock outstanding would create wealth to a greater extent. Preferred stock outstanding was thought to act as an indicator that the pre-IPO investors (who had asymmetric information) had a reason to "hedge their bets" and get paid first. The results imply that this possibility may not be the case. It may be that the preferred stock of an IPO may not provide the protection (e.g., hedge) or benefit via dividends that this stock would ensure in an established firm. Therefore, preferred stock may not act differently from common stock. Another explanation may be that the pre-IPO owners needed to raise a greater amount of equity via common stock but were not willing to relinquish control of the company. Thus, these owners

maintained greater control via preferred stock; however, such control had no effect (either way) on firm performance.

Preferred Stock Outstanding Further Research

The present study did not address the amount of preferred stock outstanding or the amount of dividends paid. It might be informative to know whether IPOs that paid dividends performed better than those IPOs that did not pay dividends. As well as whether wealth creation varied among IPOs that had preferred stock outstanding (i.e., whether firms with more preferred stock outstanding performed worse or better). The current study did not inquire as to the status of the preferred stock outstanding after the initial public offering. It might be informative to know whether or not the owners of the preferred stock later traded or converted (to common stock) the preferred stock and whether this action had an effect on firm wealth creation.

Board Stock Options Implications/Explanations

Results indicated that there was not a statistically significant difference between IPOs that granted stock options to their board of directors (in terms of wealth creation) and IPOs that did not do so. The current study hypothesized that there was a positive relationship between board stock options and wealth creation. The result implies that at the time of the IPO the granting of stock options does not affect firm wealth creation. This result may have several causes. First, the board of directors may be composed of individuals who are already shareholders of the company, and the granting of options does not significantly improve their ownership interest. Sec-

ond, the number of options granted may not significantly improve the overall wealth of the board members; that is, the members may have other income or assets far in excess of the value or future expected value of the options. Third, the board members who were not pre-IPO owners but who have received stock may not be effective in influencing the board because of duality, independence, or other issues.

Board Stock Options Further Research

Like preferred stock outstanding, the value of the stock options was not considered. Further research is required to know the median value of the options granted and whether there was a difference in wealth creation between firms that granted options above the median and firms that granted options below the median (i.e., whether firms performed better that granted more options or less). Knowledge of the length of time before the option was redeemable may also be useful. There is a growing discussion in the literature about how long options should be held before redemption for the option to have the desired (e.g., wealth creation/financial performance) effect. The literature proposes that the longer the individual must wait before redemption, the greater the effect of granting options should be.

Healthcare Firms

Percentage Equity Implications/Explanations

Results indicated that there was no significant statistical difference between IPOs that stated their intention to retain a greater percentage of the common equity in the firm at the time of the initial public offering and IPOs that stated their intention to

retain a lesser percentage of the equity in the IPO in terms of wealth creation. This finding is counter to the hypothesis and to the biotechnology findings and is also one of the more difficult results to explain because its implications are counter to the underlying principle of agency theory–the dispersion of ownership from control. What this finding suggests is that the dispersion of ownership from control may not matter. An alternative explanation may be that there are other influences such as timing or overall need for capital within the market sector that explain wealth creation.

Percentage Equity Further Research

Additional research is needed to know whether there is a relationship between the percentage of equity that the firm is selling and the overall size of the organization. In other words, the pre-IPO owners may be selling 50 percent of the firm's equity; however, this percentage may represent only $10,000,000, which may be found to be a small amount of capital relative to other firms within this market sector or for the growth potential of the firm.

Venture Capital Involvement Implications/Explanations

Results indicated that within healthcare firms there was not a significant statistical difference between IPOs that engaged venture capital firms and IPOs that did not do so with respect to wealth creation. This finding did not support Hypothesis 1 which proposed that there was a significant, positive relationship between VCI and wealth creation. The implications of the findings are that within this market sector VCI may neither create value nor destroy value. However, this explanation may not

be the only one. An alternative explanation might be that (a) venture capital firms investing within the healthcare market sector had access to new ventures with below average potential, and their value-adding activities improved the performance of the new ventures; (b) the venture capitalists merely acted as financial intermediaries (picking neither good nor bad prospects), and their activities (if any) had no effect; or (c) the venture capitalists had access to new ventures with worse than average prospects, but their activities increased the performance of these new ventures.

Venture Capital Involvement Further Research

Further research is required with regard to differences between industries (e.g., nursing homes and medical equipment manufacturers). Similarly, it may be instructive to know whether this market sector itself could be separated into distinct market sectors and whether there were differences between wealth creations within these new market sectors (e.g., medical devices and healthcare services & facilities).

Further research is needed to determine whether specific venture capital firms performed better than others and whether specialists performed better than generalist venture capital firms. Also, it would be informative to know whether the venture capital firms engaged by the biotechnology firms that created (or destroyed) wealth were also engaged by healthcare firms that created (or destroyed) wealth (i.e., whether venture capital firms had consistent results across market sectors).

The other side of this issue is that of the entrepreneur. Additional research is needed to know whether and, if so, in what form serial entrepreneurs (i.e., entrepreneurs that have formed multiple ventures) engaged venture capitalists.

Further Research

Several areas within the agency theory literature were not tested within the current study, including the issues of duality, board independence, and founder status. The first two issues are associated with firms regardless of the size or age of the firms and have been discussed at length in Chapter 2. The issue of founder status may be especially pertinent to IPOs because founder status may shed some light on the activities of the venture capital firms and the IPOs' boards.' Most of the literature associated with founder status has asserted that there is a positive correlation between firm performance and the founder actively engaged in the firm's activities (either as CEO or as chairman). Additional research is required to know whether this assertion held true for healthcare and biotechnology firms.

Tracking of these firms over a longer period to monitor their performance is needed. The present study used 3-year averages of three financial variables. It is also noteworthy that the period of study (1996-1999) was considered a "hot market." The market has "cooled" since, and it would be informative to view the performance of such firms given this type of market. Several studies (Bygraves & Timmons, 1991; Shepard & Zacharakis, 2001) have noted the potential impact of hot markets on the performance of new ventures (and thus venture capitalists). Hence, new ventures that have gone public since this time of hot markets should be added to the study.

Shepard and Zacharakis (2001) also noted that there was a difference between industries and the speed to the initial public offering (i.e., the time from firm origination to IPO). Studying the speed to IPO may help explain the differences between biotechnology and healthcare firms (i.e., whether healthcare firms incubate for a

shorter period and whether a shorter period of incubation had an effect on firm performance and/or the independent variables).

The adjustment in the calculation of EVA involving the addition of research and development dollars was noted earlier. This adjustment may have had a disproportionate effect on biotechnology firms. This issue should be studied further (along with the studying of the capital structure of these firms), as should the issue of whether this variable (EVA) is appropriate for studying biotechnology firms given the potential effects of the variable. It should be noted that such research is beyond the scope of the present study, and that there was nothing found in the literature related to this issue; however, EVA was touted as being the most accurate means of calculating wealth creation regardless of firm size, age, or industry.

EVA has also been portrayed as a managerial measure that lets managers measure the use of scarce resources. This portrayal does not seem to be the case with respect to the adjustment (or at least the amount of the adjustment) of research and development funds. In other words, the acceptance "at face value" of the addition of all research and development dollars regardless of their actual future benefit is questionable.

In addition, the current study has defined wealth creation in terms of financial measurements. Performing a similar analysis and adding the (dependent) variable of stock price may provide additional insight.

The present study concerned IPOs that survived. A small number of firms went public and did not survive 3 years. Understanding the factors associated with firm failure may add to our knowledge of these issues.

Further research is needed to know whether the same venture capital firms invested in both market sectors and whether there were performance differences between sectors for these venture capital firms. If this activity were found to be true, it would be informative to know whether these venture capital firms had a preference (i.e., where the firms would spend their dollars if they had to choose between the two sectors), and whether the companies invested in both sectors not by choice but because they had additional funds available. Furthermore, if this activity were found to be true, additional research would be required on whether this second area of investing received as much "active" investment or whether the venture capital firms were merely acting as financial intermediaries.

Finally, the assumption was made that these firms went public to raise capital to grow. Exploring the nature of this growth would be useful. For example, the biotechnology sector could be separated into strategic groups based on the strategic dimensions of growth (internal growth or external acquisition) and strategic scope (focus or diversification). The third dimension of disease (e.g., cancer and heart) could be added. A cluster analysis could be used to determine groupings. This information, like all of the information in the present study, is readily available in the firms' public filings.

Limitations

Several limitations exist. The primary issue is one of generalizability. The current study focused on IPOs and specifically on healthcare IPOs. Further study is needed to determine whether these findings are generalizable to firms (public and

private) at different stages in their evolution. It is unknown whether the results are generalizable to nonhealthcare firms regardless of stage.

Also, as noted above, these firms went public during a "hot market." It is unknown whether firms that went public during different market cycles would achieve similar results.

Survival may be a limitation issue with respect to generalizability. To be selected for inclusion in the present study, all firms must have survived 3 years after the initial public offering. Therefore, the findings may not apply to firms that failed to survive 3 years.

It is also noted that the sample size was small. In the future, additional years are available to be added via the Internet that should help address this issue.

Conclusion

As hypothesized, the current study's results showed a difference between healthcare firms and biotechnology firms in terms of factors that influence wealth creation. Further research is needed to better explain the characteristics of these differences. The results do appear, however, to justify the underlying assumption that biotechnology and healthcare firms are distinctly different and that the bifurcation of the overall healthcare industry in studies of a similar nature is warranted.

The overall implication to theory and practice is that these agency control mechanisms are not found to significantly affect wealth creation in one market sector and are found to affect wealth creation only partially in another sector. Dalton et al. (2003) performed a meta-analysis of the literature related to financial performance

and equity. The findings of Dalton et al. (2003) suggest few examples of a systematic relationship between ownership and performance; thus, they surmise that there is little support for agency theory. Nevertheless, the majority of the studies within the analysis were noted to be of large firms, and Dalton et al. (2003) proposed that the "research . . . does not include, for example, initial public offerings (IPOs). This may be an area, however, wherein the equity of various parties may be associated with performance." The findings in the present study on healthcare IPOs support this assertion in one of its two market sectors, although not as predicted.

The current study sought to fill in the gap with regard to agency issues and IPOs per Daily et al.'s (2002) and Dalton et al.'s (2003) recommendations and explored the financial aspects of business-level market entry strategies such as venture capital investment in healthcare firms per Ginter and Duncan's (2000) suggestion. Given the empirical work that has been performed to date, the findings are (not surprisingly) mixed. Thus, the author of the present study agrees with Dalton et al.'s (2003: 20) suggestion that there is a "need to consider alternative theoretical lens." As several authors (Eisenhardt, 1988; Kuhn, 1962) have suggested, varying perspectives add to the robustness in explaining a phenomenon by emphasizing different, complementary facets. Perhaps the time has come to study these issues from a different theoretical perspective.

LIST OF REFERENCES

Abrahamson, E., & Park, C. 1994. Concealment of negative organizational outcomes: An agency theory perspective. ***Academy of Management Journal***, 37(5): 1302-1335.

Aggarwal, R., & Rivoli, P. 1991. Evaluating the cost of raising capital through an initial public offering. ***Journal of Business Venturing***, 6: 351-361.

Ahuja, G., & Lampert, C.M. 2001. Entrepreneurship in the large corporation: A longitudinal study of how established firms create breakthrough inventions. ***Strategic Management Journal***, 22: 521-543.

Alchian, A. A., & Demsetz, H. 1972. Production, information costs, and economic organization. ***American Economic Review***, 62: 777-795.

Aldrich, H. E., & Martinez, M. A. 2001. Many are called, but few are chosen: An evolutionary perspective for the study of entrepreneurship. ***Entrepreneurship: Theory & Practice***, 25(4): 41-57.

Amihud, Y., & Lev, B. 1981. Risk reduction as a managerial motive for conglomerate mergers. ***Bell Journal of Economics***, 605-617.

Amit, R., & Glosten, L. 1993. Challenges to theory development in entrepreneurship research. ***Journal of Management Studies***, 30(5): 815-835.

Amit, R., Glosten, L., & Muller, E. 1990a. Does venture capital foster the most promising entrepreneurial firms? ***California Management Review***, Spring: 102-111.

Amit, R., Glosten, L., & Muller, E. 1990b. Entrepreneurial ability, venture investments, and risk sharing. ***Management Science***, 36(10): 1232-1245.

Andrews, W. A., & Dowling, M.J. 1998. Explaining performance changes in newly privatized firms. ***Journal of Management Studies***, 35(5): 601-618.

Ang, J. S., Cole, R. A., & Lin, J. W. 2000. Agency costs and ownership structure. ***Journal of Finance***, 55(1): 81-106.

Appleby, C. 1997. The new lingo of added value. ***Hospitals & Health Networks***, 71(3): 50-52.

Arrow, K. J. 1964. Control in large organizations. ***Management Science***, 10(3): 397-408.

Bailiga, B. R., Moyer, R. C., & Rao, R. S. 1996. CEO duality and firm performance: What's the fuss? ***Strategic Management Journal***, 17(1): 41-54.

Baker, G. P., Jensen, M. C., & Murphy, K. J. 1986. Compensation and incentives: Practice vs. theory. ***The Journal of Finance***, 43(3): 593-616.

Balkin, D. B. & Gomez-Mejia, L. R. 1987. Toward a contingency theory of compensation strategy. ***Strategic Management Journal***, 8(2): 169-183.

Balkin, D. B., Markman, G. D., & Gomez-Meijia, L. R. 2000. Is CEO pay in high-technology firms related to innovation? ***Academy of Management Journal***, 43(6): 1118-1129.

Barney, J. B. 2002. ***Gaining and sustaining competitive advantage.*** Upper Saddle River, NJ: Prentice Hall.

Baron, D. P. & Holmstrom, B. 1980. The investment banking contract for new issues under asymmetric information: Delegation and the incentive problem. ***Journal of Finance***, 35(5): 1115-1138.

Barringer, B. R., & Bluedorn, A. C. 1999. The relationship between corporate entrepreneurship and strategic management. ***Strategic Management Journal***, 20: 421-444.

Barry, C. B. 1994. New directions in research on venture capital finance. ***Financial Management***, 23(3): 3-19.

Barry, C. B., Muscarella, C. J., Peavy, J. W., & Vetsuypens, M.R. 1990. The role of venture capital in the creation of public companies. ***Journal of Financial Economics***, 27: 447-471.

Bartlett, J. W. 1999. ***Fundamentals of venture capital.*** Lanham, MA: Madison Books.

Baumol, W. J. 1958. On the theory of oligopoly, ***Economica***, 25(99): 187-198.

Baumol, W. J. 1962. On the theory of expansion of the firm, ***American Economic Review***, 52(5): 1078-1087.

Baumol, W. J. 1968. Entrepreneurship in economic theory, ***American Economic Review***, Papers and Proceedings of the Eightieth Annual Meeting of the American Economic Association, 58(2): 64-71.

Baysinger, B., & Hoskisson, R. E. 1990a. Organizational performance and adaptation: Effects of environment and performance on changes in board composition. ***Academy of Management Review***, 34: 805-826.

Baysinger, B., & Hoskisson, R. E. 1990b. The composition of boards of directors and strategic control: Effects on corporate strategy. ***Academy of Management Review***, 15(1): 72-87.

Baysinger, B. D., Kosnik, R. D., & Turk, T. A. 1991. Effects of board and ownership structure on corporate R & D strategy. ***Academy of Management Journal***, 34(1): 205-214.

Beatty, R. P., & Zajac, E. J. 1994. Managerial incentives, monitoring, and risk bearing: A study of executive compensation, ownership, and board structure in initial public offerings. ***Administrative Science Quarterly***, 39(2): 313-328.

Begley, T. M., & Boyd, D. P. 1987. A Comparison of Entrepreneurs and Managers of Small Business Firms. ***Journal of Management***, 13(1): 99-108.

Berle, A. A., & Means, G. C., 1932. ***The modern corporation and private property***, New York: Harcourt, Brace & World.

Biospace.com. 2003. Biotech IPOs, http://www.biospace.com, 8/02-4/03.

Bio.org. 2003. U.S. Biotech IPOs, http://www.bio.org/investor/signs/200210ipo/.asp, 8/02-4/03.

Blendon, R. J., & Benson, J. M. 2001. Americans' views on health policy: A fifty-year historical perspective. ***Health Affairs***, 20(2): 33-46.

Blendon, R. J., Scoles, K., DesRoches, C., & Young, J. T. 2001. Americans' health priorities: Curing cancer and controlling costs. ***Health Affairs***, 20(6): 222-230.

Bloom, M., & Milkovich, G. T. 1998. Relationships among risk, incentive pay, and organizational performance. ***Academy of Management Journal***, 41(3): 283-297.

Bohren, O. 1998. The agent's ethics in the principle-agent model. ***Journal of Business Ethics***, 17(7): 745-755.

Bouillet-Cordonnier, G. 1992. Legal aspects of start-up evaluation and adjustment methods. ***Journal of Business Venturing***, 7: 91-101.

Boyd, B. K. 1994. Board control and CEO compensation. ***Strategic Management Journal***, 15(5): 335-345.

Boyd, B. K. 1995. CEO duality and firm performance: A contingency model. ***Strategic Management Journal***, 16(4): 301-12.

Brandes, P., Dharwadkar, R., & Lemesis, G. V. 2003. Effective employee stock option design: Reconciling stakeholder, strategic, and motivational factors. ***Academy of Management Executive***, 17(1): 77-93.

Brav, A., & Gompers, P.A. 1997. Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies. ***Journal of Finance***, 52(5): 1791-1821.

Brazeal, D. V., & Herbert, T. T. 1999. The genesis of entrepreneurship. ***Entrepreneurship: Theory & Practice***, Spring: 29-45.

Brenner, M. 2000. Altering the terms of executive stock options. ***Journal of Financial Economics***, 57(1): 103-128.

Brophy, D. J., & Shulman, J. M. 1992. A finance perspective on entrepreneurship research. ***Entrepreneurship: Theory & Practice***, Spring: 61-71.

Brown, T. E., Davidson, P., & Wiklund, J. 2001. An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior. ***Strategic Management Journal***, 22:953-968.

Brush, T. H., Bromley, P., & Hendrix, M. 2000. The free cash flow hypothesis for sales growth and firm performance. ***Strategic Management Journal***, 21(4): 455-472.

Bruton, G., Fried, V., & Hisrich, R. D. 1997. Venture capitalist and CEO dismissal. ***Entrepreneurship: Theory & Practice***, Spring: 41-54.

Bulmash, S. 1986. An agency perspective of the firm's life-cycle. ***Managerial And Decision Economics***, 7:107-111.

Bygraves, W. D., & Hofer, C. W. 1991. Theorizing about entrepreneurship. ***Entrepreneurship: Theory & Practice***, Winter: 13-21.

Bygraves, W. D., & Timmons, J. A. 1991. ***Venture and risk capital: Practice and performance, promises and policy***. Boston: Harvard Business School Press.

Bygraves, W. D., & Timmons, J. A. 1992. ***Venture capital at the crossroads***. Boston: Harvard Business School Press.

Byrne, B. M. 1998. ***Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming***, Mahwaw, NJ: Erlbaum.

Carland, J. W., Hoy, F., Boulton, W. R., & Carland, J. A. 1984. Differentiating entrepreneurs from small business owners: A conceptualization. ***Academy of Management Review***, 9(2): 354-359.

Carpenter, J. N., & Remmers, B. 2001. Executive stock option exercises and inside information. ***Journal of Business***, 74(4): 513-534.

Carpenter, M. A. 2000. The price of change: The role of CEO compensation in strategic variation and deviation from industry strategy norms. ***Journal of Management***, 26(6): 1179-1198.

Chaganti, R. S., Mahajan, V., & Sharma, S. 1985. Corporate board size, composition, and corporate failures in retailing industries. ***Journal of Management Studies***, 22(4): 400-417.

Chandler, G. N., & Lyon, D. W. 2001. Issues of research design and construct measurement in entrepreneurship research: The past decade. ***Entrepreneurship: Theory & Practice***, 25(4): 101-114.

Chang, S. J. 2003. Ownership structure, expropriation, and performance of group-affiliated companies in Korea. ***Academy of Management Journal***, 46(2): 238-254.

Cheah, H. B. 1990. Schumpeterian and Austrian entrepreneurship: Unity within duality. ***Journal of Business Venturing***, 5: 341-347.

Chen, H. C., & Ritter, J. R. 2000. The seven percent solution. ***Journal of Finance***, 55(3): 1105-1131.

Chen, S., &. Dodd, J. L. 1997. Economic value added: An empirical examination of a new corporate performance measure. ***Journal of Managerial Issues***, 9(3): 318-333.

Child, J. 1972. Organizational structure, environment, and performance–the role of strategic choice, ***Sociology***, 6:1-22.

Christenson, C. M. 2000. ***The innovator's dilemma***, Boston: HarperBusiness.

Christenson, C. M., Bohmer, R., & Kenagy, J. 2000. Will disruptive innovations cure health care? ***Harvard Business Review***, September/October: 102-112.

Cleverley, W. O. 1993. Economic value added–A framework for healthcare executive compensation, ***Hospital & Health Services Administration***, 38(2): 215-225.

Cleverley, W. O. 2000. Calculating the true value of healthcare organizations, **Healthcare Financial Management Review,** 4-8.

Coase, R. H. 1937. The nature of the firm. ***Economica***, 4: 387-405.

Coles, J. W., & Hesterly, W. S. 2000. Independence of the chairman and board composition: Firm choices and shareholder value. ***Journal of Management***, 26(2): 195-215.

Coles, J. W., McWilliams, V. B., & Sen, N. 2001. An examination of the relationship of governance mechanisms to performance. ***Journal of Management***, 27(1): 23-50.

Colvin, G. 2000. America's best & worst wealth creators. ***Fortune***, 142: 207-213.

Copeland, T., Koller, T. & Murrin, J. 2000. ***Valuation: Measuring and managing the value of companies***. New York: John Wiley & Sons.

Cooper, D., & Petry, G. 1994. Corporate performance and adherence to shareholder wealth-maximizing principles. ***Financial Management***, 23(1): 71-79.

Core, J. E., Holthausen, R. W., & Larcker, D. F. 1999. Corporate governance, chief executive officer compensation, and firm performance. ***Journal of Financial Economics***, 51(3): 371-406.

Covin, J. G. 1991. Entrepreneurial versus conservative firms: A comparison of strategies and performance. ***Journal of Management Studies***, 28(5): 439-462.

Covin, J. G., & Slevin, D. P. 1990. New venture strategic posture, structure, and performance: An industry life cycle analysis. ***Journal of Business Venturing***, 5: 123-135.

Covin, J. G., & Slevin, D.P. 1991. A conceptual model of entrepreneurship as firm behavior. ***Entrepreneurship: Theory & Practice***, Fall: 7-25.

Cutler, D. M. & McClellan, M. 2001. Is technological change in medicine worth it? ***Health Affairs***, 20(5): 11-29.

Daily, C. M. & Dalton, D. R. 1992. The relationship between governance structure and corporate performance in entrepreneurial firms. ***Journal of Business Venturing***, 7: 375-386.

Daily, C. M., & Dalton, D. R. 1994. Bankruptcy and corporate governance: The impact of board composition and structure. ***Academy of Management Journal***, 37(6): 1603-1617.

Daily, C. M., & Dalton, D. R. 1997. CEO and board chair roles held jointly or separately: Much ado about nothing? ***Academy of Management Executive***, 11(3): 11-22.

Daily, C. M., Dalton, D. R., & Rajapolan, N. 2003. Governance through ownership: Centuries of practice, decades of research. ***Academy of Management Journal***, 46(2):151-158.

Daily, C. M., & Johnson, J. L. 1997. Sources of CEO power and firm financial performance: A longitudinal assessment. ***Journal of Management***, 23(2): 97-117.

Daily, C. M., Johnson, J. L., Ellstrand, A. E., & Dalton, D. R. 1998. Compensation committee composition as a determinant of CEO compensation. ***Academy of Management Journal***, 41(2): 209-220.

Daily, C. M., McDougall, P. P., Covin, J. G., & Dalton, D. R. 2002. Governance and srategic leadership in entrepreneurial firms. ***Journal of Management***, 28(3): 387-412.

Dalton, D. R., Daily, C. M., Certo, S. T., & Roengpity, R. 2003. Meta-analyses of financial performance and equity: Fusion or confusion? ***Academy of Management Journal***, 46(1): 13-26.

Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. 1998. Meta-analytic reviews of board composition, leadership structure, and financial performance. ***Strategic Management Journal***, 19: 269-290.

Davidson, P., Low, M. B., & Wright, M. 2001. Editor's introduction: Low and MacMillan ten years on: Achievements and future directions for entrepreneurship research. ***Entrepreneurship: Theory & Practice***, 25(4): 5-15.

Davidson, P., & Wiklund, J., 2001. Levels of analysis in entrepreneurship research: Current research practice and suggestions for the future. ***Entrepreneurship: Theory & Practice***, 25(4): 81-99.

Davidson, W. N., Worrell, D. L, & Nemec, C. 1998. CEO duality, succession-planning and agency theory: Research agenda. ***Strategic Management Journal***, 19(9): 905-908.

Davis, J. H., Schoorman, D., & Donaldson, L. 1997a. Davis, Schoorman, and Donaldson reply: The disectionness of agency theory and stewardship theory. ***Academy of Management Review***, 22(3): 611-613.

Davis, J. H., Schoorman, F. D., & Donaldson, L. 1997b. Toward a stewardship theory of management. ***Academy of Management Review***, 22(1): 20-47.

Deckop, J. R., Mangel, R., & Cirka, C. C. 1999. Getting more than you pay for: Organizational citizenship behavior and pay-for-performance. **Academy of *Management Journal***, 42(4): 420-428.

Deeds, D. L., DeCarolis, D., & Coombs, J. E. 1998. Firm-specific resources and wealth creation in high-technology ventures: Evidence from newly public biotechnology firms. ***Entrepreneurship: Theory & Practice***, 22(3): 55-73.

Demsetz, H. 1983. The structure of ownership and the theory of the firm. ***Journal of Law and Economics***, 26: 375-390.

Demsetz, H., & Ricardo-Campbell, R. 1983. The structure of ownership and the theory of the firm/Comment. ***Journal of Law and Economics***, 26(2): 375-394.

Denis, D. J., & Sarin, A. 1999. Ownership and board structures in publicly traded corporations. ***Journal of Financial Economics***, 52(2): 187-223.

Dess, G. G., Lumpkin, G. T., & Covin, J. G. 1997. Entrepreneurial strategy making and firm performance: Tests of contingency and configurational models. ***Strategic Management Journal***, 18(9): 677-695.

Dial, J., & Murphy, K. J. 1995. Incentives, downsizing, and value creation at General Dynamics. ***Journal of Financial Economics***, 37(3): 261-315.

Directorship. 2001. New director pay survey, 27(7): 18.

Donaldson, L., & Davis, J. 1991. Stewardship theory or agency theory: CEO governance and shareholder returns. ***Australian Management Journal***, 16(1): 49-64.

Drucker, P. F. 1984. Our entrepreneurial economy. ***Harvard Business Review***, 62(1): 59-64.

Drucker, P. 1985. ***Innovation and entrepreneurship***, New York: HarperBusiness.

Drucker, P. 1995. The information executives truly need. ***Harvard Business Review***, 73, 54- 62.

Duchesneau, D. A., & Gartner, W. B. 1990. A profile of new venture success and failure in an emerging industry. ***Journal of Business Venturing***, 5: 297-312.

Duncan, W. J., 2001. Stock ownership and work motivation. ***Organizational Dynamics***, 30(1): 1-11.

Edgar-Online. 2002. http://www.edgar-online, 3/02-12/02.

Ehrbar, A. 2000. Closing the GAAP between earnings and EVA. In F. J. Fabozzi & J. L. Grant (Eds.), ***Value-based metrics: Foundations and practice***, New Hope, PA: Fabozzi Associates.

Eisenberg, T., Sundren, S., & Wells, M. T. 1998. Larger board size and decreasing firm value in small firms. ***Journal of Financial Economics***, 48:35-54.

Eisenhardt, K. M. 1985. Control: Organizational and economic approaches. ***Management Science***, 31(2): 134-149.

Eisenhardt, K. M. 1988. Agency–and institutional–theory explanations: The case of retail sales compensation. ***Academy of Management Journal***, 31(3): 458-511.

Eisenhardt, K. M. 1989. Agency theory: An assessment and review. ***Academy of Management Review***, 14(1): 57-74.

Elango, B., Fried, V. H., Hisrich, R. D., Polonchek, A. 1995. How venture capital firms differ. ***Journal of Business Venturing***, 10: 157-179.

Ernst & Young. 2002. http://www.ey.com/global/content.nsf/International/ Industries_Health_Sciences, 5/02-3/03.

Fama, E. F. 1980. Agency problems and the theory of the firm. ***The Journal of Political Economy***, 88(2): 288-307.

Fama, E. F., & French, K.R. 1999. The corporate cost of capital and the return on corporate investment. ***Journal of Finance***, 44(6): 1939-1967.

Fama, E. F., & Jensen, M. C. 1983a. Separation of ownership and control. ***Journal of Law and Economics***, 26(2): 301-326.

Fama, E. F., & Jensen, M. C. 1983b. Agency problems and residual claims. ***Journal of Law and Economics***, 26: 327-349.

Federal Reserve, 2003. http://www.federalreserve.gov/releases/h15/data/a/tcm10y.txt, 2/03.

Fiegener, M. K. 2000. CEO stakes and board composition in small private firms. ***Entrepreneurship: Theory & Practice***, 24(4): 5-25.

Fiet, J. O. 1997. Fragmentation in the market for venture capital. ***Entrepreneurship: Theory & Practice***, Winter: 5-20.

Finkelstein, S., & D'Aveni, R. A. 1994. CEO duality as a double-edged sword: How boards of directors balance entrenchment avoidance and unity of command. ***Academy of Management Journal***, 37(5): 1079-1098.

Finkelstein, S., & Hambrick, D.C. 1988. Chief executive compensation: A synthesis and reconciliation. ***Strategic Management Journal***, 9(6): 543-559.

Finkelstein, S., & Hambrick, D.C. 1989. Chief executive compensation. ***Strategic Management Journal***, 10(2): 121-135.

Finkle, T. A. 1998. The relationship between boards of directors and initial public offerings in the biotechnology industry. ***Entrepreneurship: Theory & Practice***, Spring: 5-29.

Fitzroy Dearborn International Directory of Venture Capital Funds 1998-1999. 1998. Chicago: Fitzroy Dearborn.

Ford, R. H. 1988. Outside directors and the privately-owned firm: Are they necessary? ***Entrepreneurship: Theory & Practice***, Fall: 49-57.

Foster, R. N. 1986. ***Innovation: The attacker's advantage***, New York: Summit Books.

Foster, R. N., & Kaplan, S. 2001. ***Creative destruction***, New York: Currency.

Fox, M. A., & Hamilton, R. T. 1994. Ownership and diversification: Agency theory or stewardship theory. ***Journal of Management Studies***, 31(1): 69-82.

Freeman, R. E. 1984. ***Strategic management: A stakeholder approach***, Boston: Pittman.

Fried, V. H,. & Hisrich, R. D. 1988. Venture capital research: Past, present, and future. ***Entrepreneurship: Theory & Practice***, Fall: 15-28.

Fried, V. H., & Hisrich, R. D. 1994. Toward a model of venture capital investment decision making. ***Financial Management***, 23(3): 28-41.

Fried, V. H., Bruton, G. D., & Hisrich, R. D. 1998. Strategy and the board of directors in venture capital-backed firms. ***Journal of Business Venturing***, 13: 493-503.

Gapenski, L. C. 1996. Using MVA and EVA to measure financial performance. ***Healthcare Financial Management***, 50(3) 56-60.

Gapenski, L. C. 1999. ***Healthcare finance***. Chicago: Health Administration Press.

Gartner, W. B. 1985. A conceptual framework for describing the phenomenon of new venture creation. ***Academy of Management Review***, 10(4): 696-706.

Gartner, W. B. 1990. What are we talking about when we talk about entrepreneurship? ***Journal of Business Venturing***, 5: 15-28.

Gerhart, B., & Trevor, C.O. 1996. Employment variability under different managerial compensation systems. ***Academy of Management Journal***, 39(6): 1692-1712.

Ginter, P. M., & Duncan, W. J. 2000. The content of health care strategy. ***Advances in Health Care Management***, 1: 35-65.

Gomez-Mejia, L. R., Larraza-Kintant, M., & Makri, M. 2003. The determinants of executive compensation in family-controlled public corporations. ***Academy of Management Journal***, 46(2):226-237.

Gomez-Mejia, L., & Wiseman, R. M. 1997. Reframing executive compensation: An assessment and outlook. ***Journal of Management***, 23(3): 291-374.

Gompers, P. A. 1996. Grandstanding in the venture capital industry. ***Journal of Financial Economics***, 42:133-156.

Gompers, P. A., & Lerner, J. 1998. What drives venture capital fundraising? ***Brookings Papers: Microeconomics 1998***, 149-192.

Gompers, P. A., & Lerner, J. 1999. Conflict of interest in the issuance of public securities: Evidence from venture capital. ***Journal of Law and Economics***, 42: 1-28.

Goodstein, J. B., & Boeker, W. 1991. Turbulence at the top: A new perspective on governance structure changes and strategic change. ***Academy of Management Journal***. 34(2): 306-331.

Govindarajan, V., & Fisher, J. 1990. Strategy, control systems, and resource sharing. ***Academy of Management Journal***, 33(2): 259-286.

Grant, J. L. 2000. ***Foundations of economic value added***, New Hope, PA: Fabozzi Associates.

Gray, S. R., & Cannella, A. A. 1997. The role of risk in executive compensation. ***Journal of Management***, 23(4): 517-540.

Grossman, S. J., & Hart, O.D. 1986. The costs and benefits of ownership: A theory of vertical and lateral integration. ***Journal of Political Economy***, 94(4): 691-719.

Guay, W. R. 1999. The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants. ***Journal of Financial Economics***, 53(1): 43-71.

Gupta, A. K., & Sapienza, H. J. 1992. Determinants of venture capital firms' preferences regarding the industry diversity and geographic scope of their investments. ***Journal of Business Venturing***, 7: 347-362.

Guth, W. D. 1995. Theory from field research on firm-level entrepreneurship: A normal science overview. ***Entrepreneurship: Theory & Practice***, 19(3): 169-174.

Halloran, M. 2001. Incentives for board members–a new look at pay for performance. ***Directorship***, May: 8-12.

Hambrick, D. C., & D'Aveni, R.A. 1992. Top team deterioration as part of the downward spiral of large corporate bankruptcies. ***Management Science***, 38(10): 1445-1466.

Hambrick, D. C., & Finkelstein, S. 1995. The effects of ownership structure on conditions at the top: The case of CEO pay raises. ***Strategic Management Journal***, 16(3): 175-194.

Hamel, G. 1998. Strategy innovation and the quest for value. ***Sloan Management Review***, 39(2): 7-14.

Harris, D., & Helfat, C. 1997. Specificity of CEO human capital and compensation. ***Strategic Management Journal***, 18(11): 895-920.

Harris, D., & Helfat, C. E. 1998. CEO duality, succession, capabilities and agency theory: Commentary and research agenda. ***Strategic Management Journal***, 19(9): 901-904.

Hayek, F. A. 1948. ***Individualism and economic order***. London: Routledge and Kegan Paul.

Health Care Financing Administration. 2002. National Health Expenditures Projections: 2001 - 2011, www.hcfa.gov/stats/nhe-proj/proj2001: 1-2.

Hellman, T., & Puri, M. 2002. Venture capital and the professionalization of start-up firms: Empirical evidence. ***Journal of Finance***, 57(1): 169-197.

Hermalin, B., & Wallace, N. 2001. Firm performance and executive compensation in the savings and loan industry. ***Journal of Financial Economics***, 61(1): 139-170.

Hermalin, B. E., & Weisbach, M. S. 1998. Endogenously chosen boards of directors and their monitoring of the CEO. ***American Economic Review***, 88(1): 96-118.

Herzel, L. 1990. Corporate governance through statistical eyes. ***Journal of Financial Economics***, 27(2): 581-594.

Hill, C. W. L., & Snell, S.A. 1988. External control, corporate strategy, and firm performance in research-intensive industries. ***Strategic Management Journal***, 9: 577-590.

Hillman, A. J., Cannella, A. A., & Paetzold, R. L. 2000. The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. ***Journal of Management Studies***, 37(2): 235-255.

Himmelberg, C. P., Hubbard, R. G, & Palia, D. 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. ***Journal of Financial Economics***, 53(3): 353-384.

Howton, S. D., Howton, S. W., & Olson, G T. 2001. Board ownership and IPO returns. ***Journal of Economics and Finance***, 25(1): 100-114.

Hubbard, R. G & Palia, D. 1995. Executive pay and performance: Evidence from the U.S. banking industry. ***Journal of Financial Economics***, 39(1): 105-131.

Hutchinson, P. 1999. Small enterprise: Finance, ownership and control. ***International Journal of Management Reviews***, 1(3): 343-366.

Ibbotson, R. G & Jaffe, J. F. 1975. Hot issue markets. ***Journal of Finance***, 30(4): 1027-1042.

Inglehart, J. K. 2001. America's love affair with medical innovation. ***Health Affairs***, 20(5): 6-7.

Jacobson, R. 1992. The Austrian school of strategy. ***Academy of Management Review***, 17(4): 782-805.

Jain, B. A,. & Kini, O. 1994. The post-issue operating performance of IPO firms. ***Journal of Finance***, 44(5):1699-1726.

Jaklevic, M. C. 2001. IPO resurgence. ***Modern Healthcare***, 31(9): 40-43.

Jensen, M. C. 1983a. Organization theory and methodology. ***The Accounting Review***, 58(2): 319-339.

Jensen, M. C. 1993b. The modern industrial revolution, exit, and the failure of internal control systems. ***Journal of Finance***, 48(3): 831-880.

Jensen, M. C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. ***American Economic Review***, 76.

Jensen, M. C., & Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership. ***Journal of Financial Economics***, 3: 305-360.

Jensen, M. C., & Murphy, K. J. 1990. Performance pay and top-management incentives. ***Journal of Political Economy***, 98(2): 225-264.

Jensen, M. C., & Ruback, R. S. 1983. The market for corporate control: The scientific evidence. ***Journal of Financial Economics***, 11: 5-50.

Johnson, J. L., & Daily, C. M. 1996. Boards of directors: A review and research agenda. ***Journal of Management***, 22(3): 409-439.

Joreskog, K. G., & Goldberger, A. S. 1975. Estimation of a model with multiple indicators and multiple causes of a single latent variable. ***Journal of the American Statistical Association***, 70(351): 631-639.

Joreskog, K. G, & Sorbom, D. 2000. MIMIC models. In ***LISREL 8: User's Reference Guide***, Chapter 5, Chicago: Scientific Software International.

Judge, W. Q., & Zeithaml, C.P. 1992. Institutional and strategic choice perspectives on board involvement in strategic decision process. ***Academy of Management Journal***, 35(4): 766-794.

Kang, J., & Shivdasani, A. 1995. Firm performance, corporate governance, and top executive turnover in Japan. ***Journal of Financial Economics***, 38(1): 29-59.

Kaplan, S. N., & Reishus, D. 1990. Outside directorships and corporate performance. ***Journal of Corporate Performance***, 27(2): 389-411.

Katz, J., & Gartner, W. B. 1988. Properties of emerging organizations. ***Academy of Management Review***, 13(3): 429-441.

Kaysen, C. 1957. The social significance of the modern corporation. ***The American Economic Review: Papers and Proceedings of the Sixty-eighth Annual Meeting of the American Economic Association***, 47(2): 311-319.

Kelloway, F. K. 1998. ***Using LISREL for structural equation modeling: A researcher's guide***, Thousand Oaks, CA: Sage Publications.

Kesner, I. F. 1987. Directors' stock ownership and organizational performance: An investigation of Fortune 500 companies. ***Journal of Management***, 13(3): 499-508.

Kesner, I. F. 1988. Directors' characteristics and committee membership: An investigation of type, occupation, tenure and gender. ***Academy of Management Journal***, 31(1): 66-84.

Kesner, M. S. 1992. Are U.S. executives paid too much? ***CFO***, 8(8): 6-9.

Kim, M., Blendon, R. J., & Benson, J. M. 2001. How interested are Americans in new medical technologies? A multicountry comparison. ***Health Affairs***, 20(5): 194-201.

Kim, M., & Ritter, J. R. 1999. Valuing IPOs. ***Journal of Financial Economics***, 53: 409-437.

Kirilenko, A. A. 2001. Valuation and control in venture finance. ***Journal of Finance***, 46(2): 565-587.

Kirzner, I. M. 1973. ***Competition and entrepreneurship***. Chicago: University of Chicago Press.

Kirzner, I.M. 1997. Entrepreneurial discovery and the competitive market process: An Austrian approach. ***Journal of Economic Literature***, 35:60-85.

Klein, A. 1998. Firm performance and board committee structure. ***Journal of Law and Economics***, 41: 275-303.

Klein, B. 1983. Contracting costs and residual claims: The separation of ownership and control. ***Journal of Law and Economics***, 26:367-374.

Knight, F. H. 1965. ***Risk, uncertainty, & profit***. New York: Harper & Row (originally published in 1921).

Kochhar, R. 1996. Explaining firm capital structure: The role of agency theory vs. transaction cost economics. ***Strategic Management Journal***, 17: 713-728.

Kole, S.R. 1997. The complexity of compensation contracts. ***Journal of Financial Economics***, 43(1): 79-104.

Krigman, L., Shaw, W. H., & Womack, K. L. 1999. The persistence of IPO mispricing and the predictive power of flipping. **Journal of Finance**, 44(3): 1015-1044.

Kuhn, T. S. 1962. ***The structure of scientific revolutions***. Chicago: University of Chicago Press.

Lane, P. J., Canella, A. A., & Lubatkin, M. H. 1998. Agency problems as antecedents to unrelated mergers and diversification: Amihud and Lev reconsidered. ***Strategic Management Journal***, 19(6): 555-578.

Lee, P., & O'Neill, H. M. 2003. Ownership structures and R&D investments of U.S. and Japanese firms: Agency and stewardship perspectives. ***Academy of Management Journal***, 46(2):212-225.

Lehn, K., & Makhija, A. K. 1996. EVA & MVA: As performance measures and signals of strategic change. ***Strategy & Leadership***, 24(4): 34-40.

Lerner, J. 1995. Venture capitalists and the oversight of private firms. ***Journals of Finance***, 50(1): 301-318.

Lewellen, W. G. 1969. Management and ownership in the large firm. ***Journal of Finance***, 24: 299-322.

Li, M., & Simerly, R. 1995. Reexamining the ownership and performance relationship: The moderating effect of environmental change. ***Academy of Management Journal***, Best Paper Proceedings: 27-34.

Li, M., & Simerly, R.L. 1998. The moderating effect of environmental dynamism on the ownership and performance relationship. ***Strategic Management Journal***, 19(2): 169-179.

Lichtenberg, F. R. 2001. Are the benefits of newer drugs worth their cost? Evidence from the 1996 MEPS. ***Health Affairs***, 20(5): 241-251.

Lippert, R. L., & Moore, W. T. 1995. Monitoring versus bonding: Shareholder rights and management compensation. ***Financial Management***, 24(3): 54-62.

Loughran, T., & Ritter, J. R. 1995. The new issue puzzle. ***Journal of Finance***, 50(1): 23-51.

Low, M. B., & MacMillan, I. C. 1988. Entrepreneurship: Past research and future challenges. ***Journal of Management***, 14(2): 139-161.

Mace, M. L. 1971. ***Directors: Myth and reality.*** Boston: Harvard University.

MacMillian, I. C., & Katz, J. A. 1992. Idiosyncratic milieus of entrepreneurial research: The need for comprehensive theories. ***Journal of Business Venturing***, 7: 1-8.

MacMillian, I. C., Siegel, R., & SubbaNarasimha, P. N. 1985. Criteria used by venture capitalists to evaluate new venture proposals. ***Journal of Business Venturing***, I:119-128.

Madhok, A. 1996. The organization of economic activity: Transaction costs, firm capabilities, and the nature of governance. ***Organization Science***, 7(5): 577-590.

Manne, H. G. 1965. Mergers and the market for corporate control. ***Journal of Political Economy***, 73(2): 110-120.

Marino, K. E., Castaldi, R. M., & Dollinger, M. J. 1989. Content analysis in entrepreneurship research: The case of initial public offerings. ***Entrepreneurship: Theory & Practice***, Fall: 51-66.

Markowitz, H. 1959. ***Portfolio selection: Efficient diversification of investments***. New York: Wiley & Sons.

McConaughy, D. L., Dhatt, M. S., & Kim, Y. H. 1996. Agency costs, market discipline and market timing: Evidence from post-IPO operating performance. ***Entrepreneurship: Theory & Practice***, Winter: 43-57.

McDougall, P. P., Covin, J. G., Robinson, R. B., & Herron, L. 1994. The effects of industry growth and strategic breadth on new venture performance and strategy content. ***Strategic Management Journal***, 15: 537-554.

McDougall, P. P., Robinson, R. B., & DeNisi, A. 1992. Modeling new venture performance: An analysis of new venture strategy, industry structure, and venture origin. ***Journal of Business Venturing***, 7: 267-289.

McGrath, R. G., MacMillan, I. C., & Scheinberg, S. 1992. Elitists, risk-takers, and rugged individualists? An exploratory analysis of cultural differences between entrepreneurs and non-entrepreneurs. ***Journal of Business Venturing***, 7: 115-135.

McGuire, J., & Matta, E. 2003. CEO stock options: The silent dimension of ownership. ***Academy of Management Journal***, 46(2):255-270.

McWilliams, V. B., & Sen, N. 1997. Board monitoring and antitakeover amendments. ***Journal of Financial and Quantitative Analysis***, 32(4): 491-505.

Mehran, H. 1995. Executive compensation structure, ownership, and firm performance. ***Journal of Financial Economics***, 38(2): 163-185.

Mello, A. S., & Parsons, J. E. 1998. Going public and the ownership structure of the firm. ***Journal of Financial Economics***, 49: 79-109.

Mikkelson, W. H., Partch, M. M., & Shah, K. 1997. Ownership and operating performance of companies that go public. ***Journal of Financial Economics***, 44: 281-307.

Mills, R., Rowbotham, S., & Roberts, J. 1998. Using economic profit in assessing business performance. ***Management Accounting***, 76(10): 34-38.

Minkes, A. L., & Foxall, G. R. 1982. The bounds of entrepreneurship: Inter-organizational relationships in the process of industrial innovation. ***Managerial And Decision Economics***, 3(1): 41-47.

Mintzberg, H. 1990. Strategy formation: Schools of thought. In J. W. Fredrickson (ed.), ***Perspectives on strategic management***: 105-235.

Mises, L. V. 1949. ***Human action.*** New Haven, CT: Yale University Press.

Mizruchi, M. S. 1983. Who controls whom? An examination of relation between management and boards of directors in large american corporations. ***Academy of Management Review***, 8(3):426-435.

Molinari, C., Alexander, J., Morlock, L., & Lyles, C. A. 1995. Does the hospital board need a doctor? The influence of physician board participation on hospital financial performance. ***Medical Care***, 33(2): 170-185.

Molz, R. 1985. The role of the board of directors: Typologies of interaction. ***The Journal of Business Strategy***, 5: 86-93.

Molz, R. 1988. Managerial domination of boards of directors and financial performance. ***Journal of Business Research***, 16: 235-249.

Montemayor, E. F. 1996. Congruence between pay policy and competitive strategy in high-performance firms. ***Journal of Management***, 22(6): 889-908.

Morck, R., Sheilfer, A., & Vishny, R. W. 1988. Management ownership and market valuation: An empirical analysis. ***Journal of Financial Economics***, 20(1): 293-316.

Morck, R., Schleifer, A., & Vishny, R. W. 1989. Alternative mechanisms for corporate control. ***American Economic Review***, 79(4): 842-852.

Murray, J. A. 1984. A concept of entrepreneurial strategy. ***Strategic Management Journal***, 5: 1-13.

Nandini, R. 1997. Strategic orientations, incentive plan adoptions, and firm performance: Evidence from electric utility firms. ***Strategic Management Journal***, 18(10): 761-785.

National Commission on Entrepreneurship. 2002. NCOE Update - 3.11.02, www.-ncoe.org/newsletter/update/03_11_02: 1-2, 8/02.

Neumann, P. J., & Sandberg, E. A. 1998. Trends in health care R & D and technology innovation. ***Health Affairs***, 17(6): 111-119.

North, D. C. 1983. Comment on Stigler and Friedland, "The literature of economics: The case of Berle and Means." ***Journal of Law and Economics***, 26(2): 269-271.

Norton, E. 1996. Venture capital as an alternative means to allocate capital: An agency-theoretical view. ***Entrepreneurship: Theory & Practice***, Winter: 19-29.

O'Connor, C. M. 2001. Healthcare IPOs sustain market: Last year's debut struggle. ***The IPO Reporter***, August: 4-5.

Ofek, E., & Yermack, D. 2000. Taking stock: Equity-based compensation and the evolution of managerial ownership. ***Journal of Finance***, 55(3): 1367-1384.

Ouchi, W. G., & Maguire, M.A. 1975. Organizational control: Two functions. ***Administrative Science Quarterly***, 20(4): 559-569.

Oviatt, B. M. 1986. Agency and transaction cost perspectives on the manager-shareholder relationship: Incentives for congruent interests. **Academy of *Management Review***, 13(2): 214-225.

Pearce, J. A., & Zahra, S. A. 1991. The relative power of CEOs and boards of directors: Associations with corporate performance. ***Strategic Management Journal***, 12: 135-153.

Pedhazur, E. J., & Schmelkin, L. P. 1991. ***Measurement, design and analysis: An Integrated approach***. Hillsdale, NJ: Erlbaum.

Peterson, J. 2000. EVA: The key to wealth creation. In F. J. Fabozzi & J. L. Grant (Eds.), ***Value-based metrics: Foundations and practice***. New Hope, PA: Fabozzi Associates.

Pfeffer, J. 1972. Size and composition of corporate boards of directors: The organization and its environment, ***Administrative Science Quarterly***, 17(2): 218-228.

Pfeffer, J., & Salancik, G. R. 1978. ***The external control of organizations***. New York: Harper & Row.

Pinchot, G. 1985. ***Intrapreneuring: Why you don't have to leave the corporation to become an etrepreneur***. New York, Harper & Row, Publishers.

Porter, M.C. & Stern, S., 2001. Innovation: Location matters, ***MIT Sloan Management Review***, 42(4): 28-36.

Pratt's Guide to Venture Capital Sources (1996 ed.). Wesley Hills, MA: Capital.

Preston, L. E. 1998. Agents, stewards, and stakeholders. ***Academy of Management Review***, 23(1): 9-11.

Quinn, D. P. & Jones, T. M. 1995. An agent morality view of business policy, ***Academy of Management Review***, 20(1): 22-38.

Read, J. L., & Lee, K.B. 1994. Health care innovation: Progress report and focus on biotechnology. ***Health Affairs***, 13(3): 215-220.

Rechner, P. L., & Dalton, D. R. 1991. CEO duality and organizational performance: A longitudinal assessment. ***Strategic Management Journal***, 12(2): 155-161.

Rediker, K., & Seth, A. 1995. Boards of directors and substitution effects of alternative governance mechanisms. **Strategic Management Journal**, 16(2): 85-100.

Reinhardt, U. E. 2000. Rise & Fall of physician practice management. ***Health Affairs***, 19 (1): 42-55.

Ritter, J. R. 1984. The hot issue market of 1980. ***Journal of Business***. 57(2): 215-240.

Ritter, J. R. 1991. The long-run performance of initial public offerings. ***Journal of Finance***, 45(1): 3-27.

Robbins-Roth, C. 2000. ***From alchemy to IPO***. New York: Perseus.

Robinson, R. R. 1987. Emerging strategies in the venture capital industry. ***Journal of Business Venturing***, 2: 53-77.

Rock, K. 1982. Why new issues are underpriced. ***Journal of Financial Economics***, 15(1/2): 187-212.

Rosenstein, S., & Wyatt, J. G 1990. Outside directors, board independence, and shareholder wealth. ***Journal of Financial Economics***, 26(2): 175-192.

Rosenstein, S., & Wyatt, J. G 1997. Inside directors, board effectiveness, and shareholder wealth. ***Journal of Financial Economics***, 44(2): 229-250.

Ross, S. A. 1973. The economic theory of agency: The principal's problem. ***American Economic Review***, 62: 134-139.

Roztocki, N., & Needy, K. L. 2000. EVA for small manufacturing companies. ***Proceedings of the Society for Advancement of Management (SAM) 1999 International Management Conference***, Las Vegas, Nevada, pp.461-469.

Sahlman, W. A. 1990a. The structure and governance of venture-capital organizations. ***Journal of Financial Economics***, 27: 473-521.

Sahlman, W. A. 1990b. Why sane people shouldn't serve on public boards. **Harvard Business Review**, May/June, 28-35.

Sahlman, W. A. 1994. Insights from the venture capital model of project governance. **Business Economics**, 29(3): 35-38.

Sandberg, W. R. 1992. Strategic management's potential contributions to a theory of entrepreneurship. **Entrepreneurship: Theory & Practice**, 16(3): 73-91.

Sanders, W. G., & Carpenter, M. A. 2003. Strategic satisficing? A behavior-agency theory perspective on stock prepurchase program announcements. **Academy of Management Journal**, 46(2):160-178.

Sanders, W. G, Davis-Blake, W., & Fredrickson, J. W. 1995. Prizes with strings attached: Determinants of the structure of CEO compensation. ***Academy of Management Journal***, Best Papers Proceedings: 266-271.

Sapienza, H. J. 1992. When do venture capitalists add value? ***Journal of Business Venturing***, 7: 9-27.

Sapienza, H. J., & Gupta, A. K. 1994. Impact of agency risk and task uncertainty on venture capital-chief executive officer interaction. ***Academy of Management Journal***, 37(6): 1618-1628.

Sapienza, H. J., Manigart, S., & Vermeir, W. Wim, T. 1995. A comparison of venture capitalist governance and value-added in the U.S. and Western Europe. ***Academy of Management Journal***, Best Papers Proceedings: 105-111.

Sapienza, H. J., Manigart, S., & Vermeir, W. 1996. Venture capitalist governance and value added in four countries. ***Journal of Business Venturing***, 11: 439-469.

Sapienza, H. J., & Timmons, J. A. 1989. The roles of venture capitalists in new ventures: What determines their importance? ***Academy of Management Proceedings***, 74-79.

Say, J. B. 1880. ***A treatise on political economy.*** New York: Kelley.

Schellenger, M. H., Wood, D. D., & Tashakori, A. 1989. Board of director composition, shareholder wealth, and dividend policy. ***Journal of Management***, 15(3): 457-467.

Schendel, D. 1990. Introduction to the special issue on corporate entrepreneurship. ***Strategic Management Journal***, Vol. 11, 1-3.

Schulze, W. S., Lubatkin, M. H., & Dino, R. N. 2003. Exploring the agency consequences of ownership dispersion among the directors of private family firms. ***Academy of Management Journal***, 46(2):179-194.

Schumpeter, J. A. 1969. ***The theory of economic development.*** London: Oxford University Press (originally published in 1932).

Schumpeter, J. A. 1976. ***Capitalism, socialism and democracy***. New York: Harper Brothers (originally published in 1942).

Schwartz, R. G, & Teach, R. D. 2000. Research note: Entrepreneurship research: An empirical perspective. ***Entrepreneurship: Theory & Practice***, Spring: 77-81.

Securities and Exchange Commission. 2002. http//www.sec.gov, 2/02-3/03.

Shane, S. 1995. Is the independent entrepreneurial firm a valuable organizational form? ***Academy of Management Journal, Best Paper Proceedings***, 110-116.

Shane, S. 1996. Explaining variation in rates of entrepreneurship in the United States: 1899-1988. ***Journal of Management***, 22(5): 747-784.

Shane, S., & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. ***The Academy of Management Review***, January.

Sharma, A. 1997. Professional as agent: Knowledge asymmetry in agency exchange. ***Academy of Management Review***, 22(3): 758-798.

Sharma, P., & Chrisman, J. J. 1999. Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship. ***Entrepreneurship: Theory & Practice***, Spring: 11-27.

Shaw, J. D., Gupta, N., & Delery, J. E. 2000. Empirical organizational-level examinations of agency and collaborative predictions of performance-contingent compensation. ***Strategic Management Journal***, 21(5): 611-623.

Shepard, D. A., & Zacharakis, A. 2001. Speed to initial public offering of VC-backed companies. ***Entrepreneurship: Theory & Practice***, 25(3): 59-70.

Shleifer, A., & Vishny, R. W. 1997. A survey of corporate governance. ***Journal of Finance***, 52(2): 737-783.

Simon, H. A. 1961. ***Administrative behavior***. New York: Free Press.

Singh, R. P. 2001. A comment on developing the field of research of entrepreneurship through the study of opportunity recognition and exploitation. ***The Academy of Management Review***, 26(1): 10-12.

Smith, K. G, Gannon, M. J., & Sapienza, H. J. 1989. Selecting methodologies for entrepreneurial research: Trade-offs and guidelines. ***Entrepreneurship: Theory & Practice***, Fall: 39-49.

Sorescu, S. M. 2000. The effect of options on stock prices: 1973 to 1995. ***Journal of Finance***, 55(1): 487-514.

Spence, M., & Zeckhauser, R. 1971. Insurance, information, and individual action. ***American Economic Review***, 61: 380-391.

Stancill, J. M. 1981. Realistic criteria for judging new ventures. ***Harvard Business Review***, November/December: 60-72.

Stearns, L. B., & Mizruchi, M. S. 1993. Board composition and corporate financing: The impact of financial institution representation on borrowing. ***Academy of Management Journal***, 36(3): 603-618.

Steier, L., & Greenwood, R. 1995. Venture capitalist relationships in the deal structuring and post-investment. ***Journal of Management Studies***, 32(3): 337-358.

Stevenson, H. H., & Gumpert, D. E. 1985. The heart of entrepreneurship. ***Harvard Business Review***. 2: 85-94.

Stevenson, H. H., & Jarillo, J. C. 1990. A paradigm of entrepreneurship: Entrepreneurial management. ***Strategic Management Journal***, 11: 17-27.

Stevenson, H. H., & Sahlman, W. A. 1986. In R.D. Hirsch (ed.), ***Entrepreneurship, intrapreneurship, and venture capital***: 28-42. Lexington, MA: Lexington Books.

Stewart, G. B. 1991. ***The quest for value***. New York: HarperBusiness.

Stigler, G. J., & Friedland, C. 1983. The literature of economics: The case of Bearle and Means. ***Journal of Law and Economics***, 26: 237-268.

Stiles, P. 2001. The impact of the board on strategy: An empirical examination. ***Journal of Management Studies***, 38(5): 627-651.

Stinchcombe, A. L. 1965. Social structure and organizations. In J.G. March (Ed.), ***Handbook of organizations***: 142-193. Chicago: Rand McNally.

Stoll, H. R., & Curley, A. J. 1970. Small business and the new issues market for equities. ***Journal of Financial and Quantitative Analysis***, 5(3): 309-322.

Stopford, J. M., & Baden-Fuller, C. W .F. 1994. Creating corporate entrepreneurship. ***Strategic Management Journal***, 15: 521-536.

Stoughton, N. M., & Zechner, J. 1998. IPO-mechanisms, monitoring and ownership structure. ***Journal of Financial Economics***, 49: 45-77.

Stroh, L. K., Brett, J. M., Baumann, J. P., & Reilly, A. H. 1996. Agency theory and variable pay compensation strategies. ***Academy of Management Journal***, 39(3): 751-767.

Studenmund, A. H. 2000. ***Using econometrics: A practical guide***. Boston: Addison Wesley Longman.

Stulz, R. M. 1988. Managerial control of voting rights: Financing policies and the market for corporate control. ***Journal of Financial Economics***, 20: 25-54.

Sundaramurthy, C., & Rechner, P. 1996. Governance antecedents of board entrenchment: The case of classified board provisions. ***Journal of Management***, 22(5): 783-800.

Swartz, J. 1991. The future of the venture capital industry. ***Journal of Business Venturing***, 6: 89-92.

Tabachnick, B. G., & Fidell, L. S. 2001. ***Using multivariate statistics***. Needham Heights, MA: Allyn & Bacon.

Tihanyi, L., Johnson, R. A, Hoskisson, R. E, & Hitt, M. A. 2003. Institutional ownership differences and international diversification: The effects of boards of directors and technological opportunity. ***Academy of Management Journal***, 46(2): 195-211.

Tinic, S. M. 1988. Anatomy of initial public offerings of common stock. ***Journal of Finance***, 43(4): 789-822.

Tosi, H. L., & Gomez-Mejia, L. R. 1989. The decoupling of CEO pay and performance: An agency theory perspective. ***Administrative Science Quarterly***, 34: 169-189.

Tosi, H. I., & Gomez-Mejia, L. R. 1994. CEO compensation monitoring and firm performance. ***Academy of Management Journal***, 37(4): 1002-1017.

Tosi, H. L., Katz, J. P., & Gomez-Mejia, R. 1997. Disaggregating the agency contract: The effects of monitoring, incentive alignment, and term in office on agent decision making. ***Academy of Management Journal***, 40(3): 584-602.

Tosi, H. L., Werner, S., Katz, J. P., & Gomez-Mejia, L. R. 2000. How much does performance matter? A meta-analysis of CEO pay studies. ***Journal of Management***, 26(2): 301-339.

Tyebjee, T. T., & Bruno, A. V. 1984. A model of venture capitalists investment activity. ***Management Science***, 30(9): 1051-1066.

Ucbasaran, D., Westhead, P., & Wright, M. 2001. The focus of entrepreneurial research: Contextual and process issues. ***Entrepreneurship: Theory & Practice***, 25(4): 57-81.

Vance, S. C. 1955. ***Functional control and corporate performance in large scale industrial enterprise***. Amherst, MA: University of Massachusetts.

Vance, S. C. 1968. ***The corporate director: A critical evaluation***. Homewood, IL: Dow Jones.

Vance, S. C. 1978. Corporate governance: Assessing corporate performance by boardroom attributes. ***Journal of Business Research***, 6: 203-220.

VanderWerf, P. A. 1993. A model of venture creation in new industries. ***Entrepreneurship: Theory & Practice***, 17(2):39-49.

Van de Ven, A. H., Hudson, R., & Schroeder, D. M. 1984. Designing new business startups: Entrepreneurial, organizational, and ecological considerations. ***Journal of Management***, 10(1): 87-107.

Vesper, K. H., 1982. Introduction and summary of entrepreneurship research, In C.A. Kent, D.L. Sexton, & K.H. Vesper (Eds.), ***Encyclopedia Of Entrepreneurship***: xxxi-xxxviii, Englewood Cliffs, NJ: Prentice-Hall.

Vinnell, R., & Hamilton, R. T. 1999. A historical perspective on small firm development. ***Entrepreneurship: Theory & Practice***, Summer: 5-18.

Watts, R. L., & Zimmerman, J. L. 1983. Agency problems, auditing, and the theory of the firm: Some evidence. ***Journal of Law and Economics***, 26: 613-632.

Weiss ratings' guide to common stocks fall 2001. 2001. Palm Beach, FL: Weiss Rating.

Welch, I. 2002. IPO Resources, www.iporesources.org.

Westphal, J. D., & Zajac, E. J. 1994. Substance and symbolism in CEO's long-term incentive plans. ***Administrative Science Quarterly***, 39(3): 367-385.

Williams, D. R., & Hernandez, S. R. 2002. ***Innovation and physician practices: The case for social entrepreneurship***. Paper presented at the Academy of Mangement's Annual Meeting, Denver.

Williamson, O. E. 1981. The economics of organization: The transaction cost approach. ***American Journal of Sociology***, 87(3): 548-577.

Williamson, O. E. 1983. Organization form, residual claimants, and corporate control. ***Journal of Law and Economics***, 26(2): 351-367.

Williamson, O. E. 1996. ***The mechanisms of governance***. New York: Oxford University Press.

Worrell, D. L., Nemec, C., & Davidson, W. N. 1997. One hat too many: Key executive plurality and shareholder wealth. ***Strategic Management Journal***, 18(6): 499-507.

Wortman, M. S. 1986. A unified framework, research typologies, and research prospectuses for the interface between entrepreneurship and small business. In D. Sexton & R. W. Smilor (Eds.), ***The art and science of entrepreneurship***: 273-331. Cambridge, MA: Ballinger.

Wortman, M. S. 1987. Entrepreneurship: An integrating typology and evaluation of the empirical research in the field. ***Journal of Management***, 13(2): 259-279.

Wright, P., & Ferris, S. P. 1997. Agency conflict and corporate strategy: The effect of divestment on corporate value. ***Strategic Management Journal***, 18(1): 77-83.

Wright, P., Ferris, S. P., Sarin, A., & Awasthi, V. 1996. Impact of corporate insider, blockholder and institutional equity ownership on firm risk taking. ***Academy of Management Journal***, 39(2): 441-454.

Wright, P., Kroll, M., & Elenkov, D. 2002. Acquisition returns, increase in firm size, and chief executive officer compensation: The moderating role of monitoring. ***Academy of Management Journal***, 45(3): 599-680.

Wruck, K. H. 1989. Equity ownership concentration and firm value: Evidence from private equity financings. ***Journal of Financial Economics***, 23: 3-28.

Yermack, D. 1995. Do corporations award CEO stock options effectively? ***Journal of Financial Economics***, 39(2): 237-270.

Yuan, K. H., & Bentler, P. M. 2001. A unified approach to multigroup structural equation modeling with nonstandard samples. In G. A. Marcoulides, & R. E. Schumacher (Eds.), ***New Developments and Techniques in Structural Equation Modeling***: 57-65. Mahwah, NJ: Erlbaum.

Zahra, S., Kuratko, D. F., & Jennings, D. F. 1999. Corporate entrepreneurship and wealth creation: Contemporary and emerging perspectives. ***Entrepreneurship: Theory & Practice***, 24(2): 5-8.

Zahra, S. A. 1996. Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. ***Academy of Management Journal***, 39(6): 1713-1736.

Zahra, S. A., Neubaum, D. O., & Huse, M. 2000. Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. ***Journal of Management***, 26(5): 947-976.

Zahra, S. A., & Pearce, J. A. 1989. Boards of directors and corporate financial performance: A review and integrative model. ***Journal of Management***, 15(2): 291-334.

Zahra, S. A., & Zay, T. C. 1996. How effective are governance reforms? ***Corporate Boards***, 17: 6-11.

Zald, M. N. 1969. The power and functions of boards of directors: A theoretical synthesis. ***American Journal of Sociology***, 75(1): 97-111.

Zay, T. C., & Zahra, S. 1995. The seven most popular approaches to corporate board reform: Myth or reality? ***Directorship***, 21(7): 6-10.

Zinner, D. E. 2001. Medical R & D at the turn of the millennium. ***Health Affairs***, 20(5): 202-209.

APPENDIX A

FIRMS INCLUDED IN THE STUDY

FIRMS INCLUDED IN THE STUDY

Aastrom Biosciences
ABGenix Inc.
Acreedo Health Inc.
Advance Paradigm Inc.
Advanced Health Corp.
Affymetrix Inc.
Albany Molecular Inc.
Alternative Living Services Inc.
Amarillo Biosciences Inc.
American Dental Partners Inc.
American Physician Partners Inc.
American Retirement Corp.
Ameripath Inc.
Andrx Corp.
Applied Analytical Industries Inc.
Applied Imaging Corp.
Aradigm Corp.
Arqule Inc.
Ascent Pediatrics Inc.
Aspect Medical Systems Inc.
Aurora Biosciences Corp.
Avigen Inc.
Aviron
Balanced Care Corp.
Bigmar Inc.
Bioanalytical Systems Inc.
Biomarin Pharmaceuticals Inc.
Bionx Implants Inc.
Biopure Corp.
Bioreliance Corp.
Bioshield Technologies
Biosite Diagnostics Inc.
Birner Dental Management Services Inc.
Boston Biomedica Inc.
Brookdale Living Communities Inc.
Cadus Pharmaceutical Corp.
Caliper Technologies Inc.
Calypte Biomedical Corp.
Cambridge Heart Inc.
Capital Senior Living Corp.
Cardiac Pathways Inc.
Cardima Inc.
Cardiovascular Dynamics Inc.
Careside Inc.

Castle Dental Centers Inc.
Cell Pathways Inc.
Cell Robotics International Inc.
Cell Therapeutics Inc.
Centennial Healthcare Corp.
Cerus Corp.
Charles River Laboratories Holdings, Inc.
Chromavision Medical Systems Inc.
Closure Medical Corp.
Collagenex Pharmaceuticals Inc.
Collateral Therapeutics Inc.
Commonwealth Biotechnologies Inc.
Community Care Services Inc.
Complete Wellness Centers Inc.
Computer Motion Inc.
Corixa Corp.
Coulter Pharmaceutical Inc.
Crescendo Pharmaceuticals
Cubist Pharmaceuticals Inc.
Curagen Corp.
CV Therapeutics Inc.
Depomed Inc.
Diatide Inc.
Diversa Corp.
Diversified Senior Services Inc.
Elite Pharmaceuticals Inc.
Enamelon Inc.
Endocardial Solutions Inc.
Entremed Inc.
Epix Medical Inc.
EP Medsystems Inc.
Focal Inc.
Gene Logic Inc.
General Surgical Innovations Inc.
Gentle Dental Service Corp.
Geron Corp.
Global Med Technologies Inc.
Grand Court Lifestyles Inc.
Harborside Healthcare Corp.
Healthcor Holdings Inc.
Healthcore Medical Solutions Inc.
Healthgate Data Corp.
Healthtronics Inc.
Heska Corp.
Horizon Medical Products Inc.
Horizon Pharmacies Inc.

Humascan Inc.
Hypertension Diagnostics Inc.
Ilex Oncology Inc.
Immtech International Inc.
Implant Science Corp.
Innovasive Devices Inc.
Innovative Medical Services
Integ Inc.
Integrated Surgical Systems Inc.
Intensiva Healthcare Corp.
International Isotopes Inc.
Invitrogen Corp.
Iomed
Karrington Health Inc.
Kendle International
King Pharmaceuticals
KOS Pharmaceuticals Inc.
Lexington Healthcare Group Inc.
LJL Biosystems Inc.
Mannatech Inc.
Maxygen Inc.
Medi Ject Corp.
Medical Alliance Inc.
Medical Science Systems Inc.
Megabios Corp.
Micro Therapeutics Inc.
Microcide Pharmaceuticals Inc.
Millennium Pharmaceuticals Inc.
Mim Corp.
Monarch Dental Corp.
Nanogen Inc.
National Medical Health Card Systems Inc.
Natrol Inc.
Neurocrine Biosciences Inc.
New York Health Care Inc.
Nitinol Medical Technologies Inc.
NovaMed Eyewear Inc.
Nutraceutical International Inc.
Nutrition Medical Inc.
Ocular Sciences Inc.
OraPharma Inc.
Orthalliance Inc.
Orthovita Inc.
Pacific Biometrics Inc.
PacificHealth Laboratories Inc.
Paradigm Medical Industries Inc.

Patient Infosystems Inc.
Pentegra Dental Group Inc.
Penwest Pharmaceuticals
Photoelectron Corp.
Praecis Pharmaceuticals Inc.
Priority Healthcare Corp.
Progenics Pharmaceuticals Inc.
Rockwell Medical Technologies
Sabratek Corp.
Schick Technologies Inc.
Sequenom Inc.
SFBC International Inc.
Sibia Neurosciences Inc.
Siga Technologies Inc.
Signature Eyewear Inc.
Somnus Medical Technologies Inc.
Specialty Care Network Inc.
Spectrx Inc.
Sterile Recoveries Inc.
Sunrise Assisted Living Inc.
Sunstar Healthcare Inc.
Superior Supplements Inc.
SurModics
Symphonix Devices Inc.
Symyx Technologies Inc.
Thermo Bioanalysis Corp.
Transcend Therapeutics
Trex Medical Corp.
Tri Point Medical Corp.
Triangle Pharmaceuticals Inc.
Trimeris Inc.
Tularik
Twinlab Corp.
United Therapeutics Corp.
Univec Inc.
Urocor
Urologix Inc.
Uroquest Corp.
US Vision Inc.
VantageMed Corp
Vascular Solutions Inc.
VaxGen Inc.
Ventana Medical Systems Inc.
VI Technologies
Viropharma Inc.
Vista Medical Technologies Inc.

Vysis Inc.
Wesley Jessen Holding Inc.
Women First Healthcare Corp.
Xomed Surgical Products Inc.
Young Innovations Inc.
Zymetx Inc.

APPENDIX B

VENTURE CAPITAL FIRMS INCLUDED IN STUDY

VENTURE CAPITAL FIRMS INCLUDED IN STUDY

Abingworth Management
Accel Partners
Advanced Technology Ventures
Advent International Corp.
Allstate Venture Capital
Alpinvest Holding NV
Ampersand Ventures
Artisan Capital
Aspen Venture Partners
Atlas Ventures
Avalon Ventures
BancBoston Ventures
BankAmerica Ventures
Bessemer Venture Partners
Biotechnology Investments Ltd.
Boston Capital Ventures
Brentwood
Brinson Partners
Burr Egan Deleage-Alta
Canan Partners
Capricorn Venture Partners
Castle Group
Charles River Ventures
Charter Ventures
Chase Capital Partners
Chemical & Materials Enterprise Associates
Cherry Tree Investments Inc.
CIT Group
Columbine Venture Fund
Coral Group
Cordova Capital Partners
Coronado Venture Fund
Credit Suisse
CW Group
Delphi Ventures
DH Blair Investment Banking Corp.
Dillon Read
Domain Associates
DSV Partners
Electra Fleming ET Associates
Enterprise Development Fund
Enterprise Partners
Euclid Partners Corp.
Fidelity Ventures

Forest Binkley & Brown
Forward Ventures
Frazier & Company
Frontenac Co.
Galen Associates
Gateway Associates
Greylock Management Corp.
GroTech Capital Group
H & Q
Hambro International Equity Partners
Hancock Venture Partners
Healthcare Ventures
Hillman Medical Ventures Inc.
IAI Venture Capital Group
InnoCal Ventures
Institutional Venture Partners
Interwest Partners
JH Whitney
Keystone Venture Capital Management Co.
Kingsbury Associates
Kleiner Perkins Caulfield & Byers
Marquette Venture Partners
Mayfair Capital Partners
Mayfield Fund
Medical Innovation Partners
Medical Science Partners
Medicus Venture Partners
Menlo Ventures
Middlewest Ventures
New Enterprise Associates
New York Life Ventures
Noro-Moseley
Northwood Ventures
Oak Investment Partnerships
Olympic Venture Partners
OneLiberty Ventures
Oxford Bioscience Corp.
Papajohn Capital Resources
Paribus Principal
Pathfinders Investment Co.
Patricof & Co. Ventures
Pecks Management Partners Ltd.
Peterson-Spencer-Fansler Co.
Piper Jaffray Ventures Inc.
Polaris Venture Partners
Primus Venture Partners

Prince Ventures
Quest Ventures
RAF Ventures
RFE Investment Partners
Robertson Stevens
Schroeder Ventures-Collinson Howe Venture Partners
Sequoia Capital
Sevin Rosen
Sierra Ventures
Sofinnova
Spencer Trask Securities
Sprout Group
SR One Ltd.
SRK Management Co.
Summit Ventures
Sutter Hill Ventures
TA Associates
Technology Leaders LP
Technology Partners
Technology Venture Investors
Thompson Clive
Three Arch Partners
TVM TechnoVenture Management
Venrock Associates
Venture Capital Fund of New England
Venture Fund of Washington-Fairfax
Vertical Group Inc.
Warburg Pinchus Inc.
Weiss Peck Greer Venture Partners
Welsh Carson Anderson & Stowe
WindPoint
Wolfensohn Associates

APPENDIX C

STANDARD INDUSTRIAL CLASSIFICATIONS

STANDARD INDUSTRIAL CLASSIFICATIONS

Medicinal Chemicals & Botanical Products	2833
Pharmaceutical Preparations	2834
In Vitro & In Vivo Diagnostic Substances	2835
Biological Products, (No Diagnostic Substances)	2836
Surgical & Medical Instruments & Apparatus	3841
Orthopedic, Prosthetic & Surgical Appliances & Supplies	3842
Dental Equipment & Supplies	3843
X-Ray Apparatus & Tubes & Related Irradiation Apparatus	3844
Electromedical & Electrotherapeutic Apparatus	3845
Ophthalmic Goods	3851
Wholesale-Medical, Dental & Hospital Equipment & Supplies	5047
Wholesale–Drugs, Proprietaries & Druggists' Sundries	5122
Services–Health Services	8000
Services–Offices & Clinics of Doctors of Medicine	8011
Services–Nursing & Personal Care Facilities	8050
Services–Skilled Nursing Care Facilities	8051
Services–Hospitals	8060
Services–General Medical & Surgical Hospitals	8062
Services–Medical Laboratories	8071
Services–Home Health Care Services	8082
Services–Misc. Health & Allied Services	8090
Services–Specialty Outpatient Facilities	8093
Services–Commercial Physical & Biological Research	8731

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM
DOCTOR OF PHILOSOPHY

Name of Candidate David Raymond Williams

Graduate Program Administration-Health Services

Title of Dissertation The Relationship Among Ownership, Board Compensation, Venture Capitalists, and the Quest for Value Within Healthcare IPOs: An Agency Perspective

I certify that I have read this document and examined the student regarding its content. In my opinion, this dissertation conforms to acceptable standards of scholarly presentation and is adequate in scope and quality, and the attainments of this student are such that he may be recommended for the degree of Doctor of Philosophy.

Dissertation Committee:

Name		Signature
W. Jack Duncan	**Co-Chair**	
Peter M. Ginter	**Co-Chair**	
Jeffrey H. Burkhardt		
Samuel Robert Hernandez		
Richard M. Shewchuk		

Director of Graduate Program

Dean, UAB Graduate School

Date