

**ORGANIZATIONAL RESOURCES, INDUSTRY MEMBERSHIP, AND FIRM  
PERFORMANCE: THE ROLE OF CAPABILITY FORMATION AND USE IN  
VALUE CREATION FOR IPO-STAGE NEW VENTURES**

A Dissertation

by

TIMOTHY R. HOLCOMB

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2007

Major Subject: Management

**ORGANIZATIONAL RESOURCES, INDUSTRY MEMBERSHIP, AND FIRM  
PERFORMANCE: THE ROLE OF CAPABILITY FORMATION AND USE IN  
VALUE CREATION FOR IPO-STAGE NEW VENTURES**

A Dissertation

by

TIMOTHY R. HOLCOMB

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Approved by:

Co-Chairs of Committee,

Committee Members,

Head of Department,

Michael A. Hitt

R. Duane Ireland

S. Trevis Certo

Dudley L. Poston, Jr.

R. Duane Ireland

August 2007

Major Subject: Management

**ABSTRACT**

Organizational Resources, Industry Membership, and Firm Performance: The Role of  
Capability Formation and Use in Value Creation for IPO-Stage New Ventures.

(August 2007)

Timothy R. Holcomb, B.B.A., University of Louisiana at Monroe;

M.B.A., University of Louisiana at Monroe

Co-Chairs of Advisory Committee: Dr. Michael A. Hitt  
Dr. R. Duane Ireland

A widely held belief is that resource constraints and industry conditions pose severe threats to the performance of entrepreneurial firms. While previous research links resources controlled by these firms to different performance outcomes, extant research on organizational performance often assumes away contextual differences in the allocation of scarce resources by firms to develop and leverage different organizational capabilities. Further, no research has explored the performance implications of resource use, especially for new ventures.

The purpose of this study is to bring capabilities to the foreground in the examination of organizational performance for new ventures following an initial public offering (IPO). Building from resource-based theory and contingency theory, I examine the indirect (through capability formation and use) effects that occur within the 'black box' between resources and performance for a sample of entrepreneurial firms undertaking an IPO. New theory is offered to explain the formation and performance outcomes of two configurations of organizational capabilities: market-managing

capabilities and market-creating capabilities. Human capital is considered, bringing agency into theory explaining capability formation and use. Further, I consider how underlying routines allow resources to be managed for greater value across different industries—conditions that make resources valuable in some contexts and not in others.

I find that resource endowments at IPO affect the formation and use of organizational capabilities and that this relationship varies across different industry contexts. Further, I find support for the indirect effect of resources on performance outcomes *through* capability formation and use. More specifically, I find that adjustments to the configuration of organizational capabilities affect performance prospects over time. Results confirm that capability configurations compete for scarce resources, necessitating tradeoffs in allocation decisions between them. I also find that industry conditions moderate this relationship.

By employing an integrative, multidisciplinary approach, this dissertation extends research on the performance effects of resource endowments and capability formation and use for entrepreneurial firms. Further, it contributes to growing research on IPO firms in strategic management and entrepreneurship, especially theoretical and empirical research examining the different firm and industry conditions that affect organizational performance during the period following a firm's transition into the public arena.

## DEDICATION

I dedicate this dissertation to my wife, our two children, and my mother and father.

Marla, nothing will ever be more precious to me than you. You are my rock, my foundation, and my confidant. I don't know where I would be today without your loving support and encouragement. Through the good times and bad, you have been there for me and for us. Your love for Him gives me strength in my faith. Your devotion to our family provides the energy that I need to face life's difficult challenges. I look forward to living the rest of our lives together. I love you, Marla.

Haley, you are so precious and beautiful to me. Your smile, your laugh, your hug—they all bring joy to me. I will forever treasure our early mornings together and hearing you say, "I love you, daddy." I cherish the times I watched you color a picture, read a book, or simply watch daddy work. You will always be my little girl. Your love for and devotion to Him gives me strength. Listen to His call. Follow Him. Always do your best.

And remember that I will always be there for you. I love you, Haley.

Zachary, my son, I would not be who I am today without you. I've watched you grow into a young boy who loves life, cherishes family, and sings praises to Him. When I think of the unspeakable joy that you have brought to me over the past four years, time becomes a fleeting moment. Your smile lifts me up. Your laugh carries me. Your hug brightens my day. Your love gives me strength. Your devotion keeps me grounded. You will always be my little boy and I will always be there for you. I love you, Zachary.

Mom and Dad, thank you for your unconditional love and for giving me a start in life.

Your love for me, for each other, and for Him serves as my inspiration. I love you.

## ACKNOWLEDGEMENTS

This dissertation and the experience gained during my four years in the doctoral program would not have been possible without the guidance, help, and contributions of those who have supported my efforts along the way.

First and foremost, I give thanks to God for His mercies and blessings and for granting me the strength, ability, determination, and patience to persevere. Though I have not always been there for Him, He has always been there for me, a constant companion without whom I would not be who I am today, where I am today. Enjoying the warmth of my family and friends, reflecting on my personal journey, and during my early morning quiet times alone with You, I am reminded how truly blessed that I am.

Second, I thank my dissertation co-chairs, Professor Michael A. Hitt and Professor R. Duane Ireland. Words cannot express how especially blessed I feel to have studied and tutored under the two of you. You have played an indispensable role not only in the completion of this project and in the launch of my “new” career in academics, but also in my growth as an individual. Your drive, determination, integrity, and work ethic are remarkable and your scholarly accomplishments are second to none, but your humility and respect for others, your compassion for those around you, and your tireless encouragement to succeed—rare commodities in any profession—are the qualities that set you apart from others. They are the standards to which we should all aspire. I know that I do. It is these qualities that validate your selflessness and will be the ones that I will forever remember. I hope to inspire others within this profession as you have inspired me. Thank you, Mike and Duane.

I also thank my dissertation committee members Professor S. Trevis Certo and Professor Dudley L. Poston, Jr. for their assistance and invaluable support throughout this process. Trevis, you took me in during my first semester in the program, at a time when I could barely get through an entire journal article without help, and provided me with first-hand experience with the publication process. Your unselfish service, unwavering can-do spirit, and remarkable accomplishments in the field are an inspiration to me. Your support and encouragement has been indispensable to me. Thank you, Trevis. Dudley, you make the world of statistics fun. From my introduction to you during the first day of your class, your enthusiasm and sincerity brought the topic to life and made the learning experience worthwhile. Your advice, keen methodological insights, and support have been essential to my ability to complete this project. Thank you, Dudley.

A multitude of other faculty members allowed my stay at Texas A&M University to exceed my loftiest expectations. Professor Angelo S. DeNisi (Tulane University) and Professor Adrienne Colella (Tulane University), you were my first two contacts at Texas A&M, and your exuberance for the profession made my decision to leave corporate life and pursue the doctorate an easy one. I am indebted to you for allowing me to become an Aggie by accommodating my request to begin the program in 2003. Professor Albert A. Cannella (Arizona State University), thank you for your encouragement and support during my first year in the program and for giving me my first publication opportunity. Professor Cynthia E. Devers (University of Wisconsin), thank you for your support and for providing your thoughtful advice and encouragement when I needed it most. Professors Lorraine Eden, Gareth Jones, Richard Woodman, Ramona Paetzold, Maura

Belliveau, Michael Pustay, Victor Willson, Babu Baradwaj, Bruce Thompson, Gilad Chen (University of Maryland), Scott Shane (Case Western University), and Jeff Lenn (George Washington University), I thank you for enriching seminars that introduced me to the fields of strategy and entrepreneurship and to the broader world of academic research. Special thanks also go to everyone else in the Management Department at Mays Business School for their friendship and kindness during my years in College Station.

My friends and colleagues in the doctoral program also deserve thanks. I am especially grateful to my cohort and dear friend R. Michael Holmes and to his wife Stacey for her patience with our endeavors together. Michael, I have no doubt that a bright and promising career in academics lies ahead for you. Be patient. Be strong. Be confident. You have pressured me to excel, and encouraged me to reach for my best. You made the trying times fun and the joyous times memorable. Words cannot express how important your friendship means to me. I hope it continues to grow over the years to come. I also want to acknowledge the other three members of my cohort Laura Riedel, Jenny Keng, and Tom Fleming for without them my experience at Texas A&M would not be complete. May your future bring you happiness and success, and many, many personal and professional accomplishments. A very special thanks also goes to Bill Worthington, Chris Reutzel, Carrie Belsito, Yvette Lopez (a.k.a. Y-lo), Brian Connelly, Toyah Miller, and Justin Webb; your friendship and helpfulness aided me at various times more than you know. Thank you all. A final thanks goes to my longest and dearest friends Herman Randow, Tim Montrose, Steve Austin, Jason Denmon, and Ford Zabasky. We've laughed together. We've cried together. We've celebrated together.



We've mourned together. Through it all, you guys have been there for me to offer support and encouragement. Words cannot express how much your friendship means to me and to Marla. Thank you.

Finally, I extend a very special thank you to my in-laws Marvin and Janelle Macicek. A special thank you as well goes to my three brothers' in-law Mike, Mark, and David and to my sister in-law Amy. The Macicek family is truly amazing and I am so very proud to be a part of it. Thank you for all that you have done and continue to do for Marla, for Haley and Zachary, and for me. Words cannot express the gratitude that I feel for the two of you for your many gifts to us and for the love you so freely offer.

Whenever we are in need, you are there. In times of laughter and celebration, you are there. In times of sorrow and pain, you are there. May God continue to richly bestow the blessings on you that you so richly deserve.

## TABLE OF CONTENTS

	Page
ABSTRACT .....	iii
DEDICATION .....	v
ACKNOWLEDGEMENTS .....	vi
TABLE OF CONTENTS .....	x
LIST OF FIGURES .....	xii
LIST OF TABLES .....	xiii
 CHAPTER	
I INTRODUCTION.....	1
Research Questions .....	6
Contributions .....	9
Organization of Dissertation .....	13
II LITERATURE REVIEW.....	15
Introduction .....	15
Dominant Approaches to New Venture Growth and Performance.....	16
Summary .....	58
III THEORY DEVELOPMENT AND HYPOTHESES.....	61
Introduction .....	61
The Resource-based View of the Firm.....	64
Contingency Theory: A Subject of Fit .....	71
New Ventures: A Focus on Initial Public Offering (IPO) Firms .....	74
Venture Resource Endowments and New Venture Outcomes.....	80
Venture Resources and the Formation/Use of Capability Configurations .....	91
Influence of Industry Membership on the Formation/Use of Capability Configurations .....	116

CHAPTER	Page
Resources, Capability Formation/Use, and New Venture Outcomes: The Partial Mediation Effect .....	125
Summary .....	138
IV METHODOLOGY.....	141
Introduction .....	141
Sample and Data Sources .....	142
Measures.....	144
Model Specification and Analytical Procedures .....	162
Summary .....	175
V RESULTS .....	176
Introduction .....	176
Validity of Objective Capability Configuration Measures .....	177
Descriptive Statistics and Correlations .....	181
Test of Hypotheses .....	186
Summary .....	209
VI DISCUSSION AND CONCLUSIONS.....	212
Overview .....	212
Analysis of Results.....	214
Contributions to the Literature .....	224
Implications.....	226
Limitations and Future Research.....	228
Conclusion.....	232
REFERENCES .....	233
APPENDIX A .....	275
VITA .....	286

**LIST OF FIGURES**

FIGURE		Page
1	Conceptual Model .....	8
2	Theoretical Model .....	63
3	Illustration of Simple Mediation .....	169
4	Illustration of Multiple Mediation.....	170
5	Summary of Multiple Mediation Results .....	208

## LIST OF TABLES

TABLE	Page
1	Theories Relevant to New Venture Growth and Performance.....17
2	List of Definitions .....78
3	Two Dimensions of Capability Formation and Use.....100
4	Summary of Hypotheses .....140
5	Operationalization of Dependent and Intervening Variables .....146
6	Listing of Elite Educational Institutions.....155
7	Operationalization of Independent and Moderator Variables .....158
8	Descriptive Statistics and Correlations of Items Measuring Capability Formation and Use .....178
9	Rotated Factor Patterns .....179
10	Description of Sample: Distribution of IPOs for Firms Used in Study .....182
11	Description of Sample: IPO Firm Attributes for Firms Used in Study .....183
12	Descriptive Statistics and Correlations of Variables Used in Study .....185
13	RCM Regression Analysis of the Effect of Financial Capital and Human Capital on Shareholder Return .....187
14	RCM Regression Analysis of the Effect of Financial Capital and Human Capital on Market-Managing Capability Formation/Use.....192
15	RCM Regression Analysis of the Effect of Financial Capital and Human Capital on Market-Creating Capability Formation/Use .....196
16	RCM Regression Analysis of the Multiple Mediation Effects of Market-Managing and Market-Creating Capability Formation/Use on the Relationship between Financial Capital and Shareholder Return .....204
17	Product of Coefficients Test for Indirect Effects of Financial Capital on Shareholder Return.....207

TABLE	Page
18 Product of Coefficients Test for Indirect Effects of Human Capital on Shareholder Return.....	207
19 Summary of Results .....	210

## CHAPTER I

### INTRODUCTION

New ventures face significant challenges in their efforts to foster growth and improve performance, while enduring resource constraints and environmental pressures threatening their success. Management scholars offer different behavioral, structural, and environmental explanations of factors inducing or compelling their growth and performance under various conditions. Previous research, for example, has examined differences in behavioral and cognitive attributes (e.g., Baum & Locke, 2004; Baum, Lock, & Smith, 2001; Begley & Boyd, 1987; Katz & Shepherd, 2003), ecological and evolutionary conditions (e.g., Agarwal, Sarkar, & Echamebadi, 2002; Boone, Carroll, & van Witteloostuijn, 2002; Carroll & Hannan, 1989; Eisenhardt & Schoonhoven, 1990; Robinson & McDougall, 2001), network ties and interorganizational relations (e.g., Gulati & Higgins, 2003; Florin, Lubatkin, & Schulze, 2003; Schoonhoven, Eisenhardt, & Lyman, 1990; Stuart, Hoang, & Hybels, 1999), and strategic orientation (e.g., Bamford, Dean, & McDougall, 2000; Echols & Tsai, 2005) as potential explanations for new venture success.

Recently, scholars have presented resource-based perspectives of new venture performance that augment behavioral, structural, and environmental explanations and sharpen the focus on new ventures' relative advantages (e.g., Baker & Nelson, 2005; George, 2005; Katila & Shane, 2005; Lichtenstein & Brush, 2001). According to this

perspective, firms differ in their resource positions, providing a source of performance heterogeneity across firms (Peteraf, 1993). This growing body of work, which is based on the original work of Penrose (1959) and uses Barney's (1991) more recent translation of the resource-based view (RBV) of the firm, emphasizes the importance of resources in guiding firm activity and the management of a firm's capabilities as central to competitive advantage.<sup>1</sup>

When applying resource-based theory to explain why new ventures perform differently, however, results are mixed. Some scholars suggest that new ventures are undercapitalized (Holtz-Eakin, Joulfaian, & Rosen, 1994a, 1994b) and face a 'liability of newness' that constrains efforts to accumulate resources necessary for survival and growth (Brush, Green, & Hart, 2001; Certo, 2003; Choi & Shepherd, 2005). These conditions make it difficult to compete, especially against established firms, stifle growth and performance, and result in higher mortality rates for young firms. On the other hand, scholars have also argued that new ventures often 'make do' and even flourish by applying different combinations of resources to exploit opportunities despite enduring considerable resource constraints (Baker & Nelson, 2005; Garud & Karnoe, 2003). These firms embrace and even pursue challenging growth strategies despite their inability to attract resources these actions demand (MacMillan & McGrath, 1997;

---

<sup>1</sup> Resources, broadly defined, have often been used in the literature in a generic sense to also include capabilities (e.g., Barney, 1991). Other scholars claim that capabilities represent how firms *manage* resources (e.g., Dutta, Narasimhan, & Rajiv, 2005; Helfat & Peteraf, 2003) or that capabilities represent a unique combination of resources that enable firms to pursue specific actions that create value (Sirmon, Hitt, & Ireland, 2007). For purposes of this dissertation, I use 'resources' to represent tangible or intangible assets (Barney, 1991; Grant, 1991) that new ventures' own, control, or are provided access to on a semi-permanent basis, and that allow them to implement their strategies (Helfat & Peteraf, 2003). By contrast, 'capabilities' represent organizational routines that allow firms to effectively integrate and use resources to implement their strategies (Lavie, 2006; Winter, 2003). Capabilities serve as the intermediate transformation between allocations of resources by new ventures and the outcomes such resources are intended to achieve (Dosi, Nelson, & Winter, 2002; Lavie, 2006; Winter, 2000).



Mahoney & Michael, 2005) by making more efficient use of their resources (Mosakowski, 1998). Still, surprisingly little is known about how new ventures exploit their resources to achieve market and financial success (Katila & Shane, 2005; Zahra, 1996). This gap is puzzling because poor resource allocation choices by new ventures, facing resource constraints, not only can undermine their performance, but also can affect their survival. Furthermore, while the RBV integrates context-specificity by requiring resources be 'valuable' (Barney, 1991), only a few attempts have been made to unpack the contingent effects that make resources more effective in some contexts and not in others.

In response, this dissertation brings capabilities to the foreground in the examination of new venture performance. Further, building on earlier recommendations by scholars to consider the context in which resources are used (e.g., Barney, 2001; Priem & Butler, 2001a, 2001b; Sirmon, Hitt, & Ireland, 2007), this dissertation proposes an approach to examine the influence of environmental uncertainty on relationships between venture resources and performance. Stated differently, because resource-based theory is 'context insensitive' (Brush & Artz, 1999: 223), it is instructive to understand that certain conditions make the same resources and capabilities valuable in some contexts and not in others. Furthermore, resource-based arguments imply that organizational capabilities partially mediate the resource-performance link (Amit & Schoemaker, 1993; Black & Boal, 1994; Galunic & Rodan, 1998; Peteraf & Bergen, 2003; however, no theory has substantiated this relationship and it stands untested. Indeed, the majority of resource-based research examines performance effects broadly, focusing on the distal relationship between resource attributes (e.g., the so-called VRIN

characteristics) and different performance outcomes. Accordingly, to understand the relationship between venture resources and performance, I examine relationships that occur within the ‘black box’ between resources and performance by identifying capabilities and measuring the underlying routines that allow resources to be managed for greater value.

This dissertation views resources as inputs to productive activity that also act as inducements to experiment, take risks, and make discretionary strategic choices (George, 2005; Mishina, Pollock, & Porac, 2004). They vary in type (e.g., financial capital and human capital) and they are used by new ventures to exploit existing product-market positions and to develop *new* product-market positions or substantially alter the process by which goods and services are produced. Neither owning nor controlling resources, nor having semi-permanent access to them, ensures performance (e.g., Black & Boal, 1994; Maritan & Brush, 2003; Peteraf & Bergen, 2003; Priem & Butler, 2001a). Instead, resources must be used effectively (Morrow, Sirmon, Hitt, & Holcomb, 2007; Sirmon et al., 2007). In turn, capabilities ‘transform’ venture resources to achieve outcomes that are either operational or strategic in scope (Dutta, Narasimhan, & Rajiv, 2005; Winter, 2000). Accordingly, how firms configure and ultimately use capabilities affect resource value and confer upon management decision options for performance in the short-term and for value creation and growth over time.

Building on two enduring theoretical perspectives, the resource-based view of the firm (e.g., Barney, 1991; Penrose, 1959; Wernerfelt, 1984) and contingency-based theory (e.g., Donaldson, 2001; Burns & Stalker, 1961; Lawrence & Lorsch, 1968; Zajac, Kraatz, & Bresser, 2000), I develop a theoretical model that examines the indirect

(through capability formation and use) effects of resources on firm performance for new ventures following an IPO. Herein, a capability configuration represents a distinctive combination of organizational capabilities consisting of routines, the attributes of those routines, and interdependencies formed across different configurations that allow firms to establish, maintain, and extend a competitive advantage (Lavie, 2006; Winter, 2003). New theory is offered to explain the formation and use together with the performance effects of two configuration types: market-managing capabilities and market-creating capabilities. *Market-managing capabilities* consist of operating routines that permit firms to exploit existing product market positions (March, 1991) and to more efficiently manage related productive and administrative activity. These capabilities are considered value-enabling because they exploit existing positions and bring stability and greater efficiencies to existing business activity. Examples include manufacturing, distribution and logistics management, procurement and inventory management, finance and financial reporting, labor relations and human resource management, and service management and customer support.

By contrast, *market-creating capabilities* consist of dynamic routines (Teece, Pisano, & Shuen, 1997) that extend or substantially augment existing product-market positions, create new ones, or alter the process(es) by which future goods and services are produced and thus provide an important source of organizational flexibility and change. Accordingly, market-creating capabilities are value-enhancing, rather than value-enabling, because they permit ventures to achieve growth by altering current organizational scale and scope and thus enable competitive advantages to be sustained. Examples include research and development, engineering design, brand management

and advertising, new product introduction, alliance formation and management, mergers and acquisitions, and divestitures.

In sum, this dissertation suggests that resources exert an indirect influence on performance of new ventures through the capabilities these firms configure and maintain. This conjecture is based on resource-based and contingency-based logics, which suggest that resource value is contingent on the context of their use. Accordingly, this work attempts to reach beyond the question of resource heterogeneity as an explanation for performance differences to deepen our understanding of contingencies influencing both the formation of different capability configurations, and the performance outcomes such capabilities are leveraged to achieve.

### **Research Questions**

This research builds on previous studies of large firms and privately-held businesses in strategic management and entrepreneurship. It explores factors influencing the configuration of organizational capabilities by new ventures and the effect such configurations have on performance outcomes for these firms. Specifically, I propose and empirically test the influence of different venture resource combinations at IPO on the formation and use of organizational capabilities, given different industry conditions, as well as the indirect effects of venture resources on performance outcomes *through* different configurations of organizational capabilities.

Young, entrepreneurial firms, specifically IPO-stage new ventures, provide an important context to consider our questions. These firms confront many obstacles in their formation and growth—limits in resources, knowledge, and legitimacy—and poor

choices about resource use not only undermine their performance, but also their survival. For purposes of this dissertation, new ventures are defined as firms that are six years old or less (Brush, 1995; Robinson & McDougall, 2001; Zahra, Ireland, & Hitt, 2000) at the time of their IPO (Florin et al., 2003). As previously discussed, this study examines how different resource endowments and environmental conditions at IPO affect the configuration of capabilities for new ventures, and how different capability configurations given prevailing environmental conditions explain performance outcomes among these firms. In doing so, this dissertation draws on and extends resource-based theory and contingency theory in the study of new venture performance.

I examine three research questions:

1. To what extent do resource endowments (e.g., financial capital and human capital) controlled by a new venture explain its performance following an IPO?
2. To what extent do venture resources and environmental conditions at IPO account for the formation and use of market-managing and market-creating capabilities by new ventures following the IPO? Is the relationship between venture resources at IPO and the formation and use of these two configurations contingent on different environmental conditions at IPO? If so, to what extent?
3. To what extent is the configuration of organizational capabilities likely to influence performance among new ventures? And importantly, does capability formation and use partially mediate the relationship between venture resources at IPO and performance?

**FIGURE 1**  
**Conceptual Model**

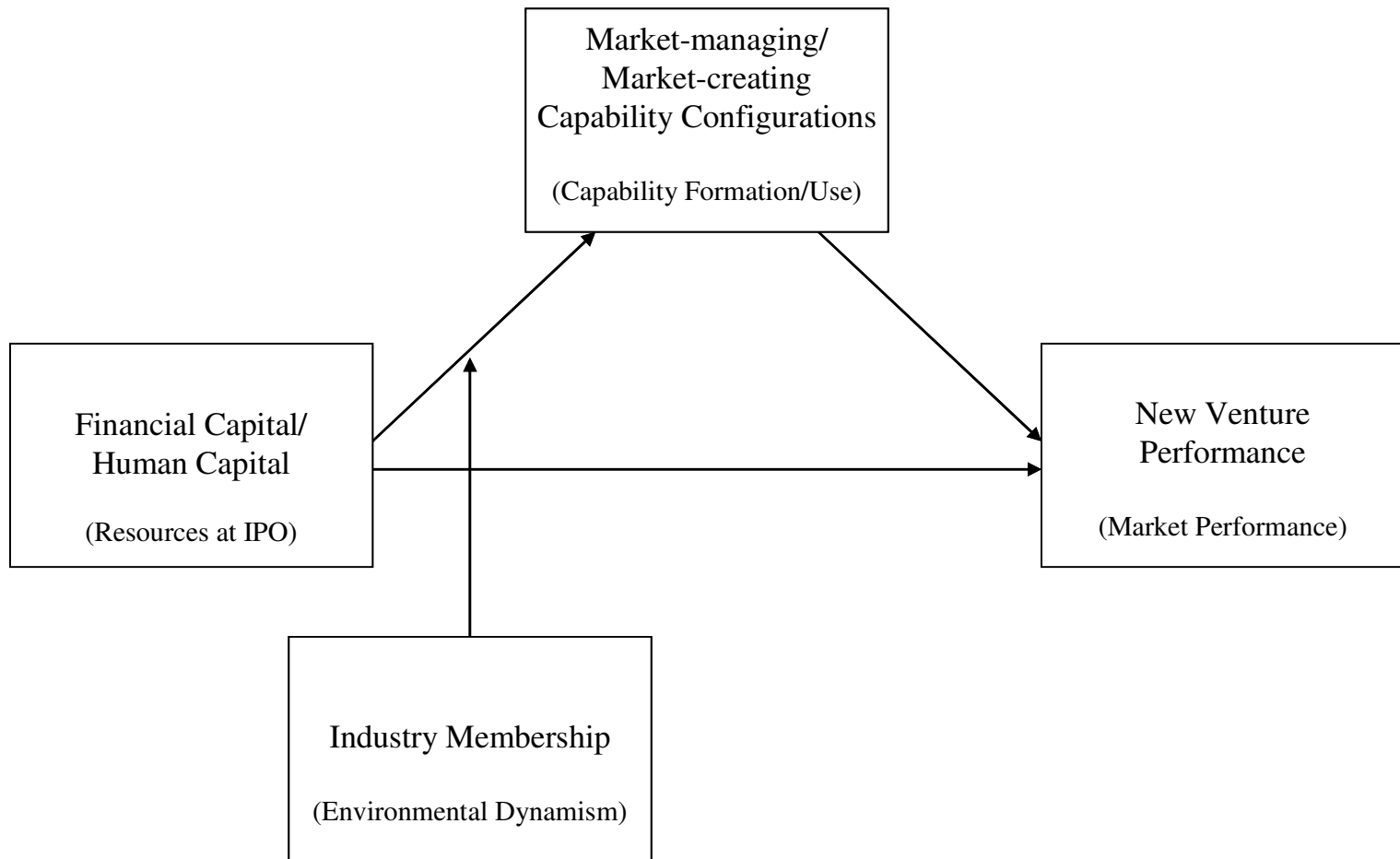


Figure 1 summarizes the conceptual model for this dissertation. This model depicts conditions for new venture performance driven by assumptions about a venture's resource endowment at IPO, and the contingent effects of the environment at IPO on the relationship between venture resources and the configuration of organizational capabilities by new ventures. Resource-based arguments imply a partial mediation effect of the use or allocation of resources through capabilities on firm performance (e.g., Dosi, Nelson, & Winter, 2002; Kogut & Kulatilaka, 2001). Nevertheless, the majority of resource-based research examines the use of resources broadly, focusing on the distal relationship between the value, rarity, inimitability, and nonsubstitutability (i.e., so-called VRIN attributes) characteristics of firms' resource endowments and different performance outcomes. As a result, scholars have largely overlooked the mediating effect that resource use exhibit on performance. In light of these deficiencies, this model asserts that the formation and use of different capability configurations partially mediates the effects of venture resources at IPO on the performance of these firms. Further, this model also asserts that the industry context moderates this relationship, such that the extent to which certain capability configurations explain different venture outcomes is contingent on environmental conditions at IPO.

### **Contributions**

Although the elusive link between firms' resource endowments and different performance outcomes has frustrated strategic management scholars for decades, resources and the resource-based view continues to receive widespread attention from scholars. By employing an integrative, multidisciplinary approach, this dissertation

makes three important contributions to the growing research on new venture performance.

First, this research proposes and measures new constructs representing how firms configure capabilities. In doing so, the study builds new theory that extends the RBV to explain the indirect influence of resources on performance through capability formation and use. These constructs increase the theory's predictive validity and enhance our understanding of the performance efficacy of resources. Resource-based logic suggests that resource endowments exhibit both direct and indirect effects on new venture performance. Thus, embedded within this argument is the implicit assumption that capabilities serve an important role in the relationship between venture resources and the performance outcomes such resources achieve (Dosi et al., 2002; Lavie, 2006; Winter, 2000). Nevertheless, the majority of resource-based research overlooks possible intervening effects and focuses almost exclusively on direct resource-performance or capability-performance relationships (e.g., Denrell, Fang, & Winter, 2003; Peteraf & Bergen, 2003) or, more recently, on measurements of capability effectiveness (e.g., Dutta et al., 2005; Lieberman & Dhawan, 2005).

On the surface, the resource-performance relationship might appear to be a fair proxy of value creation via the development of competitive advantage (Ireland, Hitt, & Sirmon, 2003). However, considerable research suggests that performance outcomes are not simply a function of the value and rarity of resources, but also depend on the way in which those resources are deployed and used by a firm (Alchian & Demsetz, 1972; Amit & Schoemaker, 1993; Penrose, 1959). Given the noise in firm-level performance outcomes and measures (Brush, Bromiley, & Hendrickx, 1999) and the relatively



equivocal nature of the resource-performance relationship in prior research (Priem & Butler, 2001a), this work asserts that examining the influence of resources on firm performance *through* the configuration of a venture's capabilities will enhance our understanding of the efficacy of different resource endowments in achieving valuable performance outcomes.

Second, in examining relationships across different industry contexts, this study provides a contingent view of the resource-performance link that to-date has been unexplored. Thus, it extends research examining the influence of industry membership on the value of resources (e.g., Agarwal et al., 2002; Bamford et al., 2000; Eisenhardt & Schoonhoven, 1990), answering calls to further integrate contingency theory logic into our understanding of the RBV (Aragon-Correa & Sharma, 2003; Sirmon et al., 2007). Further, by employing a multilevel framework to examine cross-level relationships, this study contributes to the growing literature examining the relative importance of firm- and industry-level factors on firm performance (e.g., Hawawani, Subramanian, & Verdin, 2003; Hough, 2006; Misangyi, Elms, Greckhamer, & Lepine, 2006).

Relying on resource-based theory and contingency theory perspectives, this dissertation provides a theoretical framework explaining how characteristics of the environment influence the allocation of resources to different capability configurations and its impact on new venture performance. This is important because while prior work has established that patterns of capabilities vary with different environmental contingencies (e.g., Brush & Artz, 1999; Eisenhardt & Martin, 2000), the contingent resource-based approach as yet has not generated sufficient empirical research to explain performance variations between different environmental contexts. In integrating these

two perspectives, this research accepts the view that environmental conditions influence firm performance, but does not mechanistically determine it, thus avoiding previous criticisms of contingency theory as being too deterministic (Dess, Lumpkin, & Covin, 1997; Schoonhoven, 1981). Accordingly, this dissertation contributes to the literature by offering a systemic examination of contingency theory, and it reinforces previous studies addressing the influence of environmental and competitive conditions on resource allocations and the performance outcomes venture resources are intended to achieve.

Finally, this study advances our understanding of firms recently completing the transition to the public arena. Specifically, it contributes to a growing body of research on IPO-stage firms, especially theoretical and empirical research examining conditions that affect performance following an IPO. Over the past several years, IPOs have received a significant amount of attention in the finance (e.g., Jain & Kini, 1994), strategic management (e.g., Certo, Covin, Daily, & Dalton, 2001; Certo, Daily, Cannella, & Dalton, 2003; Certo, 2003), and organizational (e.g., Fischer & Pollock, 2004; Welbourne & Andrews, 1996) literatures. The primary focus of much of this research has been on discovering factors affecting the initial pricing of IPO stocks and their market returns over various periods. Although IPOs offer a number of benefits to firms that successfully navigate the transition, the transformation from private to public ownership often necessitates a change in strategies (Fisher & Pollock, 2004) as firms determine how to deploy new financial resources made available by the public offering. Although IPO firms vary in the intensity with which they pursue different activities, all generally face the difficult task of adapting their administrative systems enough to incur some reexposure with liabilities of newness (Certo, 2003; Fisher & Pollock, 2004).

Because capabilities form the basis for the ability of firms to perform critical activities, resource considerations are likely to constrain the range of capabilities available to these ventures. Accordingly, this dissertation contributes to the growing research on IPO firms in strategic management and entrepreneurship, especially theoretical and empirical research examining the different conditions that may affect a new venture's performance during the period following its transition into the public arena.

In sum, I conjecture that given the critical role of resource endowments to firm success, the configuration and use of different resource combinations (i.e., capabilities) and their impact on new venture growth and performance carries substantive implications for scholarship in strategic management and entrepreneurship research and for the practice of management. Furthermore, the conceptual and theoretical framework developed in this dissertation may have important implications beyond the current focus on new ventures to privately-held firms and to larger publicly traded firms in strategic management.

### **Organization of Dissertation**

This dissertation is organized as follows. Chapter II presents a review of the extant literature on theories used to explain new venture performance. In Chapter III, I describe why and how new ventures combine their resources to form different capability configurations and elaborate on the direct and indirect performance implications of these actions on the performance of new ventures. I also consider how the environment moderates these relationships. Additionally in Chapter III, I present the hypotheses and theoretical model relating different resource types, environmental conditions, and their

interaction with the configuration of organizational capabilities and new venture performance. I also demonstrate how the formation and use of capability configurations partially mediate the relationship between venture resources at IPO and new venture success. In Chapter IV, I describe the research methodology employed to test the hypothesized relationships. More specifically, I describe the sample, operationalizations of the dependent, intervening, independent, moderator, and control variables, and the model specification approach with the analytical procedures applied to test the hypotheses. Chapter V reports the results of the analyses. Finally, Chapter VI discusses the contributions of this study as well as possible directions for future research.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **Introduction**

Investigation of new venture success remains a principal area of research in multiple disciplines. Scholars have employed a variety of theoretical approaches to explain various behavioral, structural, and environmental factors as causes of new venture growth and performance. However, previous research has generally applied less sophisticated theoretical models, often choosing to examine these factors in isolation in order to answer questions about different venture outcomes (Baum & Locke, 2004). Authors of more recent studies, however, combine different dimensions to provide a more comprehensive prediction of venture growth and performance (e.g., Baum, & Locke, 2004; Baum et al., 2001; Chrisman, Bauerschmidt, & Hofer, 1998; Covin & Slevin, 1990; Eisenhardt & Schoonhoven, 1990). These studies reflect similar attempts in strategic management research to explain the contingent effects of different organizational attributes and environmental conditions on firm performance (e.g., Zajac et al., 2000). However, despite calls for increasingly more robust theoretical frameworks to untangle the multifaceted process by which new ventures and established firms perform (Aldrich & Martinez, 2001; Dess et al., 1997; Shane & Venkataraman, 2000), there is room for substantial theoretical and methodological improvements using models that are more sophisticated.

This chapter summarizes literature pertaining to new venture performance. This review consists of two sections. The first section of this chapter provides a descriptive overview of dominant theoretical perspectives previously used to explain different performance outcomes. This section also summarizes the extensive empirical literature investigating the relationships between behavioral, structural, and environmental factors and the different performance outcomes. Limitations of the extant literature on new venture performance are discussed to motivate further investigation of the relationship between venture resources and new venture performance.

### **Dominant Approaches to New Venture Growth and Performance**

A number of dominant perspectives, including those associated with strategic management, organization theory, economics, sociology, and psychology, prescribe conditions for increased new venture growth and performance (Ireland, Webb, & Coombs, 2005). Theories from strategic management, for example, offer insights for how new ventures develop and sustain competitive advantages and why some firms succeed while others fail. By contrast, organization theory informs our understanding about environmental conditions affecting the founding, growth and performance, and mortality of new and established firms and populations of firms. Economics provides theoretical frameworks used by scholars to examine the efficiency and effectiveness of new ventures. Sociology provides insights into how different groups collectively function within organizations, and psychological perspectives permit examination of the effects of different personality traits, behaviors, cognitions, and other attributes on the

**TABLE 1**  
**Theories Relevant to New Venture Growth and Performance**

	<b>Behavioral Theory</b>	<b>Organizational Ecology</b>	<b>Institutional Theory</b>	<b>Network Theory</b>	<b>Organizational Strategy</b>	<b>Resource-based Theory<sup>2</sup></b>
<b>Disciplinary Origins</b>	<i>Psychology &amp; Sociology</i>	<i>Organization Theory &amp; Sociology</i>	<i>Organization Theory &amp; Sociology</i>	<i>Organization Theory &amp; Sociology</i>	<i>Strategic Management</i>	<i>Strategic Management</i>
<b>Theoretical Approaches and Related Research Streams</b>	Behavioral Traits Theory Cognitive Theory Intentionality - Theory of Planned Behavior - Entrepreneurial Event Model	Density Dependence Theory Liability of Adolescence Liability of Newness Liability of Smallness Niche-Width Theory Resource-Partitioning Theory	Institutional Theory New Institutional Theory	Social Capital Theory Structural Hole Theory	Strategy Formulation/ Formation Strategic Orientation Entrepreneurial Orientation	<i>Contingent Resource-based Theory</i> Dynamic Capabilities Entrepreneurial Bricolage Knowledge-based View Resource-based View Resource Allocation
<b>Key Contributors</b>	Ajzen (1991) Bandura (1997) Baum & Locke (2004) Baum, Locke, & Smith (2001) Begley & Boyd (1987) Bird (1988) Brockhaus (1980) Gatewood, Shaver, & Gartner (1995) Gist & Mitchell (1992) Katz & Shepherd (2003) Krueger (2003) Krueger, Reilly, & Carsrud (2000) Locke & Latham (1990) McClelland (1965) Mitchell, Smith, Seawright, & Morse (2000) Sexton & Bowman (1986) Shapiro (1975, 1982)	Boone, Carroll, & van Witteloostuijn (2002) Brush, Green, & Hart (2001) Brüdel & Schüssler (1990) Carroll (1984, 1985) Carroll, Dobrev, & Swaminathan (2002) Carroll & Hannan (1989) Choi & Shepherd (2005) Dobrev, Kim, & Hannan (2001) Freeman, Carroll, & Hannan (1983) Freeman & Hannan (1983) Hannan & Freeman (1977, 1984) Pfeffer & Salancik (1978) Stinchcombe (1965) Swaminathan (2001)	Baum & Oliver (1991, 1996) DiMaggio & Powell (1983) Greenwood & Hinings (1996) Meyer & Rowan (1977) Selznick (1996) Scott (1987, 1995) Stuart, Hoang, & Hybels (1999) Zucker (1987)	Burt (1992) Coleman (1988) Granovetter (1973) Gulati & Higgins (2003) Florin, Lubatkin, & Schulze (2003) Nahapiet & Ghoshal (1998)	Covin & Slevin (1989) Lumpkin & Dess (1996) McDougall, Robinson, & DeNisi (1992) Miller (1983) Miles & Snow (1978) Sandberg (1986) Sandberg & Hofer (1987) Vesper (1980)	Baker & Nelson (2005) Barney (1991) Bower & Gilbert (2006) Brush & Artz (1999) Dosi, Nelson, & Winter (2002) Dutta, Narasimhan, & Rajiv (2005) Garud & Karnoe (2003) Grant (1996) Helfat & Peteraf (2003) Lavie (2006) Morrow, Sirmon, Hitt, & Holcomb (2007) Mosakowski (2002) Penrose (1959) Peteraf (1993) Sirmon, Hitt, & Ireland (2007) Teece, Pisano, & Shuen (1997) Wernerfelt (1984) Winter (2000, 2003)

<sup>2</sup> Previous theoretical and empirical research investigating the relationships posited by resource-based theory is provided in Chapter III.

**TABLE 1 (cont.)**

	<b>Behavioral Theory</b>	<b>Organizational Ecology</b>	<b>Institutional Theory</b>	<b>Network Theory</b>	<b>Organizational Strategy</b>	<b>Resource-based Theory</b>
<b>Underlying Theoretical Assumptions</b>	Venture growth and performance is a function of personality traits, cognitions, and other important individual attributes (i.e., education, experience, tenure, etc.) that differentiate entrepreneurial and managerial tendencies across individuals	Venture growth and performance is a function of the age and size of the venture, the organizational form (structure), the distribution of resources, and the density of population of firms.	Venture performance is a function of the degree to which features of a venture conform to cognitive, normative, and regulative structures that provide stability and meaning to social behavior, i.e. rules, norms, expectations, and values of society.	Venture growth and performance is explained by virtue of the relationships ventures maintain with actors (i.e., other firms, government institutions, etc.) in the environment.	Venture growth and performance is a function of the degree to which a venture's strategic orientation matches the competitive market and whether it possess the necessary attributes to identify, evaluate, and exploit new opportunities.	Venture growth and performance is explained by the value, inimitability, rarity, and non-substitutability of a ventures resource endowment and the manner in which those resources are employed through capabilities for productive purposes.
<b>Resource and Capability Conditions</b>	Conceptualizations of resources and capabilities are generally confined to attributes of an individual (the entrepreneur, founder, manager).	Treats resources as an exogenous condition. Accounts for adaptive organizational change by focusing on the distribution of resources in the environment and the terms on which they are available.	New ventures conform to institutional rules in order to gain access to resources that enhance their ability to compete.	Structural, relational, and cognitive linkages between firms and within networks facilitate information and resource flows between firms. Social capital refers to the sum of resources that accrue to a firm through relationships formed between firms and itself is considered a resource.	Resources affect strategic actions to the extent ventures' management consider resources owned and controlled, or available via the market in formulating strategy.	Resources guide venture activity and management of capabilities is central to value creation. When resources and capabilities are valuable, rare, and inimitable, they convey a potential for competitive advantage. Rent generation then is a function of <i>ex ante</i> resource-selection and <i>ex post</i> capability-building.
<b>Variables of Interest</b>	Personality traits (Need for achievement, self-esteem, self-efficacy, locus of control, risk-taking propensity, tolerance for ambiguity) Cognitions (knowledge, heuristics, biases, decision routines) Other demographics (age, gender, education, experience, etc.)	Bargaining power Firm age Firm size Legitimacy Number of organizations Population density Population concentration Resource partitioning	TMT and Board composition Performance heterogeneity Resource composition	Tie number Tie strength Network centrality Board interlocks Relationship prestige	Strategy type Entrepreneurial characteristics	Financial capital (cash, assets, debt, equity) Human capital (knowledge, expertise, experience) Social capital (relationship ties, board interlocks, underwriter prestige)



behavior and performance outcomes of new ventures. Table 1 provides a summary of dominant perspectives explaining different performance outcomes for new ventures: behavioral theory, organizational ecology, institutional theory, network theory, and new venture strategy. This dissertation briefly examines each of these perspectives in the following sections.

### **Behavioral Theory**

Generally, psychological research into new venture performance has concentrated on the relationship between psychological traits (e.g., Brockhaus, 1980), intentionality (e.g., Krueger, Reilly, & Carsrud, 2000), and cognitions (e.g., Krueger, 2003; Katz & Shepherd, 2003), respectively, and different venture outcomes.

#### Traits

Personality traits are dispositions that are relatively stable across time and setting (Epstein & O'Brien, 1985). According to this perspective, individuals possess personality traits that are assumed to correlate with entrepreneurial or managerial behaviors, and thus directly influence venture outcomes. Personality traits often associated in the literature with new venture success include need for achievement (e.g., Lee & Tsang, 2001; McClelland, 1965), self-esteem (e.g., Baum et al., 2001; Locke & Latham, 1990), self-efficacy (e.g., Bandura, 1997; Gatewood et al., 1995; Gist & Mitchell, 1992; Poon, Ainuddin, & Junit, 2006; Zhao, Seibert, & Hills, 2005), locus of control (e.g., Lee & Tsang, 2001; Sexton & Bowman, 1986), risk-taking propensity (e.g., Brockhaus, 1980; Teoh & Foo, 1997), tolerance of ambiguity (e.g., Teoh & Foo, 1997), and tenacity (e.g., Baum & Locke, 2004; Baum et al., 2001), among others.

Although venture capitalists and entrepreneurs themselves commonly point to entrepreneurs' personal characteristics as dominant reasons for success (Sexton, 2001), research examining the utility of using personality trait measures in the prediction of new venture creation, in addition to new venture growth and performance, has produced equivocal results (Aldrich & Wiedenmayer, 1993; Begley & Boyd, 1987; Brockhaus & Horwitz, 1986; Low & MacMillan, 1988). For example, Johnson's (1990) meta-analysis results concluded that while achievement motivation is a distinguishing characteristic of entrepreneurs, personality traits more generally are not meaningful predictors of new venture performance, finding that their effects accounted for less than 7% of the explained variance.

Recent attempts to show the relevance of risk-taking and tolerance of ambiguity in the role-conflict to firm performance relationship also produced weak results (e.g., Teoh & Foo, 1997). Based on their review of the literature, Carsrud and Krueger (1995) found need for achievement (McClelland, 1965), risk-taking propensity (Brockhaus, 1980), and locus of control (Sexton & Bowman, 1986) were not meaningfully related to new venture performance. Baum and Locke (2004) concluded passion for work, defined as one's enthusiasm or zeal for challenge and task uncertainty (Locke, 2000), and tenacity, or perseverance (Gatewood et al., 1995), traits failed to significantly account for variance in new venture growth. These results led some researchers to conclude the use of personality traits to explain new venture outcomes was a 'dead-end strategy' (Gartner, 1990).

## Intentionality

In contrast to the representation of personality traits as stable dispositions, intentions, in their simplest form, capture motivational factors believed to influence behaviors (Ajzen, 1991; Krueger et al., 2000). More specifically, intentions indicate the degree to which people commit to a course of action and the level of effort they are willing to exert. Thus, intentions motivate people to act and guide goal-setting, communication, and commitment (Bird, 1988). Generally, the greater the intention to engage in a behavior, the more likely should be its performance. These motivations refer to the different mechanisms governing the direction, intensity, and persistence of actions not due solely to differences in ability or to environmental conditions that coerce or force certain actions (Bolles, 1975; Vroom, 1964). In fact, evidence suggests that intentionality may be the single best predictor of planned behavior (e.g., Krueger et al., 2000). Because individual behaviors have consequential effects on venture behaviors (Busenitz & Barney, 1997), scholars therefore believe intentions play an important role in the growth and performance of new ventures.

Entrepreneurial intentions are derived from perceptions of desirability (i.e., the personal attractiveness of new opportunities or a specified venture outcome) and feasibility (the degree to which an individual feels personally capable) and from an individual's propensity to act volitionally (Shapiro, 1975, 1982). Accordingly, intentional routines are central to voluntary behavior because they govern entrepreneurial choice among alternative courses of action (Vroom, 1964), and then orient behaviors that guide actions (Ajzen, 1991; Bandura, 1986; Bird, 1988; Krueger,

2003; Weiner, 1985). In other words, only when the features of an opportunity align with an individual's intentions will s/he act. As such, intentionality directs attention, experience, and action toward search and discovery routines aimed at the exploitation of new opportunities. Accordingly, the stronger the intention to engage in a behavior, the more likely should be its performance.

Social psychologists have found success in using parsimonious models of behavioral intentions to explain individual behaviors (Krueger, 2003; Krueger et al., 2000). As a result, two of the more robust theory-driven models of intentions found their way into new venture research: the theory of planned behavior (Ajzen, 1991) and Shapero's (1975, 1982) model of entrepreneurial events. The theory of planned behavior is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This theory offers a dispositional prediction of human behavior that emphasizes factors affecting the motivation to perform a given behavior, such as attitudes toward the behavior (perceptions and beliefs about personal impacts of the resulting outcomes), perceived social norms, and perceived behavioral control (ability; e.g., availability of time, money, skills, etc.). By contrast, Shapero's (1982) entrepreneurial event model is implicitly an intention model, specific to the domain of entrepreneurship, whereby intentions to start a new venture derive from perceptions of desirability and feasibility and from a propensity to act on recognized emergent opportunities.

Both models have produced considerable empirical support. For example, research has verified the significance of perceptions of desirability and perceptions of feasibility and, for example, the intent to start a new venture (e.g., Krueger et al., 2000;

Shook, Priem, & McGee, 2003) or to be self-employed (e.g., Kolvereid, 1996).

However, there appears to be no substantive research examining specific venture outcomes beyond the creation of new ventures.

### Cognitions

Understanding of the uncertainty of traits and intentions in explaining new venture outcomes led researchers to study variations in cognitions and decision processes to explain new venture creation and outcomes such as growth, performance, and survival. Theories of social cognition play a vital role in explaining the venture creation decision, and suggest that perceptions and judgments, rather than objective reality, may explain venture success (Simon, Houghton, & Aquino, 1999). Cognitive theory explains behavior as it is shaped by the person-environment interaction.

According to this perspective, decision making occurs within a specific context or situation described by two pairs of factors: (1) cognition and motivation, and (2) the person and the situation (Fiske & Taylor, 1984: 4-5). Accordingly, models used to explain individual behavior attempt to approximate reality as perceived when an individual processes information about these two factor pairs. In this manner, social cognition scholars associate individual information processing, judgment, and choice with individual decision-making conditions that occur as a result of different situational contexts (Salancik & Pfeffer, 1978).

Sociologists often apply cognitive theory to examine the interaction between individuals and their environment, arguing that social context plays a major role in shaping cognitive structures and, consequently, entrepreneurial behaviors (Zahra, Korri,

& Yu, 2005). For example, Day and Lord (1992) concluded that, compared to novices, individuals with significant experience founding and managing new ventures (i.e., experts) were more schema-driven, which they attribute to different heuristics formed by experts through experience. In other words, social cognition theory suggests that experience conditions individuals in such a way as to explain how such individuals gather and analyze certain types of information differently than individuals without experience (Ucbasaran, Wright, Westhead, & Busenitz, 2003). Accordingly, researchers have relied on measures of entrepreneurial experience to explain variation in differential propensities among individual entrepreneurs and entrepreneurial firms to recognize and consequently choose to exploit opportunities in the market.

Some research suggests that cognitive constructs relating to biases and heuristics differentiate behaviors of entrepreneurs from those of non-entrepreneurs in explaining the discovery and exploitation of opportunities (Baron, 1998; Busenitz & Barney, 1997; Simon et al., 1999). Accordingly, entrepreneurial cognition can importantly lead to the opportunity recognition and success with new venture creation (Mitchell, Busenitz, Lant, McDougall, Morse, & Smith, 2004; Zahra et al., 2005). As one of the few studies linking social cognitions with new venture creation, growth, and profitability, Mitchell et al. (2000) demonstrated a link between entrepreneurial cognitions and new venture creation. Using a sample of business professionals from seven countries, Mitchell and his colleagues found that certain knowledge structures (cognitive scripts) are associated with the venture creation decision and the effects are consistent across different national and cultural contexts.

Although research linking different entrepreneurial cognitions with new venture growth and performance is limited, research in strategic management has established empirical linkages between venture behavior and performance outcomes and characteristics of different cognitive structures and knowledge routines among individual members of the executive team (e.g., Reger & Palmer, 1996) and at the group-level, among, for example, members of the top management team (e.g., Hambrick & Mason, 1984; McNamara, Luce, & Thompson, 2002; Porac & Thomas, 1990). Examining new venture top management teams, Ensley and Pearce (2001) concluded that cognition as a group-level construct figured importantly in predicting new venture performance.

### **Organizational Ecology**

In contrast to psychological-based theories that posit direct and indirect effects between attributes of individuals and new venture success, organizational ecology accounts for adaptive change by focusing on the distribution of environmental resources and the terms on which these resources are available. Inspired by the question “Why are there so many kinds of organizations?” (Hannan & Freeman, 1977: 936), ecologists seek to explain the relative abundance and diversity of firms and to account for their changing composition by examining the effects of social, economic, and political conditions over time (Baum, 1996; Singh & Lumsden, 1990).

Environments contain firms vying for similar resources; the need for similar resources provides the basis for competition between firms. Because individual ‘populations’ maintain finite capacities for given resources (Hannan & Freeman, 1989), market forces are thought to differentially select or selectively eliminate ventures on the

basis of different organizational attributes (e.g., organizational structure, strategies, and routines), competitive pressures, and the logic of institutionalized norms. Accordingly, organizational scholars contend that new venture creation, different performance outcomes, and mortality emerge as a function of *variation, selection, retention,* and *competition* processes at work in an environment (Aldrich, 1979; McKelvey & Aldrich, 1983). According to this perspective, firms face constraints in their ability to adapt to environmental demands. Nevertheless, firms vary their strategy, structure, resource endowments, competences, and so forth to meet evolving market conditions for resource acquisition.

Variations may be intentional or blind (Aldrich, 1979; McKelvey & Aldrich, 1983). More specifically, variations may occur as a purposeful response to changing market conditions (e.g., intentional variation; Baum, 1996) or they may occur independently of selection pressures by accident or chance (e.g., blind variation; March, 1981). Accordingly, when successful variations are known, other firms imitate them creating normative pressures for conformity, retention, and diffusion that make resulting growth and performance advantages temporary (DiMaggio & Powell, 1983; Nelson & Winter, 1982). By contrast, complex variations often create causal ambiguity making it difficult for rivals to imitate. As a result, variations that are both valuable and difficult-to-imitate provide a source of sustainable competitive advantage leading to favorable venture growth and performance.

Organizational theorists apply a range of ecological theories to explain different outcomes. This dissertation briefly reviews six theoretical frameworks: liability of



newness, liability of adolescence, liability of smallness, density dependence theory, niche-width theory, and resource-partitioning theory.

### Liability of Newness

Directing attention to an age-dependent decline in mortality rates, Stinchcombe (1965) argued that young firms have a high propensity to fail. He noted that new ventures are likely to fail because members of these young organizations cannot adjust quickly enough to new roles and working relationships and because these organizations lack a “track record” with customers and suppliers. Underlying the failure of new ventures is their limited resources. Limited resources make young firms especially vulnerable to even slight operational inefficiencies, production delays, and environmental dynamism (Van de Ven, Hudson, & Schroeder, 1984) and limit their ability to shift to circumstances that are more favorable.

Stinchcombe labeled these problems ‘liabilities of newness.’ According to this perspective, new ventures are set on a course at founding that may be difficult or costly to change (Boeker, 1989; Eisenhardt & Schoonhoven, 1990). Structures and routines develop quickly (Gersick, 1989), and members of these ventures come to see them as the only acceptable way to accomplish tasks (Zucker, 1989). In other words, structures and routines in new ventures become viewed as part of an integrated whole in which it is difficult to enact change in one element of the organization without adversely affecting the whole. Finally, young firms often make investments in people, technology, and assets using limited financial capital that they may not be able to change because they

are too resource-poor. Accordingly, new ventures face a number of challenges that make growth and survival in the new domain prohibitive.

Because selection processes favor older, more reliable organizations, failure rates are expected to decline monotonically with age (Freeman et al., 1983; Hannan & Freeman, 1984). Stated differently, as time passes, organizational structures stabilize and ties with other actors become more resilient, and young firms come to have their actions sanctioned by powerful collective actors. This results in older more established firms developing advantages over newer ventures in part because of the ease these firms have in continuing existing routines compared with the difficulties new ventures face in either creating new routines or borrowing old ones (Henderson, 1999; Nelson & Winter, 1982).

A complementary treatment of the liability of newness comes from Hannan and Freeman (1984). These scholars argue that environmental selection processes favor firms exhibiting high levels of reliability and accountability in their routines, structure, and performance. More specifically, selection processes favor organizations with high reliability, i.e., a low variance in quality, and high accountability, i.e., the ability of an organization to account rationally for its actions. Reliability and accountability, in turn, require that organizational structures be highly reproducible (Hannan & Freeman, 1984). Because reliability and accountability tend to increase with age, failure rates decrease, as firms grow older. Due both to processes of internal learning, coordination, and socialization within an organization and because of the legitimacy that results from relationships formed between organizations over time, reproducibility increases with age (Singh & Lumdsen, 1990). Accordingly, highly reproducible structures generate stronger inertial pressures on the organization over time, making the organizations with high

structural inertia more favored by selection processes. However, organizational changes alter established structures and patterns of communication and disrupt the stability of the organizational routines (Nelson & Winter, 1982), resetting the liability-of-newness clock, and creating the same conditions that make young firms more likely to fail. Organizations that continually change structures to respond to new environmental pressures are said to recreate a liability of newness (new organizations are more vulnerable to selection processes than older ones). Consequently, as predicted, failure rates vary directly with the frequency of reorganizations.

Stinchcombe (1965) emphasized the importance of two sets of contextual factors. One is organizational. New ventures lack resources and often have key organizational members in unfamiliar roles with underdeveloped work relationships. Moreover, these firms maintain underdeveloped routines, which adversely affect the efficiency of their task environments because routines not only define what an organization can do, they also define what the organization knows (Nelson & Winter, 1982; Levitt & March, 1988). The second set is environmental. Young firms face performance constraints and mortality risks in part because they lack legitimacy and power and also because they often maintain few relationships with different owners of valuable resource stocks (Eisenhardt & Schoonhoven, 1990).

Researchers within and outside of organizational ecology have elaborated on these factors and provide support for liability of newness arguments involving different new venture outcomes (e.g., Carroll, 1983; Carroll & Delacroix, 1982; Freeman et al., 1983). Freeman et al. (1983), for example, found support for the liability of newness and its continuous decline interpretation in survival data of different U.S. ventures, including

semiconductor manufacturers, newspaper organizations, and labor unions. Singh, House, and Tucker (1986), in a study of the processes underlying the liability of newness, examined the impact of internal organizational changes on mortality rates of voluntary social service organizations and found that the lack of external legitimacy was one main reason for the high mortality of young organizations. In a companion study, Singh et al. (1986) tested competing theoretical perspectives on the impact of organizational change on mortality rates. Subsequent studies, however, when controlling for the time-varying function of size, has found much less pronounced liability of newness effect (Singh & Lumsden, 1990).

Research in finance and strategic management examining the valuation of firms undertaking the transition from privately held ventures to publicly traded firms have applied liability of newness arguments to explain, for example, IPO performance (e.g., Higgins & Gulati, 2006; Ritter, 1984). Institutional investors face tremendous uncertainty associated with the quality of young firms undertaking an IPO. This uncertainty is reflected in the research on equity values of IPOs, which has been marked by considerable debate regarding how to value IPO deals (e.g., Ritter, 1984). Certo (2003) describes this general problem of determining firm quality at time of IPO a 'liability of market newness' and offers that firms undertaking IPOs strive to overcome this liability by providing signals of legitimacy to investors. Higgins and Gulati (2003) similarly suggested that young firms gain organizational legitimacy by offering symbols of quality that redress specific concerns regarding product viability, competitive efficacy, and marketing efficacy. In another empirical study, Stuart et al. (1999)

examined how two forms of uncertainty—firm age and pre-IPO financing—moderate the effects of prestigious affiliations on IPO performance.

Throughout these and other theoretical and empirical studies of IPO firms, the general proposition remains that, given uncertainty at the time of IPO, young firms must convince external parties of the firm's quality and often do so by providing information that signals the firm's legitimacy. Following arguments posed by Barney (1986), such uncertainty can also obscure the value of resource endowments owned or controlled by IPO firms, a situation that will be explored further in Chapter III. Indeed, this logic echoes the seminal work of Pfeffer and Salancik (1978), who suggested that an organization's most critical activity is gaining the support of social entities that can ensure the firm's survival (see also, March and Simon, 1958)—entities, such as investors, who are the ultimate stakeholders.

Research in strategic management has also begun to recognize the conditioning effects of age on new venture performance and survival. Findings suggest the new ventures suffer significantly high levels of mortality owing to liabilities of newness once markets reach maturity (e.g., Agarwal & Gort, 2002; Suarez & Utterback, 1995). Using evolutionary theory to extend ecological perspectives on resource constraints and mortality among new ventures, Agarwal et al. (2002) found an elevated survival advantage for new ventures founded during the growth stage related to a more favorable knowledge regime and less formidable scale and resource barriers that exists in these market contexts.

### Liability of Adolescence

In contrast to the linear decline in mortality suggested by proponents of the liability of newness, some scholars argue that new ventures suffer from a liability of adolescence, evidenced by failure rates having a non-linear (inverted U-shaped) relationship with age (e.g., Levinthal & Fichman, 1988; Fichman & Levinthal, 1991). These studies suggest that young firms survive for a period with little risk of failure by drawing on initial resource endowments typically acquired at founding (e.g., venture capital funding, bank loans, initial public offering proceeds). Accordingly, new ventures face their highest mortality rate several years after their founding as initial endowments are expended and as these firms become increasingly more reliant on their ability to sustain resource needs from naturally evolving business operations.

Empirical research lends support to this argument. In a large study of German firms, Brüderl and Schüssler (1990), for example, challenged the liability of newness argument theoretically and empirically with the 'liability of adolescence' perspective. They found that the length of time between new venture creation and the time when this class of firms experience peak mortality rates was resource-dependent. Young firms with larger initial financial resource endowments enjoyed lower peak failure rates and were able to postpone the time when peak failure rates occurred. This viewpoint distinguished between two periods of an organizational life cycle. In the first phase, the adolescence phase, death risks are low, following a nonmonotonic risk function, in part, because powerful actors in the population were monitoring performance and postponing judgment about success or failure and because new organizations typically possessed a

stock of slack resources. The higher the initial endowments, the longer the duration of adolescence. In the later phase, the post-adolescence phase, monitoring ends, endowments return to equilibrium, and new ventures are subject to usual risks of failure. Other empirical studies also provide support for an initial 'honeymoon period' (e.g., Henderson, 1999; Mitchell, 1991; Singh et al., 1986).

### Liability of Smallness

Common to both the liability of newness and the adolescence perspectives is that the initial period following new venture creation is the most hazardous, and failure rates eventually decline with age. These two perspectives differ only about whether failure rates peak at founding or several years later. In contrast, other scholars have advanced a very different perspective. They have observed that most of the initial work examining these two perspectives neglected to account for age-varying effects of size (e.g., Barron, West, & Hannan, 1994; Baum, 1989; Henderson, 1999; Ranger-Moore, 1997). Thus, closely related to the liability of newness and liability of adolescence is the so-called 'liability of smallness,' which predicts failure rates decline monotonically with size.

Larger organizations are assumed to be less likely to fail for a variety of reasons. First, since large size increases inertial tendencies (i.e., reproducibility), and since selection pressures favor structurally inert organizations for their reliability, large organizations are proposed to be less vulnerable to the risk of failure (Barnett & Amburgey, 1990; Hannan & Freeman, 1984). Second, the propensity of small ventures to fail is often the consequence of resource constraints facing organizations that fail to raise adequate financial capital, recruit and train a quality workforce, meet higher

interest payments, or handle the administrative burden of governmental compliance (Aldrich & Auster, 1986). Finally, large size also tends to legitimate organizations, to the extent that large size signals dependability and success to current and future stakeholders.

Since new ventures tend to be small organizations at founding, if small organizations have higher failure rates as the liability of smallness predicts, then evidence suggests that negative relationships between age and failure were probably due to differences in size rather than the causal effects of age. In other words, what appears as negative age dependence in empirical studies examining liabilities of newness and adolescence perspectives may actually be a confounding of unmeasured size (Barnett & Amburgey, 1990; Baum & Oliver, 1991; Levinthal, 1991). Although previous empirical studies find consistent support for the liability of newness hypothesis (e.g., Carroll, 1983; Carroll & Delacroix, 1982; Freeman et al., 1983), more recent studies find failure rates do not decline with age after controlling for contemporaneous size (e.g., Barron et al., 1994; Brüderl & Schüssler, 1990; Fichman & Levinthal, 1991). Instead, the relationship between age and failure rates is actually positive in studies where size has been included as a time-varying control (e.g., Barron, West, & Hannan, 1994; Baum & Oliver, 1991; Ranger-Moore, 1997).

Barron and his colleagues (1994) also found that new venture growth rates are negatively related to age, further evidence that age worsens performance outcomes. As a result, some ecologists have concluded that firms suffer not from liabilities of newness or adolescence, but from a liability of obsolescence, because older firms face the time-varying effects of inertia such that they become more inefficient and unresponsive to



changes in the external environment. Consequently, failure rates are expected to increase with age, and growth rates are expected to decline. As a result, a growing number of organizational theorists recommend a more contingent approach (e.g., Baum, 1996; Ranger-Moore, 1997; Singh, 2006).

### Density Dependence Theory

One of the most studied arguments in the population ecology domain is density dependence theory (Carroll & Hannan; 1989; Hannan, Carroll, Dundon, & Torres, 1995; Hannan & Freeman, 1989). According to this perspective, changes in population density predict venture founding and failure rates as a consequence of processes of legitimation and competition (Hannan & Carroll, 1992). More specifically, initial foundings signal a developing niche to entrepreneurs, encouraging the creation of additional new ventures. As a result, founding rates rise and mortality rates fall as the legitimation of a population increases. However, as competition within and among population's intensifies, significant increases in density reduce founding rates and increase mortality rates. Because legitimacy exerts less of a positive influence on founding and less of a negative influence on mortality, further increases in density beyond an inflection point induce competition, driving founding rates down and increasing mortality rates among newer ventures (Carroll & Hannan, 1989). This results in an inverted U-shaped relationship between density and founding, and a U-shaped relationship between density and failure rates.

Evidence indicates conditions at founding shape the resource opportunities that fund new venture growth and survival, and thus figure prominently in the success of new

ventures (e.g., Agarwal & Bayus, 2004; Agarwal et al., 2002; Bamford et al., 2000; Eisenhardt & Schoonhoven, 1990). For example, examining a population of new ventures in the semiconductor sector, Eisenhardt and Schoonhoven (1990) found that environmental conditions at founding play a significant and meaningful role in the resource opportunities that shape the performance outcomes for new ventures.

Specifically, founding in growth-stage markets, defined as markets providing significant resource opportunities with growing consumer demand, is associated with higher growth rates among new firms than is founding in either an emergent (e.g., new markets characterized by low demand and high uncertainty; Anderson & Zeithaml, 1984) or mature (e.g., large markets with stable or slowly growing demand; Tushman & Anderson, 1986) market. In addition, empirical results suggest that characteristics of the market at founding also affect the profitability of new ventures. Carroll (1984), for example, found that while new ventures founded in mature markets were unlikely to become very large, they tended to become more profitable than other firms founded in emergent or growth markets did.

According to the density model, at the firm-level, competition among firms depends implicitly on the likelihood that two or more firms will attempt to exploit the resources from the same factor markets (Swaminathan, 1996). Not addressed is the *intensity* of competition for resources that is generated by these firms. Research suggests that competitive intensity is likely to have both contemporaneous and persistent effects related to conditions that exist at the time of a new venture's founding (Barnett & Amburgey, 1990). In other words, new ventures founded in periods of high competitive

intensity likely face resource constraints that are similar to those encountered by new ventures founded in high-density environments (Barnett, 1997).

Moreover, there is considerable debate about whether or not legitimacy is the true causal mechanism for the first half of the density curves (e.g., Baum, 1996; Baum & Powell, 1995; Singh, 1990; Zucker, 1989). Baum (1996), in particular, argues that institutional processes and linkages, political turmoil, government regulations, and technology may also underlie the observed relationship between density and founding. That is, an organizational form is legitimate to the extent that relevant actors regard it as the 'natural' way to organize (Meyer & Rowan, 1977). From this perspective, rarity of a form poses serious problems of legitimacy for new ventures. For example, Baum and Oliver (1992) found that controlling for institutional embeddedness eliminated legitimacy as an explanation for the front half of the density dependence curve. This finding suggests the importance of establishing institutional linkages to the success of new ventures (Baum & Oliver, 1991; Oliver, 1997). Moreover, density dependence arguments also fall short of explaining variations in the effect between organizations. Specifically, this perspective implies each venture in a population has an equivalent impact on the mortality rates and performance of member-firms (Singh & Lumsden, 1990). Accordingly, the covariates needed for more robust description of the competitive heterogeneity between firms and the density dependence of a population are not fully understood. Nevertheless, the model's basic predictions concerning the shape of the curves themselves have generally received empirical support (e.g., Baum, 1996).

### Niche-Width Theory

Evidence suggests that resource opportunities available to new ventures also depend on the competition for those opportunities within their founding environment (Carroll & Hannan, 1989; Eisenhardt & Schoonhoven, 1990). Ecologists refer to a market niche as the resource ‘space’ within which firms operate, expressing ways in which population and venture growth rates depend on the availability of resources and the competitive actions within and between populations (Dobrev et al., 2001; Freeman & Hannan, 1983). The existence of established competitors occupying large shares of a market’s resource space makes it particularly difficult for new ventures to grow. One reason is that established firms with large market shares are difficult to dislodge from a market, given their size, legitimacy, and first-mover advantages (Aaker & Day, 1986). Niche-width therefore represents a market’s ability to sustain the growth of member firms and its tolerance for changing levels of resources. According to this perspective, new ventures depend on the availability of distinct combinations of resources—called niches—and on the level of competition for those resources for their survival and growth. By determining the combination of resources available to member-firms, niches therefore act as a ‘fitness function’ (Hannan & Freeman, 1989), influencing the composition of firms, the nature of competition among those firms, and the conditions for growth and performance for new ventures and established firms alike. Stated differently, the nature of the competitive interdependence that results from the pursuit of similar resources jointly affects firm outcomes (Aldrich, 1999).

Niche width then refers to an organization's variance in resource utilization (Hannan & Freeman, 1989). This representation proves useful for classifying firms in terms of generalist (wide niche) and specialist (narrow niche) strategies. Firms competing across a limited range of product and geographic markets (niches) are called specialists. Because specialists compete in fewer markets, they require fewer resources to deal with environmental contingencies, and thus appear leaner than generalists (i.e., less resource slack). By contrast, generalists compete in a wider variety of product and geographic markets simultaneously generating economies of scale and scope by diversifying into new markets. However, by competing in a diversity of markets, generalists face complex demands requiring greater resource slack and excess capacity to exploit opportunities. Freeman and Hannan (1983) elaborated and refined the theory, focusing on two features of environmental variation that determine niches—levels of environmental variability and grain. Whereas *variability* refers to the variance in magnitude of environmental fluctuations about their mean, *grain* refers to the rate at which these environmental fluctuations occur (i.e., the frequency and duration of each change), with many small periodic fluctuations representing *fine-grained change* and a smaller number of large, episodic variations representing *coarse-grained change*. Accordingly, niche-width theories are formulated to explain how environmental conditions, specifically variations in resources, affect the mortality and performance outcomes of specialists and generalists.

Niche width theories have been empirically tested across a variety of different markets, including the restaurant (e.g., Freeman & Hannan, 1983), newspapers (e.g., Delacroix & Carroll, 1983; Carroll, 1985), and automobile (Dobrev et al., 2002)

industries. In relatively stable environments where the pattern of variation is fine-grained, specialist strategies are favored because of specialists can concentrate on particular market conditions of a narrower niche (Carroll, 1984). Specialist strategies are also favored for coarse-grained fluctuations when the level of environmental variation is low, because generalism offers no particular advantage against uncertainty. However, in uncertain environments where the level of variability is high, the broad market reach of generalists give them a selection advantage over specialists regardless of the frequency and duration of changes (i.e., the grain), because diversified organizations can more effectively allocate risks across the different markets served.

### Resource-Partitioning Theory

Niche-width perspectives assume that environmental resources and conditions are disjointed and highly dissimilar (Carroll et al., 2002; Péli, 1997). As a result, generalist organizations that straddle different ‘niches’ (i.e., resource markets) suffer diseconomies resulting from inefficient administrative overhead or excess capacity (i.e., resource slack). By contrast, resource-partitioning theory assumes that different resource markets are not substantially dissimilar. Accordingly, generalists may actually benefit from diversification, especially when participation in additional markets provides scale economies (Carroll et al., 2002).<sup>3</sup> In other words, resource-partitioning theory uses insights about economies of scale to make different predictions about niche-width theory based on environmental states across markets supporting different resource levels, which

---

<sup>3</sup> For example, General Motors participates in a variety of different ‘resource markets,’ ranging from gas, diesel, alternative fuel vehicles in both the consumer and commercial (trucks and buses) vehicle markets, to gas and diesel turbine engines for other vehicles. Accordingly, these markets share resource similarities that enable General Motors to leverage its resource endowments and capabilities across different market segments.

yield scale economies to larger, more established firms operating in two or more markets. Moreover, evidence suggests that resulting scale and scope economies may outweigh administrative overhead costs that would otherwise make generalists organizations inefficient (Carroll et al., 2002).

Broadly speaking, this theoretical perspective assumes markets consisting of finite sets of heterogeneous resources and explains the simultaneous occurrence of different organizational forms as a function of resource distributions within each market and a firm's centrality to those resources (Boone et al., 2002). Owing to scale competition, established generalist firms come to dominate the market center, which represents place at which most resources accumulate.<sup>4</sup> Owing to entrepreneurial discovery, 'empty spots' in the resource space defining the market become populated by new ventures (Swaminathan, 1996), implying a stronger linkage between environmental resources and new venture creation than previously thought. Moreover, because higher production activities by generalists generally leads to greater scale efficiencies, which can be passed on to customers in the form of lower prices or better goods or services, competition in the market center among large established generalists often trigger scale-driven competition for scarce resources (Boone et al., 2002). As a result, resource-partitioning perspectives are used to explain differential growth rates and performance variations among new ventures within and between different environmental contexts.

---

<sup>4</sup> The original niche width theory (e.g., Hannan & Freeman, 1977) assumes firms face a single, homogenous resource condition at any point in time. Over time, resources are assumed to be disjointed or highly dissimilar (Péli, 1997). According to this perspective, firms face highly dissimilar environmental resource states that alternate over time. Because of the dissimilarity in resource states, generalists occupying two or more markets pay a price in terms of overhead and excess capacity. By contrast, according to resource-partitioning theory, firms confront multiple resource conditions at any point in time and these resource markets are not assumed to be dissimilar.

Empirical results lend support to these theoretical arguments. Examining automobile industries in France, Germany, and the U.K., Dobrev et al. (2002: 1333), found that firms often seek viable positions outside of a market center when faced with 'competitive crowding' by diversifying into new or different product or geographic segments. Moreover, their results suggest that drivers of density dependence (i.e., competitive crowding) explain the diversification actions firms take and may explain variations in mortality rates that occur when firms explore less competitive market segments. More recently, in strategic management research, scholars have become increasingly interested in the influence of different environmental contexts on firms' diversification decisions, especially the criticality of different resource contexts. Wan and Hoskisson (2003), for example, found that in less munificent environments, increases to product diversification positively affect firm performance.

### **Institutional Theory**

Complementing organizational ecology's examination of different resource contexts, institutional theory stresses the influence of systems surrounding new and established firms that shape social and organizational behavior (Scott, 1995). The role of institutions in a market is to "establish the fundamental political, social, and legal ground rules that [shape] the basis for production, exchange, and distribution" (North: 1981: 6). Thus, institutions set the rules of the game (North, 1990) and may "reduce both transaction and information costs through reducing uncertainty and establishing a stable structure that facilitates interactions" (Hoskisson, Eden, Lau, & Wright, 2000: 252-253).



Institutional theory declares that firms' behaviors are the product of norms, values, and taken-for-granted assumptions that originate in the institutional context (Meyer & Rowan, 1977; Zucker, 1987). Economic choices are constrained not only by resource constraints, but also by socially constructed limits framing norms, habits, and customs. According to this perspective, conformity to social expectations determines venture performance and survival (Baum & Oliver, 1991; DiMaggio & Powell, 1983; Oliver, 1991). As Scott (1987: 498) observes, "organizations ... conform because they are rewarded for doing so through increased legitimacy, resources, and survival capabilities." Unlike theoretical frameworks from economics and strategic management, which examine the extent to which firm behavior is rational and economically justified, institutional theorists emphasize the extent to which firm behavior "is compliant, habitual, reflective, and socially-defined" (Oliver, 1997: 699).

Institutional theorists are especially interested in how organizational structures and routines become institutionalized over time (Scott, 1987; Zucker, 1987). Meyer and Rowan (1977: 341) explains, "Institutionalization involves the process by which social processes, obligations, or actualities come to take on a rule-like status in social thought and action." In other words, organizations are driven to adapt their formal structures to become isomorphic with domains of rationalized activity that are defined by prevailing institutional norms, expectations, and values as the source of pressures on organizations to conform (Scott, 1995). These pressures have important implications for new ventures because these firms face the prospect of having to direct comparatively greater levels of resources to institutionalized activities aimed at achieving conformity than established rivals do.

Institutional activities are the result of interrelated processes occurring at different levels of analysis: individual, organizational, and interorganizational or industry. At the individual-level, managers' norms, habits, and conformity to traditions account for institutionalized activities (Berger & Luckmann, 1967). At the firm-level, corporate culture organizing principles, and political processes perpetuate institutionalized structures and behaviors (Tolbert & Zucker, 1996). At the interorganizational-level, pressures emerging from industry relationships, societal expectations, and government policies define socially-acceptable firm conduct, and those social pressures common to all firms in the same sector cause these firms to exhibit similar behaviors (DiMaggio & Powell, 1983; Haveman, 1993; Scott, 1995).

Because institutional environments are not uniform, individual markets are composed of institutions that may differ significantly from one another (Scott, 2005). Further, institutional change is complex and institutions often persist over long periods of time (DiMaggio & Powell, 1991; Tolbert & Zucker, 1996). At any given time, it is likely that institutions may be changing at different rates and may be at different stages of development. Resource endowments take on added importance as a source of superior performance when environments are in a state of flux (Grant, 1991; Makhija, 2003). Resources determine the extent to which new ventures can formulate and implement strategies that take advantage of opportunities in the market (Grant, 1991; Amit & Schoemaker, 1993). Moreover, resources are context-sensitive and, depending on the characteristics of that context, certain resources can create strategic inflexibility and core rigidities that may lead to negative performance returns (Leonard-Barton, 1992). New ventures therefore must direct attention to the institutional context of their resources to

create value and sustain the advantage over time, especially when institutions change. Managing these processes requires sophisticated routines and processes to determine, develop, and deploy the resources and capabilities required by young firms (cf. Lei, Hitt, & Bettis, 1996; Teece et al., 1997).

Research finds that adoption of prevailing structures and routines also increases organizational legitimacy (Staw & Epstein, 2000). This is especially important for new ventures because legitimacy assists these firms in resource acquisition and in survival (DiMaggio & Powell, 1983; Pfeffer & Salancik, 1978). Deephouse (1999: 152) states, “a firm which is similar to other firms avoids legitimacy challenges that hinder resource acquisition.” Singh et al. (1986) cite the lack of institutional support experienced by young firms as one prominent reason underlying the higher mortality rates among these firms (i.e., liability of newness). Furthermore, firms with higher level of institutional support are able to acquire resources that are more valuable at more favorable terms than firms facing legitimacy constraints (Deephouse, 1996). Because legitimate firms are less likely to fail, suppliers of financial capital may accept lower risk premiums (Miller & Bromley, 1990), which provides needed capital for growth and lower interest charges increases operating margins and returns. According, institutional theory may not only explain the behavior and actions of new ventures, but also provides insight into how different actors interpret the signals firm behaviors relate.

### **Network Theory**

Where institutional theory argues for conformity to norms as the basis for organizational legitimacy and the acquisition of resources from the environment,

network theory adopts a relational approach (Gulati, Nohria, & Zaheer, 2000) examining firm outcomes and survival in a world in which new and established firms are embedded in networks of social and professional relationships with other firms (Granovetter, 1985; Gulati, 1999). Both liability of newness and smallness arguments assume that embryonic routines (Eisenhardt & Schoonhoven, 1990), uncertainty about the quality of new ventures' goods and services (Hannan & Freeman, 1984), and a lack of social acceptance, stability, and sufficient resources (Boeker, 1989) typify young firms and that these shortcomings raise their risk of failure. New ventures are truncated in their resource endowment and thus these firms depend critically on their environment for success.

Mobilizing resources to establish and grow a new venture is an undertaking laden with uncertainty and unforeseeable complexities (Aldrich & Auster, 1986). This process is also inherently social, because young firms depend on outside firms for resources beneficial to but not possessed by these firms (Gulati, 1995; Stuart et al., 1999). Aiken and Hage (1968: 914-915) noted that new ventures, in particular, face such dependence, "because of their need for resources—not only money, but also resources such as specialized skills, access to particular kinds of markets, and the like." Ahuja (2000) stressed the importance of network configuration in establishing interfirm linkages that allow firms to access network resources and legitimacy and to combine these resources with existing stocks to create value. Network theory therefore helps explain the benefits made available to firms from their relationship ties with other actors. Accordingly, significant effort has since been made to identify crucial contingencies likely to lead to

such dependence that in turn explains relationship ties and network formation (for a review, see Oliver, 1990).

Network resources are distinct from the resources residing securely within firms' boundaries (Gulati, 1999). They can be considered to be "strengths that firms can use to conceive of and implement their strategies" (Barney, 1991: 101). While resource-based perspectives highlight the importance of social factors and also the role of unique firm histories, only recently has attention been given to network resources that emerge from firms' participation in interfirm networks (Barney, 1991). For resource-constrained new ventures, relationship ties formed with venture capitalists, business angels, investment bankers, underwriters, and other financial institutions provide a valuable source of both financial capital and knowledge (Shane & Stuart, 2002; Steier & Greenwood, 2000). Their ability to mobilize extramural resources, attract new customers, and identify entrepreneurial opportunities is conditioned on external networks (Lee, Lee, & Pennings, 2001), since social relations often mediate economic transactions and convey organizational legitimacy (Granovetter, 1985). Accordingly, network theory holds that new ventures should pursue strategies focusing on the development of valuable networks with external resource holders in order to succeed. However, while such relationships constitute an important, possibly more efficient channel of resources, considerable investments are required to establish and maintain networks given norms of reciprocity (Adler & Kwon, 2002).

Although scholars generally agree that network positioning and relationship ties figure prominently in the performance outcomes of new ventures, explaining network formation is an important point of contention. According to Bourdieu (1986) and

Coleman (1988), patterns of relationships emerge due to the value to individuals and firms in establishing and preserving social capital. Social capital represents the network itself and the sums of resources embedded within the durable network of social relationships firms possess (Bourdieu, 1986; Nahapiet & Ghoshal, 1998). According to this perspective, a dense network with strong ties is associated with trust and fine-grained information exchanges between network members (Larson, 1992; Rowley, Behrens, & Krackhardt, 2000; Uzzi, 1997). On the other hand, weak ties increase information diversity and lead to novel information (Granovetter, 1973).

By contrast, Burt (1992) suggests that firms embedded in sparsely connected networks enjoy greater efficiencies and brokerage advantages based on the ability to arbitrage nonredundant information exchanges between otherwise disconnected members of the network. Burt explains new venture creation as a function of structural holes that emerge between dense pockets of network relationships. In other words, network positions associated with greater value creation opportunities lie *between* not *within* dense regions of relationships. These structural holes, in turn present opportunities for brokering information and resource flows between otherwise disconnected firms. These two perspectives are briefly reviewed in the following sections.

### Social Capital Theory

Social capital theory (e.g., Bourdieu, 1986; Coleman, 1988; Granovetter, 1973) relies on closed networks where dense relationships connect members with each other. In closed networks, social capital facilitates the development of norms of acceptable

behavior by diffusing information about normative behaviors within a network. As a result, a network provides value to members by providing access to information and resources that are embedded within the network.

Social capital is represented by the relational resources available to a firm through its partners or through its network of social relationships (Baker, 1990). Adler and Kwon (2002) define social capital as goodwill engendered through social relations that can be mobilized to facilitate action.<sup>5</sup> It is available to individuals or groups whose source lies within the structure and content of the actor's (e.g. the individual, group or firm) social relations. The effects of social capital on firms flow from the information, influence, and solidarity it makes available to them.

For new ventures, social capital is especially important. In particular, researchers argue that social capital facilitates resource exchanges and product innovation between firms (e.g., Tsai & Ghoshal, 1998); influences the creation of knowledge capital (e.g., Nahapiet & Ghoshal, 1998) and the effectiveness of cross-functional teams (e.g., Rosenthal, 1996); facilitates entrepreneurship (e.g., Chung & Gibbons, 1997) and the formation of start-up companies (e.g., Walker et al., 1997); and strengthens inter-firm learning and culture (e.g., Kraatz, 1998). Thus, social capital is a powerful construct for understanding the emergence, viability, and strength of relationships between new ventures and other actors and for explaining performance variations that occur between new and established firms.

Fewer cultural differences between two firms, for example, facilitate communication between them. Communication provides an avenue to avoid conflicts

---

<sup>5</sup> Goodwill is defined as “sympathy, trust and forgiveness offered ... by friends and acquaintances” (Adler & Kwon, 2002: 18).

and spurs a process resulting in trustworthiness. Thus, relational capital is interchangeable with social capital and reflects each unique boundary-spanning linkage between a firm and its partners (Luo, 2002). In addition, Dyer and Singh (1998) argue that absorptive capacity in knowledge sharing between the firm and its partners is enhanced as individuals within each organization become more familiar with each other, and as the cultural distance is narrowed during the socialization process.<sup>6</sup> A closer proximity reinforces trust, strengthens relational linkages and bonds, and encourages organizations to cooperate with each other to achieve common goals (Tsai & Ghoshal, 1998; Koka & Prescott, 2002; Luo, 2002).

The conceptualization of social capital as a resource for action is one way of introducing social structure into the rational action paradigm. Coleman (1988) introduced the concept “social capital” which parallels the concepts of human capital, financial capital, and physical capital. Social capital “is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors—whether persons or corporate actors—within the structure” (Coleman, 1988). Like other forms of capital, social capital is productive, making possible the achievement of certain ends that in its absence would not be possible. Similarly, Walker et al. (1997) refer to social capital as a means of enforcing norms of behavior among individual or corporate actors and thus act as a constraint as well as a resource.

---

<sup>6</sup> Absorptive capacity is the ability of a firm to recognize the value of new, external information, assimilate it, and disseminate it to achieve “commercial ends” where prior related knowledge confers an ability to more effectively embrace new information (Cohen & Levinthal, 1990).



Relying on Granovetter's (1992) distinction between structural and relational embeddedness, the structural dimension of social capital relies on the property of the network (i.e., position in the network) and emphasizes the social interaction. The location of an actor's contacts in a social structure of interactions provides certain advantages for the actor. The relational dimension of social capital in contrast refers to assets rooted in these relationships such as trust and trustworthiness (Granovetter, 1992). Capturing the essence of what Coleman (1988) described as "the public good aspect of social capital", the cognitive dimension is embodied in attributes like a shared code or a shared paradigm that facilitates a common understanding of collective goals and proper ways of acting in a social system (Nahapiet & Ghoshal, 1998).

Prior research in strategic management, organization theory, and finance suggests that relational ties affect startup innovation (Walker et al., 1994) and the growth and performance (e.g., Carter & Manaster, 1990; Baum, 1996) among new ventures. For example, relational ties with prestigious underwriters signal lower risk offerings resulting in higher returns for new ventures undertaking an IPO (Carter & Manaster, 1990). Further, organizational scholars argue that ties to prominent organizations mitigate uncertainty by signaling a new venture's legitimacy and quality to external resource holders, which in turn affects the growth and market performance of these firms (Stuart et al., 1999). Specifically, Stuart and his colleagues (1999) found that ties with well-regarded affiliates increased sales growth rates among U.S. semiconductor startups, and resulted in faster IPOs—at higher valuations—among U.S. biotechnology startups. One benefit to new ventures in developing relational ties with established firms is access to valuable information, resources, and capabilities that can enable these firms to

overcome the liabilities of newness and/or smallness (Baum & Silverman, 1999; Rao, 1994). Accordingly, social capital gained through relational ties not only influence new ventures' resources and capabilities, but also others' *perceptions* of these firms' resources and capabilities (Baum, Calabrese, & Silverman, 2000).

### Structural Hole Theory

By contrast, structural hole theory (e.g., Burt, 1992, 1997) emphasizes the importance of open rather than closed networks whereby the positions within the network that are associated with the highest returns lie between not within regions of relationships (Walker et al., 1997). Structural holes are gaps between network members indirectly linked to one another through a common third party, but that otherwise remain disconnected (Ahuja, 2000). Structural autonomy therefore strengthens firms' positions in a network. When a firm fills structural holes by linking other network members that are otherwise disconnected and eliminates its own structural holes, the firm is structurally autonomous (Burt, 1992). Structural autonomy allows the firm to extract value from the network by brokering and controlling the exchange of information and the flow of resources between the disconnected network members (Burt, 1997). Accordingly, firms build relationships with multiple disconnected clusters and use these connections to obtain resource and information control advantages over others.

According to this perspective, network positions associated with the highest economic return lie between, not within, dense regions of relationships called structural holes, which present opportunities for brokering information flow among firms (Burt, 1992). These opportunities have greater economic payoffs because the brokers'

information advantage creates the potential for arbitrage in markets for goods and services. Resources embedded in networks are a function of (1) the information and control advantages that emerge from the position one holds in the network and (2) the individual actor's ability to act as a broker in relations between other partners. Thus, social capital is derived from the ability to broker the flow of information and resources between otherwise disconnected parties across a network, which reinforces the importance of structural autonomy leading to lower network constraint and greater social capital.

Reductions in independence, however, offset the benefits of increasing social constraint from establishing relationships in closed regions of the network. Thus, network structure determines the redundancy of its information benefits to young and established firms alike. Burt introduced two indicators of network redundancy. The first is cohesion. Cohesive contacts—contacts strongly connected to one another—are likely to have similar information and therefore provide redundant information benefits. The second indication is structural equivalence. Equivalent contacts—contacts that link an actor to the same third parties—have the same sources of information and therefore provide redundant information flow. In contrast, structural holes are the gaps between non-redundant contacts that can offer additive, rather than redundant, information advantages.

There is a growing body of research in strategic management coming to terms with the performance consequences of networks for new ventures. For example, research suggests that network location (i.e., centrality) shapes the nature of competition with ventures more centrally located having more timely access to information about

promising opportunities, which in turn affects rates of growth for these firms (Powell, Koput, & Smith-Doerr, 1996). Uzzi (1997: 49) found that structural embeddedness promotes allocative resource efficiencies and “economies of time (the ability to capitalize quickly on market opportunities)” yielding higher survival rates for networked firms. Evidence also suggests that diversity levels are lower at higher levels of structural integration and further increases in redundancy reduces a venture’s ability to adapt, diminishing performance and survival chances (Uzzi, 1996, 1997). Similarly, Baum and his colleagues (2000) also found that highly redundant network ties reduced the diversity of information flow creating inefficient partner configurations and capabilities while incurring greater costs.

More recently, scholars have begun to examine the contingent effects of environmental conditions on value derived from these networks. Powell et al. (1996), for example, demonstrated the importance of collaboration to innovation among ventures operating in ‘high-velocity’ environments, such as those conditions found in biotechnology. Afuah’s (2000) examination of alliances among computer workstation manufacturers concluded that firms operating in complex and highly dynamic markets should not invest limited resources in strong ties among a small set of network members. Dramatic shifts in environmental conditions dramatically impede competitive advantage, because of an overcommitment to network positions established through its network of strong ties. Instead, firms should allocate resources to maintaining weak ties with alternative partners, who represent options for dealing with environmental shocks in the ‘local’ market. Finally, studying the effects of tie density and network sparsity among ventures in the semiconductor steel industries, Rowley et al. (2000) concluded that

stronger ties were more credible for firms when dealing with lower environmental uncertainty and a competitive environment demanding higher degrees of exploration.

### **New Venture Strategy**

Scholars also devote considerable attention to understanding the relationship between new venture strategy and different performance outcomes (e.g., Carter, Stearns, Reynolds, & Miller, 1990; Covin & Slevin, 1990; McDougall & Robinson, 1990; Sandberg, 1986; Sandberg & Hofer, 1987; Vesper, 1980). A central argument in the new venture strategy literature draws from contentions in strategic management research that young firms must fit with their environment to survive and achieve success. According to this perspective, new ventures' managers are responsible for developing strategies that maintain "satisfactory alignments of environmental opportunities and risk on the one hand, and organizational capabilities and resources on the other" (Miles, 1982: 14). Accordingly, strategic management is understood as a process that deals with formulating and implementing strategy that enables firms to maintain alignment with the external environment (Hofer & Schendel, 1978; Vesper, 1980; Eisenhardt & Schoonhoven, 1990) and, more broadly for new ventures, with actions aimed at opportunity exploitation, organizational renewal, and growth (Dess, Ireland, Zahra, Floyd, Janney, & Lane, 2003). According to this perspective, strategies address two questions: "What business(es) should we be in?" and "How should we compete within a given business?"

Attempts to specify appropriate strategies for new ventures have yielded a number of different typologies and insightful perspectives. Much of the early research

about new venture strategies dealt with the debate over whether these firms should pursue 'niche' strategies wherein they would avoid direct competition with large, more established firms (e.g., Broom & Longenecker, 1971) or risk an aggressive campaign against established firms on a broad front aimed at rapidly building share (e.g., Hanan, 1976; Vesper, 1980). Supporters of the underlying niche perspective argued that startups possess a liability of newness (Stinchcombe, 1965) in which limits in both resources and learning constrain chances for growth and survival (Broom & Longenecker, 1971; Cohn & Lindberg, 1974). These scholars urge new ventures to concentrate on specialized products, localized business operations, and higher levels of quality and craftsmanship and market segments where high levels of customer service create unique (to new ventures) advantages or opportunities too small to be of interest to larger firms (Cohn & Lindberg, 1974). By contrast, other scholars contend that new ventures should consider a broader range of strategic alternatives, including direct competition with market leaders (Biggadike, 1979; Cooper, Willard, & Woo, 1986; Miller & Camp, 1985). Biggadike (1976), for example, argued that unless new ventures enter markets with aggressive share objectives, and invested and marketed with a focus on rapid share growth, they penalize themselves by lacking the broad appeal of established competitors. Accordingly, being more aggressive and broader than incumbents' results in superior financial and market performance.

Subsequent empirical studies examining new venture strategy have also considered the contingent effects of different organizational (e.g., Henderson, 1999), competitive (e.g., Chaganti, Chaganti, & Mahajan, 1989; Zahra & Bogner, 2000), industry (e.g., McDougall et al., 1992; Sandberg & Hofer, 1987), and national (e.g.,

Shane & Kolvareid, 1995; Zahra et al., 2000) contexts on strategy formulation and new venture success. For example, Carter et al. (1992) found evidence that new venture strategies vary across different stages in the evolutionary lifecycle of industry supply chains. Empirical findings also suggest the effects of strategy on new venture performance and profitability may be greater when analyses also considered the industry structure (e.g., McDougall et al., 1992; Sandberg & Hofer, 1987). Chaganti, Chaganti, and Mahajan (1989) found that in price competitive environments a cost leadership strategy negatively correlates with new venture profitability. By contrast, other research suggests that in highly competitive environments 'high performance' new ventures tend to offer higher quality goods and services for a premium price relative to competitors (e.g., Covin & Slevin, 1990).

These efforts borrow from broader strategic management literature where a limited number of strategic models are presumed to capture the essence of most competitive postures. Two especially influential schemes are the approaches developed by Porter (1980) and Miles and Snow (1978). Porter (1980: 35) emphasized three generic strategies by which firms develop defensible positions: cost leadership, product or service differentiation, or focus. Firms adopting cost leadership pursue investments in scale and scope economies, tight cost and administrative controls, and productivity enhancements aimed at minimizing value chain costs. Low cost positions yield cost savings allowing these firms to undercut competitors by passing savings on to customers in the form of lower prices. Firms pursuing approaches to differentiation emphasize the quality of goods and services. Successful differentiation strategies yield higher margins and provide defensible positions against competitors owing to brand loyalty by

customers and resulting lower price sensitivities of targeted customer groups. Finally, a focused approach involves seeking out a particular customer group, product or service line, or geographic markets that ventures serve using cost leadership or differentiation.

Miles and Snow (1978) distinguished generic strategies according to how firms respond to different environmental conditions and characterized firms by how they align strategy, structure, and process variables under these various environmental conditions. Their work placed the concept of congruence in the domain of strategic management research. ‘Prospectors’ possess flexible structures that are used to search the environment for different product/service/market opportunities. These firms tend to be the first-to market innovators to which industry competitors must respond. ‘Defenders’ attempt to seal off a segment of the market by exploiting efficiencies across their value chain, thereby improving operational stability and reducing vulnerability to the environment. ‘Analyzers’ operate in two or more competitive domains simultaneously. By paying close attention to the actions of key competitors in each market, they selectively pursue production efficiencies to exploit stable domains or product innovations to success in more dynamic domains when appropriate. Finally, ‘Reactors’ have no clearly articulated strategy. These firms respond inconsistently to different market conditions and are therefore at the mercy of environmental variations.

### **Summary**

As demonstrated in the previous sections, multiple and varied theoretical explanations from strategic management, organization theory, economics, sociology, and psychology, prescribe conditions for different performance outcomes among new



ventures. Additionally, the vast empirical evidence presented in the preceding sections illustrates the empirical inconsistencies as well as the lack of explanatory power in the literature on new venture performance. Furthermore, as noted in this chapter, previous studies often examine factors in isolation and thus fail to provide a more robust prediction of new venture performance. For example, many of the behavioral theories concentrate on the relationship between different psychological traits (e.g., Gatewood et al., 1995; Lee & Tsang, 2001; Locke & Latham, 1990; Zhao et al., 2005), motivational factors such as intentionality (e.g., Ajzen, 1991; Bird, 1988; Krueger et al., 2000), or the application of cognitive theory to explain different entrepreneurial behaviors (e.g., Busenitz & Barney, 1997; Mitchell et al., 2004; Simon et al., 1999; Zahra et al., 2005). These theoretical perspectives tend to dwell on the individual-level of analysis, often ignoring broader contextual factors that may further our understanding of organizational outcomes.

By contrast, ecological theories focus primarily on the effects of environmental conditions on the formation, growth, and mortality of populations of firms (e.g., Agarwal & Bayus, 2004; Carroll et al., 2002; Dobrev et al., 2001; Singh, 2006). These theories generally account for adaptive change to organizations by focusing on the distribution of environmental resources and the various terms on which those resources are made available within populations. Accordingly, theoretical perspectives grounded in organizational ecology often are not concerned with the possibility of heterogeneity in resource endowments between firms within a population.

While institutional theory stresses the influence of exogenous systems surrounding a firm influencing its behavior and performance prospects (Scott, 1995;

Oliver, 1991), network theory adopts a relational approach (Gulati et al., 2000) stressing the examination of firm behavior and related outcomes among a dyad of relationships occurring within and across various levels of analysis, i.e., between individuals, groups of individuals, and organizations. While these two theoretical perspectives often provide more comprehensive predictions of new venture performance, to-date very few studies have been concerned with the influence of exogenous systems and networks of social and professional relationships on the formation and use of organizational capabilities by firms.

Perhaps the most significant weakness in previous research surrounds the nature of the relationship between venture resources and new venture performance, which is the focus of this study. Considering the limitations of the various dominant theoretical perspectives, this dissertation argues that without an explicit incorporation of the contextual setting and the presence of more complex intervening factors in the examination of the value of resources to new ventures and established firms alike, our understanding of the source of performance heterogeneity among firms is likely to be inadequate. I set out to address this aspect in more detail in Chapter III by presenting the theoretical model and accompanying hypotheses.

## CHAPTER III

### THEORY DEVELOPMENT AND HYPOTHESES

#### Introduction

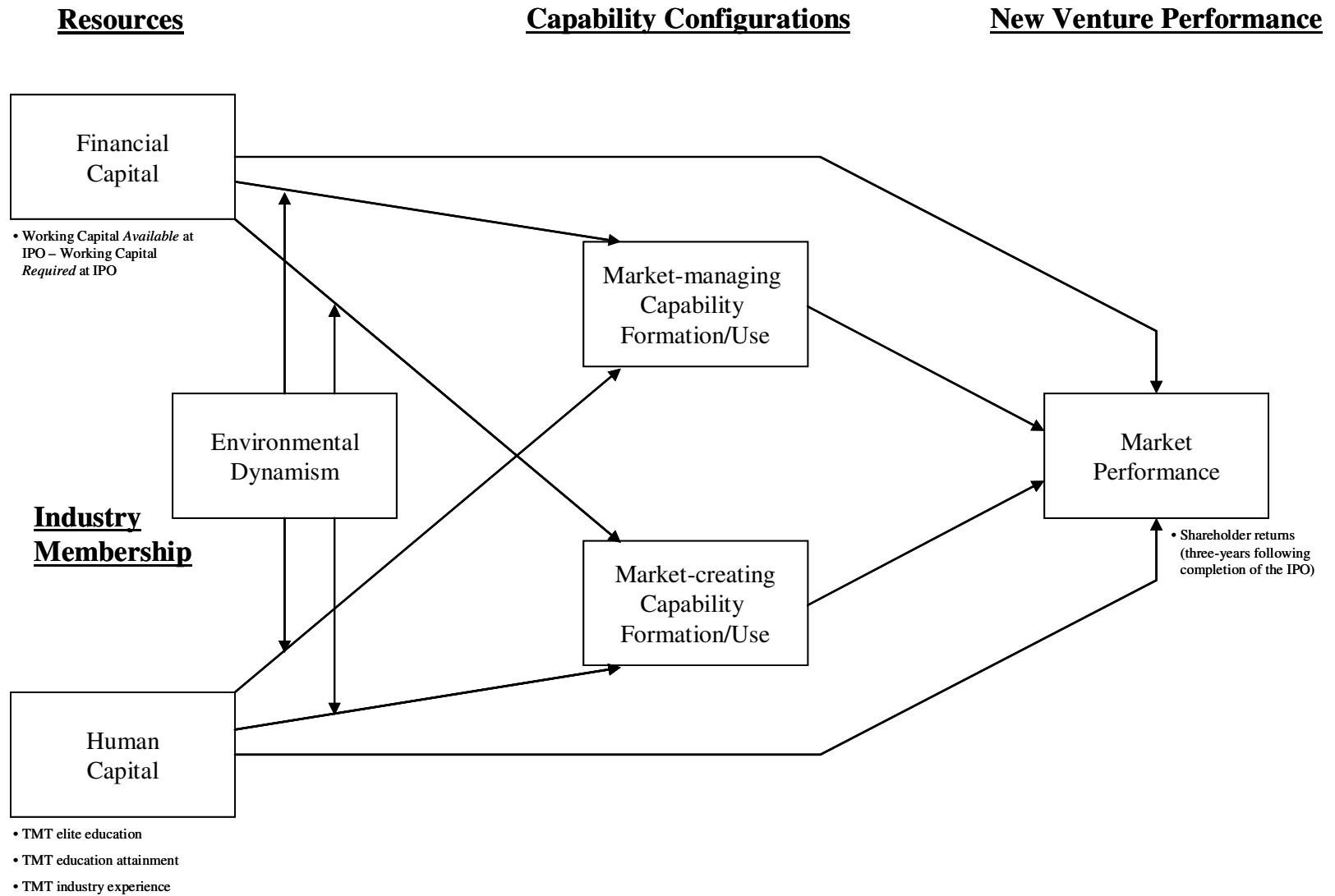
Relying on the resource-based view of the firm and contingency theory perspectives, this chapter examines the direct and indirect effects of organizational resources and capabilities on the performance outcomes of new ventures. More specifically, this chapter accomplishes two objectives. First, it incorporates context-specificity using resource-based and contingency theory logics to investigate contingencies affecting resource value among new ventures under different environmental conditions. In particular, this dissertation proposes that certain organizational and environmental contingencies predict allocations to different capability configurations among new ventures and also predict new venture performance outcomes. Second, this chapter theorizes and empirically tests the indirect relationship between venture resources at IPO and new venture performance through allocations to capability configurations formed and maintained by these firms.

In this chapter, I review the main tenets of the resource-based view of the firm (RBV) and contingency theory, discuss the important role of resource allocations, describe market-managing and market-creating capabilities, and provide an overview of the IPO process and its relevance to the study of performance outcomes among new ventures. Next, I introduce this dissertation's theoretical model. In particular, I examine the relationships between venture resources, capability configurations, the environment,

and new venture growth and performance. Finally, I describe how organizational capabilities partially mediate the relationship between venture resources and the performance of new ventures. Hypotheses are presented for each relationship examined in the study.

Figure 2 presents a theoretical model describing the proposed relationships among the constructs of interest to this study. This dissertation predicts that venture resources at IPO directly *and* indirectly affect the performance of new ventures. In doing so, I predict that venture resources at IPO influence new venture success directly and through the intensity of post-IPO allocations to configuration and use of market-managing and market-creating capabilities. Specifically, the model illustrates how the hypothesized relationships between available financial capital at IPO, defined as proceeds from the IPO plus the net current assets at IPO (Katila & Shane, 2005; Schoonhoven et al., 1990), human capital at IPO, defined as managerial knowledge and experience that resides within and is utilized by a firm (Hitt, Bierman, Uhlenbruck, & Shimizu, 2006; Nahapiet & Ghoshal, 1998; Subramaniam & Youndt, 2005; Youndt et al., 2004), and environmental uncertainty at IPO affect (1) post-IPO allocations to the formation and use of organizational capabilities, and (2) performance outcomes among new ventures. This dissertation elaborates this overview into hypotheses coming from resource, environmental, capability, and performance constructs. For parsimony, hypotheses are specified only for the links considered most central to the resource-based and contingency-based rationales asserted by this work.

**FIGURE 2**  
**Theoretical Model**



## The Resource-based View of the Firm

The RBV is one of the most prominent theoretical perspectives in strategic management (Penrose, 1959; Wernerfelt, 1984; Barney, 1991). Central to this perspective is the idea that firms' resources determine heterogeneity, and that such differences drive value creation via development of competitive advantage (Ireland et al., 2003). Tracing the origins of their work to Penrose (1959) and Barney's (1991) more recent articulation, resource-based scholars argue that a firm's unique resource portfolio not only influences performance but also affects the rate and direction of its growth. In other words, the RBV assumes that the sources of superior performance are internal to the firm. In particular, it links firm performance to the resources and capabilities possessed by a firm (Barney, 1991; Peteraf, 1993; Teece, 1980). According to this perspective, performance is sustainable when resources are inimitable and lack viable substitutes (Priem & Butler, 2001a). Relative performance advantages result when firms combine resources to form capabilities and then effectively leverage those capabilities to exploit specific market opportunities (Grant, 1991). Research also suggests that performance depends on the context in which firms develop and deploy resources and capabilities along their value chain (e.g., Aragon-Correa & Sharma, 2003; Brush & Artz, 1999; Zajac et al., 2000).<sup>7</sup> Stated differently, some conditions make the same

---

<sup>7</sup> A value chain, as defined in this dissertation, consists of *the structured set of value-enabling production activities that may be undertaken for a product to be made or a service to be rendered* (Holcomb & Hitt, 2007). The concept of the value chain was originally used to describe the set of productive activities that occur within the boundaries of any given firm, such as research and development, engineering design, inbound/outbound logistics, marketing, etc. (see Porter, 1985). My definition of the term is consistent with the general use (e.g., Porter, 1985) to mean the structured set of activities associated with a firm's productive output, regardless of whether they take place within the boundaries of a single integrated firm.

configuration of capabilities valuable in one context and not in others, which is explored further in this chapter.

At its most basic level, the RBV is built on four arguments. First, the RBV asserts that resource endowments vary between firms (Penrose, 1959; Peteraf, 1993). Second, resources convey the potential for competitive advantage and superior performance to the extent they are valuable and difficult-to-imitate (Wernerfelt, 1984; Dierickx & Cool, 1989; Barney, 1991). Third, competitive advantage and superior performance is realized when resources are combined and used to create value (Lippman & Rumelt, 2003; Miller, 2003). Fourth, competitive advantage is sustained over time by firms that better utilize their resources to create value for customers and to protect unique combinations from imitation (Black & Boal, 1994). It is argued therefore that firms achieve superior performance not simply because of the resources they possess, but because of their innovative and effective management of those resources (Morrow et al., 2007; Sirmon et al., 2007).

In contrast to neoclassical economic theory explaining persistent firm differences on the basis of collusion or monopolistic behavior (Nelson & Winter, 1982), the RBV holds that variance in competitive outcomes stems from differences in the characteristics of rivals' resources (Barney, 1991) and capabilities (Miller, 2003). According to this perspective, organizational *resources* are tangible and intangible assets owned, controlled, or accessed on a semi-permanent basis by firms that allow them to formulate and implement strategies in valuable and difficult-to-imitate ways (Morrow et al., 2007).

---

Focusing on activities—the physically and technologically distinct activities a firm performs—provides an efficient way of examining how firm boundaries change and how capabilities are leveraged to accommodate some or all of the activities within a value chain.

Resources are valuable when they allow firms to implement strategies that increase net rents or decrease net costs and/or when they allow firms to sustain competitive advantages over time. Using routines and related procedures to deploy and use resources, *capabilities* allow firms to manage productive activity that exploits existing product-market positions and to develop new and/or substantially alter existing product-market positions. In other words, firms endowed with *superior* capabilities are better able to compete in the marketplace by producing more efficiently and/or better satisfying customer wants (Peteraf, 1993; Priem, 2007).

Although a dominant perspective in management research, the RBV has been criticized. Three of the more common criticisms of the RBV are as follows: (1) the RBV largely ignores *how* resources are managed to create competitive advantage, (2) it presents a static view of an evolving and dynamic process, and (3) it fails to consider external contingencies such as environmental uncertainty and the competitive context (Barney & Arkan, 2001; Priem & Butler, 2001a). Specific to the focus of this dissertation, there is minimal research investigating the context-sensitivity of relationships between resources, capabilities, and outcomes such as growth and performance (Priem & Butler, 2001a), especially studies involving new ventures that observe these relationships across different environmental contexts. Therefore, this dissertation follows calls for additional research to examine the context of resource use (e.g., Sirmon et al., 2007).

In addition, scholars have largely overlooked the effect that resources implicitly exhibit on performance through their allocation and use by firms. RBV logic holds that resource value is contingent on its use. Thus, the resource-performance relationship



likely relies on the different capabilities that firms maintain, because capabilities govern the transformation of resource endowments to achieve productive outcomes (Collis, 1994; Dutta et al., 2005). This is especially important for new ventures because these firms often lack sufficient financial resources to fund growth (Katila & Shane, 2005; Schoonhoven et al., 1990). Moreover, new ventures often possess or control limited human capital (knowledge) (Busenitz & Barney, 1997; Florin et al., 2003), and possess fewer socially endowed resources such as legitimacy that otherwise can provide them with access to resources controlled by other firms (Aldrich & Fiol, 1994; Certo, 2003; Zimmerman & Zeitz, 2002). This research addresses these two theoretical gaps in the literature.

Furthermore, despite its appeal as a theoretical framework for explaining firm heterogeneity, some scholars criticize the resource-based theory for lack of an empirical base, and argue previous conceptualizations and measurement of resources are tautological (e.g., Porter, 1991; Williamson, 1999). In particular, researchers often identify critical resources and capabilities by comparing successful firms with unsuccessful ones, and then test the criticality of those resources/capabilities for better performing firms. However, resources alone do not necessarily convey competitive advantage. Resources are valuable only within the context of some activity (Porter, 1991), making performance outcomes contingent on their *use* (Priem & Butler, 2001a). This research attempts to overcome measurement limitations highlighted in previous studies by establishing measures of capability configurations that are observable and quantifiable. Specifically, I develop measures of resource allocation intensity that

provide an assessment of value derived from the resource transformation process and therefore offer an objective assessment of capability formation and use.

This dissertation examines the allocation of resources in the formation and use of different capability configurations. In particular, I conceptualize the process by which capabilities are formed through the relative allocation of venture resources to different capability configurations and the effect of these allocations on new venture success. This approach entails modeling a venture's distinctive capability configurations as allocation functions relating each configuration to the venture resources necessary for their formation and use. Thus, I attempt to link variations in venture outcomes with the choices ventures make when *allocating* their resources. In doing so, this dissertation explores how the configuration of capabilities potentially mediates the relationship between venture resource endowments at IPO and the performance outcomes of new ventures.

### **Resource Allocations**

Resources are at the heart of the RBV. They are those specific physical (e.g., facilities, equipment, geographic location), human (e.g., knowledge, expertise, education, experience), and structural (e.g., organizational form, relational ties, network centrality) assets that can be used to implement value-creating strategies (Barney, 1986; Wernerfelt, 1984). They include the local abilities or 'competencies' that are fundamental to a firm's success such as industry-specific skills and experience or the ability to effectively advertise and brand a firm (Eisenhardt & Martin, 2000). However,

ownership or control of firm resources alone does not ensure success. Firms must put resources to productive use.

One important decision made within virtually all firms is the allocation of resources (Bower & Gilbert, 2006; Chandler, 1962; Daft, 1978; Hofer & Schendel, 1978; Pfeffer & Salancik, 1974; Porter, 1980). Resource allocation within firms is important in understanding how firms make productive use of their resources through choices characterized by uncertainty, complexity, and conflict. As a result, competition is driven not simply by similarities or dissimilarities in resource endowments, but by how resources are used, such that different performance outcomes occur when separate firms employ similar resources in different ways (Amit & Schoemaker, 1993; Peteraf & Bergen, 2003). Accordingly, following Pfeffer and Salancik (1974), this dissertation argues that resource allocation provides a compelling basis for examining the performance effects of different capability configurations and the resources they use.

In particular, this research employs a method of measuring firm-level resource deployments that has close analogues in research examining conditions at the firm-level (e.g., Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Zhang & Rajagopalan, 2003) and at the industry-level (e.g., Miles, Snow, & Sharfman, 1993; Dooley, Fowler, & Miller, 1996). Used as both a dependent variable and later as the mediating variable in the relationship between venture resource endowments and performance outcomes, actual resource allocations represent an observed pattern of deployment activity in an array of resource-related actions and thus have some attractive pragmatic and theoretical features that make them useful for this study.

There are several reasons that examining resource allocations can further our understanding of the relationship between venture resources, capability formation and use, and new venture performance. First, allocations provide an observable measure of firms' use of key resources in productive activity across different capabilities, such as manufacturing, research and development (R&D), marketing, and finance. More specifically, actual resource allocations associated with operating expenditures (e.g., labor, material and other intermediate goods or services, and selling, general and administrative expenditures), working capital management (e.g., inventory management, accounts receivable, accounts payable), and strategic growth (e.g., R&D expenditures, capital expenditures, advertising expenditures) at firms are highly visible. Thus, resource allocations offer reliable indicators of resource uses (Harrigan, 1985; Mintzberg, 1978; Schendel & Patton, 1978), especially for firms operating in the public markets because these firms are required to complete independent audits of financial operating results.

Second, how resources are actually allocated and used shapes a firm's strategic intent and determines its performance outcomes (Bower & Gilbert, 2006). Thus, it is through the deployment of venture resources across these capabilities that firms manifest their competitive approaches (Chandler, 1962; Hofer & Schendel, 1978; Porter, 1980). Third, financial results are generally available for firms across different industries and environmental settings; therefore, they provide opportunities for extending and replicating research results. Finally, allocations are theoretically important because they represent actions that are not only critical and contested within most firms (e.g., Pfeffer & Salancik, 1974), but also may affect the competitive resource allocation decisions of rivals (McGrath, Chen, & MacMillan, 1998).

Resource allocation is especially important for new ventures because most of these firms face severe resource constraints (Baker & Nelson, 2005; Choi & Shepherd, 2005) and tend to be undercapitalized (Holtz-Eakin et al., 1994a, 1994b). As a result, different organizational priorities compete for a share of these resources, with the total amount fixed in the short-run. By contrast, some new ventures pursue and even embrace challenging growth strategies by making efficient use of their resources (Mosakowski, 2002), despite their inability or refusal to attract the resources these actions often demand (MacMillan & McGrath, 1997; Mahoney & Michael, 2005). For instance, Baker and Nelson (2005) found that resource-poor firms often “make do” by applying different combinations of the resources at hand to pursue new opportunities more effectively than rivals do. In making do with whatever is at hand, these scholars attribute performance heterogeneity to differences in discretionary choices about the exploitation of physical, human, and structural resource inputs. Similarly, in a study of privately held firms, George (2005) found that when resource demands exceed availability within these firms, performance is likely to be higher, because when demand substantially exceeds availability, these firms bootstrap and find more efficient and effective uses for limited resources. Accordingly, new ventures survive and often flourish experiencing growth and better performance despite facing potentially daunting resource constraints.

### **Contingency Theory: A Subject of Fit**

To propose a general theory of how environmental conditions influence the formation of different capability configurations and their resulting impact on new venture performance, this research also draws upon contingency theory, which posits

that organizational outcomes are a result of the alignment of organizational elements with the environmental context (Donaldson, 2001; Lawrence & Lorsch, 1968; Thompson, 1967). According to Scott (1992: 98), the concept of fit suggests “there is no best way to organize but several, and their suitability is determined by the extent of the match between the form of the organization and the demands of the environment.” In other words, firms with organizational and strategic elements that more closely match the requirements of their environmental context are likely to be more effective than those firms that do not. In the organizational theory literature, the notion of fit has focused primarily on environment-structure relationships, focusing on contextual elements presumed to affect structural choices. Three of the more prominent contingency-based arguments have been made for size (e.g., Blau, 1970; Gooding & Wagner, 1986), technology (e.g., Rousseau, 1979; Thompson, 1967; Woodward, 1977), and the environment (e.g., Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Pfeffer & Salancik, 1978).

According to organization theory’s interpretation of contingency theory, firms’ strategic actions take the form of ‘adaptation’ in which the environment contingencies suggest the adoption of structures that ‘fit’ prevailing conditions. Lawrence and Lorsch (1968), for example, suggest that the heterogeneity in a firm’s environment is directly related to the level of differentiation among the firm’s component parts because each component of the firm is responsible for dealing with certain areas of the environment. According to this perspective, firms in highly dynamic, complex, and uncertain environments adopt a differentiated structure that is unique from those in more stable, less complex, and more certain environments. Similarly, Pennings (1992) contends that

firms that adopt structures matching the demands of the environment are more efficient and effective than those that do not. Thus, by adopting 'organic' structures, firms in highly dynamic and uncertain environments utilizing low levels of work standardization and highly decentralized decision-making are able to process large amounts of relatively complex information more efficiently than firms that use more formalized and centralized structures.

Strategic management scholars adopt a broader multidimensional view of 'context' in which different levels of environmental variation require different degrees of strategic formality as a means to match organizational resources and capabilities with opportunities and threats in the general business environment. In doing so, strategy scholars find strong support for the influence of both firm-specific and environmental conditions on performance outcomes (e.g., Hofer & Schendel, 1978; Porter, 1980; Youndt, Snell, Dean, & Lepak, 1996). For instance, Hofer and Schendel argued that firms must align their strategy with exogenous conditions such as environmental uncertainty, competitive entry barriers, and industry life-cycle factors to achieve superior performance. Drawing on contingency and resource-based arguments, Zajac et al. (2000) developed and tested a model of *strategic fit*, using industry- and firm-level conditions to predict changes in a firm's strategy and the performance implications of such changes.

Confirming the importance of contingency approaches to new ventures, empirical research in the field of entrepreneurship has found that contingency models incorporating the interactive effects of environmental conditions more useful than 'direct effects' models that do not consider context-sensitivity (e.g., McDougall et al., 1992; Sandberg, 1986; Tsai, MacMillan, & Low, 1991; Zahra, 1996). For example, Robinson

and McDougall (2001) demonstrated the importance of disentangling the effects of different environmental conditions on measures of new venture performance. Integrating arguments from industrial organization (IO) economics, strategic management theory, and entrepreneurship, they found that different market entry barriers (e.g., economies of scale and capital requirements) had divergent effects on both return-on-sales and shareholder return after accounting for the moderating effects of industry growth and venture strategy.

In integrating resource-based and contingency theory perspectives within this research, I accept the view that environmental conditions affect the way in which new ventures may utilize their resources and therefore influences the value derived from the allocation of resources to different capability configurations. However, I do not argue that environmental conditions mechanistically determine resource value, thus avoiding the criticism of contingency theory by strategy scholars as being deterministic (Pennings, 1992; Schoonhoven, 1981). In particular, this research utilizes dynamism to the measure environmental uncertainty. This construct: (1) appears repeatedly in organizational theory and strategic management research with empirical support, and (2) fits the entrepreneurship context, having also appeared in a broad range of strategic management and entrepreneurship studies as a significant predictor of different organizational outcomes in new ventures.

### **New Ventures: A Focus on Initial Public Offering (IPO) Firms**

The establishment of new ventures lies at the foundation of entrepreneurship (Hitt, Ireland, Camp, & Sexton, 2001), and the growth and performance of



entrepreneurial ventures is responsible for much of the wealth creation in developed and emerging economies (Birch, 1987; Kirchoff, 1991). Nevertheless, many obstacles confront young companies. New ventures often lack financial resources, knowledge of their competitive environment, and legitimacy with customers, suppliers, and partners (Stinchcombe, 1965). Similarly, young firms often have limited production experience, and therefore operate using routines that may be underdeveloped (Sorensen & Stuart, 2000). Because new ventures can encounter numerous potential hazards, there is considerable uncertainty about the viability of these firms. Added to the hazards of inexperience, young firms often require substantial resources to fund early-stage and speculative strategic development programs (Stuart et al., 1999), while cash flows to fund growth are not expected until later development stages of a venture's growth. Thus, the decision to 'go public' represents an important transitional stage in the development of young firms (Aldrich, 1999), in part, because initial public offerings allow firms to access financial resources that can be used to seize and finance growth and/or repay debt (Nelson, 2003).

An initial public offering (IPO) is the event that transforms a privately held venture into a publicly owned company. Over the past several years, IPOs have received a significant amount of attention in the finance (e.g., Jain & Kini, 1994), strategy (e.g., Certo, 2003; Certo et al., 2001; Certo et al., 2003), and organizational theory (e.g., Fischer & Pollock, 2004; Welbourne & Andrews, 1996) literatures. The primary focus of this research has been on discovering the factors that significantly affect survival rates (e.g., Fischer & Pollock, 2004; Jain & Kini, 1994; Welbourne & Andrews, 1996), IPO performance (e.g., Certo et al., 2003; Deeds, DeCarolis, & Coombs, 1997; DeCarolis &

Deeds, 1999; Gulati & Higgins, 2003; Sanders & Boivie, 2004; Stuart et al., 1999), and longer-term performance outcomes (e.g., Florin et al., 2003).

Although an IPO offers a number of benefits to firms that successfully navigate the transition, it also represents a critical point in a new venture's development bringing with it a number of costs and risks (see Husick & Arrington [1998] and PriceWaterhouseCoopers [2005] for discussions of potential benefits, costs, and risks). In particular, the change from the private to public market often necessitates a change in organizational goals (Aldrich, 1999), as top managers of IPO firms must consider the different goals and time horizons of new shareholders. Further, IPO firms often undergo a number of changes to their administrative systems and patterns of activity that necessitate refining existing operating routines and capabilities and developing new ones. For example, more formal governance procedures are often required and additional finance and administrative personnel are added to accommodate the reporting requirements of the Securities and Exchange Commission (SEC) and to facilitate communication with a firm's new investors (Husick & Arrington, 1998). As a result, IPO firms must learn how to deal with reduced flexibility, increased oversight from the investment community and the firm's own board of directors, greater demands for short-term profitability and performance, and less tolerance for performance variability and uncertainty (Fischer & Pollock, 2004; PriceWaterhouseCoopers, 2005).

From a new venture's perspective, however, selling equity to the public not only produces a positive signal of legitimacy to the market, but also generates much-needed capital. This observation is significant, especially from a shareholder's perspective, because, similar to free cash flow from operations, cash proceeds from an IPO can be

reallocated to operations and to unfunded projects, albeit at the discretion of management. Accordingly, firms have decision options at the time of the IPO for deploying newly acquired financial resources. Available decision options include funding operational initiatives, expanding existing strategic initiatives, or devising new strategic programs. For example, firms can improve production capabilities to gain better cost efficiencies, engage in acquisitions that alter and/or expand firm boundaries, or enter new product or geographic markets to enhance scale and scope economies (Holcomb, Holmes, & Hitt, 2006; Husick & Arrington, 1998).

In sum, although IPO firms vary in the intensity with which they experience specific changes and the resource allocation choices triggered by an IPO event, all face the task of adjusting goals, boundaries, and/or routines enough to incur performance and survival risks. In other words, the disruptive events associated with an IPO effectively ‘reset the clock’ and reintroduce risks associated with the liability of newness as firms struggle to adapt strategies, internal operational routines and processes, and/or capabilities with the intent of continued growth and improved performance (Amburgey, Kelly, & Barnett, 1993; Fischer & Pollock, 2004).

Furthermore, because IPO firms have not had the opportunity to establish a consistent performance record of accomplishment in the public market, they also lack the organizational legitimacy that other publicly traded counterparts often possess and thus suffer from a ‘liability of market newness’ (Certo, 2003). Taken together, previous research suggests that firms recently experiencing an IPO face significant performance challenges and failure risks that mirror the challenges faced by recently launched firms.

**TABLE 2**  
**List of Definitions**

Term	Definition	Citation
Resource	Resources, broadly defined, have often been used in the literature in a generic sense to also include capabilities (e.g., Barney, 1991). ‘Resources’ are defined as tangible or intangible assets that new ventures’ own, control, or are provided access to on a semi-permanent basis, and that allow them to implement their strategies.	Barney (1991); Grant (1991); Helfat & Peteraf (2003)
Financial Capital	Financial capital is defined as proceeds from a new venture’s IPO plus tangible and intangible net current assets at IPO. It represents the cash ‘on-hand’ plus tangible and intangible ‘equity’ assets (e.g., facilities, patents, trademarks, etc.) that is available to allocate towards development and use of market-creating and/or market-managing capabilities.	Katila & Shane (2005); Schoonhoven et al. (1990)
Human Capital	The sum of all knowledge, skills, and ‘life’ experiences residing in and utilized by its most senior executives. It represents knowledge owned by individuals that firms, in turn, borrow or rent from their managers and employees. Two important features of human capital are the level of formal education and level of work experience within a particular industry.	Hitt et al. (2006); Nahapiet & Ghoshal (1998); Schultz, (1961); Subramaniam & Youndt (2005); Youndt et al. (2004)
Resource Allocation	Resource allocation is the process by which firms deploy and make productive use of their resources through choices that are characterized by uncertainty, complexity, and conflict. Resource allocations associated with operating expenditures (e.g., direct labor and material; selling, general and administrative expenditures), working capital management (e.g., inventory, receivables, payables), and strategic growth (e.g., R&D expenditures, capital expenditures, advertising expenditures) at firms are examined in this dissertation.	Bower (2006); Chandler (1962); Daft (1978); Hofer & Schendel (1978); Pfeffer & Salancik (1974); Porter (1980)
Capability	Scholars claim that capabilities represent how firms manage resources or that capabilities represent a unique combination of resources that enable firms to pursue specific actions that create value. ‘Capabilities’ are defined as organizational routines that allow firms to effectively integrate and use resources to implement their strategies. Capabilities serve as an intermediate transformation ability between the allocation of resources by new ventures and the organizational outcomes such resources achieve.	Dosi et al.(2000); Helfat & Peteraf (2003); Lavie (2006); Sirmon et al. (2007); Winter (2000, 2003)

**TABLE 2 (cont.)**

<b>Term</b>	<b>Definition</b>	<b>Citation</b>
Capability Configuration	Capability configurations represent a distinctive combination of organizational capabilities consisting of routines, the attributes of those routines, and interdependencies formed across different configurations that allow firms to establish, maintain, and extend a competitive advantage.	Lavie (2006); Winter (2003)
Market-making Capability Formation/Use	Market-creating capabilities consist of dynamic routines that enable firms to extend or substantially augment existing product-market positions, to create new product-market positions, or to alter the process(es) by which future goods and services are produced. Accordingly, these capabilities are value-enhancing, rather than value-enabling, because they permit ventures to achieve growth by altering current organizational scale and scope thereby converting existing and newly accessed resources into new product-market segments that enable competitive advantages to be sustained. Examples include research and development, engineering design, brand management and advertising, new product introduction, alliance formation and management, mergers and acquisitions, and divestitures.	--
Industry Membership	Industry membership is represented by the exogenous environmental/market conditions that are assumed to be idiosyncratic to each industry, which affect the formation of capabilities and the resulting organizational outcomes those capabilities are intended to achieve. Two specific conditions are examined in this dissertation: environmental munificence and environmental dynamism.	Aldrich (1979); Dess & Beard (1984); Keats & Hitt (1988)
Environmental Dynamism	The level of instability or uncertainty associated with an environment and represents environmental change that is difficult to predict. Dynamism (uncertainty) is the variance in the rate of market and industry change and the level of uncertainty about the forces beyond the control of individual firms	Dess & Beard (1984); Keats & Hitt (1988)

Consequently, this research employs a sample of firms that have recently completed an IPO to test the hypotheses presented in this chapter.

In the following sections of this dissertation, I develop the research hypotheses. These hypotheses explore the direct effects of venture resources on the performance of new ventures and on the allocation of resources to different capability configurations, the moderating effect of environmental conditions on these relationships, and the indirect effects of venture resources on new venture success via a venture's capability configurations. Table 2 provides a brief summary of the descriptions of the main constructs represented in the theoretical model (see Figure 2).

### **Venture Resource Endowments and New Venture Outcomes**

Underlying resource-based logic is based on the assumption that firms' performance and the rate and direction of their growth are influenced by how firms conceptualize and use their resources. Given the popularity of resource-based arguments, several studies have explored relationships among similar resource types and outcomes such as firm growth and performance (e.g., Bamford et al., 2000; Cooper, Gimeno-Gascon, & Woo, 1994; Covin, Slevin, & Heeley, 2000; Mishina et al., 2004). Although these studies offer many useful insights, there is still need for additional theorizing and empirical research. First, conceptualizations of organizational resource and capability constructs in prior studies vary widely and do not consistently capture the logic of growth and performance (Mishina et al., 2004), especially for new ventures. Second, the relationship between venture resources and different performance outcomes differ based on the contingent and indirect effects of these resources on performance. Thus, much

prior research overlooks the complexity in these relationships and a study incorporating them may better explain the influence of venture resources at IPO on new venture success. In this dissertation, I examine the direct, moderating, and indirect performance effects of two resource types: financial capital and human capital.

### **Financial Capital**

Previous research suggests that the amount of initial financial capital invested by new ventures positively affects new venture survival and growth (e.g., Cooper et al., 1994). In this research, I conceptualize a new venture's financial resource endowment as the 'liquid' financial capital at IPO—proceeds from a new venture's IPO plus tangible and intangible net current assets at IPO (Katila & Shane, 2005; Schoonhoven et al., 1990)—that is available to allocate towards the development and use of different capabilities.<sup>8</sup> Availability or slack in liquid financial resources is a general asset that is easily allocated to varied uses. Accordingly, the presence of positive amounts of financial capital implies that a firm has available financial resources that can be used for productive purposes, including the pursuit of capital-intensive strategies, which are more difficult to imitate (Cyert & March, 1963).

---

<sup>8</sup> The concept of available financial capital bears some resemblance to the concept of free cash flow, which refers to “undistributed cash flow in excess of that needed for positive net present value (NPV) projects” (Brush, Bromiley, & Hendrickx, 2000). However, this research considers the two concepts to be distinct from one another. In particular, by definition, the concept of free cash flow assumes that the only investment alternatives available for the allocation of free cash flow are unprofitable (i.e., negative NPV) alternatives. By contrast, the concept of available financial capital, or slack, refers to financial resources in excess of amounts needed to satisfy current operational demands and support current performance levels (Bourgeois, 1981; Cyert & March, 1963). The measure of available financial capital utilized by this research does not assume that excess resources exist because all profitable investment opportunities have been exhausted, as is posited by the free cash flow hypothesis (Jensen, 1989, 1993). Rather, this research assumes that available financial capital exists because a firm has more resources than required to satisfy current demands. In addition, the focus on IPO firms highlights the significance of proceeds raised from this event and thus fails to qualify under the tenets of free cash flow logic.

Research suggests that available financial capital enhances experimentation and risk-taking, which influences the innovativeness and performance of large firms (e.g., Bromiley, 1991; Cho & Pucik, 2005; Greve, 2003) and privately held companies (e.g., George, 2005). In this case, the availability of such capital relaxes internal controls and creates funds that firms can redirect towards programs with uncertain outcomes, thereby fostering an environment for innovation (Nohria & Gulati, 1996; Singh, 1986). Therefore, this research assumes that financial capital at IPO will be positively associated with new venture performance. I offer two possible reasons for a positive effect. First, available financial capital eases financial resource constraints on the operation and growth of the business and expands the range of strategic alternatives available to management for investments with potentially positive returns (Tan & Peng, 2003). Second, available financial capital allows experimentation and risk-taking (Nohria & Gulati, 1996), which may have positive performance consequences.

The motivation to transform available financial resources into growth is fixed in what Penrose (1959) refers to as the 'entrepreneurial ambition' of new ventures, which she describes as management's propensity for taking risks to ensure growth occurs. In other words, excess capacity provides an internal mechanism for growth that allows firms to more fully utilize available resources. According to this perspective, optimal performance requires a balance between the exploitation of existing resource endowments and the development (or acquisition) of new resource positions (Chatterjee & Wernerfelt, 1991; Ghemawat & Costa, 1993). In support of this view, Thompson (1967: 150) suggested that excess resources endow firms with the ability "to take advantage of opportunities afforded by the environment," and various studies have found



that available financial resources have a positive effect on different measures of performance, including profitability and shareholder returns (e.g., Miller & Leiblein, 1996; Mishina et al., 2004). For new ventures, financial capital provides the ability to adjust to prevailing environmental and competitive conditions and to establish new market positions vis-à-vis rivals (Bamford et al., 1999; Cooper et al., 1994).

Accordingly, for entrepreneurial managers, *available* financial resources may be considered a ‘waste,’ and these managers are often willing to endure short-term resource deficits in order to promote future growth (Bhide, 1992).

Results examining venture growth, however, are mixed. Evidence suggests that resources controlled by a firm often promote growth (e.g., Bamford et al., 2000; Cooper et al., 1994), while others observe that resource differences are unrelated to growth (e.g., Shrader & Simon, 1997). Other researchers have found that the combination of resources with business strategies influences growth (e.g., Chandler & Hanks, 1994) while other studies report that resource-strategy interactions do not have certain performance implications (e.g., Brush & Chaganti, 1999). The lack of clear findings between resources and performance, especially growth, in the literature may be attributed to the way in which the resource-performance relationship has been operationalized in the literature. Prior research has construed that greater levels of available financial capital will lead to better performance. However, countervailing claims to the resource-performance relationship suggest that such relationships are contingent upon a firm’s allocation of resources. In other words, for available financial capital to spur better performance outcomes, it must be applied to productive uses.

By contrast, performance declines are likely at increasingly higher levels of available financial capital. Proponents of behavioral theory, for example, argue that higher levels of available financial capital provide opportunities for executives to appease different coalitions by allowing these parties to pursue their own agendas (Cyert & March, 1963), even when such allocations are unlikely to produce acceptable returns. In addition, some research suggests that ventures with large financial resource reserves can become overly optimistic in their assessment of risky projects. In turn, overly optimistic ventures often pursue strategic programs with higher failure rates yielding lower investment returns (Cooper, Woo, & Dunkelberg, 1988; de Meza & Southey, 1996), which reduce profitability and shareholder returns when entrepreneurial opportunities are not properly exploited. Moreover, research on small entrepreneurial firms suggests that firms with *fewer* resources are likely to leverage them more effectively (Baker & Nelson, 2005; Starr & MacMillan, 1990). According to this perspective, resource ‘constraints’ alter the behavior by which resources are allocated and used, forcing these firms to improve allocative efficiency.

In this dissertation, I first examine the direct effect of available financial capital at IPO on venture performance and address the potential indirect effects later in this chapter. Based on the arguments presented above, I argue that a non-linear relationship (inverted U-shape) exists between available financial capital at IPO and venture performance. More specifically, allocation activity intensifies at lower to moderate levels of available financial capital at IPO, enhancing experimentation and risk taking. As a result, performance improves as ventures capitalize on gains from investments in the most profitable entrepreneurial opportunities. However, as allocation activity

intensifies with higher levels of available financial capital at IPO, ventures often discover fewer profitable opportunities. Thus, higher levels of available financial capital at IPO are unlikely to produce performance gains necessary to offset added costs. Furthermore, as allocations intensify, organizational boundaries grow, increasing bureaucratic complexity and information asymmetries (Hitt, Hoskisson, Johnson, & Moesel, 1996). Information asymmetries produce information deficits. Information deficits add to the administrative demands of organizing transactions. In turn, excessive administrative demands associated with governance oversight reduce firm performance (D'Aveni & Ravenscraft, 1994; Rothaermel, Hitt, & Jobe, 2006). Thus, beyond a certain level of available financial capital at IPO, I expect the relationship to be negative. Specifically, I propose that:

**Hypothesis 1: Financial capital at IPO has a non-linear association (inverted U-shaped) with IPO-stage new venture performance.**

### **Human Capital**

Resources that are valuable, unique, and difficult to imitate can provide the basis for ventures' competitive advantage (Amit & Schoemaker, 1993; Barney, 1991). In turn, these competitive advantages enhance venture success by producing higher levels of performance (Peteraf, 1993). Scholars argue that both tangible resources (such as financial resources and other physical assets) and intangible resources (such as human capital) form the basis of firm strategies (e.g., Barney, 1991; Hitt, Bierman, Shimizu, & Kochhar, 2001) and are critical to the execution of those strategies as well (e.g., Schoenecker & Cooper, 1998). In particular, intangible resources, such as human capital,

produce positive returns via competitive advantage because they are often rare and causally ambiguous, thereby making them more difficult and costly to imitate (Hitt et al., 2001; Itami, 1987). Furthermore, human capital can enable firms to establish and sustain performance advantages over time because some capabilities generate private synergies when based on firm-specific knowledge (Barney, 1988).<sup>9</sup> Others create scale economies when integrated with firm resources (i.e., complementary assets; Harrison, Hitt, Hoskisson, & Ireland, 2001). In both cases, such advantages may not be easily imitated by rivals and are likely to be immobile.

This dissertation defines a firm's human capital as the sum of all knowledge, skills, and 'life' experiences residing in and utilized by its most senior executives (Hitt et al., 2006; Nahapiet & Ghoshal, 1998; Schultz, 1961; Subramaniam & Youndt, 2005; Youndt et al., 2004). Top managers gain knowledge through formal education and through learning on the job (Hitt et al., 2001; Hitt et al., 2006). Accordingly, executives' higher education and work experiences form their skill sets and knowledge structures as well as their distinctive worldviews. Furthermore, although individual knowledge is held by people (i.e., know-how and know-what), it is embedded within the organizing principles, culture, etc. of the firm (Kogut & Zander, 1992). In turn, firm knowledge is nested in a higher order set of routines that form different capabilities (Winter, 2003).

Different types of knowledge vary in their transferability. Previous research classifies these different knowledge types as either explicit or tacit knowledge (e.g., Polanyi, 1967). Explicit knowledge is codifiable and can be transferred at little or no

---

<sup>9</sup> Private synergy is created when information about the combination of firm-specific resources is observed from rivals and when no other combination of resources can produce the same value (Barney, 1988; Harrison et al., 1991).

cost (Eden, Levitas, & Martinez, 1997; Liebeskind, 1996). Whereas explicit knowledge is considered easy to transfer, making it susceptible to unintended transfer to or expropriation by competitors, tacit knowledge is embedded within individual skills and the collaborative working relationships within firms and therefore is unique to each firm. As a result, tacit knowledge is often embedded in uncodified organizational routines (see also Nelson & Winter, 1982; Winter, 2003), making it difficult to transfer (Teece et al., 1997). As such, tacit knowledge is rare and inimitable making it a likely source of profitability and advantage (Barney, 1991; Berman, Down, & Hill, 2002; Mowery, Oxley, & Silverman, 1996; Spender, 1996).

In contrast to organizational capital, which represents institutionalized knowledge and codified experiences stored in firms' databases, patents, manuals, and other formalized structures (Hall, 1992; Itami, 1987), human capital represents knowledge owned by individuals that firms, in turn, *borrow* or *rent* from their managers and employees. Youndt et al. (2004: 338) describe organizational capital as "the knowledge, skills, and information that stays behind when an organization's people go home at night." Daft and Weick (1984: 285) note the distinction between human capital and organizational capital by observing, "[i]ndividuals come and go, but organizations preserve knowledge ... over time." In other words, individual expertise and knowledge may or may not remain with a firm and can evolve depending on the hiring, development, and turnover of its people. By contrast, organizational capital is institutionalized and therefore it does not change very easily (Walsh & Ungson, 1991).

The upper echelons perspective is firmly grounded in the belief that top managers account for what happens in and to an organization (Cannella & Holcomb,

2005; Hambrick & Mason, 1984). According to this perspective, the knowledge, education, experiences, perceptions, and personalities of top managers manifest themselves at several stages of the decision process, from opportunity identification to alternative generation and exploitation. Thus, both strategic choices and organizational decision outcomes reflect the characteristics of the top managers in a firm. Drawing from the Carnegie School approach to decision theory (Cyert & March, 1963; March & Simon, 1958), the upper-echelons model assumes that cognitive and behavioral factors, rather than rational calculation, shape strategic decision-making. In this way, the knowledge and experiences of organizational decision makers strongly influence the ease with which firms make complex choices.

An important feature of the upper echelons perspective adopted by this dissertation is a primary focus on the top management team (TMT) rather than strictly the chief executive officer (CEO). Except in extreme cases, management is a shared effort in which a dominant coalition (Cyert & March, 1963) collectively shapes organizational outcomes. Recent research in strategic management suggests that human capital attributes (including education, experience, and skills), and, in particular, top managers' attributes affect firm outcomes (e.g., Finkelstein & Hambrick, 1996; Huselid, 1995; Pennings, Lee, & van Witteloostuijn, 1998). For example, Eisenhardt and Schoonhoven (1990) found that new ventures with TMTs having greater work experience experienced higher growth. Furthermore, examining a sample of the largest professional law firms in the U.S., Hitt and his colleagues (2001) found that partners' human capital (knowledge) had a positive effect on firm performance. In particular, the authors' empirical findings supported theoretical arguments suggesting the effects of top

managers' human capital on firm performance are both direct and indirect. Carpenter, Sanders, and Gregersen (2001) concluded that a CEO's work experience, specifically his or her international experience, was positively related to firm performance. In addition, they found that TMTs' work experience positively moderated the relationship between CEO experience and firm performance. Thus, a higher level of knowledge among top managers is expected to have a positive influence over new venture performance.

Beyond knowledge gained through formal education and through experience on the job, managers, especially the senior-most executives managing firms in the public arena, are often required to have extensive education and training prior to assuming leadership roles. This education and prior work experience usually provide a high level of articulable knowledge in specific functional disciplines (i.e., finance, engineering, law; Wiersema & Bantel, 1992), broader managerial know-how (Kogut & Zander, 1992), and awareness of different industry recipes (Reger & Huff, 1993). Often there is some variation in the degree and quality of this education and experience. For example, higher levels of education are associated with higher capacities for information processing and the ability to discriminate among a variety of decision options (Wiersema & Bantel, 1992). As such, high levels of education have consistently been associated with receptivity to and pursuit of innovation (Bantel & Jackson, 1989). Top managers who attended the best universities are perceived to have higher levels of codified knowledge and to have higher intellectual potential to accumulate and apply tacit knowledge (Hitt et al., 2001). Furthermore, individuals graduating from top institutions often develop and maintain social networks that can be a valuable organizational resource because such networks can provide access to valuable external resources

(Finkelstein, 1992; Useem & Karabel, 1986). The more information-rich a TMT's external social network, the more opportunities it will have available. Information-rich networks also enhance a venture's ability to withstand random environmental shocks by providing access to additional external resources (Brüderl, Preisendorfer, & Ziegler, 1992; Cooper et al., 1994).

After completing their formal education, managers continue to acquire knowledge through different work experiences, and thus, they gain tacit knowledge through 'learning by doing' (Pisano, 1994). Their experience builds valuable industry-specific knowledge, which is often tacit. Industry-specific knowledge reflects specialized knowledge of the products and technologies, customer markets, and/or suppliers of similar businesses within an industry that cannot be completely transferred to other industries and that can be developed either through direct experience (Pennings et al., 1998). Interpretive maps of competition within industries are often developed and shared among top managers (Reger & Huff, 1993). These maps reflect perceived 'industry recipes' (i.e., best practices) that represent "shared or interlocking metaphors [and the] taken-for-granted assumptions [that] most describe a cohesive industry's character" (Huff, 1982: 125). As a result of industry-specific experience, top managers at new ventures apply knowledge about highly valued practices or recipes (cf. Kogut & Zander, 1992). In turn, these industry practices and recipes influence firm behavior and the formation of individual ventures' strategies, which aid these firms in competing effectively with rivals (Reger & Huff, 1993).

Different aspects of human capital and their interrelationships have been linked with innovation and new product development (e.g., Ahuja, 2000; Powell et al., 1996;



Subramaniam & Youndt, 2005), internationalization (e.g., Carpenter & Fredrickson, 2001; Carpenter et al., 2001; Hitt et al., 2006), and competitive firm behavior (e.g., Ferrier, 2001; Hambrick, Cho, & Chen, 1996; Wiersema & Bantel, 1992), and with different performance outcomes such as profitability, sales growth, and shareholder returns (e.g., Carpenter et al., 2001; Geletkanycz & Hambrick, 1997; Hitt et al., 2001; Miller & Shamsie, 1999; Peng & Luo, 2000). Accordingly, a venture's human capital is not only essential to its ability to survive and sustain performance, but also to achieve growth, especially with IPO firms.

During the post-IPO period, when market uncertainties are high and external demands add complexities, ventures that are endowed with greater levels of human capital are better able to plan, troubleshoot, and manage venture activities more effectively (Snell & Dean, 1992). They also are better able to adapt to environmental conditions (Youndt et al., 1996). Accordingly, superior human capital at IPO enhances a new venture's ability to establish, sustain, and extend its competitive advantage during the post-IPO period, and therefore, to enhance its performance prospects. Specifically, I propose that:

**Hypothesis 2: Human capital at IPO is positively associated with IPO-stage new venture performance.**

### **Venture Resources and the Formation/Use of Capability Configurations**

The RBV attributes performance differences across firms to the variance in firms' resources and capabilities. According to this perspective, resources having VRIN

characteristics provide a basis for firms' competitive advantages (Amit & Schoemaker, 1993). These competitive advantages often produce positive performance returns (Peteraf, 1993). In turn, resources form the basis of organizational capabilities (Sirmon et al., 2007), and therefore are critical to the formation and use of those capabilities as well. This is particularly important for young firms who face early resource and legitimacy concerns (Certo, 2003; Holtz et al., 1994a, 1994b). While different initiatives that such firms pursue may be associated with variations in new venture outcomes, I contend that more research examining *how* new ventures allocate and use resources to manage growth and performance is required.

Evolutionary theory (Nelson & Winter, 1982) and the dynamic capabilities literature (Teece et al. 1997) provide useful perspectives for understanding how firms build capabilities, especially how capabilities allow resources to be managed for greater value across different industry contexts. Scholars studying capabilities have advanced different ways of thinking about them. Capabilities embody a duality of structure and agency—one part is grounded in normative views of the capability (structure) and the other in actual execution by different actors (agency) (Feldman & Pentland, 2003). Understanding these two aspects helps explain organizational performance and change.

Capabilities are programs of action that reflect a firm's experience with different tasks (Winter, 2000). As firms accumulate experience, they increase proficiency. Capabilities, then, can become a source of competitive advantage and play an influential role in the formulation of strategic choices by supplementing, or even substituting for, calculative, formal decision-making rules (March, 1999). Their configuration also helps

explain performance differences in firms. Thus, we need to better understand how firms build and use them.

Routines appear prominently in descriptions of organizational capabilities (e.g., Levitt & March, 1988; March & Simon, 1958; Nelson & Winter, 1982), serving as their nervous system (Winter, 2000) or building blocks (Dosi et al., 2000). By definition, routines constitute more atomistic units of behavior than capabilities. They represent persistent patterns of learned behavior (Cohen & Bacdayan, 1994) or distinctive organizational procedures (Nelson & Winter, 1982). In turn, routines store organizational experience in a form that allows firms to more effectively accomplish patterned and repetitious tasks and actions exhibiting continuity over time (Winter, 2003).<sup>10</sup> Strategy and organizational theory literature provide evidence that firm behavior is influenced by the level of experience organizational members have with a particular strategic action or direction (e.g., Amburgey et al., 1993; Amburgey & Miner, 1992; Gulati, 1995; Miller & Friesen, 1980). As a venture accumulates experience in a certain routine, it gains proficiency in that routine. As new ventures gain proficiency in a routine, they increase the speed and reliability of decision-making, enhancing their ability to achieve desirable outcomes (Cohen & Bacdayan, 1994).

Furthermore, routines provide a source of competitive advantage in the formation and use of organizational capabilities by supplementing, or even substituting for, rational, calculative strategic decision-making logic pertaining to the allocation (use) of

---

<sup>10</sup> Winter (2000: 983) describes organizational capabilities as “high-level routine[s] (or collection[s] of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type.” In this context, the ‘set of decision options’ language emphasizes a managerial control aspect and the fact that a capability is deployable in various directions. ‘Implementing input flows’ is a reminder that production output requires actual inputs before the coordinating information flows and information processing features of a capability (i.e., its ‘nervous system’) can be enacted.

scarce resources. In turn, capabilities enable firms to acquire, develop, and deploy resources, convert those resources into value-enhancing products, and ultimately transform resources as the basis for sustainable competitive advantage. Accordingly, capabilities emerge in situations where the recurring cost of careful deliberation among organizational members would otherwise make organizations an inefficient structure for collective action (Cohen & Bacdayan, 1994; March & Simon, 1958).

Capability configurations are composed of routines, their attributes, and the interdependencies that exist between them (Lavie, 2006). They reflect the value-maximizing behaviors of rational decision makers (Dutta et al., 2005). Accordingly, performance depends on the degree to which capabilities fit with value-maximizing sets relative to the degree of convergence among industry members. Over time, firms affect performance outcomes by adjusting their capability configurations and narrowing capability gaps (Lavie, 2006).

In this research, I build on Lavie's (2006: 153) conceptualization of a capability configuration as "the composition of constituting routines, the attributes of these routines, and the interdependencies across these routines." According to this perspective, the formation, reconfiguration, and use of different capability configurations reflect the value-maximizing behavior of rational decision makers. This behavior involves attempts to select the 'best' alternative among various options (i.e., the value-maximizing configuration), in which a value-maximizing configuration represents the most valuable configuration of similar capabilities available among rivals within a competitive industry segment (Dutta et al., 2005; Lavie, 2006). Thus, new venture performance depends on the degree to which its capability configuration achieves a fit with the value-maximizing

capability relative to the degree of convergence achieved by its competitors. However, cognitive limitations and lack of information among top managers affect a firm's capacity to conceive of and then implement value-maximizing configurations, which affects the extent to which ventures are able to narrow (widen) performance gaps with rivals (Winter, 2000). Furthermore, the degree to which financial resources limit the range of potential alternatives considered also affects the performance gap that emerges when a firm's configuration differs from rivals' value-maximizing configuration.

Previous studies argue that certain organizational capabilities can be a source of sustainable competitive advantage (e.g., Collis, 1994; Dutta et al., 2005; Teece et al., 1997). To begin with, scholars have shown that because organizational capabilities govern the transformation of resources to productive outputs (Dosi et al., 2002); they allow firms to create and maintain unique product-market positions and thus establish a competitive advantage. However, to the extent that product-market positions can be imitated by rivals, current positions alone do not explain the future sustainability of competitive advantage over time (Porter, 1991). Additional capabilities are required to augment a venture's market-positions and/or its production and administrative processes in such a way as to extend its distinctive advantage in a market (Eisenhardt & Martin, 2000). Accordingly, scholars often distinguish capabilities on the basis of two types of routines that underlie their formation and use: operating routines and dynamic routines.

Operating routines involve the execution of 'known procedures' that are used by firms to satisfy ongoing productive activity, such as manufacturing, distribution, and finance, for the purpose of generating *current* revenue and profit (Winter, 2000; Zollo & Winter, 2002). These routines guide organizational action and establish the basis for

market-managing capabilities (cf. Winter, 2000). They enable firms to exploit resources when implementing strategy (Teece et al., 1997) and represent the capacity of the firm to deploy resources to satisfy existing production activity usually in combination with organizational resources and knowledge (Amit & Schoemaker, 1993; Dosi et al., 2002). Firms create these capabilities in part by making strategic investments in reusable capabilities that link together and potentially transcend traditional business units and functions (Stalk, Evans, & Shulman, 1992).

By contrast, dynamic routines bring about desirable changes in the existing set of operating routines for the purpose of sustaining competitive advantage and enhancing profit *in the future* (Helfat & Peteraf, 2003; Leonard-Burton, 1992). These routines enable firms to adapt, extend, and substantially alter their organizational scale to exploit developing opportunities in the market. These routines are regarded as constitutive of ‘dynamic capabilities’ (Teece et al., 1997; Zollo & Winter, 2003), which consist as a set of specific and identifiable routines that augment, extend, or establish new operating routines and capabilities (Eisenhardt & Martin, 2000). As Loasby (1998: 139) notes, “‘managing capabilities’ is itself a capability.” Stated differently, firms develop routines that when formed into capabilities often provide them with the ability to more effectively develop new capabilities or link newly acquired capabilities with existing capabilities across a value chain. As such, this research draws on dynamic capabilities’ perspectives (e.g., Helfat & Peteraf, 2003; Teece et al., 1997) to define the role such capabilities perform in furthering a firm’s ability to market new products or services in new or existing markets using newly formed resource combinations (Lavie, 2006; Sirmon et al., 2007; Winter, 2003).

Prior research has characterized capabilities using different grouping attributes, such as ‘specialized’ versus ‘generalized’ and ‘core’ versus ‘complementary’ (e.g., Chatterjee & Wernerfelt, 1991; Helfat & Raubitschek, 2000; Teece, 1980; see also Helfat & Lieberman [2002] for a review of previous classifications).<sup>11</sup> Other research has grouped individual capabilities into broader portfolios based on the function each capability performs (e.g., Oliver, 1997; Wan, 2005). For example, Oliver (1997: 709) conceives of firms as possessing both resource capital and institutional capital, where ‘capital’ is used to denote a “durable but not necessarily tangible ... capability that yields services over its lifetime that contribute to sustainable competitive advantage.”<sup>12</sup> More recently, in explaining the relationship between country resource environments, firm capabilities, and diversification strategies, Wan (2005) proposed that firms consist of two types of capabilities: market and non-market capabilities. According to Wan, ‘market’ capabilities refer to those organizational capabilities that enable firms to compete in a particular product or geographic market. He further segmented market capabilities on the basis of their function. For example, production capabilities enable

---

<sup>11</sup> According to Teece (1982), specialized resources and capabilities are specific to particular settings, and therefore useful only in a limited range of environments. They include such functional activities as R&D, marketing, and production that tend to be tailored in important ways to the technologies, operations, and products of the markets in which a firm operates. By contrast, generalized resources and capabilities can be applied broadly across two or more different environmental or competitive settings. Examples include the capability to organize multiple business units or diversify into a new geographic market. Core resources and capabilities refer to knowledge that is required to create a new product or service, including core technical knowledge (Teece, 1986) and knowledge of customer needs (Helfat & Raubitschek, 2000). According to Helfat and Lieberman (2002), complementary resources and capabilities are those needed to profit from core resources and capabilities, including finance, marketing, sales, production, and distribution.

<sup>12</sup> Oliver (1997: 709) defines resource capital as “value-enhancing assets and competencies of the firm” and institutional capital as “the firm’s capability to support value-enhancing assets and competencies.” Citing Amit and Schoemaker (1993), Oliver provides the following examples of resource capital: superior distribution channels, ‘lean’ cost structures, patented production processes, and customer loyalty. According to Oliver, examples of institutional capital include training programs that accelerate the adoption of new technology, information systems that accelerate the diffusion of information, and interfirm alliances that facilitate resource learning and knowledge sharing.

firms to produce goods more efficiently using existing resources. The second type, innovation capabilities, allows firms to either improve existing products or generate new products. 'Non-market' capabilities refer to those organizational capabilities that firms use to replace, compliment, or influence features of institutional environments within local country-markets. For example, firms use non-market capabilities to influence public policy (Hillman & Hitt, 1999) or to leverage and 'skillfully' manage internal labor, capital, and product markets (Khanna & Palepu, 1997). These capabilities are most valuable when used to compensate for deficiencies in existing market institutions.

Previous classification schemes suffer from several conceptual limitations. First, previous attempts at describing different capability configurations offer only a partial view of the role that organizational capabilities perform in managing and/or growing the business. Furthermore, previous research has not linked the formation and use of different capability configurations with the constitutive elements underlying their formation (e.g., operating routines versus dynamic routines). Second, none of the previous attempts links the formation and use of different capability configurations with the resource allocation decisions that precede them. Examining allocation decisions reveals the discretionary choices firms make under different conditions and may also explain variation in the performance between firms. Finally, previous research has not fully accounted for the configuration of capabilities among new ventures, especially for those firms making the transition from privately held ventures to publicly traded firms. Accordingly, this work represents an early attempt to frame and provide a theoretical understanding of how new ventures configure organizational capabilities following an IPO and the performance implications of such actions.



This research attempts to capture the influence of different capability configurations on performance outcomes for new ventures by considering how different capability configurations figure in the productive activity of new ventures. I therefore examine the post-IPO allocation of resources to capability configurations organized using two distinct taxonomies: market-managing capabilities and market-creating capabilities.

The above arguments have some corollary to the exploration-exploitation framework in organizational learning (March, 1991). According to this perspective, exploitation processes represent the continual refinement and extension of existing routines in pursuit of more proximal opportunities, whereas exploration represents the search for new, distant, and more uncertain opportunities. Both processes “compete for scarce resources” (March, 1991: 71). As a result, firms make explicit and implicit choices between them. This study complements research examining these two processes by suggesting how choices about resource use in the configuration of capabilities necessitate tradeoffs and how these tradeoffs affect performance under different contexts. Table 3 provides a brief summary of the two proposed taxonomies, which are explained in more detail below.

**TABLE 3**  
**Two Dimensions of Capability Formation and Use**

	Market-Managing Capability Formation/Use	Market-Creating Capability Formation/Use
<b>Emphasis</b>	Operational/administrative focus.	Development/growth focus.
<b>Underlying Routines</b>	Operating routines that involve the execution of ‘known procedures’ that are used by firms to satisfy ongoing productive activity.	Dynamic routines that bring about desirable changes—i.e., introduction of new products, entry into new geographic markets, etc.— in the existing set of operating routines.
<b>Description</b>	Market-managing capabilities bring stability to and thus leverage existing product-market positions. They permit new ventures and established firms to more efficiently and more effectively produce goods or services and to manage related productive and administrative activity using routines that exploit existing product-market positions.	Market-creating capabilities are used by new ventures to extend or substantially augment existing product-market positions, to create new product-market positions, or to alter the process(es) by which future goods and services are produced. They also permit ventures to alter the process(es) by which future goods and services are produced.
<b>Value Creation Potential</b>	Value-enabling because they exploit existing product-market positions and bring stability and greater efficiencies to existing business activity and therefore affect <i>current</i> performance.	Value-enhancing because they influence performance <i>in the future</i> , permitting ventures to achieve growth by altering organizational scale and scope thereby converting existing and newly accessed resources into new product-market segments that enable competitive advantages to be sustained.
<b>Examples of Venture Capabilities</b>	Manufacturing, distribution and logistics management, procurement and inventory management, finance and financial reporting, labor relations and human resource management, and service management and customer support.	Research and development, engineering design, brand development and advertising, new product introduction, alliance formation and management, mergers and acquisitions, and divestitures.
<b>Approaches to Capability Development</b>	Different ways to develop or enhance market-managing capabilities include: development of demand and supply planning capabilities leading to more reliable and predictable forecasting of production and inventory requirements; use of decentralized cross-functional team-based structures that facilitate increased spans-of-control by eliminating management layers and bureaucracy; improvements to manufacturing and facilities management capabilities that enable firms to reduce cycle times and increase thereby reducing per unit costs; and the integration of specialized capabilities from intermediate markets that allow firms to increase efficiencies through strategic outsourcing.	Approaches to developing or enhancing market-creating capabilities through allocations of available resources include: investments in capabilities aimed at improving the quality and effectiveness of basic and/or applied research abilities; cultivation of interfirm linkages and alliances in different industries and geographic markets to maximize the potential for accessing novel, specialized market information or to facilitate entry into uncertain markets; and development of specialized capabilities that support the evaluation of, negotiation with, and integration of acquisition targets and alliance partners enabling firms to further diversify and expand the scale of their revenue-producing activities.

## **Formation of Market-Managing Capabilities**

*Market-managing capabilities* are value-enabling because they permit firms to more effectively exploit existing product-market positions (March, 1991). They are formed using operating routines, which are characterized as stable and reproducible patterns of activity (Zollo & Winter, 2002). Although market-managing capabilities can enable some adjustments to processes that underlie existing positions, they are not used to make substantive changes. Firms develop and use market-managing capabilities to produce goods or services and to manage related productive and administrative activity with routines that exploit existing product-market positions. Amit and Schoemaker (1993: 35) describe these capabilities as “repeated process or product innovations, manufacturing flexibility, responsiveness to market trends, and short development cycles.”

Market-managing capabilities concern the ability of firms to perform important functional activities “more effectively than competitors with otherwise similar resource endowments” (Collis, 1994: 145). Examples include manufacturing, distribution and logistics management, procurement and inventory management, finance and financial reporting, labor relations and human resource management, and service management and customer support. Different ways to develop or enhance market-managing capabilities include: improvements in consumer demand and supply planning capabilities leading to more reliable and predictable forecasting of production and inventory requirements; the use of decentralized cross-functional team-based structures to facilitate increased spans-of-control, thereby reducing overhead costs structures by eliminating the need for

management layers and bureaucracy; improvements to manufacturing and facilities management capabilities that enable firms to reduce production cycle times and increase throughput in such a way as to increase direct margins by reducing per unit product costs; and the integration of specialized capabilities from intermediate markets that allow firms to increase production efficiencies through strategic outsourcing.

Accordingly, market-managing capabilities are value-enabling because they bring stability and greater efficiencies by permitting firms to make more effective use of resources allocated to the production of goods or services. Market-managing capabilities are formed using operating routines, which characterize relatively stable and highly reproducible patterns of organizational activity (Zollo & Winter, 2002). For example, receipt of a customer order initiates a predictable and interrelated set of operating routines and procedures that involve the consumption of resources (e.g., material or intermediate goods inventory, production labor, facility and equipment utilization, and management time) and eventually conclude with the shipment of the ordered goods to the customer as well as the receipt of payment. Accordingly, effective performance necessitates effective market-managing capabilities, and *superior* capabilities found in this taxonomy may be a source of competitive advantage.

There are several reasons to believe that new ventures with greater levels of available financial capital at IPO are likely to allocate more financial resources to market-managing capabilities. First, drawing on the behavioral theory of the firm, greater levels of available financial capital at IPO provide opportunities for top managers within young firms to appease internal political affiliations. In other words, available financial capital acts as an inducement, which represents “payments to members of the

coalition in excess of what is required to maintain the organization” (Cyert & March, 1963: 36). Furthermore, available financial capital is used to insulate firms from exogenous shocks (e.g., Thompson, 1967), which suggests that at higher levels of availability, firms may be more likely to fund major infrastructure investments.

Second, new ventures entering the public arena may have certain incentives to allocate resources to market-managing capabilities following an IPO. For example, investments aimed at production and administrative processes that are more efficient reduce costs, which, in turn, enhance operating margins and profitability. Thus, ventures are more likely to apply proceeds from a recently completed IPO to the formation and use market-managing capabilities when improvements to financial ratios used by investors not only enhance operating performance, but also enhance a firm’s market value. Research in finance supports this argument. For instance, Pagano, Panetta, and Zingales (1998) found that when considering whether to pursue an IPO, privately held firms are influenced by opportunities to reduce their debt and improve their operating efficiencies and overall profitability (e.g., retire debt, renegotiate loan repayment schedules, secure lower risk premiums, and so forth). In other words, the reduced cost of credit that results from improved public information provides these firms with stronger bargaining positions. In addition, the cost of capital literature also supports the argument that available financial capital is likely to be deployed to market-managing capabilities (e.g., Modigliani & Miller, 1963; Scott, 1976), suggesting that firms conduct IPOs when external equity will minimize their cost of capital (thereby maximizing the profit potential to a company).

Furthermore, management ownership has wealth creating effects that occur when a venture enters the public arena making ownership interests (equity) more marketable and is therefore likely to lead to the agency problem described by Jensen and Meckling (1976). Because managers prefer strategies that maximize their utility (Amihud & Lev, 1981), entrenchment motives often cause top managers to behave opportunistically. This is especially important at higher levels of ownership among management, such as those conditions that occur when senior executives maintain significant ownership in a post-IPO venture, because investments that increase debt leverage often inflate the voting power of their equity stakes. For instance, research suggests that managers often opportunistically consume proceeds from an IPO in non-value maximizing projects such as those involving the expansion of organizational structures (e.g., Jain & Kini, 1994).<sup>13</sup> As a result, ventures are more likely to allocate resource to market-managing capabilities by developing and expanding organizational structures and bureaucratic processes after completing an IPO because managers are often incentivized to increase perquisite consumption.

Finally, new ventures, immediately following an IPO, are relatively unknown to investors and thus face a 'liability of market newness' (Certo, 2003), which creates valuation difficulties for investors and that adversely affect market performance. According to Certo, these difficulties are evidenced by wide fluctuations in the equity values of IPO firms in the initial days of public trading. Moreover, he contends that

---

<sup>13</sup> Additional research has documented the superior operating performance of firms that have completed the transition from public to private ownership through investor-, management- or employee-led leveraged buyouts (LBOs) (e.g., Kaplan, 1989; Smith, 1990; Muscarella & Vetsuypens, 1990). A common conclusion in these studies explaining the efficiency gains is related to the relaxation of conditions that increase the conflict of interest between management and owners in a closely held firm.

positive signals of organizational legitimacy (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), such as signals to investors of a new venture's ability to meet the increased pressures of public markets, have a positive impact on the success of these firms. Accordingly, new ventures, after completing a transition to the public arena, are likely to allocate resources to strengthen certain administrative capabilities necessary to cope with the demands of public trading (e.g., financial and regulatory reporting, investor relations, and so forth). Based on the arguments presented above, I propose that:

**Hypothesis 3: Financial capital at IPO is positively associated with allocations to market-managing capability formation/use.**

Actions by firms involving the conduct of underlying routines are guided by the subjective interpretations and improvisations of different decision makers (Feldman & Pentland, 2003). Everyone cannot know everything. Agency is therefore apparent in management's collective choices. Given the brief histories of IPO-stage new ventures, superior human capital can greatly influence firm behavior (Baum et al., 2001). Highly educated managers show a greater capacity for the 'integrative complexity' that occurs when structural complexity increases. Thus, superior human capital is essential to their ability to exploit performance benefits in that it allows them to add value to existing factors of production (Hitt et al., 2001; Hitt et al., 2006).

Further, research suggests that intangible resources are more likely than tangible resources to produce a competitive advantage (Hitt et al., 2001). In particular, intangible resources such as human capital allow firms to add value to existing factors of production. Indeed, Spender (1996) argued that a firm's knowledge and its ability to generate new knowledge are at the core of the theory of the firm. Much of a firm's

knowledge resides in its human capital. Top managers best represent the firm's human capital because implicit in this study is an assumption that top managers represent a firm's 'power-holding' group (i.e., its' dominant coalition; Cyert & March, 1963). Thus, a firm's senior-most executives hold decision-making power to formulate and administer strategic decisions (Child, 1972), are provided incentives to achieve higher levels of firm performance (Devers, Holcomb, Holmes, & Cannella, 2006; Jensen & Meckling, 1976), and therefore often have the largest stake in using a firm's resources to the greatest advantage.

Dollinger (1984) linked TMT education levels with programs advancing the expansion of organizational boundaries, especially for small business organizations. In particular, evidence from his research suggests that more highly educated managers show a greater capacity for 'integrative complexity' that occurs when organizations face uncertain environments. Managers who can discriminate among a wide variety of stimuli possess a larger potential for information processing (Hambrick & Cannella, 2004). This enhances their capacity to conduct different search routines and to collect and discriminate between different information inputs. In turn, increased information processing capacity among top managers result in more effective decision-making and therefore in better performance (Eisenhardt, 1989).

Examining a group of banks, Bantel and Jackson (1989) found that more innovative banks were led by management teams with higher levels of human capital (i.e., education). These authors found that higher levels of education enhanced top managers' ability to generate creative solutions to complex problems. As importantly, these management teams possess a greater capacity for managing the complexities



(Dollinger, 1984) and therefore are expected to be more efficient at managing ongoing production and administrative routines (i.e., market-managing capabilities). Thus, facing resource-constrained decision options, I conjecture that firms with management team's possessing higher levels of human capital are likely to pay greater attention to actions that extend existing or develop new product-market positions.

This is not to say that managers with higher levels of human capital at IPO view market-managing capabilities as unimportant; rather, ventures with management teams possessing higher levels of human capital at IPO are likely to be better prepared for the demands of public trading than other similar ventures with lower levels of human capital and, importantly, have greater legitimacy with the investor community. Furthermore, TMTs with higher levels of education and work experience often have higher legitimacy among investors (Higgins & Gulati, 2006). Young firms going public are dependent on the decisions of investors for a successful IPO. Yet, new ventures at IPO have limited records of accomplishment and therefore often face a skeptical investing public (Certo, 2003). In particular, investors face tremendous uncertainty associated with the quality of young firms undertaking an IPO. This uncertainty is reflected in research on equity values of IPOs, which has been marked by considerable debate regarding how to value IPO deals (e.g., Ritter, 1984).

In his theoretical account, Certo (2003) offers that firms undertaking IPOs often strive to overcome a 'liability of market newness' by providing signals of organizational legitimacy. Young firms gain organizational legitimacy by offering symbols of quality that redress specific concerns regarding product viability, competitive efficacy, and marketing efficacy (e.g., Higgins & Gulati, 2003). One such signal of a venture's

legitimacy is the quality of the human capital embodied in members of its TMT. Applying signaling theory and the upper echelons perspective, Higgins and Gulati (2006) found that the work experience of the TMT provides a signal of organizational legitimacy and affects investor perceptions of potential market returns. In turn, these signals affect investors' decision to participate in new offerings. More specifically, ventures headed by TMTs with higher levels of human capital endow their ventures with greater legitimacy and are therefore less likely to require investments in administrative structures to establish their legitimacy in the market. Accordingly, new ventures with more seasoned and knowledgeable executives at IPO will allocate relatively lower levels of financial resources to market-managing capabilities following an IPO, choosing instead to pursue initiatives linked to innovation and growth. Specifically, I propose that:

**Hypothesis 4: Human capital at IPO is negatively associated with allocations to market-managing capability formation/use.**

### **Formation of Market-Creating Capabilities**

Whereas market-managing capabilities permit firms to make productive use of resources allocated to the production of existing goods and services, *market-creating capabilities* represent organizational capabilities used by firms to extend or substantially augment existing product-market positions, to establish new product-market positions, or to alter the process(es) by which future goods and services are produced. Examples include research and development, engineering design, brand management and advertising, new product introduction, alliance formation and management, mergers and acquisitions, and divestitures. Approaches to developing or enhancing market-creating

capabilities through allocations of available resources include: investments in capabilities aimed at improving the quality and effectiveness of a new venture's basic and/or applied research abilities; cultivation of interfirm linkages and alliances in different industries and geographic markets to maximize the potential for accessing novel, specialized market information or to facilitate entry into uncertain markets; and development of specialized capabilities that support the evaluation of, negotiation with, and integration of acquisition targets enabling a new venture to diversify and expand the scale of its existing operations.

Drawing on the 'dynamic capabilities' literature (e.g., Helfat & Peteraf, 2003; Teece et al., 1997), market-creating capabilities consist of 'dynamic' routines enabling firms to extend, modify, or create new operating routines. In turn, these capabilities alter a firm's portfolio of market-managing capabilities consisting of operating routines used to exploit a venture's product-market positions. Market-creating capabilities are used to create and substantially alter the composition of a firm's resources (Eisenhardt & Martin, 2000; Galunic & Eisenhardt, 2001; Morrow et al., 2007), its operating routines (Nelson & Winter, 1982; Winter 2000; Zollo & Winter, 2002), and related productive activities of the firm (Porter, 1985). They not only alter a firm's product-market positions, but also the routines a firm uses to manage its productive activity, and therefore its performance (Zott, 2003). Accordingly, market-creating capabilities are value-enhancing, rather than value-enabling, because they permit new ventures to achieve growth and performance gains by altering organizational scale and scope thereby converting existing and newly accessed resources into new competitive positions.

Although the effect of market-creating capabilities is generally value-enhancing, these capabilities often require firms to operate in domains where they lack knowledge or experience. Returns, then, have less certainty and firms exert less control over outcomes (Chattopadhyay, Glick, & Huber, 2001). Furthermore, actions involved in the formation and use of market-creating capabilities involve the allocation of substantial resources without the guarantee of returns. In turn, increases in the allocation of resources often increase external dependencies, leading to agreements with other firms and institutional actors that constrain the range of future options (Dutton & Jackson, 1987; Pfeffer & Salancik, 1978). Because actions that form and use these capabilities are generally riskier, require greater resources, and may be more difficult to implement, they are likely to be more complex and require more time to pursue than actions that form and use market-managing capabilities.

Nevertheless, *ceteris paribus*, a positive association exists between the availability of financial resources and human capital among new ventures at IPO and their propensity to allocate resources to market-creating capabilities following the IPO. In fact, this propensity may be greater for those ventures recently completing the transition into the public arena. Evidence from Brau and Fawcett's (2006) survey of 336 chief financial officers (CFOs) that had successfully completed an IPO supports this argument. These authors found that two of the primary motivations for going public were to facilitate broader strategic moves by their firms (i.e., fund product and geographic expansion initiatives) and to facilitate takeover activity. Similarly, Brau, Francis, and Kohers (2003) argued that IPOs create 'public shares' that may be used as currency in acquiring other firms in stock deals. Furthermore, proponents of financial

*slack* argue that available financial resources allow firms to innovate by permitting them to experiment with new strategies, diversification initiatives, and new R&D projects that might not be pursued in more resource-constrained conditions (Cyert & March, 1963; Levinthal & March, 1981).

There are two additional reasons for the positive effect of available financial capital at IPO on the formation of market-creating capabilities. First, the availability of ‘excess’ financial resources eases capital restrictions; it also frees management attention to experiment and evaluate opportunities to exploit emerging market conditions (Cyert & March, 1963). In firms with lower levels of available financial capital, managerial attention is likely focused on short-term performance issues rather than actions involving the development of new product-market positions. As a result, the range of decision options available to a firm with potentially positive performance returns is expanded. Second, excess financial resources allow experimentation and risk taking by providing a buffer against downside risk (Moses, 1992; Singh, 1986), which implies the need for a greater range of related capabilities that may also have positive consequences. In other words, available financial resources permit firms to more safely experiment with new strategies by, for example, introducing new products and entering new markets (Moses, 1992).

By contrast, opponents counter that increasing levels of available financial resources eventually diminishes firms’ incentives to innovate (Noria & Gulati, 1996) and often promotes undisciplined investments in programs with higher risk and lower potential economic benefits (Jensen, 1986, 1993; Leibenstein, 1978). Indeed, with increasing slack, Noria and Gulati (1996) uncovered a non-linear (inverted U-shaped)

relationship between financial slack and innovation. Accordingly, by combining these two countervailing treatments of financial resource slack, I propose that available financial capital at IPO will have a non-linear (inverted U-shaped) association with the intensity of post-IPO allocations to market-creating capabilities.

There are several reasons to believe that the relationship between available financial capital and the formation and use of market-creating capabilities is non-linear. First, although diversification offers prospective market opportunities and thus affords the opportunity for greater firm performance (Hitt, Hoskisson, & Kim, 1997), the process of expanding augmenting existing and/or diversifying into new product-market positions is a highly complex task (Vermeulen & Barkema, 2002). Learning to operate in diverse product-market segments is subject to certain time compression diseconomies (Dierickx & Cool, 1989), whereby the amount of new experiences firms can absorb is constrained by time. Therefore, even if substantial performance benefits accrue early with allocations to the formation of market-creating capabilities, escalating growth requiring substantially altered or entirely new operating routines greatly enhance the complexity of coordination and therefore a venture's costs.

Second, as the allocation of available financial resources to the formation and use of market-creating capabilities increases, the number and diversity of a firm's product-market positions increase. As the number and diversity of product-market positions increase, information asymmetries emerge (Hitt et al., 1996). These asymmetries produce deficits. Information deficits add to the administrative demands of organizing newly developed routines. Higher administrative demands reduce the degrees of freedom available to a firm (D'Aveni & Ravenscraft, 1994; Rothaermel et al., 2006). In turn,

these demands distract managerial attention from important sources of innovation and growth because of the demands of managing increasingly complex governance structures (D'Aveni & Ravenscraft, 1994). As a result, management attention is drawn towards financial controls, which entail objective criteria such as return on investment (ROI) in the evaluation of opportunities for continued growth (Hoskisson & Hitt, 1988). In doing so, managers become less likely to propose risky investments or to champion product ideas of geographic expansion that place their future earnings at risk (Hitt et al., 1996). As a result, firms with stronger financial controls achieve growth largely through acquisition, which tend to be more complex and require more time to integrate (Hayward, 2002). In turn, they reduce the level of direct internal investment in R&D in favor of externally directed sources of growth (i.e., acquisitions).

Finally, profitable decision options diminish over time as available financial resources increase because of the diminishing availability of allocation options involving the formation and use of market-creating capabilities. In other words, as allocation intensity to the formation and use of market-creating capabilities intensifies, ventures discover fewer valuable opportunities. Thus, additional allocations to improve or develop market-creating capabilities will be difficult to recoup. Based on these arguments, at some point, the costs and decision complexities associated with additional allocations to market-creating capabilities will overwhelm a venture's ability to discover, evaluate, and exploit 'new' opportunities, eventually reducing the intensity of allocations to market-creating capabilities. Specifically, I propose that:

**Hypothesis 5: Financial capital at IPO has a non-linear association (inverted U-shaped) with allocations to market-creating capability formation/use.**

The hallmarks of human capital are knowledgeable, experienced managers, with expertise in the functional disciplines and the competitive environment. Top managers constitute the predominant source for new ideas and knowledge in a firm and therefore directly influence decisions involving the allocation and use of financial resources (Snell & Dean, 1992). Furthermore, individuals, and more generally firms, learn by doing, repeating actions with which they have experience. Experience with routines gained through education and work experience, such as the knowledge embodied in top managers' human capital, reinforces the experiential lessons learned from using certain routines (e.g., acquisition experience, alliance experience, etc.), which increases the likelihood of further adoption of these routines over time (Levitt & March, 1988). This is especially important for strategic actions involving the decision whether to form and use market-creating capabilities by new ventures because such actions are generally more complex, often involving the allocation of resources without reasonable expectations of return. Whereas managers with valuable industry-specific experience gain valuable tacit knowledge and develop interpretive maps that are used to form judgments about riskier actions (Pisano, 1994; Pennings et al., 1998), management teams that lack sufficient experience may view these actions as riskier, and therefore are less likely to allocate resources to market-creating capabilities.

Superior human capital can also enhance development and use of a venture's dynamic routines (Florin et al., 2003). During the post-IPO stage, ventures that are endowed with better human capital should be more able to effectively plan, strategize, and problem-solve, especially when market uncertainties are high (Snell & Dean, 1992), and they should be better able to continuously adapt and respond to changing



environmental conditions (Youndt et al., 1996). In turn, higher levels of human capital increase the likelihood that entrepreneurial opportunities, which emerge from changing environmental factors, will be ‘discovered’ by these firms. Thus, ventures with higher levels of human capital should be able to find new ways to increase customer benefits by engineering more efficient production processes and/or by innovating (Lengnick-Hall, 1992).

As previously indicated, strategic management research has linked human capital with various types of market-creating capabilities, including new product development (e.g., Ahuja, 2000; Subramaniam & Youndt, 2005), acquisitions (e.g., Zollo & Singh, 2004), and international diversification (e.g., Carpenter et al., 2001; Hitt et al., 2006). Examining a sample of entrepreneurial high technology ventures, Deeds, DeCarolis, and Coombs (2000) found that CEO experience directly affected a venture’s commercial R&D capabilities. Specifically, the prior experience of a CEO in managing a commercial research facility positively enhanced a venture’s ability to more effectively manage its new product development process. Following Dutton and Duncan’s (1987) logic, prior research suggests that the greater the level of a venture’s resource endowment, in particular the knowledge and experience represented in its human capital, the more the venture is likely to take actions that reflect an understanding of the available opportunities in the market (cf. Bourgeois, 1981; Sharfman & Dean, 1997), increasing the likelihood that entrepreneurial opportunities will be discovered. Accordingly, I argue that human capital at IPO has a non-linear influence on the formation and use of market-creating capabilities among new ventures. Specifically, I propose that:

**Hypothesis 6: Human capital at IPO is positively associated with allocations to market-creating capability formation/use.**

### **Influence of Industry Membership on the Formation/Use of Capability Configurations**

Industries impose demands that may enable or constrain the collective patterns of action that firms pursue. Firms adapt to industry conditions by reconfiguring their capabilities and by shifting resources into or away from different positions. Because the degree of fit between firms and their environments affects performance, it is important that capabilities be appropriate for the overarching industry context (Doty et al., 1993). This reasoning is consistent with contingency theory assertions that environmental properties, such as dynamism, impose structural constraints on the range of resource actions that a firm might pursue.

In the previous section, this work highlighted the importance of financial capital at IPO and human capital at IPO for explaining new venture success and the influence of endowments of both resource types on capability formation and use. Nevertheless, examining only the direct effects of venture resources on different organizational outcomes largely ignore the context-sensitivity of their value to a firm. Specifically, firms operate in unique environments, and characteristics of these environments may directly, and in combination with other factors, influence the hypothesized relationships. In particular, I expect that environmental conditions at IPO will moderate the relationship between venture resources at IPO and the formation and use of organizational capabilities. This line of reasoning is consistent with Goll and Rasheed's

(1997) assertion that environmental properties impose constraints on the range of strategies, structures, processes, and outcomes that firms may enjoy.

Because of the demands imposed by industries on firm behavior and performance, the study of the environment-organization interface has been an important focus in the strategic management and organizational theory literatures. The underlying premise is that external environments affect firm behavior, and thus firms must account for environmental conditions when formulating strategies and structures before taking actions (Zajac et al., 2000).

Entrepreneurship scholars also agree that environmental theories are relevant in the entrepreneurship context and that environmental concepts matter for new venture performance (e.g., Acs & Audretsch, 1987; Aldrich & Zimmer, 1986; Bygrave & Hofer, 1991; Bull & Willard, 1993; Cooper, 1993; Covin & Slevin, 1997; Naman & Slevin, 1993, Zahra, 1996). Research in this area highlights the importance of government regulation and financial support, community culture, academic support, regional incubators, industry conditions, life cycles, and global innovation as factors that affect young venture performance. Indeed, empirical studies in entrepreneurship have found significant direct, indirect, and moderated relationships between environmental conditions and a variety of new venture outcomes (e.g., Carroll, 1983; Harrigan, 1981; McDougal et al., 1992; Sandberg & Hofer, 1987; Tsai et al., 1991).

Dess and Beard (1984), building on earlier work by Aldrich (1979), decomposed the organizational task environment into several distinct dimensions (i.e., munificence, dynamism, and complexity), which have dominated empirical studies in strategic management (e.g., Keats & Hitt, 1988) and closely resemble dimensions proposed by

other scholars (e.g., Mintzberg, 1979; Pfeffer & Salancik, 1978). These dimensions also fit the entrepreneurship context, having appeared in several studies as predictors of new venture success. Consistent with previous research examining the effects of industry membership on different organizational outcomes, this study proposes that certain environmental dynamism may account for variations in the relationship between venture resources at IPO and the formation and use of different capability configurations.

Because certain environmental conditions create uncertainty, interpretations of the environment play an important role in decisions involving the allocation of a firm's resource endowment. Specifically, executives' perceptions influence their firm's actions as top managers filter, interpret incoming information, and make decisions based on those interpretations (Cannella & Holcomb, 2005; Hambrick & Mason, 1984; Starbuck & Milliken, 1988). These interpretations may influence managerial responses to environmental conditions and, therefore, are likely to affect organizational actions involving the allocation of resources.

Dynamism refers to the instability of an environment and represents environmental change that is difficult to predict (Dess & Beard, 1984). Dynamism is related to Aldrich's (1979: 69) notion of environmental turbulence, which reflects "externally induced changes ... that are obscure to administrators and difficult to plan for." Dynamism is manifested in the variance in the rate of market and industry change and the level of uncertainty about forces that are often beyond the control of individual firms. Although all environments undergo change, dynamism generally refers to change that is unpredictable (Goll & Rasheed, 2004). Accordingly, some industries reflect high

levels of dynamism not simply because of growth, but because of the level of the unpredictability or volatility of growth (Dess & Beard, 1984; Pfeffer & Salancik, 1978).

Highly dynamic markets are particularly taxing on management, due to large information-processing demands (Galbraith, 1973) and the potential need for consequential modifications in strategy (Hamel & Prahalad, 1994). Because uncertainty arising from dynamism is usually confounded by incomplete information about rivals' abilities and resources (Zahra & Bogner, 2000), actions are often pursued without adequate consideration of potential competitive responses. As a result, "firms will often be forced to act and respond blindly, motivated by fear of losing ground" (Smith, Grimm, & Gannon, 1993: 126). When demand for example varies widely, strategic decision-making becomes difficult to program, and competitive positions among rivals can shift considerably. Such unpredictability can create large, non-routine information-processing requirements and represents another instance of high external task demands for new ventures, in which managers must devote greater attention to evaluating and responding to environmental conditions, rather than to strategies that address internal priorities (Hambrick & Cannella, 2004).

Dynamic industries often include industries that are high-growth and technology-intensive. In these contexts, decision makers may conclude that the stakes associated with competitive conditions in the marketplace are so great that their efforts on those fronts must be maximized. When demand swings widely, decision-making becomes difficult to program, and market positions can shift considerably, which increases the likelihood that experienced managers will be more highly valued by firms operating in these environments. For example, Eisenhardt (1989) found that the behavior of effective

decision makers working in dynamic environments is characterized by speed and comprehensiveness. According to Eisenhardt, effective decision makers maintain sophisticated information search and processing routines developed through experience, whereas less effective decision makers resort to using less well-developed routines to cope with complexities brought on by uncertain and rapidly changing environments.

Research suggests that the volatility and unpredictability associated with dynamic environments create uncertainty for organizational leaders (Eisenhardt & Bourgeois, 1988) and the need for frequent strategic adjustments (Hamel & Prahalad, 1994; Porter, 1980). Highly turbulent environments represent highly dynamic conditions, and managers in these environments often must adapt quickly to cope with these constant changes. This is especially difficult for new ventures because these firms often face significant internal resource constraints (Cooper, 1993) and are less likely to have well developed external networks to rely on when environmental demands vary widely (Venkataraman & Van de Ven, 1998). Given the liabilities of newness and small size, hostile environments characterized by high dynamism threaten new venture performance and survival.

Furthermore, Dess and Beard (1984) propose that dynamic environments increase the information that executives must process. In addition, Pearce (1997) suggests that dynamism reduces the time available for executives to make decisions. This limits firms' ability to determine the impact of actions on current and future activities, and to determine viable alternatives, which, in turn, reduces the stability and predictability of relations among firms. Thus, as the degree of environmental dynamism varies across industries, it is reasonable to expect that there should be significant

differences in the adaptive capabilities required for survival, and that these differences should also have performance implications for new ventures.

Concerns about uncertain environments intensify management concerns about efficiency and often manifest themselves in a restriction of external activities, especially when firms interpret perceptions of the prevailing conditions as a threat (Thomas, Clark, & Gioia, 1993). In a survey of top executives examining the effect of perceived threats and opportunities on organizational actions, Chattopadhyay et al. (2001) found that firms facing uncertain environmental conditions considered a threat were more likely to pursue internally directed organizational actions. Applying Staw, Sandelands, and Dutton's (1981) threat-rigidity hypothesis, Chattopadhyay and his colleagues found that threats resulting from environmental uncertainty lead to be more conservative internally directed actions. Moreover, because firms' existing routines influences organizational adaptation (Lant & Mezias, 1992), firms that encounter highly dynamic conditions are more likely to act in those domains in which their management is most familiar, which increases the likelihood these firms will attempt to further leverage returns from existing product-market positions.

Owing to resource constraints and legitimacy concerns, these effects are expected to be more salient for new ventures. These firms are particularly vulnerable to dynamism in the environment, especially volatile conditions requiring frequent strategic adjustments, because of their relative inexperience in handling crisis situations (Singh et al., 1986). Cooper (1993) pointed to the dangers that new ventures face from unforeseen environmental shocks because they have fewer resources and concentrated risk.

Venkataraman and Van de Ven (1998) found that high dynamism hurt new ventures

because young firms lack knowledge and financial capital necessary to cope with substantial environmental change. They explained that high dynamism is disruptive, and it leads to damaged relations with customers and suppliers.

Ventures operating in environments with higher levels of dynamism face decision complexities that increase information-processing requirements and restrict the range of decision options (Eisenhardt, 1989; Pearce, 1997). As the environment becomes increasingly more dynamic, a venture relies more heavily on its ability to provide meaningful interpretations of increasingly ambiguous information (Dutton & Jackson, 1987; Thomas et al., 1993). Such conditions increase the pressure to conserve resources (Goll & Rasheed, 1997) and to restrict investments in externally directed actions with uncertain outcomes (Chattopadhyay et al., 2001). In turn, ventures operating in highly dynamic environments are likely to pursue internally directed investments, which adapt the organization to the demands of changing environmental conditions, because these actions are generally less risky and easier to implement (Dutton & Jackson, 1987). Furthermore, these actions are expected because actions that align structures with institutionalized norms often confer legitimacy with publicly traded rivals in the same industry segment during the period following an IPO, making them less risky to the top managers of new ventures. Accordingly, higher levels of environmental dynamism at IPO impacts upon existing organizational structures and therefore often results in an increase in a firm's allocations to market-managing capabilities.

Thus, I expect that environmental dynamism will negatively moderate the relationship between available financial resources at IPO and the intensity of allocations to market-managing and market-creating capabilities. Because highly dynamic



environmental conditions are more likely to be considered a threat, such conditions will increase a firm's propensity to preserve its financial resources for internally directed investments (Chattopadhyay et al., 2001). In other words, higher levels of environmental dynamism at IPO will decrease the intensity of allocations to market-creating capabilities following an IPO in favor of additional investments with more predictable returns that further improve the efficiency of market-managing capabilities. Thus, I hypothesize that:

**Hypothesis 7a: Dynamism at IPO positively moderates the relationship between financial capital at IPO and allocations to market-managing capability formation/use.**

**Hypothesis 7b: Non-linear association (inverted U-shaped) between financial capital at IPO and allocations to market-creating capability formation/use will be negatively moderated by dynamism at IPO.**

Strategic decisions regarding the formation and use of organizational capabilities are made in the context of an organization's environment. In particular, environmental conditions at IPO influence the complexity of allocation decisions, and their outcomes, thereby increasing the value of human capital at IPO to new ventures. In particular, management teams with higher levels of education and work experience are more likely to favor growth opportunities within industry segments characterized by lower levels of environmental dynamism because they are more likely to view such conditions as an opportunity further invest in growth by substantially augmenting or establishing new product-market positions.

By contrast, management teams that operate in environments with higher levels of dynamism face greater decision complexities (Eisenhardt, 1989). Such instability can create large, non-routine information-processing requirements. This restricts decision

options and represents another instance of high external task demands in which managers devote attention to actions that respond to environmental changes rather than to value creation strategies (Hambrick & Cannella, 2004). As dynamism increases, they rely more heavily on their ability to meaningfully interpret increasingly ambiguous information (Dutton & Jackson, 1987; Thomas et al., 1993), which increases pressures to restrict investments in actions with uncertain outcomes (Chattopadhyay et al., 2001). As dynamism increases, managers satisfice and rely more heavily on efforts to interpret increasingly ambiguous information (Dutton & Jackson, 1987), which increases rigidity and restricts investments in actions with uncertain outcomes. In turn, managers operating under these conditions are more likely to pursue internally directed investments, because these actions are more familiar to them and are generally less risky to implement. Therefore, environmental dynamism at IPO will attenuate the negative association between human capital at IPO and allocations to market-managing capabilities following the IPO.

As previously indicated, *ceteris paribus*, higher levels of human capital increase the likelihood that entrepreneurial opportunities will be 'discovered' by firms. Furthermore, higher levels of education and work experience are associated with higher capacities for information processing and the ability to discriminate among a variety of decision options (Wiersema & Bantel, 1992). However, higher levels of environmental dynamism often increase the complexity and decrease the range of decision options available to firms. Therefore, although firms with TMTs possessing higher levels of human capital have the capacity to pursue new opportunities (Youndt et al., 1996), at

higher levels of environmental dynamism, this relationship is also likely to weaken.

Thus, I propose that:

**Hypothesis 8a: Dynamism at IPO positively moderates the relationship between human capital at IPO and allocations to market-managing capability formation/use.**

**Hypothesis 8b: Dynamism at IPO negatively moderates the relationship between human capital at IPO and allocations to market-creating capability formation/use.**

### **Resources, Capability Formation/Use, and New Venture Outcomes:**

#### **The Partial Mediation Effect**

Central to RBV logic is the implicit assumption of resource use (Dosi et al., 2002); outcomes are a function not only of resource possession, but of the way in which those resources are managed to create value. Whereas resources represent tangible and intangible assets, capabilities reflect “a firm’s capacity to deploy *Resources*, usually in combination, using organizational processes, to effect a desired end. They are information-based, tangible or intangible processes that are firm-specific and are developed over time through complex interactions among the firm’s *Resources*.” (Amit & Schoemaker, 1993: 35). Itami (1987) refers to capabilities as ‘invisible assets.’ Unlike resources, capabilities are largely based on the persistence of routines and related procedures acquired through the formation and reinforcement of productive activity by a firm over time (i.e., learning; Loasby, 1998). Building on earlier work by Grant (1991) and Amit and Schoemaker (1993), Dutta et al. (2005) established a link between

organizational capabilities and their outputs, measuring capabilities based on the efficiency with which they employ a given set of resources:

One can think of capabilities as the efficiency with which a firm uses the *inputs* available to it (i.e., its resources, such as R&D expenditure), and converts them into whatever *output(s)* it desires (i.e., its objectives, such as developing innovative technologies). ... Since capabilities are an intermediate step between resources and outputs, one can hope to *see* the inputs that a firm uses and the outputs it achieves, but one can only *infer* its abilities in converting one to the other (Dutta et al., 2005: 278-279)

In this section, I establish the theoretical linkage between the two capability configurations described earlier in this chapter with the performance outcomes they are intended to produce. According to the model posited in this dissertation, allocations to capability configurations by new ventures following an IPO importantly influence their success. The greater the functional capability a firm possesses, the more effectively it is able to deploy its resources (Dutta et al, 2005). More specifically, firms create value through more effective resource use by either (1) reducing cost structures to provide existing products and services to consumers at a lower cost, (2) enhancing the quality, performance, reliability, etc. of existing products and services, (3) improving legitimacy thereby expanding network relationships and lowering the cost of capital to the firm, and/or (4) expanding or substantially augmenting existing product-market positions or entering new ones.

It is argued that for new ventures to enjoy superior growth and performance relative to their competition, they must not only possess *superior* capabilities, i.e., the ability to deploy resources more efficiently (Amit & Schoemaker, 1993), but also be

more effective at configuring and using organizational capabilities to establish and maintain their competitive advantage. Because a firm's capability is defined by its ability to deploy resources to achieve its desired outcome(s), the higher the functional capability a firm possesses, the more efficiently it should therefore be able to deploy its resources. Specifically, the effectiveness of organizational routines at value creation is subject to the diversity in the information, knowledge, and goals of managers in each firm. As diversity increases, resource actions are more likely to vary. Therefore, extending extant literature on capabilities and the RBV, value that new ventures realize resource possession and control is indirectly a function of the formation and use of capabilities/routines that use them. In what follows, I show how these two capability configurations can confer certain performance advantages to new ventures.

### **Linking Market-Managing Capabilities with New Venture Outcomes**

A strong market-managing capability entails the integration and coordination of a complex set of tasks—often combining different activities and productive inputs from various sources—that enable a firm to enjoy lower production and/or administrative overhead costs, higher operating margins, and better cash flows. In other words, strong market-managing capabilities enable firms to enjoy lower cost structures and consume fewer resources when exploiting existing product-market positions to produce goods or services. Further, market-managing capabilities also enable younger companies to allay legitimacy concerns owing to the demands of public trading after completing an IPO (Certo, 2003). When a venture's market-managing capability is more effective and/or

produces a superior good or service, in terms of quality or performance, than its industry rivals, venture performance is expected to increase.

Evidence from Youndt et al.'s (1996) study of the relationship between human capital, manufacturing, and firm performance provides some evidence supporting this argument. Results from a study of 97 manufacturing facilities found that the value of human capital was predominantly contingent on performance enhancements achieved when firms link 'human-capital-enhancing HR systems' (i.e., resource management 'capability') with manufacturing. The authors found that investments to human resource capabilities designed to develop talented and team-oriented factory workers improved employee productivity, machine efficiency, and customer satisfaction. These outcomes, in turn, allow firms to make better use of more highly trained human resources and translate to higher relative financial performance when compared with industry rivals.

Similarly, Lieberman and Demeester's (1999) examination of the causal link between inventory management and manufacturing productivity found that inventory reductions stimulated gains in manufacturing productivity, resulting in higher operating margins (profitability). In particular, the authors found that, on average, each 10% reduction in inventory levels (or a 10% improvement in inventory turns) led to at least a 1% gain in labor productivity. In other words, investments by firms to implement just-in-time production techniques resulted in more effective inventory management capabilities and preceded productivity gains in manufacturing, serving as an important driver for subsequent reductions in production costs.

Examining a sample of 221 U.S. manufacturing companies, Chen, Paulraj, and Lado (2004) found that development of *superior* strategic procurement capabilities

enables firms to more effectively manage beneficial buyer-supplier relationships.<sup>14</sup> In particular, Chen et al.'s work provides empirical support to arguments linking superior procurement capabilities with a firm's ability to: (1) foster close working relationships with a smaller number of suppliers, (2) reduce the information asymmetries by promoting open communication among supply-chain partners, and (3) establish and foster long-term relationships that foster greater commitment and trust, thereby reducing costs associated with managing these relationships. In firms with weaker procurement capabilities, the authors found that short-term oriented, adversarial buyer-supplier relationships existed that inhibited attainment of procurement efficiencies, created conditions for distrust, and heightened the need for more costly governance mechanisms, which ultimately reduced the performance benefits accruing from relational exchanges between the supply-chain partners.

Although allocations to market-managing capabilities are expected to have a positive effect on direct and indirect costs of production, the theoretical linkage between the intensity of allocations to these capabilities and growth is less clear. On the one hand, assuming supply-side constraints to meet consumer demand, a reduction in the time and costs associated with the production of a particular good or service holds the potential for higher production rates and thus increases in the levels of finished goods firms can produce (Lieberman & Demeester, 1999), thereby enabling firms to potentially realize

---

<sup>14</sup> For example, Toyota is generally recognized among Japanese automobile manufacturers as having made substantial investments in supplier management capabilities that resulted in superior knowledge transfer that improve the level of communication and learning between Toyota and its OEMs and supplier networks who produce as much as 70% of the value of each vehicle (Dyer & Nobeoka, 2000). Because cost and quality is a function of the productivity of a network of OEMs and suppliers working in collaboration, labor productivity and per-unit costs for Toyota consistently outpace the performance of U.S. automobile rivals. As a result of continuous investments in its supplier management capabilities, Toyota enjoys a defensible competitive position that has enabled it to sustain its performance advantage.

increased revenues from higher consumer demands for existing products. These conditions are likely to be greatest for young firms at IPO because these firms are more likely to be resource-constrained than larger, more established industry rivals immediately preceding an IPO, especially where production occurs within capital-intensive industries. Therefore, post-IPO allocations to market-managing capabilities may enable these firms to boost production to meet greater levels of anticipated consumer demand.

Research also suggests that IPO firms experience a number of changes to their production and administrative systems that necessitate new learning (e.g., Fischer & Pollock, 2004). As described earlier in this chapter, changing from a privately held to a publicly traded company constitutes a significant event (Aldrich, 1999) that potentially introduces an IPO firm to the risks associated with the liability of newness. Certo (2003) refers to this condition as the ‘liability of market newness,’ which creates valuation difficulties for investors. He describes this condition as follows:

[L]iability of newness refers to the discount that investors place on IPO firms because these firms have not demonstrated an ability to cope effectively with the demands of public trading (e.g., market fluctuations, meetings with analysts, and so forth) (Certo, 2003: 433).

Thus, new ventures’ ability to succeed and even to survive a change as significant as the transition from private to public ownership likely depends on their ability to modify existing administrative and financial reporting systems, adopting organizational forms that are common with other firms within their industry. This homogenization process, referred to as isomorphism, compels firms in a given population to resemble other firms facing similar environmental and competitive conditions (DiMaggio & Powell, 1983).



Accordingly, post-IPO allocations to market-managing capabilities to strengthen capabilities such as financial reporting and human resource management are often necessary to enhance a new venture's growth and performance subsequent to its IPO.

On the other hand, although increasing post-IPO allocations to market-managing capabilities can provide ventures with the ability to more efficiently deliver existing goods or services in the short-term, such allocations reduce their ability to make post-IPO allocations of resources to market-creating capabilities aimed at expanding a firm's product or geographic market reach, which eventually constrain a venture's longer-term growth prospects. Indeed, beyond a certain investment threshold, routinization of market-managing capabilities might have negative consequences. Miller (1990), for example, described how core capabilities of an organization—the very capabilities that made the organization successful in the first place—can lead to rigidity and an inability to adapt the business to a changing environment. Thus, firms can become trapped within their own competencies (Levinthal & March, 1993). Because capabilities erode in value over time either because of shifts in environmental conditions or organizational complacency, or both, further allocations to market-managing capabilities can result in 'core rigidities' (Leonard-Burton, 1992) for firms and lead to a competitive disadvantage.

As such, there is a point of diminishing returns for post-IPO allocations to market-managing capabilities. Beyond a certain level, additional resource allocations to further develop and/or strengthen market-managing capabilities following the IPO will not be recouped by productivity gains and lower costs nor will they be offset by legitimacy gains in the market. Furthermore, path-dependent investments in capabilities

supporting existing product-market positions are likely to increase internal inertial pressures, reducing incentives to further optimize operating routines and/or directly reduce allocations to market-managing capabilities. In turn, these inertial pressures result in further declines in financial performance.

As the allocation of resources to ‘production’ or ‘administrative’ capabilities (i.e., manufacturing, inventory management, financial reporting, etc.) exceed a firm’s ability to capture incremental value (i.e., lower product costs and/or higher direct margins), the additional benefits that allocations to these capabilities require to positively affect growth and performance will not be generated. Thus, as allocations to market-managing capabilities associated with the production, delivery, and reporting of existing goods or services exceeds a certain level, firm performance will suffer. In short, there exists a point of diminishing returns for allocations to market-managing capabilities beyond which performance outcomes will turn negative. At some point the intensity of post-IPO allocations of resources by new ventures to market-managing capabilities will overwhelm potential enhancements to the value (i.e., quality, performance, reliability) realized from the production of existing products or services.

Extending extant literature on capabilities and the RBV, because capabilities represent a firm’s ability to use resources to achieve productive outputs (Amit & Schoemaker, 1993), any value that firms receive from resource ownership or control is indirectly a function of the effectiveness of capabilities that use them. According to this perspective, a strong market-managing capability (i.e., manufacturing, inventory management, financial reporting, etc.) entails the integration and coordination of complex tasks that enable firms to increase production throughput and to enjoy lower

overhead costs, higher operating margins, and better cash flows; superior market-managing capabilities produce lower cost structures and consume fewer resources when producing goods/services. When a firm's market-managing capabilities are more effective or produce a superior good than rivals, firm performance increases (Chen et al., 2004; Lieberman & Demeester, 1999; Youndt et al., 1996). These capabilities also enable IPO-stage new ventures to diffuse legitimacy concerns arising from the demands of public trading, further enhancing their market performance (Certo, 2003). However, as allocations exceed the ability to capture incremental value, the returns that allocations to these capabilities require may not be generated. Accordingly, these arguments predict that:

**Hypothesis 9a: Allocations to market-managing capability formation/use partially mediate the influence of financial capital at IPO on IPO-stage new venture performance.**

**Hypothesis 9b: Allocations to market-managing capability formation/use partially mediate the influence of human capital at IPO on IPO-stage new venture performance.**

### **Linking Market-Creating Capabilities with New Venture Outcomes**

Whereas superior market-managing capabilities are value-enabling because they permit new ventures to stabilize and more effectively manage production activity that exploits existing product-market positions, as previously indicated, such capabilities might also have a downside that inhibits long-term growth. Leonard-Barton (1992: 112) describes the resulting paradox that occurs when 'established' capabilities become inert: core capabilities simultaneously enable and potentially inhibit development of new operating routines that can be applied to sustain and/or further extend a venture's

competitive advantage. Thus, researchers that take a dynamic capabilities perspective focus on the processes by which firms substantially alter and leverage their portfolio of market-managing capabilities and establish product-market positions that often create new and distinctive performance advantages (Winter, 2000; Zollo & Winter, 2002).

As market-creating capabilities by definition enable new ventures to enact or seize opportunities or neutralize threats in different environmental contexts (cf. Eisenhardt & Martin, 2000), allocations to these capabilities can enhance ventures' longer-term growth and performance prospects. Knott's (2003) theory of persistent heterogeneity, which emphasizes the importance of market-creating capabilities to sustaining performance advantages over time, supports this perspective. Using a Monte Carlo simulation, Knott concluded that firms should avoid 'resting on their laurels' and actively pursue strategies that continuously exploit the inherent value of their resource advantages through innovation. Accordingly, whether through incremental change or a more advanced degree of 'creative destruction' (Schumpeter, 1942), I contend that post-IPO allocations to market-creating capabilities can provide new ventures with an opportunity to enhance their long-term growth and performance prospects.

Consistent with the definition provided earlier in this chapter, market-creating capabilities include the design, development, and introduction of new products; the identification, selection, and integration of acquisition targets; 'greenfield' entry into new geographic markets; and the formation and management of various alliance types (e.g., marketing alliances, technology alliances, and equity joint ventures), as well as other related capabilities that allow a firm to extend or substantially augment existing product-market positions or the process by which goods and services are produced.

Applying RBV logic, therefore, *superior* market-creating capabilities establish a competitive advantage in so far as they are difficult to trade in the strategic factor markets (Barney, 1991; Morrow et al., 2007), are historically based and path-dependent (Nelson & Winter, 1982), and require time to develop (Dierckx & Cool, 1989). Furthermore, when market-creating capabilities entail complex dependencies and/or complementarities with other resources (Harrison et al., 2001), private synergies emerge (Barney, 1988), which make imitation by rivals difficult and therefore enhances a venture's ability to sustain its competitive advantage over time.

Kale, Dyer, and Singh's (2002) study of firms from a cross-section of industry segments provides support for this argument. The authors found that firms with a dedicated function to manage inter-organizational relationships (i.e., strategic alliances) generated substantially higher market returns. Stated differently, firms that systematically invest in developing the ability to manage inter-organizational relationships consistently performed better than other firms that choose not to make such investments. Furthermore, these researchers found the presence of a dedicated alliance function to be a better predictor of performance realized by firms from their alliances than alliance experience itself. Zollo and Singh (2004) argued that acquiring firms learn to manage the post-acquisition integration processes by tacitly accumulating acquisition experience and explicitly codifying it in manuals, systems, and other acquisition-specific tools. They found that a dedicated capability in which firms accumulate and explicitly codify acquisition experience in reusable routines significantly improved overall performance of subsequent acquisitions by counteracting the coordination problems that future contingencies create. Similarly, Holcomb and Hitt (2007) argued that firms

enhance their ability to leverage specialized capabilities accessed through strategic outsourcing relationships with suppliers in intermediate markets by developing and refining mechanisms that strengthen the synergies such capabilities provide. By developing relational capability-building mechanisms, these scholars argue that firms pursuing strategic outsourcing can enhance the potential value of specialized capabilities deployed along their value chain.

Furthermore, Katila and Ahuja's (2002) examination of European, Japanese, and North American industrial robotics companies supports the notion that a firm's problem-solving capabilities—specifically, the capability used in the development and introduction of new products—enable more efficient and valuable search routines (Winter, 1984) and are an important source of performance heterogeneity between firms. Henderson and Clark (1990) attest that 'architectural competence' in the pharmaceutical industry—that is, a firm's capability to integrate and leverage knowledge from external sources—is positively associated with research productivity (i.e., patent counts). Iansiti and Clark (1994) explored 'integration capability' in the automotive and computer industries and found broad empirical support for their hypotheses that a firm's knowledge integration capability in product development is positively associated with firm performance and with firm growth over time.

Despite the progress made in the empirical investigation of firm performance heterogeneity, there are few theories on how organizational capabilities—in particular, those 'dynamic' capabilities that enable extension of and/or substantial augmentation to a firm's market-creating capabilities—precisely affect firm performance (Zott, 2003). Based on the RBV and dynamic capabilities research, post-IPO allocations to market-

creating capabilities enable firms to extend and/or substantially augment existing product-market positions or to establish new product-market positions and therefore enhance firms' performance prospects. This chain of causality implies a direct link between market-creating capabilities and new venture success. Stated differently, the routines by which new ventures develop new product-market positions and accumulate strengths and capabilities, which Amit and Schoemaker (1993) characterize as 'intermediate goods' generated by a firm to enhance the productivity of its current and future resource endowment, are a logical prerequisite to new ventures' efforts at establishing sustainable performance advantages relative to industry rivals over time.

However, again there is a point of diminishing returns beyond which further allocations to market-creating capabilities are unlikely to yield performance gains to offset the level of continued investment. In other words, a firm's ability to invest in developing these capabilities may outstrip its ability to assimilate the knowledge and experience gained from the experiences. For example, Vermeulen and Barkema's (2002) empirical study of Dutch multinationals found that firms' capacity to absorb international expansion is subject to capacity constraints such that a diversification activity that exceeds a certain pace, rhythm, and/or pace negatively impact their profitability. This is especially a concern for new ventures because these firms often face constraints in their ability to assimilate newly acquired knowledge.

In addition, as firms diversify into increasingly greater numbers of new product and geographic markets, the external demands on the CEO and his or her top management team also increases (Hambrick & Cannella, 2004). At a time when continued expansion heightens the need for strategic resource-sharing and also creates

the need for more intensive coordination, the external demands can become overwhelming outstripping management's ability to manage increasingly complex organizational task demands. Thus, as post-IPO allocations into market-creating capabilities exceed a certain threshold, the performance of new ventures is expected to decline.

As market-creating capabilities enable firms to enact or seize opportunities or neutralize threats, allocations to these capabilities naturally enhance performance prospects. Despite the progress made in the empirical investigation of firm performance heterogeneity, there are few theories on how capabilities precisely affect firm performance. This is especially true of the formation and use of 'dynamic' capabilities. Nonetheless, research has linked performance gains with development of different market-creating capabilities, including in alliance management (Kale et al, 2002), post-acquisition integration (Zollo & Singh, 2004), and strategic outsourcing (Holcomb & Hitt, 2007). This chain of causality implies that such capabilities are a logical prerequisite to firms' efforts at sustaining performance advantages. Thus, I propose that:

**Hypothesis 10a: Allocations to market-creating capability formation/use partially mediate the influence of financial capital at IPO on IPO-stage new venture performance.**

**Hypothesis 10b: Allocations to market-creating capability formation/use partially mediate the influence of human capital at IPO on IPO-stage new venture performance.**

### Summary

This chapter reviewed the main tenets of the RBV and contingency theory, discussed the important role of resource allocations in the formation of capability



configurations, introduced two new constructs to explain how firms configure their capabilities (e.g., market-managing and market-creating capabilities), and developed the dissertation's theoretical model. In particular, this chapter presented hypotheses that framed the relationships between venture resources, capability configurations, the environment, and new venture growth and performance. By framing the investigation of venture resources within the context of how these firms make productive use of limited endowments, new insights into the relationship between resources and capabilities and the performance effects of these relationships were developed. Table 4 provides a summary of the dissertation's hypotheses.

**TABLE 4**  
**Summary of Hypotheses**

<b>Number</b>	<b>Hypothesis</b>
H1	Financial capital at IPO has a non-linear association (inverted U-shaped) with IPO-stage new venture performance.
H2	Human capital at IPO is positively associated with IPO-stage new venture performance.
H3	Financial capital at IPO is positively associated with allocations to market-managing capability formation/use.
H4	Human capital at IPO is negatively associated with allocations to market-managing capability formation/use.
H5	Financial capital at IPO has a non-linear association (inverted U-shaped) with allocations to market-creating capability formation/use.
H6	Human capital at IPO is positively associated with allocations to market-creating capability formation/use.
H7a	Dynamism at IPO positively moderates the relationship between financial capital at IPO and allocations to market-managing capability formation/use.
H7b	Non-linear association (inverted U-shaped) between financial capital at IPO and allocations to market-creating capability formation/use will be negatively moderated by dynamism at IPO.
H8a	Dynamism at IPO positively moderates the relationship between human capital at IPO and allocations to market-managing capability formation/use.
H8b	Dynamism at IPO negatively moderates the relationship between human capital at IPO and allocations to market-creating capability formation/use.
H9a	Allocations to market-managing capability formation/use partially mediate the influence of financial capital at IPO on IPO-stage new venture performance.
H9b	Allocations to market-managing capability formation/use partially mediate the influence of human capital at IPO on IPO-stage new venture performance.
H10a	Allocations to market-creating capability formation/use partially mediate the influence of financial capital at IPO on IPO-stage new venture performance.
H10b	Allocations to market-creating capability formation/use partially mediate the influence of human capital at IPO on IPO-stage new venture performance.

## **CHAPTER IV**

### **METHODOLOGY**

#### **Introduction**

As indicated previously, this dissertation outlines several research questions important to the study of new ventures. Building from resource-based theory and contingency theory, I examine relationships that occur within the ‘black box’ between resources and performance by identifying capabilities and measuring the underlying routines that allow resources to be managed for greater value. The role of human capital is considered, bringing agency into theory explaining capability formation and use (Emirbayer & Mische, 1998; Feldman & Pentland, 2003). Specifically, this study examines the indirect (through capability formation and use) effects of resources on firm performance for new ventures following an initial public offering (IPO). Further, following contingency theory logic, I also examine the potential moderating influence of industry membership—conditions that can make resources valuable in some contexts and not in others. More specifically, this study considers the contingent role of environmental dynamism in moderating relationships between the aforementioned venture resources, organizational capabilities, and new venture performance.

The purpose of this chapter is to explain the methodology used to test the hypothesized relationships developed in Chapter III (see Table 4). First, I describe the sample of firms included in this study and identify data sources used to construct the dataset. Second, I discuss operationalizations of the dependent, intervening, independent,

and moderating variables included in the theoretical model. I also discuss the control variables included in the study. Finally, I specify the statistical analyses and procedures used to test each of the hypothesized relationships.

### **Sample and Data Sources**

The sample for this dissertation consists of a dataset of young, entrepreneurial firms that completed an IPO in the United States between 1996 and 2000.<sup>15</sup> Firms undertaking an IPO during this period were identified from the Thomson Financial's Securities Data Company (SDC) New Issues database, which provides a comprehensive listing of firms undertaking U.S.-based IPOs. This source reports that 2,544 firms undertook an IPO during this period. As with prior research involving IPO firms (e.g., Fischer & Pollock, 2004; Ritter, 1991; Welbourne & Andrews, 1996), several restrictions were applied. First, the sample was restricted to new ventures that were six years old or less at IPO (Brush, 1995; Robinson & McDougall, 2001; Zahra et al., 2000). Even though research suggests that disruptive events associated with an IPO often 'reset' the liability of newness clock (Amburgey et al., 1993; Fischer & Pollock, 2004), a six-year cutoff reflects a conservative position in the research definition of new ventures applied by this dissertation. Previously, researchers have used different cutoff points, including twelve years (Covin, Slevin, & Covin, 1990), ten years (Park, Chen, &

---

<sup>15</sup> This dissertation does not distinguish between firm-commitment and best-efforts' offerings. Virtually all firms going public use either best-efforts or firm-commitment methods to market their initial public offerings (IPOs) (Price Waterhouse Coopers, 2005). Once the Securities and Exchange Commission (SEC) approves the registration of a firm-commitment IPO offering, the investment bank purchases the shares from the issuer and then attempts to resell them to the public. In a best-efforts IPO offering, the bank only pledges to provide its "best efforts" to sell between some pre-specified minimum and maximum number of shares.

Gallagher, 2002), and eight years (McDougall & Robinson, 1990; Zahra, 1996). Bantel (1998) argued that by the fifth year, the majority of young firms that have been unable to establish defensible market positions have failed. Biggadike (1979) found that new ventures, on average, needed eight years to reach profitability and twelve years before their behavior resembled 'established' firms. Thus, I selected a six-year cutoff for this study. A total of 1,143 ventures that completed an IPO during this timeframe met the six-year firm age restriction.

Second, I excluded the following types of IPO entities from the analysis: Regulation A offerings (small issues raising less than \$1.5 million; Ritter, 1991), real estate investment trusts (REITS), spin-offs, savings banks and insurance companies experiencing a demutualization, closed-end mutual funds, and reverse leverage buyouts (LBOs). These restrictions further eliminated 244 firms from the dataset. Finally, to assess the influence of environmental conditions on the formation and use of different organizational capabilities and new venture success, only single-product firms were included. A firm was considered a single-product company if at least 90-percent of its sales came from one industry segment (Rumelt, 1974). Using single-product firms limits extraneous variance and increases the accuracy of measures and results (Morrow et al., 2007). This final restriction reduced the dataset to 689 firms.

Of the 689 IPO firms that remained following application of the restrictions, 57 firms were excluded due to missing data. The final sample of firms consisted of 632 IPO firms, representing 68 industries, as captured by the three-digit SIC. Firm IPO prospectuses filed pursuant to the Securities and Exchange Commission's (SEC) Rule 424(b)(1) provided information about the structure of each firm's board of directors and

included descriptions of directors and members of the top management team. Financial and related operating information for firms in this sample were collected from Standard & Poor's (S&P) COMPUSTAT database. I compiled additional data from the Investor Responsibility Research Center (IRRC) Directors database, the Compact Disclosure database, the Center for Research in Securities Prices (CRSP) database, and Thomson Financial's SDC Platinum Merger and Acquisitions database. These databases were selected for their comprehensiveness and extensive use in strategy research.

## **Measures**

### **Dependent and Intervening Variables**

As illustrated in Figure 2 and described in Chapter III, this dissertation tests relationships involving two different dependent variables: new venture performance and two sets of measures representing different configurations of organizational capabilities, including (a) one set of indicators for the formation and use of market-managing capabilities and (b) one set for the formation and use of market-creating capabilities. In addition, both sets of capability configuration measures also serve as intervening variables in the analyses of indirect relationships between venture resources at IPO and new venture performance (see Figure 2).

### New Venture Performance (Three-year Shareholder Return)

Prior research and reviews of firm performance constructs used in strategy and entrepreneurship studies suggest that one of the most commonly used measures of market-based performance is shareholder return (e.g., Anand & Singh, 1997; Hoskisson,

Johnson, Moesel, 1994; Robinson & McDougall, 2001). Thus, this dissertation utilizes shareholder returns as its measure of new venture performance; in this case, I adjusted for the return of the *S&P 500 Composite Value-Weighted Index* during the period.

It is widely recognized that publicly held firms pursue strategies with the intention of increasing shareholder returns (e.g., Ibbotson & Ritter, 1995; Robinson & McDougall, 2001). Thus, I constructed a measure of shareholder return to represent the post-IPO growth (decline) in the economic value (i.e., market capitalization) of each venture over the three-year period following the IPO year. *Three-year shareholder return* is defined as a firm's stock market performance, which I calculate as the three-year index-weighted holding period return for a firm's common stock. This calculation estimates stock price appreciation over a three-year period, including the monthly reinvestment of any dividends received. By definition, a firm's shareholder return is driven by changes to expected cash flows and/or the discount rates that represent a firm's risk premiums in capital markets (Vuolteenaho, 2002). I estimated shareholder return for each firm from the end of the first full fiscal year following a venture's IPO to the end of the fourth full fiscal year (as adjusted for stock splits) plus average dividends over the three-year period. Accordingly, a three-year shareholder return measure is computed for each new venture as follows (Ritter, 1991):

$$3 - year \text{ Shareholder Return } _j = \prod_{t=1}^{36} (1 + (r_{jt} - r_{it}))$$

where  $r_{jt}$  is the return (share appreciation, adjusted for stock splits, plus dividends) on firm  $j$  in event month  $t$ ;  $r_{it}$  is the return for the *S&P 500 Composite Value-Weighted Index* in event month  $t$ . This computation of shareholder return measures the total returns

from a 'buy-and-hold strategy' where a stock is purchased at the closing market price on the last day of the current year of the IPO and held until the earlier of (1) the anniversary of its third full year of operation after completing the IPO, or (2) its delisting (Ritter, 1991: 8).

**TABLE 5**  
**Operationalization of Dependent and Intervening Variables**

Variable	Measurement	Source
Shareholder Return (3-year)	$3\text{-year Shareholder Return}_j = \prod_{t=1}^{36} (1 + (r_{jt} - r_{it}))$ <p>where <math>r_{jt}</math> is the return (share appreciation, adjusted for stock splits, plus dividends) on firm <math>j</math> in event month <math>t</math>; <math>r_{it}</math> is the return for the <i>S&amp;P 500 Composite Value-Weighted Index</i> in event month <math>t</math>.</p>	Ibbotson & Ritter (1995); Ritter (1991); Robinson & McDougall (2001)
Allocations to Market-Managing Capability Formation/Use	<p>Five indicators were considered:</p> <ol style="list-style-type: none"> <li>(1) direct production costs (e.g., cost of goods sold),</li> <li>(2) non-production overhead and administrative costs (e.g., selling, general, and administrative costs),</li> <li>(3) inventory turnover,</li> <li>(4) receivables turnover, and</li> <li>(5) payables turnover.</li> </ol> <p>The 'cost-of-goods-sold' (#1) and 'selling, general, and administrative costs' (#2) measures represent a venture's operating expense structure.</p> <p>The 'inventory turnover' (#3), 'receivables turnover' (#4), and 'payables turnover' (#5) measures assess a venture's production efficiency and working capital management.</p>	--
Allocations to Market-Creating Capability Formation/Use	<p>Five indicators were considered:</p> <ol style="list-style-type: none"> <li>(1) capital expenditures,</li> <li>(2) plant and equipment newness (e.g., ratio of new plant and equipment to gross plant and equipment),</li> <li>(3) research and development expenditures,</li> <li>(4) advertising expenditures, and</li> <li>(5) the total value of acquisitions completed during the period.</li> </ol>	--



Because the shareholder return measure is based on market performance, it is likely to be biased by the bullish expectations that characterized the IPO markets during the mid- to late-1990's, which, if unadjusted, is likely to result in important differences between firms attributable to the time period over which the variable is measured. Therefore, I adjust the shareholder returns measure to reflect changes in the *S&P 500 Composite Value-Weighted Index* for comparable time periods (see Table 5). Share appreciation and dividend reinvestment data for each firm were collected from the Center for Research in Securities Prices (CRSP) database.

#### Capability Formation/Use

All firms face difficult decisions involving the allocation of scarce resources among different priorities (Daft, 1978). Previous research has found that performance heterogeneity occurs when separate firms employ the same or similar resources in different ways, even when those resources share similar attributes (the so-called VRIN characteristics; e.g., Amit & Schoemaker, 1993; Peteraf & Bergen, 2003). Moreover, the pattern or positioning of resources of a venture relative to its environment also explains performance heterogeneity between these firms (Schendel & Patton, 1978). Thus, I contend that the allocation of resources to capability formation and use provides a compelling basis for examining the performance effects of different capability configurations and the resources they use.

Specifically, I identified key indicators of strategic resource deployments from previous empirical research (e.g., Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Schendel & Patton, 1978; Schoeffler, Buzzell, & Heany, 1974) (see

Table 5). Selected indicators include measures of ventures' operating expenses, production efficiency and working capital management, capital intensity, and innovation. When combined to represent the configuration of organizational capabilities, these dimensions provide an overview of sample ventures' resource allocation actions—specifically, *how* they configure organizational capabilities to compete against rivals in their given industry segments.

This approach is consistent with the view of strategy and the strategic behavior of firms as an observed pattern in an array of actions (Mintzberg, 1978), including those involving the allocation of resources. It is through the deployment of resources across discretionary priorities—in particular, those allocations involved in the configuration and use of organizational capabilities—that firms manifest and leverage their competitive advantage (Chandler, 1962; Hofer & Schendel, 1978; Porter, 1980).

*Allocations to market-managing capability formation/use.* This construct measures the extent to which a venture allocates resources to the formation and use of market-managing capabilities. Conceiving market-managing capabilities as those capabilities used to produce goods and services and to manage administrative activity against existing product-market positions, I considered five indicators: (1) direct production costs (e.g., cost of goods sold), (2) non-production overhead and administrative costs (e.g., selling, general, and administrative costs), (3) inventory turnover, (4) receivables turnover, and (5) payables turnover. The 'cost-of-goods-sold' and 'selling, general, and administrative costs' measures represent a venture's production efficiency and operating expense structure. The 'inventory turnover,'

'receivables turnover,' and 'payables turnover' measures assess a venture's working capital management. The data were collected from S&P's COMPUSTAT database.

*Allocations to market-creating capability formation/use.* This latent construct measures the extent to which a venture allocates resources to the formation and use of market-creating capabilities. Whereas market-managing capabilities permit ventures to make productive use of *existing* product-market positions in the production of goods and services, market-creating capabilities reflect those capabilities used by ventures to establish *new* product-market positions or to substantially alter the process by which goods and services are produced.

Five indicators of allocation intensity were considered for a composite measure to operationalize variable: (1) capital expenditures, (2) plant and equipment newness (e.g., ratio of new plant and equipment to gross plant and equipment), (3) research and development expenditures, (4) advertising expenditures, and (5) the total value of acquisitions during the period. Capital expenditures, gross and net plant and equipment figures, research and development expenditures, and advertising expenditures were collected from S&P's COMPUSTAT database. I obtained acquisition volume histories from Thomson's SDC Platinum Merger and Acquisitions database. Specifically, I included all acquisitions announced during the period that were subsequently executed to ensure the measure of total acquisition value includes only those transactions that were actually completed by a firm.

In addition to the use of these indicators in previous empirical studies, this approach has several additional strengths. First, these indicators represent meaningful measures of discretionary expenditures that are controllable by a venture, each of which

reflect the important strategic choices and tradeoffs by a venture (Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997). Furthermore, they reflect *realized* allocations, rather than intentions or perceptions. In keeping with the logic of the two constructs, market managing capability formation/use and market-creating capability formation/use represent strategic decision patterns in an array of possible resourcing actions that a venture might consider (Mintzberg, 1978). The most appropriate way to assess such decision patterns is to examine actions on multiple fronts. Second, collectively, these indicators allow a more parsimonious analysis of the allocation decisions that potentially play an important role in determining the configuration of market-managing and market-creating capabilities as well as new venture success. Finally, the component metrics are not only widely recognized measures, but also are generalizable across industries (Hofer & Schendel, 1978; Schendel & Patton, 1978), rendering them conducive to cross-industry study. A summary of the indicators that were considered for potential inclusion in the composite measures for the capability configurations are summarized in Table 5.

### **Independent and Moderator Variables**

*Financial capital at IPO.* Mishina et al. (2004) suggest that possessing the appropriate level of working capital to meet a firm's operational growth needs is the most useful indicator of available financial resources (see also Moses, 1992). This dissertation represents *financial capital at IPO* as the difference between working capital 'available' at IPO and working capital 'required' (Brealey & Myers, 1996). Working capital available at IPO is defined as a firm's cash and cash equivalents, accounts

receivable, inventory, marketable securities, and other current assets. For new ventures recently completing the transition to the public market, this figure includes the net proceeds raised by the firm from its IPO (i.e., amount raised after deducting underwriting discounts and offering expenses). Working capital required is defined as a firm's current liabilities at IPO (e.g., accounts payable and accrued expenses). Thus, *available* financial capital at IPO is a measure of short-term resources that are available for productive purposes (e.g., Bromiley, 1991; Miller & Leiblein, 1996). Measures of current assets (e.g., cash and cash equivalents, accounts receivable, inventory, marketable securities, and other current assets) and current liabilities were collected from S&P's COMPUSTAT database. Net IPO proceeds were collected from Thomson's New Issues database and from firm IPO prospectuses pursuant to SEC Rule 424(b)(1).

Importantly, several authors have argued that the influence of financial resource availability (e.g., slack) on firm behavior is a quantity relative to a target level of resources, using for example industry financial ratios as proxies for targets (Lev, 1969; Miller & Leiblein, 1996), not absolute measures of resources (e.g., Bromiley, 1991; March & Shapira, 1987; Miller & Leiblein, 1996). In other words, research suggests that managers use comparisons of certain financial operating ratios with expected levels when considering whether to pursue action. While this may be an appropriate approach for established firms, ventures recently completing an IPO experience a substantial influx of cash and cash equivalents from the net proceeds of the public offering that make the use of financial ratios for computing measures of resource availability inappropriate. Furthermore, financial ratios such as those commonly used as slack indicators differ across industries. Ratios that are the norm in one industry may be

exceptionally high or low in another. As such, slack measures based on financial ratios may not generalize across industries (Miller & Leiblein, 1996). Thus, while other studies have used financial ratios (e.g., Bromiley, 1991; Deephouse & Wiseman, 2000; George, 2005) for computing measures of financial capital availability, this dissertation uses absolute measures of financial resources to calculate available financial capital at IPO.<sup>16</sup>

There has been some debate in the strategic management literature about measuring changes in financial resources over time versus assessing the level of financial resources at a given point in time (e.g., Marino & Lange, 1983; Moses, 1992). In this study, I compute a measure of available financial capital at a specific moment—at the IPO—for two important reasons. First, measurements of financial capital that include changes in the availability of these resources over time are only appropriate when the longitudinal dynamics of financial resources is of interest (Mishina et al., 2004). In particular, this study focuses on resource allocations following an IPO, which are affected by the net proceeds secured by a venture from the IPO itself. Second, measures of financial resources at a specific point in time are more appropriate where the concern is with the deployment of these resources over a definitive period of time (Marino & Lange, 1983), such as those resource allocations that occur over subsequent to the completion of an IPO. Thus, I calculate available financial capital at IPO as the difference between working capital available at IPO, including net proceeds raised from the IPO itself, and the working capital required at IPO.

***Human capital at IPO.*** This dissertation contends that superior human capital residing in a firm's top management team at IPO enhances a new venture's ability to

---

<sup>16</sup> Of note, scholars have also used survey instruments to compute actual and perceived measures of financial slack (e.g., Nohria & Gulati, 1996; Tan & Peng, 2003).

attain, sustain, and enhances its performance during the period following its transition into the public markets. Conceptually, the TMT consists of the firm's senior-most executives, including the CEO, who comprise the firm's dominant coalition (Cyert & March, 1963; Siegel & Hambrick, 2005). Following previous studies, this dissertation defines the top management team as the five most senior executives across the top two tiers of a venture's management team. Specifically, I attempt to include the CEO, chairman, chief operating officer (COO), chief financial officer (CFO), and the next highest management tier of a venture. This approach is intended to capture the highest-ranking officers of the company (Wagner, Pfeffer, & O'Reilly, 1984), encompassing the key activities of the firm at the senior-most level. Such a definition has been applied in other research concerned with top management teams (e.g., Carpenter & Fredrickson, 2001; Finkelstein & Hambrick, 1990; Wiersema & Bantel, 1992). Because the SEC requires firms to publish comprehensive information on the top executives of publicly-traded firms, data for TMT characteristics were obtained from the executives' career histories reported in firm IPO prospectuses pursuant to SEC Rule 424(b)(1). Further, *Dun & Bradstreet's Reference Book of Corporate Management* and company web sites were used, as needed, to supplement these data.

Following previous studies, the measure of human capital employed by this study has three dimensions: elite education, educational attainment, and industry experience. The degree a top management team's membership in the educational elite is measured as the percent of the top team who graduated from elite educational institutions (D'Aveni, 1990; Finkelstein, 1992). Attendance at certain schools carries with it a perception of prominence in the business elite (Finkelstein, 1992). In turn, research suggests that top

managers from elite universities rely on these relationships to acquire additional resources and to absorb uncertainty in the institutional environment (Useem & Karabel, 1986). This study used the comprehensive list of elite educational institutions developed by Finkelstein (1992), which was guided by original work by Useem and Karabel (1986), and supplemented by *U.S. News & World Report's* (2006) annual rankings of top universities to confirm the listing (see Table 6 for a listing of the elite institutions used by this study). In total, TMT data were collected for 983 IPO firms during this period.

The top management team's educational attainment was assessed as the average number of years of higher education obtained by a venture's top five executives (Wiersema & Bantel, 1992). It is not possible to determine the exact number of years an executive spent pursuing each degree from the secondary data. Thus, I assigned four years to the first undergraduate degree, two years to the first master's degree, three years to the first law degree, and four years to the first doctorate obtained by each executive. High educational attainment scores indicate that a TMT is composed of members with a greater number of degrees. Finally, industry experience was measured by computing the average number of years of work experience in a venture's primary industry for the top five executives on the TMT.

I combined these three dimensions of human capital using standardized scores to produce a composite measure. Scholars observe that when constructing composite variables, weights should be selected *a priori*, independent of the data based on theory (McDonald, 1996). When no theory exists to rank extant component elements in terms of importance, equal weighting is recommended (McDonald, 1996). I therefore summed



the three standardized scores to form an equally weighted composite measure of human capital at IPO.

**TABLE 6**  
**Listing of Elite Educational Institutions**

<b>School Name</b>
Amherst College
Brown University
Carleton College
Columbia University
Cornell University
Dartmouth College
Grinnel College
Harvard University
Haverford College
Johns Hopkins University
Massachusetts Institute of Technology
New York University
Northwestern University
Oberlin College
Pomona College
Princeton University
Stanford University
Swarthmore College
United States Military Academy
United States Naval Academy
University of California, Berkeley
University of California, Los Angeles
University of Chicago
University of Michigan
University of Pennsylvania
Wellesley College
Wesleyan University
Williams College
Yale University

***Environmental dynamism.*** *Environmental dynamism* refers to the volatility within a given industry segment (Dess & Beard, 1984); it is generally used to describe environmental change that constrain managerial decision options and firm behavior (e.g., Goll & Rasheed, 2004). As previously discussed in Chapter III, higher levels of environmental dynamism reduce firms' opportunistic behavior by introducing additional uncertainty regarding the ultimate outcomes of targeted growth-oriented investments. Under such conditions, firms are posited to reduce allocations to market-creating capabilities in favor of increased funding of internally-directed investments in market-managing capabilities with more predictable returns.

Dess and Beard (1984) examined the concept of task environments empirically and used customers (e.g., industry sales) as the primary environmental constituent. Since that time, most scholars have adopted this approach and have constructed environmental measures based on industry sales (e.g., Keats & Hitt, 1988). More recently, some scholars have also used stock market measures to gauge industry conditions such as market uncertainty (Beckman, Haunschild, & Philips, 2004; Folta, 1998; Wu, Levitas, & Priem, 2005).

I combined elements of these two approaches to create my dynamism measure. Specifically, maintaining the spirit of the Keats and Hitt (1988) approach, I used measures of market capital (equity and debt) to compute my measure of environmental dynamism. More specifically, I began by summing the market capitalizations and long-term debt of all publicly traded firms in the given industry of sampled firms (classified with three-digit SIC codes) for each of the five years preceding the year each sample firm completed its IPO. Both data elements represent *ex post* industry-level measures

and were gathered using data obtained from COMPUSTAT. Using these data, five-year average growth measures that reflect increases (reductions) in capital flows within an industry were used to compute measure of environmental dynamism for each industry segment. I computed measures for each industry segment in the year of each new venture's IPO.

I summed the market capitalization for each firm operating in an industry represented by one or more new ventures in the sample (classified with 3-digit SIC codes); this value represents the capital flows for each industry. I took the natural logarithm of each market capitalization value to reduce skewness (Keats & Hitt, 1988). I then regressed the industry market capital measure (dependent variable) on time (independent variable) over the five years immediately preceding the year of a venture's IPO (e.g., Keats & Hitt, 1988). I employed the following regression equation:

$$\text{Industry Market Capital}_k = \gamma_{0j} + \gamma_{1j}(\text{year}) + e_k$$

where  $\gamma_{0j}$  is the intercept coefficient of the regression modeling market capital flows for industry  $k$ ,  $year$  is the discrete time period for each firm-year observation weighted by the slope coefficient for industry  $k$  and indexed by  $year = 1, 2, \dots, 5$ ,  $\gamma_{1j}$  is the slope coefficient for  $year$  for industry  $k$ , and  $e_k$  represents the error term for the regression equation. Specifically, dynamism is determined by dividing the antilog of the standard error of the slope coefficient by the mean value of the dependent variable (market capitalization) for industry segment  $k$  (McNamara, Vaaler, & Devers, 2003; Sutcliff, 1994).

**TABLE 7**  
**Operationalization of Independent and Moderator Variables**

Variable	Measurement	Source
Financial Capital at IPO	<p><i>Financial Capital at IPO = Working Capital Available at IPO - Working Capital Required at IPO</i></p> <p>where</p> <p>(1) <i>working capital available at IPO</i> is defined as cash and cash equivalents, accounts receivable, inventory, marketable securities, and other current assets, including the net proceeds raised by a firm from an IPO (i.e., amount raised after deducting underwriting discounts and offering expenses) and</p> <p>(2) <i>working capital required</i> is defined as a firm's current liabilities at IPO (e.g., accounts payable and accrued expenses).</p>	Brealey & Myers (1996); Mishina, Pollock, & Porac (2004)
Human Capital at IPO	<p>Composite variable using equally weighted measures of <i>elite education, educational attainment, and industry experience</i>.</p> <p>where,</p> <p>(1) <i>elite education</i> was measured as the percent of the top team who graduated from elite educational institutions.</p> <p>(2) <i>educational attainment</i> was assessed as the average number of years of higher education obtained by a venture's top five executives and</p> <p>(3) <i>industry experience</i> was measured by computing the average number of years of work experience in a venture's primary industry for its top five executives.</p>	D'Aveni (1990); Finkelstein (1992); Wiersema & Bantel (1992)
Environmental Dynamism	<p><i>Industry Market Capital</i> <math>_k = \gamma_{0j} + \gamma_{1j}(\text{year}) + e_k</math></p> <p>where,</p> <p>(1) <math>\gamma_{0j}</math> is the intercept coefficient of the regression modeling industry market capital, <i>year</i> is the discrete time period for each firm-year observation weighted by the slope coefficient for industry <i>k</i> and indexed by <i>year</i> = 1, 2, ... 5, <math>\gamma_{1j}</math> is the slope coefficient for year for industry <i>k</i>, and <math>e_k</math> represents the error term for the regression equation.</p> <p>(2) The standard error of the residual divided by the mean value of the dependent variable (market capital) is used to measure dynamism.</p>	Keats & Hitt (1988); McNamara, Vaaler, & Devers (2003)

Operationalizations of the independent and moderator variables used in this dissertation—including financial capital at IPO, human capital at IPO, and environmental dynamism—are provided in Table 7.

### **Control Variables**

***Age at IPO.*** I control for venture age at IPO, measured by the number of years a venture has been in existence. I obtained each firm's founding date from Thomson's SDC New Issues database and confirmed the inception year using data collected from firm IPO prospectuses. The age at IPO was computed as the firm's IPO year minus its year of inception.

***Firm size.*** *Firm size* is thought to influence the diversification behavior of new and established firms, especially acquisition intensity (Hoskisson, Hitt, Johnson, & Moesel, 1993; Hitt et al., 1997). Further, several studies of IPO firms found a negative association between firm size and market returns (e.g., Carter, Dark, & Singh, 1998; Ibbotson, Sindelar, & Ritter, 1988; 1994). Thus, using data from S&P's COMPUSTAT, I control for firm size at IPO by taking the natural logarithm (a linear transformation) of a venture's total sales dollars the year prior to the IPO (Certo et al., 2003; Florin et al., 2003).

***CEO power.*** Research suggests that powerful CEOs may be able to opportunistically pursue actions that raise their compensation and reduce their employment risk by increasing firm size (Carpenter et al., 2001; Seth, Song, & Pettit, 2002). Accordingly, I use *CEO duality* as a proxy for CEO power. Using data collected from executives' career histories in firm IPO prospectuses, CEO duality was

operationalized as a dichotomous variable reflecting whether the CEO was board chair (coded 1) or not (coded 0) at IPO.

**Board structure.** To account for board vigilance, I control for board structure, using the *percentage of inside directors*. This measure is obtained from the Compact Disclosure and Investor Responsibility Research Center (IRRC) Directors databases, where available, computed in the year of each venture's IPO. Additional board data were also collected directly from firm IPO prospectuses. These data sources provide detailed descriptions of directors. With these data, the calculations of board size and board composition are straightforward.

Although inside directors generally have sufficient knowledge of venture operations to perform their monitoring duties adequately (Geletkanycz & Hambrick, 1997), these directors depend on a firm and its leaders for their financial well-being. Thus, inside directors may be in an unfavorable position to monitor firm activities (Finkelstein, 1992). By contrast, outside (or independent) directors are argued to exercise the greatest oversight over their respective ventures (Peng, 2004). Thus, I control for the influence of board structure on resource use and market performance using the percentage of inside directors by dividing the total number of directors who were either current or former employees of the venture (inside directors) at the time of the IPO by the total number of directors on the board at IPO.

**TMT/director ownership.** I also control for the *percentage of shares owned by officers and directors* at IPO. Top managers and board members have both the ability and the incentive to monitor the venture and to influence decisions affecting its formation and use of different capability configurations. Thus, I further control for the

overall influence of top managers and board members using the percentage of shares owned by officers and directors at IPO. The percentage of shares owned by officers and directors is computed by dividing the total number of shares held and/or controlled by this group by the new venture's total number of shares outstanding following the IPO. Using share ownership data for executive officers and directors collected from firm IPO prospectuses and supplemented by S&P's EXECUCOMP database, this measure is computed for each new venture in the year the venture completed its IPO.

***Environmental munificence.*** *Environmental munificence* represents the abundance of critical resources needed by firms operating within a particular industry (Castrogiovanni, 1991; Dess & Beard, 1984) and thus influences a firm's propensity to act. The amount of resources available in the external environment can influence a new venture's need to maintain available financial resources and is expected to stimulate resource allocation decisions affecting the formation and use of different capability configurations by these firms.

I follow the approach described previously for computing environmental dynamism. Specifically, to operationalize munificence, I obtained measures of common equity (shares outstanding and share price on the final trading day of each calendar year) and long-term debt from S&P's COMPUSTAT database. I then summed the market capitalizations (equity and debt) of all publicly traded firms in the given industry of sampled firms (classified with three-digit SIC codes) for each of the five years preceding the year each sample firm completed its IPO. Using these data, five-year average growth measures that reflect increases (reductions) in capital flows within an industry are used to compute the measure of environmental munificence for each industry segment in the

year of each new venture's IPO. I log each value to reduce skewness and regress the industry market capital measure (dependent variable) on time (independent variable) over the five years immediately preceding the year of a venture's IPO (e.g., Keats & Hitt, 1988). Munificence represents the slope of the regression line produced by the equation (see the regression equation summarized previously in the description of environmental dynamism).

*Year indicators (dummy variables).* Finally, since the IPO firms included in this study were drawn from the period 1996 through 2000, I included four *year indicators (dummy variables)*, one for each IPO year represented in the sample,<sup>17</sup> to control for systematic differences across these years that could influence a firm's three-year shareholder returns (Mishina et al., 2004). An indicator was coded '1' during a given year that the firm's IPO was completed and '0' otherwise.

### **Model Specification and Analytical Procedures**

I rely on random coefficient modeling (RCM) to test the hypothesized relationships described in Chapter III (e.g., Bliese & Ployhart, 2002; Singer & Willett, 2003; Xiao, 2002). In this study, firms are nested in industries; environmental conditions vary between industries. Therefore, a multilevel approach is well-suited for this study. Further, the use of multilevel analysis to examine such hierarchically ordered systems avoids certain statistical concerns (Hofmann, Griffin, & Gavin, 2000; Hough, 2006), such as lack of independence and aggregation to higher levels. Lack of independence between observations occurs when multiple observations are included from the same

---

<sup>17</sup> I dropped one dummy variable for identification purposes.



higher-level unit, for example, using observations from multiple firms from the same industry in a study examining the relationship between resource use and firm performance across industries. Aggregation to higher levels of analysis can result in a loss of information.

Specifically, I model relationships at two levels: level-1 or the between-firm level (within industry), which consists of firm-specific attributes, and level-2 or the between industries-level, which consists of industry-specific characteristics. Practically speaking, in this study, use of multilevel modeling allows for regression-like modeling of relationships at the firm-level of analysis alongside regression-like models that describe how relationships at the firm-level vary between industries. Specifically, RCM addresses three general purposes with respect to its use in this study: (1) improved estimation of effects within and between individual units (i.e., developing an improved estimate of a regression model for an individual firm); (2) better formulation and testing of random influences on the dependent variable of interest (e.g., 3-year shareholder return) across each level of the data hierarchy; and (3) the partitioning of variance and covariance components among levels (i.e., decomposing variance among the set of firm-level variables into between-firms/within-industries and between industries components). I followed the approach described by Raudenbush and Bryk (2002) and advocated by Singer (1998) to fit multilevel models; in this study, the proposed data hierarchy is represented by firms that operate within specific industries and are thus exposed to different environmental conditions. This approach therefore allows me to account for the nested nature of the data and thus exploit its multilevel structure.

Consistent with this approach, I began each analysis by fitting an unconditional means model (e.g., the so-called “*null*” model; Kreft & de Leeuw, 1998) that contains no predictors at level-1 or level-2 to partition the variance into between-firm/within industries and between-industry components. Specifically, I modeled each IPO firm observation as a linear combination of the firm’s mean plus a random error:

$$Y_{ij} = \beta_{0j} + r_{ij} \quad (1)$$

In Equation 1,  $Y_{ij}$  is the firm-level dependent variable (either shareholder return or one of the two dimensions of capability formation/use advocated in this study) of the firm observation for firm  $i$  and industry  $j$ ;  $\beta_{0j}$  represents the sum of the intercept for each firm  $i$  (at the firm-level or level-1) in industry  $j$  (level-2);  $r_{ij}$  represents a random error, which is associated with the  $i^{th}$  firm  $j^{th}$  industry and contains no level-1 predictors. In this study, the indices  $i$  and  $j$  denote  $i = 1, \dots, n_j$  firms nested within  $j = 1, \dots, J$  industries.

Consistent with Equation 1, at level-2 (the industry-level), industry-level intercepts are expressed as the sum of the overall grand mean,  $\gamma_{00}$ , and the series of deviations varying randomly around that mean:

$$\beta_{0j} = \gamma_{00} + u_{0j} \quad (2)$$

In Equation 2,  $\gamma_{00}$  represents the grand mean, and  $u_{0j}$  represents the random “industry effect”, which is the deviation of industry  $j$ ’s mean from the grand mean. As previously indicated, the model represented by equations 1 and 2 include no independent

or control variables, which typifies the unconditional means model. Subsequent analyses contain control variables and/or independent, moderator, or intervening variables added to the unconditional means model as required to test the various hypotheses described in Chapter III. More specifically, the level-1 model with  $l$  to  $n$  level-1 predictors (including IVs and controls) for each subsequent analysis is represented by the following general approach:

$$Y_{ij} = \beta_{0j} + \beta_{1j} (X_{ij} - X\text{-bar}_j \dots) + r_{ij} \quad (3A)$$

$$\beta_{0j} = \gamma_{00} + u_{0j} \quad (3B)$$

$$\beta_{1j} = \gamma_{10} + u_{1j} \quad (3C)$$

where shareholder returns or one of the two dimensions of capability the formation and use (e.g., market-managing capability formation/use or market-creating capability formation/use) for every  $i^{\text{th}}$  firm in every  $j^{\text{th}}$  industry-group, i.e.,  $Y_{ij}$ , is the dependent variable, which is modeled as a function of the intercept and the individual slopes of each firm's set of predictors on the dependent variable.<sup>18</sup>  $X_{ij}$  represents the level-1 predictor (of which there can be  $l - n$  variables) and  $X_{ij} - X\text{-bar}_j \dots$  denotes the requirement to center each level-1 predictor.  $\gamma_{00}$  is the average intercept across level-2 units;  $\gamma_{10}$  is the average regression slope across level-2 units;  $u_{0j}$  is the unique increment to the intercept associated with level-2 unit  $j$ ; and  $u_{1j}$  is the unique increment to the slope associated with level-2 unit  $j$ .

---

<sup>18</sup> Each predictor (e.g.,  $X_{1j}$ ,  $X_{2j}$ , ...  $X_{nj}$ ) is centered, which is noted by the notation,  $X_{ij} - X\text{-bar}_j$ , in equation (3) above.

Similarly, analysis of level-2 predictors is generally modeled with a modification to equations 3B and 3C as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} (W_j) + u_{0j} \quad (4A)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} (W_j) + u_{1j} \quad (4B)$$

where  $W_j$  represents a level-2 predictor. In the combined form, this yields the following model:

$$Y_{ij} = \gamma_{00} + \gamma_{01} (X_{ij}) + \gamma_{01} (W_j) + \gamma_{11} (X_{ij}) (W_j) + u_{0j} + u_{1j} (X_{ij}) + r_{ij} \quad (4C)$$

Each subsequent model adds complexity, which is described further in the results summarized to explain the individual models (see Raudenbush & Bryk [2002] for additional detail). For each model, variance components and the deviance statistics were examined. Likelihood ratio tests gauge the statistical significance of the coefficients among the models. I used SAS PROC MIXED routine to accommodate testing of the multilevel relationships hypothesized in Chapter III.

### **Testing for Mediation Effects**

Mediation hypotheses posit how, or by what means, an independent variable ( $X$ ) affects a dependent variable ( $Y$ ) through one or more potential intervening variables, or mediators ( $M$ ). Traditionally, scholars have held that mediation is established and significant only when the predictor-outcome coefficient goes from ‘significant’ to ‘not

significant' when the mediating variable is added to the model (e.g., James & Brett, 1984; Baron & Kenny, 1986). However, more recently, scholars have shown that mediating effects identified by such an approach may be spurious (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In other words, it is possible to have the predictor-outcome relationship drop from significant to not significant when accounting for the mediator even though there is no significant mediation, or for a mediating effect to be present when the predictor-outcome relationship continues to be statistically significant even after adding the mediator into the model.

Accordingly, I tested for mediation using the multivariate extension of the product of coefficients strategy available for models involving multiple mediators. This test uses the multivariate delta method (Bishop, Fienberg, & Holland, 1975; Oehlert, 1992) to derive the standard error of the total indirect effect ( $c - c'$ ). Using the formula derived by Sobel (1982) and extending the work by Alwin and Hauser (1975), Fox (1980, 1985), Greene (1977), and others, this approach enables testing of simultaneous mediation by multiple variables, or *multiple mediation*. A mediation hypothesis involving only one mediating variable is termed *simple mediation*. Figure 3 depicts the simple mediation model graphically. Panel A illustrates the *total effect* of  $X$  on  $Y$ , quantified with the unstandardized regression weight  $c$ . Panel B depicts both the *indirect effect* of  $X$  on  $Y$  through  $M$  as well as the *direct effect* of  $X$  on  $Y$ . The  $a$  path represents the effect of  $X$  on the proposed mediator, whereas the  $b$  path corresponds to the effect of  $M$  on  $Y$  partialling out the effect of  $X$ . Assuming  $a$  and  $b$  are unstandardized regression weights, the indirect effect of  $X$  on  $Y$  through  $M$  is quantified as  $ab$ , the product of the  $a$  and  $b$  paths. The coefficient  $c'$  represents the direct effect of  $X$  on  $Y$ . The total effect of  $X$

on  $Y$  can be expressed as the sum of the direct and indirect effects:  $c = c' + ab$ .

Equivalently,  $c'$  is the difference between the total effect of  $X$  on  $Y$  and indirect effect of  $X$  on  $Y$  through  $M$ , i.e.,  $c' = c - ab$ . Studies involving simple mediation are common in organizational research (Preacher & Hayes, in press).

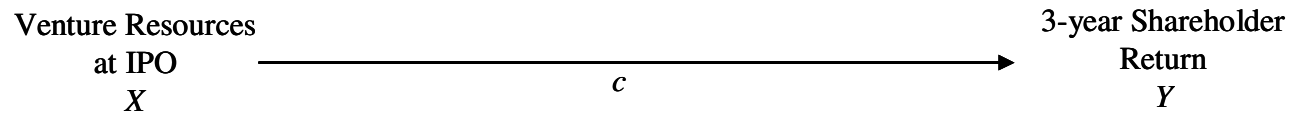
However, as indicated previously, this dissertation follows a design that has received less attention in both the methodological and applied literature involving simultaneous mediation by multiple variables, or *multiple mediation*. A graphical depiction of a multiple mediation model is illustrated in Figure 4, a model with  $j$  mediators that also incorporates covariates.<sup>19</sup> As in the simple mediation model, Panel A represents the total effect of  $X$  on  $Y$  (path  $c$ ). Panel B represents both the direct effect of  $X$  on  $Y$  (path  $c'$ ) and the indirect effects of  $X$  on  $Y$  via mediation; in this example, path  $c'$  represents the indirect effects of  $X$  on  $Y$  via  $j$  mediators. The *specific indirect effect* of  $X$  on  $Y$  via mediator  $i$  (Brown, 1997; Fox, 1985) is defined as the product of the two unstandardized paths linking  $X$  to  $Y$  via that mediator. For example, the specific indirect effect of  $X$  on  $Y$  through  $M_1$  is quantified as the product of paths  $a_1$  and  $b_1$ , or  $a_1b_1$ . Assuming the model is structurally saturated (just-identified), the *total indirect effect* of  $X$  on  $Y$  is the sum of the specific indirect effects,  $\sum_i(a_ib_i)$ ,  $i = 1$  to  $j$ , and the total effect of  $X$  on  $Y$  is the sum of the direct effect and all  $j$  of the specific indirect effects:  $c = c' + \sum_i(a_ib_i)$ ,  $i = 1$  to  $j$ .

---

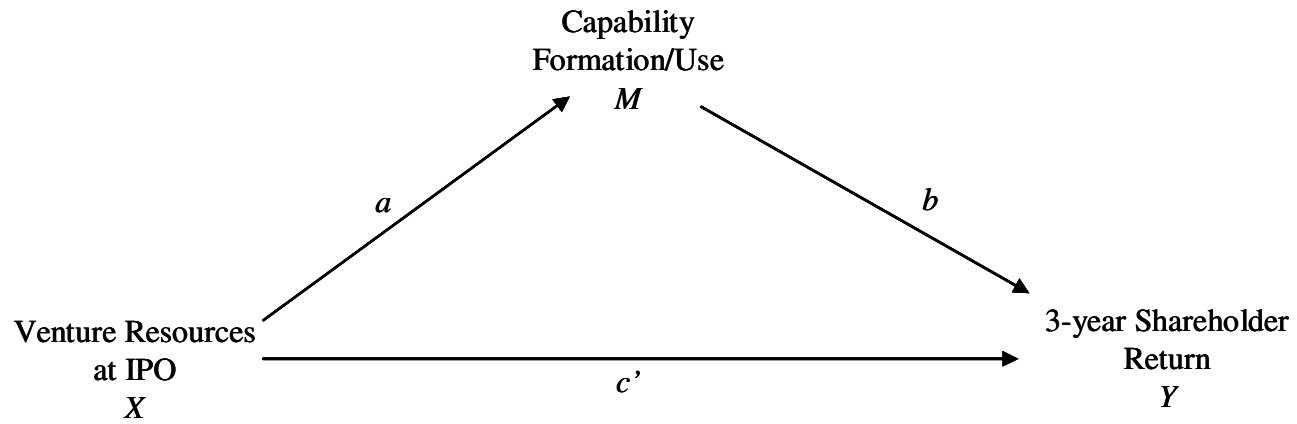
<sup>19</sup> Covariates are included in this figure to illustrate how the inclusion of controls is modeled with equations involving multiple mediators.

**FIGURE 3**  
**Illustration of Simple Mediation**

**Panel A**

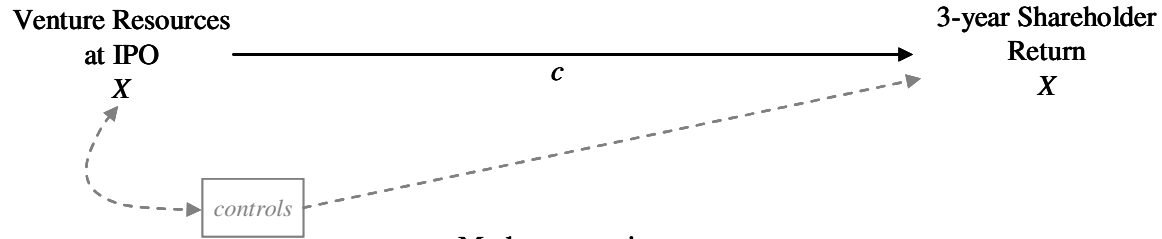


**Panel B**

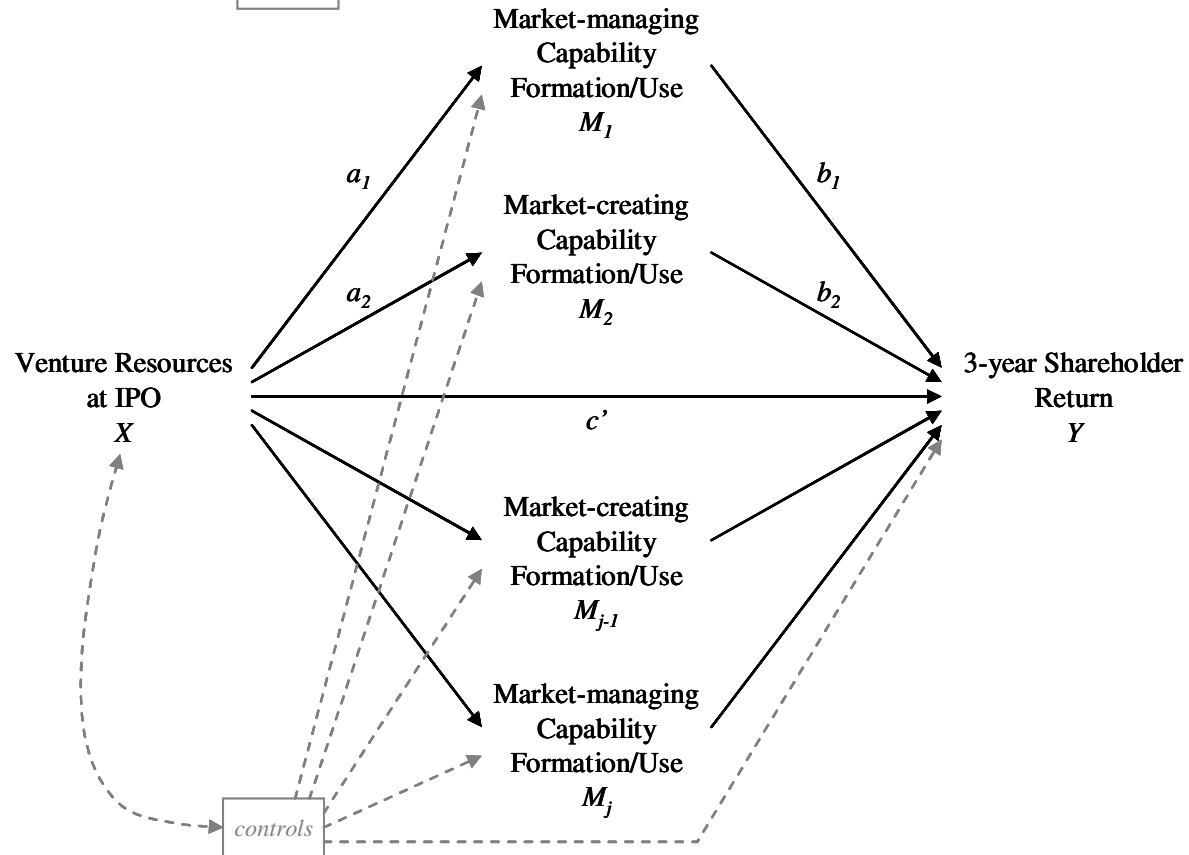


**FIGURE 4**  
**Illustration of Multiple Mediation**

**Panel A**



**Panel B**





Computations for estimating, comparing, and testing indirect effects in multiple mediation models are described further below. These mathematical computations were handled using a SAS macro developed by Professors Kristopher J. Preacher and Professor Andrew F. Hayes for estimating and comparing indirect effects in multiple mediator models (email exchange with Professor Preacher on March 23, 2006). Appendix A contains the macro for SAS that was used to provide a test of the indirect effect for multiple mediation using the Sobel test (used to compute the standard error for total indirect effects and specific indirect effects using the calculations described in Equation 5A and Equation 8, respectively). Electronic copies of the macros can be obtained at <http://www.comm.ohio-state.edu/ahayes/SPSS%20programs/indirect.htm>. Specifically, I use SAS's %MACRO ...%MEND and SAS PROC IML procedures to generate estimates for the indirect effects in a multiple mediator model, incorporating the macro to initiate the required routines. This particular macro allows for multiple mediators, statistical control of covariates, and all possible pairwise comparisons between indirect effects, and it also produces bias-corrected bootstrap confidence intervals in addition to percentile-based bootstrap confidence intervals.

Specifically, I model the indirect effect of the two venture resource types (financial capital at IPO and human capital at IPO) on the dependent variable (three-year shareholder returns) through the two mediators (market-managing capability formation/use and market-creating capability formation/use). I test significance for each specific indirect effect of each of the two dimensions of capability formation/use as well as the total indirect effect for the two mediators using the critical ratio and the confidence interval described below in Equation 9 and Equation 10, respectively.

Specifying and testing of indirect effects using multiple mediation offers several advantages to the testing of separate simple mediation models. First, omitted variables may lead to biased parameter estimates if multiple mediation hypotheses are tested with a set of simple mediator models (Judd & Kenny, 1981). When multiple hypothesized mediators are modeled together, the likelihood of parameter bias due to omitted variables is reduced. Second, multiple mediation allows determination of whether and to what extent specific  $M$  variables transmitting the  $X \rightarrow Y$  effect are conditional on the presence of other mediators in the model. Finally, multiple mediation allows researchers to contrast and evaluation of the strength of individual mediators relative to each other. More specifically, the indirect effect through, for example,  $M_2$  (see Figure 4) represents the ability of  $M_2$  to mediate the effect of  $X$  on  $Y$  conditional on the inclusion of the other mediators in the model. Because of this, collinearity plays a role in multiple mediation models in much the same way as in ordinary multiple regression. To the degree that individual mediators are correlated, the effects of the mediators on  $Y$  (the  $b$  paths) can be attenuated, which can compromise the ability to find particular specific indirect effects significant.

Accordingly, I simultaneously test for mediation involving the two dimensions of capability formation and use the product of coefficients in a path model (i.e., the indirect effect; Alwin & Hauser, 1975; Sobel, 1982, 1988) using the formula derived by Sobel (1982). I apply a multivariate extension of the product of coefficients strategy developed for models involving two or more mediators (Bishop et al., 1975; Oehlert, 1992), using matrix formulae for obtaining point estimates and first-order standard errors for each indirect effect “path” in an equation simultaneously modeling the paths created by two

or more mediators (Bollen, 1987, 1989); these standard errors permit significance testing using critical ratios for measuring specific indirect effects (i.e., the path coefficient of each individual mediation path) and total indirect effects (i.e., the path coefficients for all mediation paths included in the model). Using this approach, standard errors for indirect effects are obtained as the square roots of diagonal elements produced in an asymptotic covariance matrix (referred to as F) given by:

$$\Sigma(F) = a_1^2 \sigma_{b1}^2 + b_1^2 \sigma_{a1}^2 + a_2^2 \sigma_{b2}^2 + b_2^2 \sigma_{a2}^2 + 2(a_1 a_2 \sigma_{b1.b2} + b_1 b_2 \sigma_{a1.a2}) \quad (5A)$$

where  $\sigma_{a1}^2$ ,  $\sigma_{a2}^2$ ,  $\sigma_{b1}^2$ , and  $\sigma_{b2}^2$  are the variances of the  $a_1$ ,  $a_2$ ,  $b_1$ , and  $b_2$  coefficients, respectively. The square root of  $\Sigma(F)$  represents the first-order standard error of the *total indirect effect* in a two-mediator model given by the following equation:

$$SE_{a1.b1.2} = \sqrt{\Sigma(F)} \quad (5B)$$

The total indirect effect of X on Y given by Sobel (1986) is:

$$f = a_1 b_1 + a_2 b_2 \quad (6)$$

Employing equation 5, the critical ratio for the total indirect effect of X on Y is:

$$z = (a_1 b_1 + a_2 b_2) / \sqrt{\Sigma(F)} \quad (7)$$

The specific indirect effects for each individual mediation path are computed using the same formula offered by Sobel (1982) to test for simple mediation. Specifically, the point estimate for the specific indirect effect of  $X$  on  $Y$  through mediator  $M_n$  in the model depicted in Figure 4 is computed as the product of the coefficients for paths  $a_n$  and  $b_n$  (i.e.,  $a_nb_n$ ). Application of Sobel's multivariate delta method represents the standard error of the *specific indirect effect* for each moderator as follows:

$$SE_{anbn} = \sqrt{a_n^2 \sigma_{bn}^2 + b_n^2 \sigma_{an}^2} \quad (8)$$

The critical ratio for the specific indirect effect of  $X$  on  $Y$  through  $M_n$  is:

$$z = (a_nb_n) / \sqrt{a_n^2 \sigma_{bn}^2 + b_n^2 \sigma_{an}^2} \quad (9)$$

In addition to conducting a significance test using the critical ratio, I also use the standard error ( $SE_{anbn}$ ) to create confidence limits for the indirect effect associated with each mediation path hypothesized in Chapter III. Using the lower and upper bounds of a 95% confidence interval ( $CI_{.95}$ ), I compute the confidence interval as follows:

$$CI_{.95}(a_nb_n) = a_nb_n \pm z_{\alpha/2} SE_{anbn} \quad (10)$$

where  $z_{\alpha/2}$  is the z-score cutting off the upper  $100(\alpha/2)\%$  of the standard normal distribution (e.g., 1.96 for the 95% confidence interval). In such case, the null hypothesis of no indirect effect for  $M_n$  is rejected at  $\alpha = .05$  when the  $CI_{.95}$  for path  $a_nb_n$  does not contain 0.

### Summary

This chapter explained the methodology applied by this dissertation to test the hypothesized relationships. First, I described the sample of firms that was examined in this study and identified data sources that were used. Next, I described the operationalization of the dependent, intervening, independent, moderating variables, and control variables. Finally, I specified the statistical analyses and procedures that were used to test the relationships hypothesized in Chapter III.

## **CHAPTER V**

### **RESULTS**

#### **Introduction**

This chapter provides the results of the analyses conducted to test the ten hypotheses proposed in Chapter III. The summary includes a restatement of each hypothesis, the analytical procedure(s) relied upon to independently test each hypothesis, and an overview of the results. As described in Chapter IV, RCM is employed to test the hypothesized relationships. Further, a modified version of the product of coefficients method that supports the simultaneous modeling and testing of multiple mediation paths is applied to test the mediation hypotheses for both configurations of organizational capabilities.

The first section of this chapter describes tests of the validity of measures for the two dimensions of capability formation and use, including descriptive statistics for the items and examination of the rotated factor patterns. The second section of this chapter describes the sample and summarizes the descriptive statistics and correlation statistics associated with the variables of interest to this study. The third section of this chapter discusses the results of the statistical procedures used to test each hypothesis.

### **Validity of Objective Capability Configuration Measures**

Data were gathered for each potential indicator of market-managing capabilities and market-creating capabilities described previously in Chapter IV and considered for the composite measure from a random sample of 600 firms between 1996 and 2000 from COMPUSTAT. Table 8 reports descriptive statistics for each of the items that were considered for the two dimensions of capability formation and use. Data from all five years were pooled to simplify the reporting. Although the significance of the correlation coefficients may be somewhat overstated because of the pooling of the data, a year-by-year analysis of the correlation matrices indicated a similar pattern of relationships over time.

To evaluate the capability dimensions and their potential measures more closely, I considered two selection criteria. First, how well do the items designed to measure each construct load on a single factor? And second, how internally consistent are the items that made up each construct? The first selection criterion was assessed by conducting a principal components factor analysis of the ten items that comprised the two dimensions of capability formation and use. Following the Kaiser criterion and the scree plot, I extracted factors with eigenvalues greater than one, using an oblique rotation because I expected the specific dimensions of capability formation and use to be interrelated. As the results shown in Table 9 indicate, two factors were identified with absolute factor loading values that exceeded the conventional cutoff of 0.40 (Tabachnick & Fidell, 2001).

**TABLE 8**  
**Descriptive Statistics and Correlations of Items Measuring Capability Formation and Use<sup>a</sup>**

	Mean	s.d.	1	2	3	4	5	6	7	8	9
1. Direct production costs (e.g., Cost of goods sold)	1,261.375	6,364.930									
2. Non-production overhead/ administrative costs (e.g., Selling, general, and administrative costs)	307.931	1,421.867	0.727								
3. Total inventory costs	292.202	4,061.886	0.722	0.750							
4. Accounts receivable (t/o)	1,518.859	16,653.582	0.663	0.310	0.538						
5. Accounts payable (t/o)	1,090.514	14,102.432	0.795	0.564	0.434	0.747					
6. Capital expenditures	149.983	869.278	0.185	0.190	0.142	0.251	0.190				
7. Plant, property, and equipment	1,608.255	8,031.542	0.198	0.492	0.135	0.160	0.165	0.822			
8. Research and development expenditures	78.126	442.416	0.376	0.370	0.498	0.519	0.485	0.668	0.535		
9. Advertising expenditures	68.619	316.945	0.613	0.756	0.193	0.317	0.124	0.550	0.466	0.647	
10. Total acquisitions (\$ value)	0.413	2.070	0.061	0.066	0.023	0.050	0.032	0.403	0.523	0.332	0.032

<sup>a</sup>  $n = 600$  for all variables. Correlations greater than 0.140 are significant at  $p < .05$ .



**TABLE 9**  
**Rotated Factor Patterns<sup>a</sup>**

Variables	Factor 1: Market-managing Capability Formation/Use	Factor 2: Market-creating Capability Formation/Use
Direct production costs (e.g., Cost of goods sold)	<b>0.857</b>	0.064
Non-production overhead/administrative costs (e.g., Selling, general, and administrative costs)	<b>0.640</b>	0.239
Total inventory costs	<b>0.833</b>	0.011
Accounts receivable (t/o)	<b>0.761</b>	0.343
Accounts payable (t/o)	<b>0.810</b>	0.223
Capital expenditures	0.227	<b>0.892</b>
Plant, property, and equipment	0.171	<b>0.952</b>
Research and development expenditures	0.102	0.323
Advertising expenditures	<b>0.902</b>	0.226
Total acquisitions (\$ value)	0.191	<b>0.563</b>
Variance explained:		
Proportional	0.453	0.325
Cumulative		0.779
Subscale reliability:		
Factor 1: Market-managing Capability Formation/Use	0.664	
Factor 2: Market-creating Capability Formation/Use		0.863

<sup>a</sup>  $n = 600$ . **Bold print** highlights the factor loadings with absolute values greater than 0.40.

Nine of the ten items loaded on two factors with minimal cross-loading. However, the pattern differed from the original expectations described in Chapter IV in two ways. First, research and development expenditures did not load on *Factor 2-Market-creating capability formation/use*, neither did the absolute value of its factor loading exceed 0.40 for *Factor 1-Market-managing capability formation/use*. Therefore, the item was excluded from subsequent calculation of composite measures for both dimensions of capability formation and use. Second, advertising expenditures produced a reasonably high factor loading of 0.902 on Factor 1, rather than on Factor 2 as expected. This result suggests that advertising expenditures most likely account for costs incurred by firms to exploit existing product-market positions by promoting the sale of current goods and services rather than representing long-term efforts by a firm to extend brand equity and market “legitimacy” to any new positions that the firm chooses to pursue.

Internal consistency was assessed by calculating Cronbach alphas to obtain reliability estimates for each dimension. I applied guidelines from prior research suggesting that an alpha greater than 0.60 is considered reasonable for organizational research (Tabachnick & Fidell, 2001; Van de Ven & Ferry, 1980). Hence, both dimensions of capability formation and use were reasoned to demonstrate internal consistency given the items that loaded on each factor. Further, as noted in Table 9, the market-managing capability formation and use factor accounted for 45.3% of the total item variance ( $\alpha = .664$ ), and the market-creating capability formation and use factor accounted for 32.5% of the total item variance ( $\alpha = .863$ ). Similar results and

conclusions were obtained when performing principal axis factoring, and when employing an oblimin rotation.

As a result, I constructed a scale for each capability dimension by summing the standardized value of the items that exceeded the 0.40 threshold on each dimension of capability formation and use after completion of the factor analysis. More specifically, the composite measure of each venture's allocation to market-managing capability formation and use included standardized values of the following items: (1) direct production costs (e.g., cost of goods sold), (2) non-production overhead and administrative costs (e.g., selling, general, and administrative costs), (3) total inventory costs, (4) accounts receivable turnover, (5) accounts payable turnover, and (6) advertising expenditures. The composite measure of each venture's allocation to market-creating formation and use included standardized values of the following items: (1) capital expenditures, (2) plant and equipment newness (e.g., ratio of new plant and equipment to gross plant and equipment), and (3) the total value of acquisitions during the period.

### **Descriptive Statistics and Correlations**

As described in Chapter IV, the sample for this study consists of 632 U.S. firms that completed an IPO in the U.S. between 1996 and 2000 and met the requisite restrictions for inclusion in the sample. Table 10 summarizes the distribution of IPOs for firms included in the study, including the average proceeds generated by each IPO during the year and the average annual shareholder return for the three-year period following each firm's IPO year. Notably, the average proceeds for IPOs increased

substantially during the five-year period, increasing almost three-fold during the period from \$39.7 million per IPO in 1996 to more than \$94 million per IPO in 2000.

**TABLE 10**  
**Description of Sample: Distribution of IPOs for Firms Used in Study**

Year	IPOs	Percent of Sample	Average IPO Proceeds <sup>a</sup>	Average Annual Return <sup>b</sup>
1996	147	23.3%	\$39,737	24.6%
1997	129	20.4%	\$37,793	19.8%
1998	83	13.1%	\$44,705	15.7%
1999	141	22.3%	\$65,706	-12.1%
2000	132	20.9%	\$94,080	17.7%

<sup>a</sup> In thousands.

<sup>b</sup> Average annual return for the three-year period following the IPO year.

Table 11 provides additional details regarding the IPO firms included in the study. On average, each IPO involves the issuance of 4.63 million shares of stock (common shares) and generated \$59.58 million in proceeds for each firm included during the five-year timeframe for firms included in this study. Further, the average sales and net income at IPO, 3-year return on sales, 3-year sales growth, board size, and CEO ownership among other factors for firms included in this study are comparable with the levels for firms included in similar studies examining IPO firms (e.g., Certo et al., 2001; Florin et al., 2003).

**TABLE 11**  
**Description of Sample: IPO Firm Attributes for Firms Used in Study**

	Minimum	Maximum	Mean	s.d.
Firm age at IPO	0	6	3.47	1.55
Sales at IPO <sup>a</sup>	0	1,102.0	23.48	85.21
Net income at IPO <sup>a</sup>	-88.7	25.4	-10.31	32.95
Return on sales (3-year)			-2.06	7.29
Sales growth (3-year)			24.55	122.81
Number of employees at IPO	3	5,995	483.95	136.61
Total assets at IPO <sup>a</sup>	3.1	3,870.0	149.29	270.70
Board size	2	14	6.68	1.86
Average TMT age	28.0	58.8	43.27	4.94
Average TMT industry experience	1.6	34.0	10.84	4.44
Average TMT educational attainment	2.4	6.4	4.05	0.85
IPO proceeds <sup>a</sup>	4.0	781.2	59.58	64.42
Number of shares offered <sup>a</sup>	0.6	4.6	4.63	3.78
Number of underwriters (including international co-managers)	1.0	20.0	12.10	8.34
CEO ownership <sup>b</sup>	0.00	0.86	0.17	0.34
TMT/director ownership <sup>b</sup>	0.00	0.97	0.59	0.29
Firms with CEO duality <sup>b</sup>			0.58	0.49
Firms with founder as CEO <sup>b</sup>			0.64	0.48
Firms with founder(s) on TMT <sup>b</sup>			0.84	0.37

<sup>a</sup> In millions.

<sup>b</sup> Percentage.

Descriptive statistics and correlations for variables used in this study are reported in Table 12. Overall, these figures indicate that shareholder returns for the sample of new ventures averaged 12.8% over the three-year period. Further, the average age at IPO for firms included in the sample was 3.47, which reflects the six-year age restriction applied to the original listing of IPOs that occurred during the five-year timeframe considered by this study. The bivariate correlations report a negative relationship between financial capital at IPO ( $-.171, p < .001$ ) suggesting somewhat paradoxically that shareholder returns decrease at increasingly higher levels of available financial resources. The two dimensions of capability formation and use correlate with shareholder returns as expected. Specifically, market-managing capability formation and use is negatively correlated with shareholder returns ( $-.105, p < .01$ ), suggesting shareholder returns suffer with increasingly higher allocations to the formation and use of these organizational capabilities. In contrast, market-creating capability formation and use is positively correlated with shareholder returns ( $.091, p < .05$ ).

Further, Table 12 suggests that multicollinearity is likely not a concern for these data because none of the bivariate correlations are excessively. Nevertheless, I used SAS's PROC REG procedure with the VIF option to examine the variance inflation factors (VIFs) for each equation to assess the potential for multicollinearity. In each case, none of the VIFs exceeded 2.0. This is further indication that multicollinearity is not a concern.

**TABLE 12**  
**Descriptive Statistics and Correlations of Variables Used in Study<sup>a</sup>**

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Shareholder return	0.128	1.771											
2. Financial capital at IPO (log financial capital)	17.878	0.849	-0.171***										
3. Human capital at IPO	-0.146	2.489	0.024	0.043									
4. Market-managing capability formation/use	1.127	3.873	-0.105**	-0.364***	-0.188***								
5. Market-creating capability formation/use	-0.023	1.322	0.091*	0.214***	0.101*	-0.350***							
6. Age at IPO	3.473	1.549	0.050	0.008	-0.069†	0.086*	-0.049						
7. Firm size (log sales)	2.031	1.374	0.038	0.210***	0.105**	-0.441***	0.111**	0.077†					
8. CEO duality	0.581	0.494	-0.007	-0.106**	0.024	-0.046	0.015	-0.051	0.104*				
9. TMT/director ownership	0.752	2.228	-0.139***	0.090*	-0.011	-0.036	0.069†	-0.014	0.020	-0.055			
10. % inside directors	0.300	0.148	-0.017	-0.239***	0.001	0.063†	-0.084*	-0.161***	0.147***	0.201***	-0.059		
11. Industry munificence	0.341	0.166	-0.085*	0.190***	-0.136***	-0.012	0.028	0.000	0.023	-0.023	0.048	0.050	
12. Industry dynamism	0.049	0.038	-0.137***	-0.067†	0.080*	-0.047	-0.035	-0.095**	0.054	-0.024	-0.025	0.065†	0.167***

<sup>a</sup>  $n = 632$  for all variables.

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

### **Test of Hypotheses**

As described in Chapter IV, all hypotheses were tested using SAS's (software package) PROC MIXED procedure. PROC MIXED is considered an efficient procedure (Singer, 1998) making it particularly useful for fitting a wide range of mixed linear models to data, including multilevel (hierarchical) models, and to make statistical inferences about the data. Separate analyses were conducted for models involving each dependent variable (e.g., three-year shareholder return for H1, H2, and H9a – H10b; market-managing capability formation/use for H3, H4, H7a, and H8a; and market-creating capability formation/use for H5, H6, H7b, and H8b). Table 13 presents the results for analyses involving the regression of the two venture resource types (financial capital at IPO and human capital at IPO) on three-year shareholder return. Results of the RCM analyses involving the regression of market-managing formation/use and market-creating formation/use on the two venture resource types and the hypothesized interactions are included in the tables on pages 192-193 and 196-197, respectively. For each analysis, the first two models of the equation are the same. Model 1 for each equation presents the results of the null model (i.e., the unconditional means model with no predictors). Model 2 presents the results with only the control variables included in the equation.



**TABLE 13**  
**RCM Regression Analysis of the Effect of**  
**Financial Capital and Human Capital on Shareholder Return<sup>a</sup>**

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.058* (0.106)	-0.377* (0.343)	4.331* (2.001)	-4.342* (1.858)	-4.161* (1.863)
Age at IPO		0.043 (0.049)	0.020 (0.050)	0.006 (0.049)	0.002 (0.050)
Firm size (log sales)		0.011 (0.054)	0.057 (0.057)	0.056 (0.057)	0.062 (0.057)
CEO duality		-0.079 (0.141)	-0.109 (0.141)	-0.093 (0.140)	-0.086 (0.140)
TMT/director ownership		-0.091** (0.029)	-0.092** (0.029)	-0.091** (0.029)	-0.092** (0.029)
% inside directors		-0.200 (0.503)	-0.484 (0.515)	-0.395 (0.514)	-0.410 (0.513)
Industry munificence		0.025 (0.024)	0.028 (0.025)	0.024 (0.025)	0.026 (0.025)
Industry dynamism		-0.144† (0.082)	-0.200* (0.082)	-0.180* (0.082)	-0.200* (0.082)
Year 1 dummy		0.896** (0.324)	0.672* (0.337)	0.590† (0.338)	0.599† (0.338)
Year 2 dummy		0.794** (0.302)	0.512† (0.324)	0.485 (0.323)	0.480 (0.322)
Year 3 dummy		0.680* (0.317)	0.469 (0.328)	0.388 (0.328)	0.367 (0.328)
Year 4 dummy		-0.463† (0.264)	-0.560* (0.266)	-0.624* (0.266)	-0.643* (0.266)

<sup>a</sup>  $n = 632$ . The dependent variable is 3-year shareholder return.  
(standard error)  
\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

**TABLE 13 (cont.)<sup>a</sup>**

	Model 1 (cont.)	Model 2 (cont.)	Model 3 (cont.)	Model 4 (cont.)	Model 5 (cont.)
Financial capital at IPO			-0.251** (0.105)	5.126** (2.082)	4.916** (2.088)
Financial capital at IPO squared				-0.151** (0.058)	-0.145** (0.058)
Human capital at IPO					0.033† (0.018)
Deviance (-2ResLogLik)	2501.9	2378.1	2272.6	2206.0	2154.6
Δ Deviance		-123.8***	-105.5***	-66.6***	-48.6***

<sup>a</sup>  $n = 632$ . The dependent variable is 3-year shareholder return.  
(standard error)

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

Further, because these models are presented in a hierarchical model, the reader may be interested in comparing models to determine the extent to which the inclusion of additional predictors contributes significantly to the subsequent model. Specifically, I use the goodness-of-fit  $\chi^2$  process to evaluate model fit (Tabachnick & Fidell, 2001), whereby the log-likelihood of the full model is compared with the log-likelihood of the smaller model and the significance of the resulting  $\chi^2$  statistic is determined for the given degrees of freedom. In such case, the degrees of freedom for comparing models are the difference between degrees of freedom for the bigger and smaller models. The -2 log-likelihood is reported for each model together with the difference score and the significance of the change in  $\chi^2$  between models within each equation.

### **Venture Resources → New Venture Performance Hypotheses (H1 and H2)**

Table 13 presents the results of Hypothesis 1 and Hypothesis 2. I began the analysis by estimating a null model (e.g., unconditional means model) that contained no predictors at level-1 and level-2 to partition the variance in firm performance (e.g., three-year shareholder returns) into between-firm/within industry and between industry components (e.g., Raudenbush & Bryk, 2002). Although this model contained no predictors, it allowed me to understand the effects across the two levels. Model 1 in Table 13 displays the results of this analysis. The analysis revealed two variance components (not reported in the tables), both of which were statistically significant: the variance between firms within industries (2.963), and the variance between industries (0.177). 94-percent of the variance in shareholder returns over the three-year period

following an IPO was between firms within industries and only 6-percent of the variance in three-year shareholder return was between industries.

In Model 2, I entered the control variables. As shown in Model 2, the TMT/director ownership percentage variable ( $p < .01$ ), industry dynamism ( $p < .10$ ), and the year dummies were statistically significant. A chi-square test revealed that the inclusion of the control variables resulted in a better model. More specifically, I compared the deviance statistics (e.g., the goodness-of-fit  $\chi^2$ ) from Model 1 and Model 2 and found a statistically significant difference in the two models ( $\Delta Deviance = -123.8; p < .001$ ).

In Model 3, I entered my financial capital at IPO independent variable to equation. I subsequently added the financial capital at IPO squared variable to the equation and reported the results in Model 4. Hypothesis 1 predicted that financial capital at IPO has a non-linear association with IPO-stage new venture performance. Lower to moderate levels of available financial capital following an IPO were expected to positively affect new venture performance as these firms capitalized on gains from investments in the most profitable opportunities. However, at increasingly higher levels of available financial capital following an IPO, the relationship between financial capital at IPO and firm performance would turn negative. In other words, the relationship was expected to form an inverted U-shaped curve. As demonstrated in Model 4, financial capital at IPO is found to be positively associated with three-year shareholder return ( $p < .01$ ), while financial capital at IPO squared is negatively associated with three-year shareholder returns ( $p < .001$ ). Moreover, the likelihood ratio test suggests that Model 3

provided a better fit than Model 2 ( $\Delta$  Deviance = -66.6;  $p < .001$ ). These results support Hypothesis 1.

Hypothesis 2 predicted that human capital at IPO would have a direct and positive association with IPO-stage new venture. Specifically, during the period following an IPO, new ventures that are endowed with greater levels of human capital are expected to enhance a new venture's ability to establish, sustain, and extend its competitive advantage, and therefore, to increase its market performance during this period. I added human capital at IPO to the equation to test Hypothesis 2 and reported the results of this test in Model 5 (Table 13). As shown in Model 5, human capital at IPO has a marginally significant affect on the three-year shareholder return of new ventures following an IPO ( $p < .10$ ). These results support Hypothesis 2.

### **Venture Resources → Capability Formation/Use Hypotheses (H3 – H6)**

Separate equations were constructed to test the influence of venture resource endowments on the two dimensions of capability formation and use: market-managing capabilities and market-creating capabilities. Table 14 reports the results of the tests of Hypotheses 3 and 4. The table on pages 196-197 reports the results of the tests of Hypotheses 5 and 6.

**TABLE 14**  
**RCM Regression Analysis of the Effect of**  
**Financial Capital and Human Capital on Market-Managing Capability Formation/Use<sup>a</sup>**

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	1.023* (0.547)	7.764*** (1.055)	-4.192 (2.649)	-5.683 (3.845)	-7.315 (4.818)
Age at IPO		-0.010 (0.080)	-0.005 (0.080)	-0.020 (0.081)	0.012 (0.080)
Firm size (log sales)		-1.351*** (0.131)	-1.825*** (0.221)	-1.873*** (0.229)	-1.876*** (0.226)
CEO duality		-0.242 (0.242)	-0.195 (0.242)	-0.234 (0.245)	-0.145 (0.242)
TMT/director ownership		-0.024 (0.049)	-0.021 (0.049)	-0.014 (0.049)	-0.024 (0.048)
% inside directors		-1.050 (0.889)	-0.819 (0.889)	-0.898 (0.894)	-0.662 (0.889)
Industry munificence		-0.098* (0.047)	-0.098* (0.047)	-0.100* (0.048)	-0.101* (0.047)
Industry dynamism		0.370* (0.150)	0.370* (0.150)	0.373* (0.151)	0.420** (0.152)
Year 1 dummy		-2.011** (0.638)	-1.725** (0.644)	-1.441** (0.503)	-1.962** (0.649)
Year 2 dummy		-2.256*** (0.568)	-1.872** (0.584)	-1.922*** (0.460)	-2.027*** (0.584)
Year 3 dummy		-1.144† (0.588)	-0.866 (0.595)	-0.926† (0.489)	-1.019† (0.590)
Year 4 dummy		0.150 (0.478)	0.340 (0.481)	0.221 (0.397)	0.320 (0.477)

<sup>a</sup>  $n = 632$ . The dependent variable is Market-Managing Capability Formation/Use.  
(standard error)

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

**TABLE 14 (cont.)<sup>a</sup>**

	Model 1 (cont.)	Model 2 (cont.)	Model 3 (cont.)	Model 4 (cont.)	Model 5 (cont.)
Financial capital at IPO			0.772** (0.292)	0.850** (0.306)	0.959** (0.303)
Human capital at IPO				-0.120** (0.051)	-0.108* (0.050)
Financial capital X Dynamism					-5.587** (4.210)
Human capital X Dynamism					5.133*** (1.264)
Deviance (-2ResLogLik)	3377.2	3219.3	3162.3	3102.9	3053.4
Δ Deviance		-194.9***	-57.0***	-59.4***	-49.5***

<sup>a</sup>  $n = 632$ . The dependent variable is Market-Managing Capability Formation/Use.  
(standard error)

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

Venture Resources → Market-Managing Capability Formation/Use (H3 and H4)

Hypothesis 3 predicted that financial capital at IPO has a positive association with allocations to market-managing capability formation and use. That is, at higher levels of available financial capital, firms are expected to increasingly fund investments that develop and further utilize these organizational capabilities. In Hypothesis 4, I posited that human capital at IPO would have a negative association with the formation and use of market-managing capabilities. I expected to find a negative relationship, in part, because new ventures headed by TMTs with higher levels of human capital can handle complex business activity more effectively (Hambrick & Cannella, 2004) and also because these TMTs endow their firms with greater legitimacy (Higgins & Gulati, 2006). Therefore, I predicted that top managers with superior human capital will be less likely to pursue investments in production and administrative structures.

Results for both hypotheses are presented in Table 14. Again, I began the analysis by estimating a null model (e.g., unconditional means model) that contained no predictors at level-1 and level-2 to partition the variance in market-managing capability formation and use into between-firm/within industry and between industry components. Both variance components for the null model were statistically significant (not reported in the tables): the portion of variance between firms within industries (8.905) and the portion of variance between industries (24.350). More specifically, 27-percent of the variance in market-managing capability formation and use over the three-year period following an IPO was between firms within industries and 73-percent of the variance was between industries, suggesting the strong influence that industry membership has on



the formation/use of different organizational capabilities for firms that enable them to exploit existing product-market positions following an IPO.

I entered the control variables in Model 2. As shown in Model 2, firm size ( $p < .001$ ) and industry munificence ( $p < .05$ ) were negatively related to market-managing capability formation and use, while industry dynamism ( $p < .05$ ) had a positive association with market-managing capability formation and use. The likelihood ratio test indicates that the inclusion of the control variables resulted in a better model ( $\Delta Deviance = -194.9; p < .001$ ). I subsequently added financial capital at IPO and human capital at IPO to the equation to test Hypothesis 3 and Hypothesis 4, respectively. As reported in Model 4, financial capital at IPO is found to be positively associated with market-managing capability formation and use ( $p < .01$ ). Further, as expected, human capital at IPO is found to be negatively associated with the formation and use of this configuration of organizational capabilities (see Model 4;  $p < .001$ ). These results support Hypothesis 3 and Hypothesis 4. Moreover, the likelihood ratio test suggests that Model 3 ( $\Delta Deviance = -57.0; p < .001$ ) and Model 4 ( $\Delta Deviance = -59.4; p < .001$ ) indicate a better fit when comparing both deviance statistics.

**TABLE 15**  
**RCM Regression Analysis of the Effect of**  
**Financial Capital and Human Capital on Market-Creating Capability Formation/Use<sup>a</sup>**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.921 (0.918)	-3.382*** (0.462)	0.557 (2.172)	8.7335*** (1.499)	9.418*** (1.580)	8.786*** (1.767)
Age at IPO		0.027 (0.038)	0.026 (0.038)	0.048 (0.037)	0.062† (0.037)	0.047 (0.045)
Firm size (log sales)		0.735*** (0.061)	0.890*** (0.103)	0.875*** (0.101)	0.927*** (0.105)	-0.026 (0.053)
CEO duality		0.102 (0.115)	0.086 (0.115)	0.058 (0.112)	0.052 (0.113)	0.068 (0.126)
TMT/director ownership		0.039† (0.024)	0.038† (0.024)	0.038† (0.023)	0.038† (0.023)	0.047† (0.025)
% inside directors		-0.573 (0.416)	-0.650† (0.416)	-0.796* (0.406)	-0.842* (0.412)	-0.937* (0.474)
Industry munificence		0.0022 (0.022)	0.0020 (0.022)	0.0088 (0.021)	0.0067 (0.022)	0.0184 (0.024)
Industry dynamism		-0.0253 (0.069)	-0.0272 (0.069)	-0.0416 (0.067)	-0.0344 (0.068)	-0.0489 (0.075)
Year 1 dummy		0.286 (0.294)	0.188 (0.298)	0.363 (0.292)	0.323 (0.296)	0.729* (0.324)
Year 2 dummy		0.363 (0.264)	0.232 (0.273)	0.302 (0.266)	0.276 (0.269)	0.655* (0.302)
Year 3 dummy		0.377 (0.274)	0.277 (0.279)	0.444† (0.273)	0.503† (0.275)	0.939* (0.304)
Year 4 dummy		0.118 (0.225)	0.055 (0.227)	0.149 (0.222)	0.158 (0.223)	0.415† (0.243)

<sup>a</sup>  $n = 632$ . The dependent variable is Market-Creating Capability Formation/Use.  
(standard error)

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

**TABLE 15 (cont.)<sup>a</sup>**

	Model 1 (cont.)	Model 2 (cont.)	Model 3 (cont.)	Model 4 (cont.)	Model 5 (cont.)	Model 6 (cont.)
Financial capital at IPO			-0.254* (0.137)	-10.043** (1.680)	-10.749*** (1.763)	-10.677*** (1.975)
Financial capital at IPO squared				0.275*** (0.047)	0.292*** (0.049)	0.320*** (0.055)
Human capital at IPO					0.048** (0.023)	0.068** (0.026)
Financial capital squared X Dynamism						0.009 (0.061)
Human capital X Dynamism						-0.110 (0.146)
Deviance (-2ResLogLik)	2402.0	2277.2	2223.8	2180.5	2140.8	2136.2
Δ Deviance		-124.8***	-53.4***	-43.3***	-39.7***	-2.2

<sup>a</sup>  $n = 632$ . The dependent variable is Market-Creating Capability Formation/Use.  
(standard error)

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

Venture Resources → Market-Creating Capability Formation/Use (H5 and H6)

Table 15 provides results for Hypothesis 5 and Hypothesis 6. In Hypothesis 5, I posited that financial capital at IPO has a non-linear association with the formation and use of market-creating capabilities. A positive association was expected between low to moderate levels of available financial capital and the propensity to invest in these capabilities, in part, because such resources ease capital restrictions and act as inducements to experiment, take risks, and make strategic choices (Singh, 1986); however, research has found that increasingly greater levels of financial capital diminishes incentives to innovate (Nohria & Gulati, 1996). More specifically, the relationship between financial capital at IPO and the formation and use of market-creating capabilities was expected to form an inverted U-shaped curve.

Hypothesis 6 predicted that human capital at IPO has a positive association with the formation and use of market-creating capabilities. New ventures endowed with higher levels of human capital following an IPO are expected to be more effective at strategizing to develop new product-market positions, increasing the likelihood that profitable entrepreneurial opportunities will be discovered and thus positively influencing investments in this configuration of capabilities.

The null model (see Model 1) partitions the variance in market-creating capability formation and use into between-firm/within industry and between industry components. Both variance components were statistically significant: the portion of variance between firms within industries (2.100) and the portion of variance between industries (2.509). More specifically, 46-percent of the variance in market-creating

capability formation and use over the three-year period following an IPO was between firms within industries and 54-percent of the variance was between industries.

Results with control variables added to the equation are presented in Model 2. As indicated, firm size ( $p < .001$ ) and TMT/director ownership percentage ( $p < .10$ ) are positively associated with market-creating capability formation and use. The likelihood ratio test indicates that Model 2 with the control variables is a better model ( $\Delta Deviance = -124.8$ ;  $p < .001$ ). Financial capital at IPO and financial capital at IPO squared was subsequently added to the equation to test Hypothesis 5. As reported in Model 4, financial capital at IPO is found to be negatively associated with market-creating capability formation and use ( $p < .01$ ) while financial capital at IPO squared is positively associated with the formation and use of these organizational capabilities ( $p < .001$ ). The likelihood ratio test suggests that Model 3 and Model 4, respectively, indicate both models are a better fit ( $p < .001$  when comparing both deviance statistics). However, the shape of the non-linear relationship is inverted from the curvilinear form that was posited in Hypothesis 5 (i.e., inverted U-shaped). Specifically, financial capital at IPO was found to have a U-shaped association with allocations to market-creating formation/use following the IPO. Thus, Hypothesis 5 is not supported.

I subsequently added human capital at IPO to the equation to test Hypothesis 6. As reported in Model 5, the association between human capital at IPO and allocations to market-creating capability formation and use is positive and statistically significant ( $p < .01$ ). Thus, Hypothesis 6 is supported.

### **Moderating Effects of Industry Membership on Venture Resources → Capability Formation/Use Hypotheses (H7a – H8b)**

In the previous section, I reported results for the direct effects of venture resources at IPO on the two dimensions of capability formation and use (e.g., market-managing capabilities and market-creating capabilities). The results of the tests for direct effects with market-managing capability formation/use as the dependent variable were reported in Table 14. Table 15 reports the results for the direct effect of venture resources on the formation and use of market-creating capabilities.

This section reports the results of the interactions hypothesized in Chapter III. Results for Hypotheses 7a and 8a testing the effect of the interaction of financial capital at IPO and human capital at IPO, respectively, with environmental dynamism on market-managing capability formation/use are reported in Model 5 of Table 14. I report the results for tests of the interaction of financial capital at IPO squared with environmental dynamism and human capital at IPO with environmental dynamism on the formation and use market-creating capabilities in Table 15, Model 6.

To test the hypothesized interaction effect, I used the multiplicative product of the direct effects (Baron & Kenny, 1986). Because higher order terms (i.e., interaction terms) tend to be highly correlated with their lower order direct effects, making regression coefficients unstable and difficult to interpret (Cohen & Cohen, 1983), I centered the lower order variables prior to calculating higher order interactions (Aiken & West, 1991). Following Aiken and West, I then examined separately the direct effects from their higher order terms in each of the analyses.

Interaction of Industry Membership with Financial Capital at IPO on Capability Formation/Use (H7a and H7b)

Hypothesis 7a predicted that environmental dynamism at IPO strengthens (e.g., positively moderates) the relationship between financial capital at IPO and market-managing capability formation and use. By contrast, I posited that environmental dynamism at IPO weakens (e.g., negatively moderates) the non-linear relationship between financial capital at IPO squared and market-creating capability formation and use in Hypothesis 7b. Specifically, I expect that higher levels of environmental dynamism at IPO increase the propensity of new ventures to preserve financial resources for more certain, internally-directed investments, decreasing investments to market-creating capability formation and use in favor of investments in the formation and use of market-managing capabilities.

Results for Hypothesis 7a and Hypothesis 7b are presented in Table 14 (Model 5) and Table 15 (Model 6), respectively. Table 14 reports a statistically significant interaction between environmental dynamism and financial capital at IPO on market-managing capability formation/use; however, in contrast to the positive interaction originally expected, I find a negative interaction between environmental dynamism and financial capital at IPO. Thus, Hypothesis 7a is not supported. Results in Table 15 report a statistically insignificant interaction between environmental dynamism and financial capital at IPO squared. Therefore, Hypothesis 7b is not supported.

Interaction of Industry Membership with Human Capital at IPO on Capability Formation/Use (H8a and H8b)

In Hypothesis 8a, I predicted that environmental dynamism at IPO weakens (e.g., positively moderates) the negative relationship between human capital at IPO and market-managing capability formation and use. Hypothesis 8b posited that environmental dynamism at IPO attenuates (e.g., negatively moderates) the relationship between human capital at IPO and market-creating capability formation and use. Results for Hypothesis 8a and Hypothesis 8b are reported in Table 14 (Model 5) and Table 15 (Model 6), respectively. As reported in Table 14, I find a positive interaction between environmental dynamism and human capital, suggesting that dynamism weakens the negative relationship between human capital at IPO and the formation and use of market-managing capabilities. Hypothesis 8a is supported. Table 15, which considers market-creating capability formation and use as the dependent variable, reports a statistically insignificant interaction between environmental dynamism and human capital at IPO. Thus, Hypothesis 8b is not supported.

**Venture Resources Capability Formation/Use, and New Venture Performance: Mediation Hypotheses (H9a – H10b)**

In this section, I report the results of the mediation hypotheses described in Chapter III. Specifically, I hypothesized that the two dimensions of capability formation and use (e.g., market-managing capabilities and market-creating capabilities) partially mediate the relationship between the two venture resource types at IPO (e.g., financial capital at IPO and human capital at IPO). Hypothesis 9a and Hypothesis 9b predicted



that allocations to market-managing capability formation/use would partially mediate the influence of financial capital at IPO and human capital at IPO, respectively, on IPO-stage new venture performance. I posited that the formation/use of market-creating capabilities would partially mediate the influence of financial capital at IPO and human capital at IPO on IPO-stage new venture performance (e.g., shareholder return) in Hypothesis 10a and Hypothesis 10b, respectively.

As indicated previously, I used the formula derived from Sobel's (1982), which is based on the product of coefficients in a path model, and extended to test for simultaneous mediation by multiple mediators in order to check for the indirect effects of capability formation and use. The coefficients used to test the underlying mediation are calculated based on the four steps recommended by Baron and Kenny (1986). Table 16 reports the results of the analyses completed in each step. In step 1, I first regressed three-year shareholder returns (the DV) on the controls (see Model 1). Next, I regressed new venture performance on controls plus the direct effects, financial capital at IPO and human capital at IPO, in the absence of the two configurations of organizational capabilities. The results are reported in Model 2. Step 2 examines the relationship between financial capital at IPO and human capital at IPO and the two dimensions of capability formation and use. Model 3 and Model 4 report the results of the equations involving market-managing capability formation/use and market-creating capability formation/use, respectively, as the dependent variable.

**TABLE 16**  
**RCM Regression Analysis of the Multiple Mediation Effects of Market-Managing and**  
**Market-Creating Capability Formation/Use on the Relationship between Financial Capital and Shareholder Return<sup>a</sup>**

<b>Dependent Variable:</b>	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	<i>Three-year shareholder return</i>	<i>Three-year shareholder return</i>	<i>Market- managing formation/use</i>	<i>Market- creating formation/use</i>	<i>Three-year shareholder return</i>	<i>Three-year shareholder return</i>
Intercept	-0.377* (0.343)	6.408* (2.644)	-5.683 (3.845)	1.075 (0.783)	1.126* (0.549)	5.569* (2.617)
Age at IPO	0.043 (0.049)	0.043 (0.045)	-0.020 (0.081)	0.038 (0.038)	0.038 (0.045)	0.038 (0.045)
Firm size (log sales)	0.011 (0.054)	0.147 (0.124)	-1.873*** (0.229)	0.916*** (0.108)	-0.265*** (0.080)	-0.079 (0.134)
CEO duality	-0.079 (0.141)	-0.091 (0.138)	-0.234 (0.245)	0.075 (0.116)	-0.095 (0.136)	-0.108 (0.136)
TMT/director ownership	-0.091** (0.029)	-0.093** (0.029)	-0.014 (0.049)	0.038† (0.024)	-0.098*** (0.029)	-0.098*** (0.028)
% inside directors	-0.200 (0.503)	-0.623 (0.489)	-0.898 (0.894)	-0.706† (0.423)	-0.571 (0.481)	-0.646 (0.482)
Industry munificence	0.025 (0.024)	0.030 (0.025)	-0.100* (0.048)	-0.002 (0.022)	0.026 (0.024)	0.025 (0.025)
Industry dynamism	-0.144† (0.082)	-0.200** (0.081)	0.373* (0.151)	-0.016 (0.070)	-0.100† (0.080)	-0.100† (0.080)
Year 1 dummy	0.896** (0.324)	0.646* (0.331)	-1.441** (0.503)	0.154 (0.303)	0.656 (0.322)	0.540† (0.328)
Year 2 dummy	0.794** (0.302)	0.558† (0.311)	-1.922*** (0.460)	0.221 (0.276)	0.569† (0.298)	0.427 (0.309)
Year 3 dummy	0.680* (0.317)	0.394 (0.321)	-0.926† (0.489)	0.334 (0.281)	0.378 (0.312)	0.273 (0.318)
Year 4 dummy	-0.463† (0.264)	-0.654* (0.265)	0.221 (0.397)	0.077 (0.229)	-0.594* (0.259)	-0.662** (0.261)

<sup>a</sup> *n* = 632. The dependent variable in Models 1, 2, 5, and 6 is 3-Year Shareholder Returns. The dependent variable in Model 3 is Market-Managing Capability Formation/Use. The dependent variable in Model 4 is Market-Creating Capability Formation/Use. (standard error)  
\*\*\* *p* < .001; \*\* *p* < .01; \* *p* < .05; † *p* < .10

**TABLE 16 (cont.)<sup>a</sup>**

<b>Dependent Variable:</b>	Model 1 (cont.) <i>Three-year shareholder return</i>	Model 2 (cont.) <i>Three-year shareholder return</i>	Model 3 (cont.) <i>Market- managing formation/use</i>	Model 4 (cont.) <i>Market- creating formation/use</i>	Model 5 (cont.) <i>Three-year shareholder return</i>	Model 6 (cont.) <i>Three-year shareholder return</i>
Market-managing capability formation/use					-0.071*** (0.022)	-0.067** (0.022)
Market-creating capability formation/use					0.170** (0.055)	0.107* (0.054)
Financial capital at IPO		-0.400** (0.167)	0.850** (0.306)	-0.291* (0.144)		-0.289† (0.167)
Human capital at IPO		-0.041† (0.028)	-0.120** (0.051)	0.057** (0.024)		-0.044† (0.028)

<sup>a</sup>  $n = 632$ . The dependent variable in Models 1, 2, 5, and 6 is 3-Year Shareholder Returns. The dependent variable in Model 3 is Market-Managing Capability Formation/Use. The dependent variable in Model 4 is Market-Creating Capability Formation/Use. (standard error)  
 \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$

Step 3 establishes the relationship between the two configurations of organizational capabilities and new venture performance, in the absence of the two venture resource types (financial capital and human capital), and the results are reported in Model 5. Finally, market-managing capability formation/use and market-creating capability formation/use are added to the equation in step 4 to test for the indirect effects.

As shown in Model 6 of Table 16, with the two dimensions of organizational capabilities added to the equation, a reduction in the effect size of financial capital at IPO ( $b = -.400, p < .01$  to  $b = -.289, p < .10$ ) was observed. This result suggests that the influence of financial capital at IPO on new venture performance may be partially mediated by one or both of the two dimensions of capability formation and use. However, when the two indirect effects were added to the model, the coefficient for human capital at IPO only did not change substantially ( $b = -.041, p < .10$  to  $b = -.044, p < .10$ ), which suggests the indirect effects may not be as salient for the influence of human capital at IPO on performance.

Tests of the indirect effects using the product of coefficients formula testing the indirect effect of financial capital at IPO on three-year shareholder returns is reported in Table 17. Table 18 reports the results of the formula testing the indirect effect of human capital at IPO on three-year shareholder returns. Figure 5 illustrates the results of the tests of multiple mediation that were hypothesized in this study. For financial capital at IPO, the specific indirect effects are  $a_1b_1 = .080$  ( $z = 2.162; p < .05; CI_{.95} : \{.017, .165\}$ ) through market-managing capability formation/use and  $a_2b_2 = .029$  ( $z = 1.320; p = .187$ ;

**TABLE 17**  
**Product of Coefficients Test for Indirect Effects of**  
**Financial Capital on Shareholder Return**

	Product of Coefficients			Percentile 95% CI	
	Estimate	SE	Z	Lower	Upper
Specific indirect effects					
Market-managing capability formation/use	0.080	0.037	2.162	0.017	0.165
Market-creating capability formation/use	0.029	0.0220	1.320	-0.088	0.010
Total indirect effect <sup>a</sup>	0.108	0.045	2.400	0.035	0.212

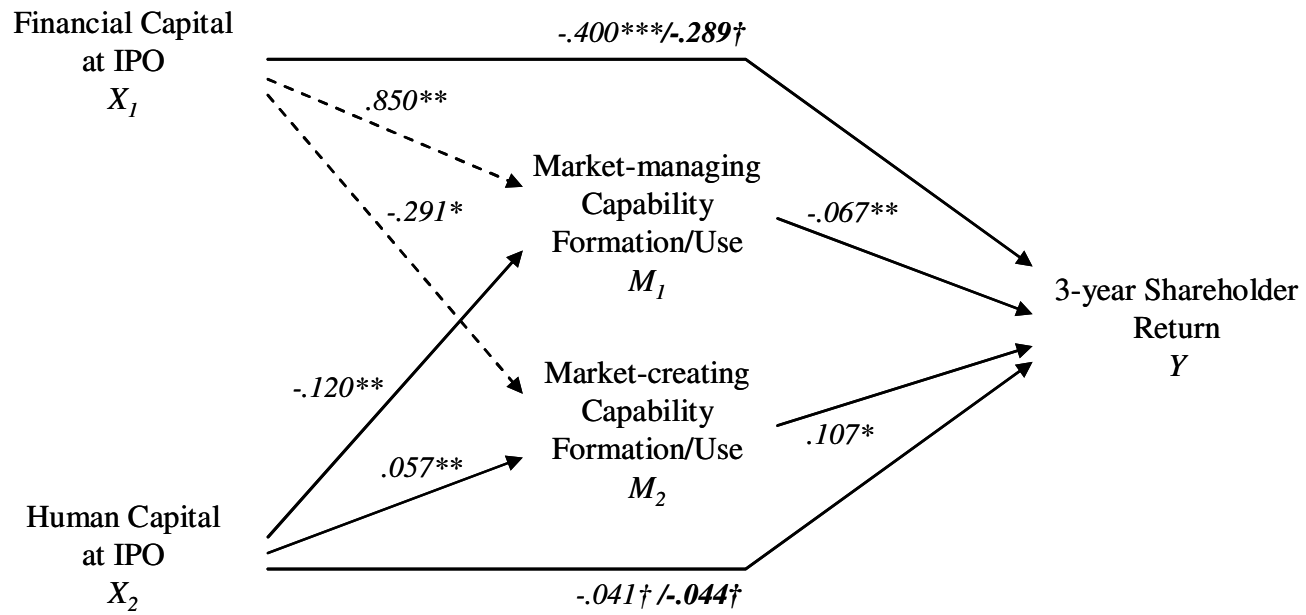
<sup>a</sup> Measure of the significance of the total (combined) indirect effect of financial capital at IPO on three-year shareholder return through both dimensions of capability formation and use.

**TABLE 18**  
**Product of Coefficients Test for Indirect Effects of**  
**Human Capital on Shareholder Return**

	Product of Coefficients			Percentile 95% CI	
	Estimate	SE	Z	Lower	Upper
Specific indirect effects					
Market-managing capability formation/use	0.096	0.049	1.960	0.014	0.021
Market-creating capability formation/use	0.025	0.023	1.090	-0.010	0.881
Total indirect effect <sup>a</sup>	0.120	0.054	2.222	0.028	0.240

<sup>a</sup> Measure of the significance of the total (combined) indirect effect of human capital at IPO on three-year shareholder return through both dimensions of capability formation and use.

**FIGURE 5**  
**Summary of Multiple Mediation Results<sup>20</sup>**



<sup>20</sup> Coefficients in bold for the direct paths between  $X_1 \rightarrow Y$  and  $X_2 \rightarrow Y$  represent path  $c'$  and are taken from Model 6 from Table 16 that includes the two mediators.

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ;  $\dagger p < .10$

$CI_{.95} : \{-.088, .010\}$ ) through market-creating capability. For human capital at IPO, the specific indirect effects are  $a_1b_1 = .096$  ( $z = 1.960$ ;  $p < .05$ ;  $CI_{.95} : \{.014, .021\}$ ) through market-managing capability formation/use and  $a_2b_2 = .025$  ( $z = 1.090$ ;  $p = .276$ ;  $CI_{.95} : \{-.010, .881\}$ ) through market-creating capability. Tests of *specific indirect effects* indicate that market-managing capability formation and use accounts for variance in the relationship between venture resources at IPO and the post-IPO performance of new ventures. Thus, Hypothesis 9a and Hypothesis 9b are supported. By contrast, the indirect effects of formation and use of market-creating capabilities were not statistically significant; therefore, Hypothesis 10a and Hypothesis 10b are not supported.

### Summary

This chapter provided the results of the analyses conducted to test the ten hypotheses proposed in Chapter III. First, I reported the tests of the validity of measures for the two dimensions of capability formation and use, including descriptive statistics for the items and examination of the rotated factor patterns. Second, I described the sample, summarizing the descriptive statistics and correlation statistics associated with the variables of interest to this study. Finally, I reported the results of the statistical procedures used to test each hypothesis. Table 19 summarizes the results of the hypothesis tests. These results are described further in the Chapter VI.

**TABLE 19**  
**Summary of Results**

<b>Hypothesis</b>	<b>Table Cross-ref</b>	<b>Supported (Y/N)</b>	<b>Comments</b>
H1 Financial capital at IPO has a non-linear association (inverted U-shaped) with IPO-stage new venture performance.	Table 13-Model 5	<i>Supported</i>	
H2 Human capital at IPO is positively associated with IPO-stage new venture performance.	Table 13-Model 5	<i>Supported</i>	
H3 Financial capital at IPO is positively associated with allocations to market-managing capability formation/use.	Table 14-Model 4	<i>Supported</i>	
H4 Human capital at IPO is negatively associated with allocations to market-managing capability formation/use.	Table 14-Model 4	<i>Supported</i>	
H5 Financial capital at IPO has a non-linear association (inverted U-shaped) with allocations to market-creating capability formation/use.	Table 15-Model 5	<i>Not supported</i>	Relationship is U-shaped and statistically significant.
H6 Human capital at IPO is positively associated with allocations to market-creating capability formation/use.	Table 15-Model 5	<i>Supported</i>	
H7a Dynamism at IPO positively moderates the relationship between financial capital at IPO and allocations to market-managing capability formation/use.	Table 14-Model 5	<i>Not supported</i>	Relationship is negative and statistically significant.
H7b Non-linear association (inverted U-shaped) between financial capital at IPO and allocations to market-creating capability formation/use will be negatively moderated by dynamism at IPO.	Table 15-Model 6	<i>Not supported</i>	
H8a Dynamism at IPO positively moderates the relationship between human capital at IPO and allocations to market-managing capability formation/use.	Table 14-Model 5	<i>Supported</i>	
H8b Dynamism at IPO negatively moderates the relationship between human capital at IPO and allocations to market-creating capability formation/use.	Table 15-Model 6	<i>Not supported</i>	



**TABLE 19 (cont.)**

	<b>Hypothesis</b>	<b>Table Cross-ref</b>	<b>Supported (Y/N)</b>	<b>Comments</b>
H9a	Allocations to market-managing capability formation/use partially mediate the influence of financial capital at IPO on IPO-stage new venture performance.	Table 16 and Table 17	<i>Supported</i>	
H9b	Allocations to market-managing capability formation/use partially mediate the influence of human capital at IPO on IPO-stage new venture performance.	Table 16 and Table 18	<i>Supported</i>	
H10a	Allocations to market-creating capability formation/use partially mediate the influence of financial capital at IPO on IPO-stage new venture performance.	Table 16 and Table 17	<i>Not supported</i>	$z = 1.320; p = .187$ ; however, the total indirect effect of venture resources on performance through the two dimensions of capability formation/use is statistically significant ( $p < .01$ ).
H10b	Allocations to market-creating capability formation/use partially mediate the influence of human capital at IPO on IPO-stage new venture performance.	Table 16 and Table 18	<i>Not Supported</i>	$z = 1.090; p = .276$ ; however, the total indirect effect of venture resources on performance through the two dimensions of capability formation/use is statistically significant ( $p < .01$ ).

## **CHAPTER VI**

### **DISCUSSION AND CONCLUSIONS**

This chapter presents the dissertation's conclusion. It begins with a brief overview of the study's theory and methodology, which is followed by an analysis of its results and a discussion of the study's overall contributions to the literature. The chapter closes with discussions of the study's implications, limitations and future research, and conclusions.

#### **Overview**

This dissertation brings capabilities to the foreground in the examination of value creation and new venture performance. The purpose of this study is to introduce the formation and use of capability configurations by ventures following an initial public offering (IPO) and the environmental context to predict performance outcomes associated with venture resources at IPO. Specifically, this study examines indirect (through capability formation/use) effects that occur within the 'black box' between resources and performance following an IPO. The role of human capital is considered, bringing agency into theory explaining capability formation and use. While previous work has attempted to operationalize and measure firm-specific capabilities (e.g., Dutta et al., 2005) and examine the performance effects of strategies that acquire and use different resource stocks (e.g., Morrow et al., 2007), this study is one of the first to link

firm resources, organizational capabilities, and routines with performance outcomes and empirically test the indirect effect of resources on performance through the formation and use of different configurations organizational capabilities. Further, I extend theory in an entrepreneurial context to explain how underlying routines allow resources to be managed for greater value across different industries—environmental conditions that make resources valuable in some contexts and not in others.

In the study reported, I proposed and tested a multiple mediation model in which venture resource endowments and environmental conditions at IPO are first used to predict the formation and use of different configurations of organizational capabilities by young, entrepreneurial firms following an IPO. In particular, I offered new theory to explain the formation and use of two configuration types: market-managing capabilities and market-creating capabilities. Subsequently, I incorporated the configuration of these different organizational capabilities into a theoretical model testing the indirect effects of resources on new venture performance through capability formation and use. Relying on a sample of U.S. ventures undertaking an IPO in the U.S. between 1996 and 2000, I used random coefficients modeling to test the relationships hypothesized in the model.

The results presented in Chapter V provide general support for the conceptual model (Figure 1) first presented in Chapter I and further developed in Chapter III (see Figure 2). In most respects, the results show that the performance outcomes of different resource endowments vary with respect to how those resources are allocated in the formation and use of different organizational capabilities. The results lend support to the central proposition of the dissertation that the formation and use of different capability

configurations is a central component in explaining performance outcomes derived from different resource endowments and must be more explicitly incorporated into our theory.

### **Analysis of Results**

Although various theories have been offered to account for differences in performance outcomes for entrepreneurial firms (e.g., Agarwal et al., 2002; Baum et al., 2001; Boone et al., 2002; Katz & Shepherd, 2003; Stuart et al., 1999), strategic management and entrepreneurship research has lacked a theory to explain the performance implications of resource use. Recently, some scholars have applied resource-based perspectives to sharpen the focus on new ventures' relative advantages (e.g., Baker & Nelson, 2005; Katila & Shane, 2005). In this study, I built on the resource-based view of the firm and drew insights from evolutionary theory (e.g., Nelson & Winter, 1982) and dynamic capabilities literature (e.g. Teece et al., 1997) to propose such a theory. Overall, the results of the empirical analyses lend support for most of the study's hypotheses. In particular, the combination of these results and the underlying theoretical logic lends partial support for the indirect effect of capability formation and use account on the relationship between venture resources at IPO and the market performance of new ventures following an IPO. Results of the hypothesis tests summarized in Table 19 are described further in the pages that follow.

### **Review of Venture Resources → New Venture Performance Results**

The first two hypotheses addressed the performance effects of resources controlled by new ventures at IPO and these hypotheses helped address the study's first

research question: To what extent do resource endowments (e.g., financial capital and human capital) controlled by a new venture explain its performance following an IPO?

Overall, I find that venture resource endowments at IPO have a direct and meaningful effect on new venture performance. First, findings indicate that financial capital at IPO has a non-linear (inverted U-shaped) relationship with shareholder returns over the three years following a new venture's entry into the public arena (supporting Hypothesis 1). Specifically, lower to moderate levels of available financial capital have a positive influence over the shareholder returns of these firms following an IPO. However, with increasingly higher levels of available financial resources, the relationship turns negative. This suggests that there may be an optimum level of financing that a new venture should consider when evaluating the total financial proceeds to raise during its IPO. Second, I found that human capital at IPO is positively associated with IPO-stage new venture performance. During the post-IPO period, when market uncertainties and external demands add complexities, new ventures that are endowed with superior human capital appear to adapt more quickly to the rigors of the public arena and thus gain a sustainable performance advantage that translates to increased shareholder value over time.

### **Review of Venture Resources → Capability Formation/Use Results**

The next six hypotheses (Hypothesis 3 – Hypothesis 8b) address the influence of different resource endowments and industry membership on the formation and use of different capability configurations by new ventures following an IPO. These hypotheses help answer the study's second research question: To what extent do venture resources

and environmental conditions at IPO account for the formation and use of market-managing and market-creating capabilities?

The results show that venture resource endowments at IPO have a direct and meaningful influence on the formation and use of different organizational capabilities among new ventures following the IPO. As expected, I find that financial capital at IPO to be positively associated with the formation and use of market-creating capabilities (Hypothesis 3). This finding confirms previous research in the field of finance examining the allocation and use of financial proceeds following an IPO (e.g., Jain & Kini, 1994; Modigliani & Miller, 1963; Pagano et al., 1998). Further, these results are consistent with the view that new ventures are more likely to allocate financial resources to strengthen administrative capabilities following an IPO, in part, because new ventures face a 'liability of market newness' and also because these firms may require additional competencies (i.e., financial reporting, investor relations, etc.) in order to cope with the demands of public trading (Certo, 2003).

However, in contrast to the inverted U-shaped relationship posited in Hypothesis 5, I find that financial capital has a U-shaped association with the formation and use of market-creating capabilities. This result suggests that firms may initially focus attention on short-term returns and thus pursue investments that enable them to exploit existing product-market positions, rather than pursue early investments in new ones. This is consistent with the view that firms often tradeoff investments in exploitation and exploration to balance demands on the firm (Gupta, Smith, & Shalley, 2006). Further, the formation and use of market-creating capabilities entails exploration, firm behaviors

that are characterized by search, discovery, experimentation, risk-taking and innovation (March, 1991). These are highly complex tasks and are subject to time compression economies (Dierickx & Cool, 1989) that constrain learning and absorption rates and thus affect the pace with which new ventures can enter new and potentially diverse product-market segments (Vermeulen & Barkema, 2002). Studies have shown that such capabilities require substantially different knowledge, organizational structures, strategies, and cultures to pursue (e.g., He & Wong, 2004).

Increasingly, scholars have noted the tension between exploitation and exploration (e.g., Benner & Tushman, 2003; Burgelman, 2002; Gibson & Birkinshaw, 2004). It is possible that new ventures recognize these complexities and opt to exploit existing positions before pursuing new ones. This study approaches the question of organizational decisions associated with the tradeoff between allocations to the formation and use of market-managing capabilities and those allocations to market-creating capability formation and use as mutually exclusive decisions. However, it may be that the impact of the two decision outcomes on organizational capabilities and performance depend on whether the two concepts are viewed as mutually antithetical or complementary. When considering the interplay in organizational behavior between exploration and exploitation, Gupta and his colleagues observed:

Theories about the ease or difficulty with which an organization can pursue both exploration and exploitation depend crucially on whether these two tasks are treated as competing or complementary aspects of organizational decisions and actions (Gupta et al., 2006: 693).

I also find that human capital at IPO is associated with allocations to capability formation and use following an IPO. Specifically, results indicate that human capital at IPO is negatively associated with market-managing capability formation and use (Hypothesis 4) and positively associated with the formation and use of market-creating capabilities (Hypothesis 6). These results suggest that firms with superior human capital may be more effective at leveraging capabilities that exploit existing product-market positions to create value. Previous research, for example, has shown that highly educated managers show a greater capacity for integrative complexity that occurs when the structural complexity within organizations increases (e.g., Baum et al., 2001). The findings in this study support this view.

Further, superior human capital has also been linked with development and use of “dynamic” capabilities (Florin et al., 2003). In other words, ventures with higher levels of human capital are not only more likely to discover profitable entrepreneurial opportunities, but also produce more innovative ways to realize the potential value from these new positions (Bantel & Jackson, 1989). These findings appear to support this view as well. It may also be that ventures with top managers possessing superior human capital have greater legitimacy with stakeholders (i.e., the investor community) (Certo, 2003; Higgins & Gulati, 2003, 2006) and may therefore be less compelled to allocate scarce resources to the formation and use of the administrative capabilities described previously.

Results also provide partial support for the view that industry membership affects the allocation choices made by new ventures following an IPO. Specifically, this study



finds that environmental dynamism weakens the influence of venture resources at IPO and the formation and use of different capability configurations. Although Hypothesis 7a is not supported, I find, in contrast to the positive association posited in Hypothesis 7a, that dynamism negatively moderates the relationship between available financial resources at IPO and market-managing capability formation/use. This contrasts with Chattopadhyay et al's (2001) findings that firms facing uncertain competitive conditions tend to direct investments to internal activities. In contrast to the findings by these scholars, young, entrepreneurial firms facing uncertain conditions in the public market such as those found in highly dynamic environments appear more likely to conserve scarce resources rather than increase investments in this area.

Consistent with Hypothesis 8a, I also find that dynamism weakens (positively moderates) the negative relationship between human capital at IPO and market-managing capability formation and use. Whereas in stable conditions, firms with superior human capital are likely to reduce investments in capabilities aimed at exploiting existing positions, these same management teams are more likely to fortify investments in this area, possibly to buffer the firm against perceived threats from future uncertain conditions (Agarwal et al., 2002). However, I find no significant interaction between dynamism and either financial capital at IPO (Hypothesis 7b) or human capital at IPO (Hypothesis 8b) on market-creating capability formation and use.

Previous research indicates that founding conditions play an important role in shaping the behavior and growth of young, entrepreneurial firms (Carroll & Delacroix, 1982; Eisenhardt & Schoonhoven, 1990). In particular, Eisenhardt and Schoonhoven

found that ventures founded in growth markets with plentiful environmental resources were more likely to experience sales growth than firms founded in emergent or mature markets. One possible explanation for the mixed findings of this study is that the influence of environmental resource variability is more salient for investments affecting the formation and use of organizational capabilities to manage existing product-market positions.

Another possible explanation is found in the way in which market-creating capability formation and use is operationalized. Specifically, the measurement of total acquisition investments that I include in the composite measure does not distinguish between the different forms of payment. More specifically, I include those transactions that use all stock, all cash, or a combination of stock and cash and that meet the conditions described previously in Chapter IV. As previously noted, IPOs create ‘public shares’ that may be used as currency in acquiring other firms in stock deals. It is possible that factors weighed in the discretionary choice about acquisitions involving stock or a combination of stock and cash differ substantially from those involving cash. Research in financing examining merger waves lends some support to this assertion. In particular, researchers examining merger waves have found a meaningful relationship between market and industry valuations and acquisition activity—specifically, firms within industries experiencing abnormally high market valuations are more likely to pursue acquisitions using equity rather than cash (e.g., Harford, 2005; Rhodes-Kropf & Viswanathan, 2004).

### **Review of the Indirect Effect of Venture Resources on New Venture Performance**

The final two hypotheses (Hypothesis 9a – Hypothesis 10b) address an important assertion of this study—indirect effects (through capability formation and use) account importantly for the value creation potential of venture resource endowments following an IPO. These hypotheses help answer the study’s third and final research question: To what extent is the configuration of organizational capabilities likely to influence performance among new ventures? And importantly, does capability formation and use partially mediate the relationship between venture resources at IPO and performance?

These results provide partial support for the assertion that neither resources nor capabilities alone explain firm performance, but instead, how firms allocate scarce resources in the formation and use of different capability configurations account in part for the value created by firms following an IPO. More specifically, financial and human resources in combination with the formation and use of organizational capabilities can enhance firm performance. In this study, I modeled capability formation and use as a mediating variable. The results find the indirect effect of financial capital at IPO (Hypothesis 9a) and human capital at IPO (Hypothesis 9a) on firm performance (e.g., three-year shareholder return) through market-managing capability formation and use to be statistically significant, while the indirect effect of the two resource types (Hypothesis 9b for financial capital at IPO; Hypothesis 10b for human capital) on performance through the formation and use of market-creating capabilities to be non-significant. While tests of the *specific (individual) indirect effects* (of each path) for the two resource types through the two dimensions of capability formation and use yield mixed results,

importantly, tests of the *total (combined) indirect effects* (e.g.,  $c - c'$ ) for financial capital at IPO and human capital at IPO, respectively, through the two dimensions of capability formation and use were statistically significant (see Table 17 and Table 18). These results support the assertion that capability formation and use partially mediate the relationship between venture resources at IPO and IPO-stage new venture performance.

Because the direct effect of financial capital at IPO and human capital at IPO on three-year shareholder return exists as well as the indirect relationship that includes the capability formation and use, one can conclude that resource characteristics (the so-called VRIN attributes; Barney, 1991) alone do not fully account for the value realized by new ventures from the resource endowments that they control. More specifically, I find that *how* those resources are used figure importantly in value creation for the firm. These findings are supportive of Penrose's (1959) distinction between resources and services, in which she describes resources as cash, physical objects, and people and services as "the contributions those resources can make to the productive operations of the firm" (Penrose 1959: 86) or what organizational scholars more recently characterize in the literature as capabilities (Sirmon et al., 2007; Winter, 2003). In particular, Penrose's distinction between resources and services implies that each firm is unique in its idiosyncratic relation to its resource environment: "Not only can the personnel of a firm render a heterogeneous variety of unique services, but also the material resources of the firm can be used in different ways" (Penrose, 1959: 75; also see Mishina et al., 2004). In other words, two firms controlling the same comparable resource endowments and facing similar competitive conditions can attain different performance outcomes

driven by human agency associated with the decisions that firms make about the allocation and use of their resource endowments.

In sum, the results of this study find that resource use does in fact matter. More specifically, different ventures can and do ‘discover’ and/or draw out different capabilities and configurations of capabilities from similar objective resource endowments. While one cannot reject the objective value creation potential of resources from the findings in this study, we should consider the value realized from the resource environment as idiosyncratic to the uses firms make of it. Whereas work from the resource-based view emphasizes attributes of resource endowments (Barney, 1991) and the centrality of unique resource combinations (Baker & Nelson, 2005; Garud & Karnoe, 2003), this study is one of the first to substantiate the tradeoff in resource use that occurs during the formation and use of different configurations of organizational capabilities. This finding appears to support Sirmon and his colleagues who asserted that, “To *realize* value creation, resources must be accumulated, combined and exploited” (Sirmon et al., 2007: 273). Further, this study finds that managerial discretion and choice (agency) accounts importantly for the potential value realized from different endowments of firm resources and resource combinations. Taken together, this extended view of the resource-based view provides a promising basis for understanding how firms might realize value by synchronizing the processes by which resources are managed by the firm.

## Contributions to the Literature

The focus of this study is on the particular dimensions of capability formation and use that account for the firm's ability to pursue and extend its characteristic "productive" actions—specifically, the exploitation of existing product-market positions and the creation of new ones. I find that performance outcomes are a function not simply of the characteristics of resource themselves, but of the way those resources are intentionally put to productive use (Morrow et al., 2007; Sirmon et al., 2007). Because a firm's capability is defined by its ability to deploy resources (Dutta et al., 2005; Winter, 2000), results in this study suggest that the greater the functional capabilities a firm possesses, the more effectively it should be at leveraging its resources to create value. These results are supportive of previous work by Dosi and his colleagues, who noted:

To be capable of some things is to have a generally reliable capacity to bring that thing about as a result of intended action. Capabilities fill the gap between intention and outcome, and fill it in such a way that the outcome bears a definite resemblance to what was intended (Dosi et al., 2002: 2).

This study addressed three questions: 1) To what extent do resource endowments controlled by a new venture explain its performance following an IPO? 2) Do different resource endowments affect the formation and use of organizational capabilities by new ventures and to what extent are these effects contingent on industry membership? 3) Does capability formation and use partially mediate the relationship between venture resources at IPO and firm performance among these firms?

By addressing these questions, this study makes three important contributions. First, it proposes, validates, and operationalizes two new constructs representing how firms configure capabilities to create value. In doing so, the study builds new theory that extends the RBV to explain the indirect influence of resources on performance through capability formation and use. These constructs increase the theory's predictive validity and enhance our understanding of the performance efficacy of resources.

Second, in examining relationships across different industry contexts, this study provides a contingent view of the elusive link between resources controlled by a firm and its performance that to-date has been unexplored. Thus, it extends research examining the influence of industry membership on the value of resources (e.g., Agarwal et al., 2002; Bamford et al., 2000; Eisenhardt & Schoonhoven, 1990), answering calls to further integrate contingency theory logic into our understanding of the RBV (Aragon-Correa & Sharma, 2003; Sirmon et al., 2007). Further, by employing a multilevel framework to examine cross-level relationships, this study contributes to the growing literature examining the relative importance of firm- and industry-level factors on firm performance (e.g., Hawawani et al., 2003; Hough, 2006; Misangyi, Elms, Greckhamer, & Lepine, 2006).

Finally, this study advances our understanding of firms recently completing the transition to the public arena. Specifically, it contributes to a growing body of research on IPO-stage firms, especially theoretical and empirical research examining conditions that affect performance following an IPO. Because capabilities form the basis for the ability of firms to perform crucial activities, resource constraints facing young,

entrepreneurial firms following an IPO can limit the range of capabilities available to these firms.

### **Implications**

Empirical tests of resource-based logic have proven challenging due to the methodological difficulties associated with developing measures for variables of interest, especially measures for resource value (Godfrey & Hill, 1995). Although the link between resources and performance has frustrated scholars for decades, the RBV continues to receive widespread attention and skepticism. The integrative, multidisciplinary theoretical framework developed in this dissertation establishes new theoretical views about the relationship between resources, capabilities, industry context, and performance (see Table 3) and thus has substantive implications for strategy and entrepreneurship and for management practice. First, this study suggests that allocation decisions figure importantly in the performance success or failure of new ventures following an IPO. Indeed, resource allocation within firms is important to understanding how firms make productive use of their resources through the choices they make (Bower & Gilbert, 2006; Porter, 1980). Further, environmental conditions prevalent in different industry settings not only influence the allocation decisions that determine the formation and use of different organizational capabilities, but also affect the value that may be realized from these combinations.

Second, the results of this study suggest an interplay between capabilities aimed at exploiting firms' existing product-market positions and those capabilities that enable



firms to build new ones. This interplay has important performance implications. Some researchers, for example, have argued that firms need to balance conflicting needs for exploration and exploitation (Levinthal & March, 1993; Gupta et al., 2006; Lavie & Rosenkopf, 2006). Several arguments can be made for the potential incompatibility of development and use of the two different configurations. First, the processes behind the configuration of these two organizational capability types compete for scarce resources. Thus, by definition, resources devoted to market-managing capabilities for the exploitation of existing positions imply fewer resources for development of new ones through market-creating capabilities, and vice-versa.

Further, these results suggest the mindset and organizational knowledge needed for exploitation differ radically from those needed for exploration (March, 1991), potentially making the simultaneous pursuit of investments in capability configurations that enable both all but impossible. These findings are consistent with March's (1991, 1996, 2006) argument that, notwithstanding the adaptation benefits of exploitation and exploration, which mirror the two capability configuration types examined in this study, the interplay between the two occurs in the form of a zero-sum game where allocations to market-managing capabilities compete with allocations to market-creating capabilities compete for resources and management attention. Accordingly, logic dictates and these results suggest that decisions about resource use among the two should consider the needs of the firm.

### **Limitations and Future Research**

As with most studies, this study has several limitations worth noting. First, the primary indicators used to develop composite measures of market-managing capability formation/use and market-creating capability formation/use were based on secondary data which does not allow for direct measurement of the efficiency of allocations to each capability configuration type. Instead, these measure represent the outcomes of specific actions believed to proxy the formation/use of the different capability configurations. Further, although the indicators selected were meant to capture allocations to the formation and use of the two configuration types, it is likely that measures of other indicators should also be considered. For example, Brau and his colleagues (Brau et al., 2003) argued that IPOs create ‘public shares’ that can be used as currency in transactions with other firms (i.e., acquisitions, equity alliances, joint ventures, etc.). While the measure of market-creating capability formation/use considered the total value of acquisition investments, it does not incorporate measures of equity used in the formation of different strategic alliances that might be used by a venture to enter a new product or geographic market. Further, the computation of available financial capital at IPO, in effect, only considered cash, cash equivalents, and other current assets and did not include measures of shareholder equity (e.g., common shares) approved but not issued by the firm, which might have otherwise captured the currency-like attribute of equity as a financial resource in this study.

Future research could address these shortcomings by examining the individual effects of different components of market-managing and market-creating capabilities

instead of aggregating measures into a single “configuration.” Although some previous research has examined the performance expectations of investors given different resource strategies (e.g., Morrow et al., 2007), research may be informed, for example, by examining the differential performance effects of capital expenditures related to the establishment of Greenfield operations in new geographic markets versus the acquisitions and/or equity-based alliances for different given resource endowments and environmental conditions at IPO.

Second, the construction of the sample did not allow for examining whether and how the hypothesized relationships evolved over time. Specifically, the sample was constructed as a pooled/cross-sectional dataset that lagged the measure of shareholder returns three years to capture the performance effects of venture resource at IPO and the intermediate allocation decisions that represented the formation and use of the market-managing and market-creating capability configurations. Future research might employ growth modeling techniques to examine the indirect effect (or not) of changes to different organizational capabilities on the relationship between different venture resource endowments and firm performance over time. For example, emphasis on the exploitation of existing positions and thus continued investments in market-managing capabilities often derive from inertia, which is evident “when the speed of reorganization is lower than the rate at which environmental conditions change” (Hannan & Freeman, 1984: 151). In other words, path dependence intensifies as established routines become further embedded in the decision-making processes and organizational structures and are applied almost automatically (Nelson & Winter, 1982), whereby “a firm’s previous

investments and its repertoire of routines (its ‘history’) constrain its future behavior” (Teece, Rumelt, Dosi, & Winter, 1994: 17).

Future research might consider the effects of path dependency (e.g., Nelson & Winter, 1982) and momentum (e.g., Amburgey & Miner, 1992; Miller & Freisen, 1980) in the development of different capability configurations on relationships between resource endowments and the performance of young entrepreneurial firms following an IPO. Although research suggests that momentum represents a pervasive force with respect to the persistence of firm behavior over time (e.g., Amburgey & Miner, 1992), little research has examined how time-varying changes in the ordering of prior activity may affect firm behavior much less how these changes might explain the relationship between venture resources and firm performance.

Third, this study examined the indirect effects of two configuration types and did not attempt to contrast the relative value creation potential of the two configurations given different resource endowments and industry contexts. Future research should consider whether an optimal balance exists between the formation and use of different capability sets and whether that balance is idiosyncratic to different resource endowments and industry setting. For example, scholars studying exploration and exploitation in organizational learning have assumed a strategic posture by recognizing the essential trade-offs firms make in undertaking these activities (e.g., Levinthal, 1997; Levinthal & March, 1993; March, 1991; Rivkin & Siggelkow, 2003), yet little is known about the organizational mechanisms that drive firms’ tendencies to engage in different capability configuration activities described in this study or about whether and how

firms balance the two activities. Subsequent research should attempt to fill this gap in organizational research by offering theory and evidence that demonstrate why and how firms balance these tendencies over time and across different domains.

Fourth, I restricted my focus to the five senior-most executives to construct the measure of human capital at IPO when, in fact, lower level managers and employees likely influence allocation decisions affecting capability formation and use. However, the top managers and the CEO retain considerable symbolic, if not direct, influence that can convey their preferences for lower-level initiatives (Finkelstein, 1992; Pfeffer, 1981). Additionally, agenda-setting at the top serves as an important guide for lower-level managers to follow (Kotter, 1982). While influence may emanate from numerous parts of the firm, I have at least expanded the scope beyond the predominant focus on the CEO alone. Nevertheless, future research should consider the role and influence of human capital from origins in the firm beyond the upper echelon.

Fifth, my sample was restricted to young, entrepreneurial firms that had recently completed an IPO, and my findings therefore may not be generalizable to all firms across different industries. For instance, managerial effects may be less intense in larger firms because they are more constrained by organizational inertia (Miller, Kets de Vries, & Toulouse, 1982). By contrast, in smaller, privately-held firms, the allocation and utilization of resources are likely dominated by managerial decisions (George, 2005). Thus, future research should consider these relationships across different organizational contexts (i.e., S&P 500 firms, privately-held firms, etc.).

Lastly, this study used conventional measures of industry membership (i.e., use of the 3-digit Standard Industrial Classification codes). It is conceivable that firms grouped by 3-digit SIC codes compete in different product and market domains. As a consequence, firms that would otherwise be considered competing within the same “industry” and thus facing similar environmental conditions may in fact face different contexts. Thus, future research could address the effects of competitive and environmental contexts on decisions to configure and use different organizational capabilities using different groupings.

### **Conclusion**

Understanding how resource use facilitates achieving organizational goals is fundamental to theories of how firms act, evolve, and perform. In this study, I find that evolutionary theory and dynamic capabilities literature provide useful perspectives for examining these factors in combination, especially how underlying routines infuse resources with sustainable value, allowing them to be managed for greater advantage across different industry settings. I find that adjustments to the configuration of organizational capabilities affect performance prospects for new ventures in the period following an IPO. I also find that industry conditions moderate this relationship. Finally, I find that capability formation/use partially mediates the relationship between resources at IPO and performance. These results confirm that different capability configurations compete for firm resources, necessitating tradeoffs in allocation decisions between them and that such tradeoffs have compromising effects on firm performance over time.

## REFERENCES

- Acs, Z. J. & Audretsch, D. B. 1987. Innovation, market structure, and firm size. *Review of Economics and Statistics*, 69: 567-574.
- Adler, P. S. & Kwon, S.-W. 2002. Social capital: Prospects for a new concept. *Academy of Management Journal*, 27: 17-40.
- Agarwal, R. & Gort, M. 2002. Firm and product life cycles and firm survival. *American Economic Review*, 92: 184-190.
- Agarwal, R., Sarkar, M., & Echamebadi, R. 2002. The conditioning effect of time on firm survival: An industry life cycle approach. *Academy of Management Journal*, 45: 971-994.
- Agarwal, R. & Bayus, B. L. 2004. Creating and surviving in new industries. In J. A. C. Baum & A. M. McGahan (Eds.), *Advances in Strategic Management: Business Strategy Over The Industry Life Cycle*, Vol. 21: 107-130. New York: Elsevier.
- Ahuja, G. 2000. The duality of collaboration: Inducements and opportunities in the formation of interfirm linkages. *Strategic Management Journal*, 21: 317-343.
- Aiken, M. & Hage, J. 1968. Organizational interdependence and intra-organizational structure. *American Sociological Review*, 33: 912-930.
- Aiken, L. S. & West, S. G. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.
- Ajzen, I. & Fishbein, M. 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50: 179-211.
- Alchian, A. A. & Demsetz, H. 1972. Production, information costs, and economic organization. *American Economic Review*, 62: 777-795.
- Aldrich, H. & Zimmer, C. 1986. Entrepreneurship through social network. In D. L. Sexton & R. Smilor (Eds.), *The Art and Science of Entrepreneurship*: 3-23. Cambridge, MA: Ballinger.
- Aldrich, H. E. 1979. *Organizations and Environments*. Englewood Cliffs, NJ: Prentice-Hall.

- Aldrich, H. E. & Auster, E. R. 1986. Even dwarfs started small: Liabilities of age and size and their strategy implications. In L. L. Cummings & B. M. Staw (Eds.), *Research in Organizational Behavior*, Vol. 8: 165-198. Greenwich, CT: JAI Press.
- Aldrich, H. E. & Wiedenmayer, G. 1993. From traits to rates: An ecological perspective on organizational foundings. In J. A. Katz & R. H. Brockhaus, Sr. (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, Vol. 1: 145-195. Greenwich, CT: JAI Press.
- Aldrich, H. E. & Fiol, C. M. 1994. Fools rush in: The institutional context of industry creation. *Academy of Management Review*, 19: 645-670.
- Aldrich, H. E. 1999. *Organizations Evolving*. London: Sage Publications Ltd.
- 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: 41-56.
- Alwin, D. F. & Hauser, R. M. 1975. Decomposition of effects in path analysis. *American Sociological Review*, 40: 37-47.
- Amburgey, T. L. & Miner, A. S. 1992. Strategic momentum: The effects of repetitive, positional, and contextual momentum on merger activity. *Strategic Management Journal*, 13: 335-348.
- Amburgey, T. L., Kelly, D., & Barnett, W. P. 1993. Resetting the clock: The dynamics of organizational change and failure. *Administrative Science Quarterly*, 38: 51-73.
- Amihud, Y. & Lev, B. 1981. Risk reduction as a managerial motive for conglomerate mergers. *Bell Journal of Economics*, 12: 605-617.
- Amit, R. & Schoemaker, P. J. H. 1993. Strategic assets and organizational rent. *Strategic Management Journal*, 14: 33-46.
- Anand, J. & Singh, H. 1997. Asset redeployment, acquisitions and corporate strategy in declining industries. *Strategic Management Journal*, 18: 99-118.
- Anderson, C. R. & Zeithaml, C. P. 1984. Stage of the product life cycle, business strategy, and business performance. *Academy of Management Journal*, 27: 5-24.
- Aragon-Correa, J. A. & Sharma, S. 2003. A contingent resource-based view of proactive corporate environmental strategy. *Academy of Management Review*, 28: 71-88.
- Baker, T. & Nelson, R. E. 2005. Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50: 329-366.



- Baker, W. E. 1990. Market networks and corporate behavior. *American Journal of Sociology*, 96: 589-625.
- Bamford, C. E., Dean, T. J., & McDougall, P. P. 2000. An examination of the impact of initial founding conditions and decisions upon the performance of new bank start-ups. *Journal of Business Venturing*, 15: 253-277.
- Bandura, A. 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. 1997. *Self-Efficacy: The Exercise of Control*. New York: Freeman.
- Bantel, K. A. & Jackson, S. E. 1989. Top management and innovations in banking: Does the composition of the top team make a difference. *Strategic Management Journal*, 10: 107-124.
- Bantel, K. A. 1998. Technology-based, "adolescent" firm configurations: Strategy identification, context, and performance. *Journal of Business Venturing*, 13: 205-230.
- Barnett, W. P. & Amburgey, T. L. 1990. Do larger organizations generate stronger competition? In J. V. Singh (Ed.), *Organizational Evolution: New Directions*: 78-102. Newbury Park, CA: Sage.
- Barnett, W. P. 1997. The dynamics of competitive intensity. *Administrative Science Quarterly*, 42: 128-160.
- Barney, J. B. 1986. Strategic factor markets: Expectations, luck and business strategy. *Management Science*, 32: 1230-1241.
- Barney, J. B. 1988. Returns to bidding firms in mergers and acquisitions: Reconsidering the relatedness hypothesis. *Strategic Management Journal*, 9: 71-78.
- Barney, J. B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17: 99-120.
- Barney, J. B. 2001. Is the resource-based "view" a useful perspective for strategic management research? Yes. *Academy of Management Review*, 26: 41-56.
- Baron, R. A. 1998. Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing*, 13: 275-294.
- Baron, R. M. & Kenny, D. A. 1986. The moderator mediator variable distinction In social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51: 1173-1182.

- Barron, D. N., West, E., & Hannan, M. T. 1994. A time to grow and a time to die: Growth and mortality of credit unions in New York City, 1914-1990. *American Journal of Sociology*, 100: 381-421.
- Baum, J. A. C. 1989. *Liabilities of newness, adolescence, and obsolescence: Exploring age dependence in the dissolution of organizational relationships and organizations*. Proceedings of the Administrative Science Association of Canada, 10: 1-10.
- Baum, J. A. C. & Oliver, C. 1991. Institutional linkages and organizational mortality. *Administrative Science Quarterly*, 36: 187-218.
- Baum, J. A. C. & Oliver, C. 1992. Institutional embeddedness and the dynamics of organizational populations. *American Sociological Review*, 57: 540-559.
- Baum, J. A. C. & Powell, W. W. 1995. Cultivating an institutional ecology of organizations: Comment. *American Sociological Review*, 60: 529-538.
- Baum, J. A. C. 1996. Organizational ecology. In S. R. Clegg, C. Hardy & W. Nord (Eds.), *Handbook of Organization Studies*: 77-114. London: Sage.
- Baum, J. A. C. & Oliver, C. 1996. Toward an institutional ecology of organizational founding. *Academy of Management Journal*, 39: 1378-1427.
- Baum, J. A. C. & Silverman, B. S. 1999. *Alliance-based Competitive Dynamics in the Canadian Biotechnology Industry*. Boston, MA: Harvard Business School Press.
- Baum, J. A. C., Calabrese, T., & Silverman, B. S. 2000. Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal*, 21: 267-294.
- Baum, J. R., Locke, E. A., & Smith, K. G. 2001. A multidimensional model of venture growth. *Academy of Management Journal*, 44: 292-303.
- Baum, J. R. & Locke, E. A. 2004. The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*, 89: 587-598.
- Beckman, C. M., Haunschild, P. R., & Phillips, D. J. 2004. Friends or strangers? Firm-specific uncertainty, market uncertainty, and network partner selection. *Organization Science*, 15: 259-275.
- Begley, T. M. & Boyd, D. P. 1987. Psychological characteristics associated with performance in entrepreneurial firms and smaller businesses. *Journal of Business Venturing*, 2: 79-93.

- Benner, M. J. & Tushman, M. L. 2003. Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review*, 28: 238-256.
- Berger, P. L. & Luckmann, T. 1967. *The Social Construction of Reality*. New York: Doubleday.
- Bergh, D. D. 2001. Diversification strategy research at a crossroads: Established, emerging and anticipated paths. In M. A. Hitt, R. E. Freeman & J. S. Harrison (Eds.), *The Blackwell Handbook of Strategic Management*: 362-383. Malden, MA: Blackwell Publishers Inc.
- Berman, S. L., Down, J., & Hill, C. W. L. 2002. Tacit knowledge as a source of competitive advantage in the National Basketball Association. *Academy of Management Journal*, 45: 13-31.
- Bhide, A. 1992. Bootstrap finance: The art of start-ups. *Harvard Business Review*, 70: 109-117.
- Biggadike, R. E. 1976. *Corporate Diversification: Entry, Strategy and Performance*. Boston, MA: Harvard University Press.
- Biggadike, R. E. 1979. The risky business of diversification. *Harvard Business Review*, 57: 103-111.
- Birch, D. L. 1987. *Job Creation in America*. New York: Free Press.
- Bird, B. 1988. Implementing entrepreneurial ideas: The case for intention. *Academy of Management Review*, 13: 442-453.
- Bishop, Y. M. M., Fienberg, S. E., & Holland, P. W. 1975. *Discretive Multivariate Analysis: Theory and Practice*. Cambridge, MA: MIT Press.
- Black, J. A. & Boal, K. B. 1994. Strategic resources: Traits, configurations and paths to sustainable competitive advantage. *Strategic Management Journal*, 15: 131-148.
- Blau, P. M. 1970. Formal theory of differentiation in organizations. *American Sociological Review*, 35: 201-218.
- Boeker, W. 1989. Strategic change: The effects of founding and history. *Academy of Management Journal*, 32: 489-515.
- Bollen, K. A. 1987. Total, direct, and indirect effects in structural equation models. *Sociological Methodology*, 17: 37-69.
- Bollen, K. A. 1989. *Structural Equations with Latent Variables*. New York: John Wiley & Sons.

- Bolles, R. C. 1975. *Theory of Motivation* (2nd ed.). New York: Harper & Row.
- Boone, C., Carroll, G. R., & van Witteloostuijn, A. 2002. Resource distributions and market partitioning: Dutch daily newspapers, 1968 to 1994. *American Sociological Review*, 67: 408-431.
- Bourdieu, P. 1986. The forms of capital. In J. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education*: 241-258. New York: Greenwood Press.
- Bourgeois, L. J. 1981. On the measurement of organizational slack. *Academy of Management Review*, 6: 29-39.
- Bower, J. L. & Gilbert, C. G. 2006. *From Resource Allocation to Strategy*. J. L. Bower & C. G. Gilbert (Eds.). New York: Oxford University Press.
- Brau, J. C., Francis, B., & Kohers, N. 2003. The choice of IPO versus takeover: Empirical evidence. *Journal of Business*, 76: 583-612.
- Brau, J. C. & Fawcett, S. E. 2006. Initial public offerings: An analysis of theory and practice. *Journal of Finance*, 61: 399-436.
- Brealey, R. A. & Myers, S. C. 1996. *Principles of Corporate Finance*. New York: McGraw-Hill.
- Brockhaus, R. H. 1980. Risk-taking propensity of entrepreneurs. *Academy of Management Journal*, 23: 509-520.
- Brockhaus, R. H., Sr. & Horwitz, P. 1986. The psychology of entrepreneurship. In D. L. Sexton & R. Smilor (Eds.), *The Art and Science of Entrepreneurship*: 25-48. Cambridge, MA: Ballinger.
- Bromiley, P. 1991. Testing a causal model of corporate risk taking and performance. *Academy of Management Journal*, 34: 37-59.
- Broom, H. N. & Longenecker, J. G. 1971. *Small Business Management* (3rd ed.). Cincinnati, OH: Southwestern.
- Brüderl, J. & Schüssler, R. 1990. Organizational mortality: The liabilities of newness and adolescence. *Administrative Science Quarterly*, 35: 530-547.
- Brüderl, J., Preisendorfer, P., & Ziegler, R. 1992. Survival chances of newly founded business organizations. *American Sociological Review*, 57: 227-242.
- Brush, C. G. 1995. *International Entrepreneurship: The Effects of Firm Age on Motives of Internationalization*. New York: Garland.

- Brush, C. G. & Chaganti, R. 1999. Businesses without glamour? An analysis of resources on performance by size and age in small service and retail firms. *Journal of Business Venturing*, 14: 233-257.
- Brush, C. G., Greene, P. G., & Hart, M. M. 2001. From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base. *Academy of Management Executive*, 15: 64-78.
- Brush, T. H. & Artz, K. W. 1999. Toward a contingent resource-based theory: The impact of information asymmetry on the value of capabilities in veterinary medicine. *Strategic Management Journal*, 20: 223-250.
- Brush, T. H., Bromiley, P., & Hendrickx, M. 1999. The relative influence of industry and corporation on business segment performance: An alternative estimate. *Strategic Management Journal*, 20: 519-547.
- Brush, T. H., Bromiley, P., & Hendrickx, M. 2000. The free cash flow hypothesis for sales growth and firm performance. *Strategic Management Journal*, 21: 455-472.
- Bull, I. & Willard, G. E. 1993. Towards a theory of entrepreneurship. *Journal of Business Venturing*, 8: 183-195.
- Burgelman, R. A. 2002. Strategy as vector and the inertia of coevolutionary lock-in. *Administrative Science Quarterly*, 47: 325-357.
- Burns, T. & Stalker, G. M. 1961. *The Management of Innovation*. London: Tavistock.
- Burt, R. S. 1992. *Structural Holes: The Social Structure of Competition*. Cambridge, MA: Harvard University Press.
- Burt, R. S. 1997. The contingent value of social capital. *Administrative Science Quarterly*, 42: 339-365.
- Busenitz, L. W. & Barney, J. B. 1997. Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, 12: 9-30.
- Buzzell, R. D. & Gale, B. T. 1987. *The PIMS Principles: Linking Strategy to Performance*. New York: Free Press.
- Bygrave, W. D. & Hofer, C. W. 1991. Theorizing about entrepreneurship. *Entrepreneurship Theory & Practice*, 16: 13-22.
- Campbell, D. T. & Fiske, D. W. 1959. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56: 81-105.

- Cannella, A. A. & Holcomb, T. R. 2005. A multi-level analysis of the upper-echelons model. In F. J. Yammarino & F. Dansereau (Eds.), *Research in Multi-level Issues: The Many Faces of Multi-level Issues*, Vol. 4: 197-238. Oxford, U.K.: JAI-Elsevier Science.
- Carpenter, M. A. & Fredrickson, J. W. 2001. Top management teams, global strategic posture, and the moderating role of uncertainty. *Academy of Management Journal*, 44: 533-545.
- Carpenter, M. A., Sanders, W. G., & Gregersen, H. B. 2001. Bundling human capital with organizational context: The impact of international assignment experience on multinational firm performance and CEO pay. *Academy of Management Journal*, 44: 493-511.
- Carroll, G. R. & Delacroix, J. 1982. Organizational mortality in the newspaper industries of Argentina and Ireland: An ecological approach. *Administrative Science Quarterly*, 27: 169-198.
- Carroll, G. R. 1983. A stochastic model of organizational mortality: Review and reanalysis. *Social Science Research*, 12: 303-329.
- Carroll, G. R. 1984. Dynamics of publisher succession in newspaper organizations. *Administrative Science Quarterly*, 29: 93-113.
- Carroll, G. R. 1985. Concentration and specialization: Dynamics of niche width in populations of organizations. *American Journal of Sociology*, 90: 1262-1283.
- Carroll, G. R. & Hannan, M. T. 1989. Density dependence in the evolution of populations of newspaper organizations. *American Sociological Review*, 54: 524-541.
- Carroll, G. R., Dobrev, S. D., & Swaminathan, A. 2002. Organizational processes of resource partitioning, *Research in Organizational Behavior*, Vol. 24: 1-40.
- Carsrud, A. L. & Krueger, N. F. 1995. Entrepreneurship and social psychology: Behavioral technology for the new venture initiation process. In J. A. Katz & R. H. Brockhaus, Sr. (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*: 73-96. Greenwich, CT: JAI Press.
- Carter, N. M., Stearns, T. M., Reynolds, P. D., & Miller, B. A. 1992. New venture strategies: Generic or industry specific. In S. Birley & I. C. MacMillan (Eds.), *International Perspectives on Entrepreneurship Research*: 149-168. Amsterdam: Elsevier Science Publishers.
- Carter, R. B., Dark, F. H., & Singh, A. K. 1998. Underwriter reputation, initial returns, and the long-run performance of IPO stocks. *Journal of Finance*, 53: 285-311.

- Carter, R. B. & Manaster, S. 1990. Initial public offerings and underwriter reputation. *Journal of Finance*, 45: 1045-1067.
- Castrogiovanni, G. J. 1991. Environmental munificence: A theoretical assessment. *Academy of Management Review*, 16: 542-565.
- Certo, S. T., Covin, J. G., Daily, C. M., & Dalton, D. R. 2001. Wealth and the effects of founder management among IPO-stage new ventures. *Strategic Management Journal*, 22: 641-658.
- Certo, S. T. 2003. Influencing initial public offering investors with prestige: Signaling with board structures. *Academy of Management Review*, 28: 432-446.
- Certo, S. T., Daily, C. M., Cannella, A. A., & Dalton, D. R. 2003. Giving money to get money: How CEO stock options and CEO equity enhance IPO valuations. *Academy of Management Journal*, 46: 643-653.
- Chaganti, R., Chaganti, R., & Mahajan, V. 1989. Profitable small business strategies under different types of competition. *Entrepreneurship Theory & Practice*, 13: 21-35.
- Chandler, A. D. 1962. *Strategy and Structure: Chapters in the History of the American Industrial Enterprise* (First ed.). Cambridge, MA: The MIT Press.
- Chandler, G. N. & Hanks, S. H. 1994. Market attractiveness, resource-based capabilities, venture strategies, and venture performance. *Journal of Business Venturing*, 9: 331-349.
- Chatterjee, S. & Wernerfelt, B. 1991. The link between resources and type of diversification: Theory and evidence. *Strategic Management Journal*, 12: 33-48.
- Chattopadhyay, P., Glick, W. H., & Huber, G. P. 2001. Organizational actions in response to threats and opportunities. *Academy of Management Journal*, 44: 937-955.
- Chen, I. J., Paulraj, A., & Lado, A. A. 2004. Strategic purchasing, supply management, and firm performance. *Journal of Operations Management*, 22: 505-523.
- Child, J. 1972. Organizational structure, environment and performance: The role of strategic choice. *Sociology - The Journal of the British Sociological Association*, 6: 1-22.
- Cho, H. J. & Pucik, V. 2005. Relationship between innovativeness, quality, growth, profitability, and market value. *Strategic Management Journal*, 26: 555-575.
- Choi, Y. R. & Shepherd, D. A. 2005. Stakeholder perceptions of age and other dimensions of newness. *Journal of Management*, 31: 573-596.

- Chrisman, J. J., Bauerschmidt, A., & Hofer, C. W. 1998. The determinants of new venture performance: An extended model. *Entrepreneurship Theory and Practice*, 23: 5-29.
- Chung, L. H. & Gibbons, P. T. 1997. Corporate entrepreneurship: The roles of ideology and social capital. *Group & Organization Management*, 22: 10-30.
- Cohen, J. & Cohen, P. 1983. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, M. D. & Bacdayan, P. 1994. Organizational routines are stored as procedural memory: Evidence from a laboratory study. *Organization Science*, 5: 554-568.
- Cohen, W. M. & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128-152.
- Cohn, T. & Lindberg, R. A. 1974. *Survival and Growth: Management Strategies for the Small Firm*. New York: AMACOM.
- Coleman, J. S. 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94: S95-S120.
- Collis, D. J. 1994. How valuable are organizational capabilities. *Strategic Management Journal*, 15: 143-152.
- Cooper, A. C., Willard, G. E., & Woo, C. Y. 1986. Strategies of high-performing new and small firms: A reexamination of the niche concept. *Journal of Business Venturing*, 1: 247-260.
- Cooper, A. C., Woo, C. Y., & Dunkelberg, W. C. 1988. Entrepreneurs perceived chances for success. *Journal of Business Venturing*, 3: 97-108.
- Cooper, A. C. 1993. Challenges in predicting new firm performance. *Journal of Business Venturing*, 8: 241-253.
- Cooper, A. C., Gimeno-Gascon, F. J., & Woo, C. Y. 1994. Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing*, 9: 371-395.
- Covin, J. G. & Slevin, D. P. 1989. Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10: 75-87.
- 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., & Covin, T. J. 1990. Content and performance of growth-seeking strategies: A comparison of small firms in high-technology and low-technology industries. *Journal of Business Venturing*, 5: 391-412.
- Covin, J. G. & Slevin, D. P. 1997. High growth transitions: Theoretical perspectives and suggested directions. In D. L. Sexton & R. Smilor (Eds.), *Entrepreneurship 2000*. Chicago, IL: Upstart Publishing Company.
- Covin, J. G., Slevin, D. P., & Heeley, M. B. 2000. Pioneers and followers: Competitive tactics, environment, and firm growth. *Journal of Business Venturing*, 15: 175-210.
- Cyert, R. M. & March, J. G. 1963. *A Behavioral Theory of the Firm* (2 ed.). Oxford, UK: Blackwell Publishers Inc.
- D'Aveni, R. A. 1990. Top managerial prestige and organizational bankruptcy. *Organization Science*, 1: 121-142.
- D'Aveni, R. A. & Ravenscraft, D. J. 1994. Economies of integration versus bureaucracy costs: Does vertical integration improve performance. *Academy of Management Journal*, 37: 1167-1206.
- Daft, R. L. 1978. System influence on organizational decision-making: Case of resource allocation. *Academy of Management Journal*, 21: 6-22.
- Daft, R. L. & Weick, K. E. 1984. Toward a model of organizations as interpretation systems. *Academy Of Management Review*, 9: 284-295.
- Daily, C. M., Dalton, D. R., & Cannella, A. A. 2003. Introduction to special topic forum: Corporate governance: Decades of dialogue and data. *Academy of Management Review*, 28: 371-382.
- Day, D. V. & Lord, R. G. 1992. Expertise and problem categorization: The role of expert processing in organizational sensemaking. *Journal of Management Studies*, 29: 35-47.
- de Meza, D. & Southey, C. 1996. The borrower's curse: Optimism, finance and entrepreneurship. *Economic Journal*, 106: 375-386.
- DeCarolis, D. M. & Deeds, D. L. 1999. The impact of stocks and flows of organizational knowledge on firm performance: An empirical investigation of the biotechnology industry. *Strategic Management Journal*, 20: 953-968.
- Deeds, D. L., DeCarolis, D., & Coombs, J. E. 1997. The impact of firm-specific capabilities on the amount of capital raised in an initial public offering: Evidence from the biotechnology industry. *Journal of Business Venturing*, 12: 31-46.

- Deeds, D. L., DeCarolis, D., & Coombs, J. 2000. Dynamic capabilities and new product development in high technology ventures: An empirical analysis of new biotechnology firms. *Journal of Business Venturing*, 15: 211-229.
- Deephouse, D. L. 1996. Does isomorphism legitimate? *Academy of Management Journal*, 39: 1024-1039.
- Deephouse, D. L. 1999. To be different, or to be the same? It's a question (and theory) of strategic balance. *Strategic Management Journal*, 20: 147-166.
- Deephouse, D. L. & Wiseman, R. M. 2000. Comparing alternative explanations for accounting risk-return relations. *Journal of Economic Behavior & Organization*, 42: 463-482.
- Delacroix, J. & Carroll, G. R. 1983. Organizational foundings: An ecological study of the newspaper industries of Argentina and Ireland. *Administrative Science Quarterly*, 28: 274-291.
- Denrell, J., Fang, C., & Winter, S. G. 2003. The economics of strategic opportunity. *Strategic Management Journal*, 24: 977-990.
- Dess, G. G. & Beard, D. W. 1984. Dimensions of organizational task environments. *Administrative Science Quarterly*, 29: 52-73.
- 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: 677-695.
- Dess, G. G., Ireland, R. D., Zahra, S. A., Floyd, S. W., Janney, J. J., & Lane, P. J. 2003. Emerging issues in corporate entrepreneurship. *Journal of Management*, 29: 351-378.
- Devers, C. E., Holcomb, T. R., Holmes, R. M., & Cannella, A. A. 2006. *Inside the black box: The contrasting effects of TMT long-term incentives on interest alignment*. Proceedings of the Academy of Management, Atlanta, GA.
- Dierickx, I. & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35: 1504-1511.
- DiMaggio, P. J. & Powell, W. W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48: 147-160.
- DiMaggio, P. J. & Powell, W. W. 1991. Introduction. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis*: 1-38. Chicago, IL: University of Chicago Press.

- Dobrev, S. D., Kim, T. Y., & Hannan, M. T. 2001. Dynamics of niche width and resource partitioning. *American Journal of Sociology*, 106: 1299-1337.
- Dollinger, M. J. 1984. Environmental boundary spanning and information-processing effects on organizational performance. *Academy of Management Journal*, 27: 351-368.
- Donaldson, L. 2001. *The Contingency Theory of Organizations*. Thousand Oaks, CA: Sage.
- Dooley, R. S., Fowler, D. M., & Miller, A. 1996. The benefits of strategic homogeneity and strategic heterogeneity: Theoretical and empirical evidence resolving past differences. *Strategic Management Journal*, 17: 293-305.
- Dosi, G., Nelson, R. E., & Winter, S. G. 2002. Introduction: The nature and dynamics of organizational capabilities. In G. Dosi, R. E. Nelson & S. G. Winter (Eds.), *The Nature and Dynamics of Organizational Capabilities*: 1-22. New York: Oxford University Press.
- Doty, D. H., Glick, W. H., & Huber, G. P. 1993. Fit, equifinality, and organizational effectiveness: A test of two configurational theories. *Academy of Management Journal*, 36: 1196-1250.
- Dutta, S., Narasimhan, O., & Rajiv, S. 2005. Conceptualizing and measuring capabilities: Methodology and empirical application. *Strategic Management Journal*, 26: 277-285.
- Dutton, J. E. & Duncan, R. B. 1987. The creation of momentum for change through the process of strategic issue diagnosis. *Strategic Management Journal*, 8: 279-295.
- Dutton, J. E. & Jackson, S. E. 1987. Categorizing strategic issues: Links to organizational action. *Academy of Management Review*, 12: 76-90.
- Dyer, J. H. & Singh, H. 1998. The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23: 660-679.
- Dyer, J. H. & Nobeoka, K. 2000. Creating and managing a high-performance knowledge-sharing network: The Toyota case. *Strategic Management Journal*, 21: 345-367.
- Echols, A. & Tsai, W. 2005. Niche and performance: The moderating role of network embeddedness. *Strategic Management Journal*, 26: 219-238.
- Eden, L., Levitas, E., & Martinez, R. J. 1997. The production, transfer and spillover of technology: Comparing large and small multinationals as technology producers. *Small Business Economics*, 9: 53-66.

- Eisenhardt, K. M. & Bourgeois, L. J. 1988. Politics of strategic decision-making in high-velocity environments: Toward a midrange theory. *Academy of Management Journal*, 31: 737-770.
- Eisenhardt, K. M. 1989. Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32: 543-576.
- Eisenhardt, K. M. & Schoonhoven, C. B. 1990. Organizational growth: Linking founding team, strategy, environment, and growth among United States semiconductor ventures, 1978-1988. *Administrative Science Quarterly*, 35: 504-529.
- Eisenhardt, K. M. & Martin, J. A. 2000. Dynamic capabilities: What are they? *Strategic Management Journal*, 21: 1105-1121.
- Ensley, M. D. & Pearce, C. L. 2001. Shared cognition in top management teams: Implications for new venture performance. *Journal of Organizational Behavior*, 22: 145-160.
- Epstein, S. & O'Brien, E. J. 1985. The person situation debate in historical and current perspective. *Psychological Bulletin*, 98: 513-537.
- Ferrier, W. J. 2001. Navigating the competitive landscape: The drivers and consequences of competitive aggressiveness. *Academy of Management Journal*, 44: 858-877.
- Fichman, M. & Levinthal, D. A. 1991. Honeymoons and the liability of adolescence: A new perspective on duration dependence in social and organizational relationships. *Academy of Management Review*, 16: 442-468.
- Finkelstein, S. & Hambrick, D. C. 1990. Top management team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative Science Quarterly*, 35: 484-503.
- Finkelstein, S. 1992. Power in top management teams: Dimensions, measurement, and validation. *Academy of Management Journal*, 35: 505-538.
- Finkelstein, S. & Hambrick, D. C. 1996. *Strategic Leadership: Top Executives and Their Effects on Organizations*. St. Paul, MN: West Publishing Company.
- Fischer, H. M. & Pollock, T. G. 2004. Effects of social capital and power on surviving transformational change: The case of initial public offerings. *Academy of Management Journal*, 47: 463-481.
- Fishbein, M. & Ajzen, I. 1975. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Fiske, S. T. & Taylor, S. E. 1984. *Social Cognition*. Reading, MA: Addison-Wesley.

- Florin, J., Lubatkin, M., & Schulze, W. 2003. A social capital model of high-growth ventures. *Academy of Management Journal*, 46: 374-384.
- Folta, T. B. 1998. Governance and uncertainty: The trade-off between administrative control and commitment. *Strategic Management Journal*, 19: 1007-1028.
- Fox, J. 1980. Effect analysis in structural equation models: Extensions and simplified methods of computation. *Sociological Methods & Research*, 9: 3-28.
- Fox, J. 1985. Effect analysis in structural equation models: 2. Calculation of specific indirect effects. *Sociological Methods & Research*, 14: 81-95.
- Freeman, J., Carroll, G. R., & Hannan, M. T. 1983. The liability of newness: Age dependence in organizational death rates. *American Sociological Review*, 48: 692-710.
- Freeman, J. & Hannan, M. T. 1983. Niche width and the dynamics of organizational populations. *American Journal of Sociology*, 88: 1116-1145.
- Galbraith, J. 1973. *Designing Complex Organizations*. Reading, MA: Addison-Wesley.
- Galunic, D. C. & Rodan, S. 1998. Resource recombinations in the firm: Knowledge structures and the potential for Schumpeterian innovation. *Strategic Management Journal*, 19: 1193-1201.
- Galunic, D. C. & Eisenhardt, K. M. 2001. Architectural innovation and modular corporate forms. *Academy of Management Journal*, 44: 1229-1249.
- Gartner, W. B. 1990. What are we talking about when we talk about entrepreneurship? *Journal of Business Venturing*, 5: 15-28.
- Garud, R. & Karnoe, P. 2003. Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Research Policy*, 32: 277-300.
- Gatewood, E. J., Shaver, K. G., & Gartner, W. B. 1995. A longitudinal study of cognitive factors influencing start-up behaviors and success at venture creation. *Journal of Business Venturing*, 10: 371-391.
- Geletkanycz, M. A. & Hambrick, D. C. 1997. The external ties of top executives: Implications for strategic choice and performance. *Administrative Science Quarterly*, 42: 654-681.
- George, G. 2005. Slack resources and the performance of privately held firms. *Academy of Management Journal*, 48: 661-676.
- Gersick, C. J. G. 1989. Marking time: Predictable transitions in task groups. *Academy of Management Journal*, 32: 274-309.

- Ghemawat, P. & Costa, J. 1993. The organizational tension between static and dynamic efficiency. *Strategic Management Journal*, 14: 59-73.
- Gibson, C. B. & Birkinshaw, J. 2004. The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47: 209-226.
- Gist, M. E. & Mitchell, T. R. 1992. Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, 17: 183-211.
- Godfrey, P. C. & Hill, C. W. L. 1995. The problem of unobservables in Strategic Management research. *Strategic Management Journal*, 16: 519-533.
- Goll, I. & Rasheed, A. M. A. 1997. Rational decision-making and firm performance: The moderating role of environment. *Strategic Management Journal*, 18: 583-591.
- Goll, I. & Rasheed, A. M. A. 2004. The moderating effect of environmental munificence and dynamism on the relationship between discretionary social responsibility and firm performance. *Journal of Business Ethics*, 49: 41-54.
- Gooding, R. Z. & Wagner, J. A. 1986. A meta-analytic review of the relationship between size and performance: The productivity and efficiency of organizations and their subunits. *Administrative Science Quarterly*, 30: 462-481.
- Granovetter, M. S. 1973. Strength of weak ties. *American Journal of Sociology*, 78: 1360-1380.
- Granovetter, M. S. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91: 481-510.
- Granovetter, M. S. 1992. Problems of explanation in economic sociology. In N. Nohria & R. G. Eccles (Eds.), *Networks and Organizations: Structure, Form, and Action*. Boston, MA: Harvard Business School Press.
- Grant, R. M. 1991. The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33: 114-135.
- Grant, R. M. 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17: 109-122.
- Greene, V. L. 1977. An algorithm for total and indirect causal effects. *Political Methodology*, 4: 369-381.
- Greenwood, R. & Hinings, C. R. 1996. Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of Management Review*, 21: 1022-1054.

- Greve, H. R. 2003. *Organizational Learning from Performance Feedback: A Behavioral Perspective on Innovation and Change*. Cambridge, UK: Cambridge University Press.
- Gulati, R. 1995. Social structure and alliance formation patterns: A longitudinal analysis. *Administrative Science Quarterly*, 40: 619-652.
- Gulati, R. 1999. Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal*, 20: 397-420.
- Gulati, R., Nohria, N., & Zaheer, A. 2000. Strategic networks. *Strategic Management Journal*, 21: 203-215.
- Gulati, R. & Higgins, M. C. 2003. Which ties matter when? The contingent effects of interorganizational partnerships on IPO success. *Strategic Management Journal*, 24: 127-144.
- Gupta, A. K., Smith, K. G., & Shalley, C. E. 2006. The interplay between exploration and exploitation. *Academy of Management Journal*, 49: 693-706.
- Hall, R. 1992. The strategic analysis of intangible resources. *Strategic Management Journal*, 13: 135-144.
- Hambrick, D. C. 1983. High profit strategies in mature capital goods industries: A contingency approach. *Academy of Management Journal*, 26: 687-707.
- Hambrick, D. C. & Mason, P. A. 1984. Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9: 193-206.
- Hambrick, D. C., Cho, T. S., & Chen, M. J. 1996. The influence of top management team heterogeneity on firms' competitive moves. *Administrative Science Quarterly*, 41: 659-684.
- Hambrick, D. C. & Cannella, A. A. 2004. CEOs who have COOs: Contingency analysis of an unexplored structural form. *Strategic Management Journal*, 25: 959-979.
- Hamel, G. & Prahalad, C. K. 1994. *Competing For The Future* (1 ed.). Cambridge, MA: Harvard Business School Press.
- Hanan, M. 1976. Venturing corporations: Think small to stay strong. *Harvard Business Review*, 54: 139-148.
- Hannan, M. T. & Freeman, J. 1977. The population ecology of organizations. *American Journal of Sociology*, 82: 929-964.

- Hannan, M. T. & Freeman, J. 1984. Structural inertia and organizational change. *American Sociological Review*, 49: 149-164.
- Hannan, M. T. & Freeman, J. 1989. *Organizational Ecology*. Cambridge, MA: Harvard University Press.
- Hannan, M. T. & Carroll, G. R. 1992. *Dynamics of Organizational Populations*. New York: Oxford.
- Hannan, M. T., Dundon, E. A., Carroll, G. R., & Torres, J. C. 1995. Organizational evolution in a multinational context: Entries of automobile manufacturers in Belgium, Britain, France, Germany, and Italy. *American Sociological Review*, 60: 509-528.
- Harford, J. 2005. What drives merger waves? *Journal of Financial Economics*, 77: 529-560.
- Harrigan, K. R. 1981. Barriers to entry and competitive strategies. *Strategic Management Journal*, 2: 395-412.
- Harrigan, K. R. 1985. Exit barriers and vertical integration. *Academy of Management Journal*, 28: 686-697.
- Harris, R. D. 2004. Organizational task environments: An evaluation of convergent and discriminant validity. *Journal of Management Studies*, 41: 857-882.
- Harrison, J. S., Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. 2001. Resource complementarity in business combinations: Extending the logic to organizational alliances. *Journal of Management*, 27: 679-690.
- Haveman, H. A. 1993. Follow the leader: Mimetic isomorphism and entry into new markets. *Administrative Science Quarterly*, 38: 593-627.
- Hawawini, G., Subramanian, V., & Verdin, P. 2003. Is performance driven by industry- or firm-specific factors? A new look at the evidence. *Strategic Management Journal*, 24: 1-16.
- Hayward, M. L. A. 2002. When do firms learn from their acquisition experience? Evidence from 1990-1995. *Strategic Management Journal*, 23: 21-39.
- He, Z. L. & Wong, P. K. 2004. Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, 15: 481-494.
- Helfat, C. E. & Raubitschek, R. S. 2000. Product sequencing: Co-evolution of knowledge, capabilities and products. *Strategic Management Journal*, 21: 961-979.



- Helfat, C. E. & Lieberman, M. B. 2002. The birth of capabilities: market entry and the importance of pre-history. *Industrial and Corporate Change*, 11: 725-760.
- Helfat, C. E. & Peteraf, M. A. 2003. The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24: 997-1010.
- Henderson, A. D. 1999. Firm strategy and age dependence: A contingent view of the liabilities of newness, adolescence, and obsolescence. *Administrative Science Quarterly*, 44: 281-314.
- Henderson, R. M. & Clark, K. B. 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35: 9-30.
- Higgins, M. C. & Gulati, R. 2003. Getting off to a good start: The effects of upper echelon affiliations on underwriter prestige. *Organization Science*, 14: 244-263.
- Higgins, M. C. & Gulati, R. 2006. Stacking the deck: The effects of top management backgrounds on investor decisions. *Strategic Management Journal*, 27: 1-25.
- Hill, C. W. L. & Rothaermel, F. T. 2003. The performance of incumbent firms in the face of radical technological innovation. *Academy of Management Review*, 28: 257-274.
- Hillman, A. J. & Hitt, M. A. 1999. Corporate political strategy formulation: A model of approach, participation, and strategy decisions. *Academy of Management Review*, 24: 825-842.
- Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. 1996. The market for corporate control and firm innovation. *Academy of Management Journal*, 39: 1084-1119.
- Hitt, M. A., Hoskisson, R. E., & Kim, H. 1997. International diversification: Effects on innovation and firm performance in product diversified firms. *Academy of Management Journal*, 40: 767-798.
- Hitt, M. A., Bierman, L., Shimizu, K., & Kochhar, R. 2001. Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management Journal*, 44: 13-28.
- Hitt, M. A., Ireland, R. D., Camp, S. M., & Sexton, D. L. 2001. Guest editors' introduction to the special issue. Strategic entrepreneurship: Entrepreneurial strategies for wealth creation. *Strategic Management Journal*, 22: 479-491.
- Hitt, M. A., Bierman, L., Uhlenbruck, K., & Shimizu, K. 2006. The importance of resources in the internationalization of professional service firms: The good, the bad, and the ugly. *Academy of Management Journal*, 49: 1137-1157.

- Hofer, C. W. & Schendel, D. E. 1978. *Strategy Formulation: Analytical Concepts*. St. Paul, MN: West Publishing Company.
- Hofmann, D. A., Griffin, M. A., & Gavin, M. B. 2000. The application of hierarchical linear modeling to organizational research. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions*: 467-511. San Francisco: Jossey-Bass.
- Holcomb, T. R. & Hitt, M. A. in press. Toward a model of strategic outsourcing. *Journal of Operations Management*: Forthcoming.
- Holcomb, T. R., Holmes, R. M., & Hitt, M. A. in press. Diversification to achieve scale and scope: The strategic implications of resource management for value creation. In J. A. C. Baum, S. Dobrev & A. van Witteloostuijin (Eds.), *Advances in Strategic Management: Ecology and Strategy*, Vol. 23: Forthcoming. Oxford, U.K.: JAI-Elsevier Science.
- Holtz-Eakin, D., Joulfaian, D., & Rosen, H. S. 1994a. Entrepreneurial decisions and liquidity constraints. *Rand Journal of Economics*, 25: 334-347.
- Holtz-Eakin, D., Joulfaian, D., & Rosen, H. S. 1994b. Sticking it out: Entrepreneurial survival and liquidity constraints. *Journal of Political Economy*, 102: 53-75.
- Hoskisson, R. E. & Hitt, M. A. 1988. Strategic control systems and relative R&D investment in large multiproduct firms. *Strategic Management Journal*, 9: 605-621.
- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Moesel, D. D. 1993. Construct validity of an objective (entropy) categorical measure of diversification strategy. *Strategic Management Journal*, 14: 215-235.
- Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. 1994. Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Academy of Management Journal*, 37: 1207-1251.
- Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. 2000. Strategy in emerging economies. *Academy of Management Journal*, 43: 249-267.
- Hough, J. R. 2006. Business segment performance redux: A multilevel approach. *Strategic Management Journal*, 27: 45-61.
- Huff, A. S. 1982. Industry influences on strategy reformulation. *Strategic Management Journal*, 3: 119-131.

- Huselid, M. A. 1995. The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, 38: 635-672.
- Husick, G. C. & Arrington, J. M. 1998. *The Initial Public Offering: A Practical Guide for Executives*. New York: Bowne & Co.
- Iansiti, M. & Clark, K. D. 1994. Integration and dynamic capability: Evidence from product development in automobiles and mainframes. *Industrial and Corporate Change*, 3: 557-605.
- Ibbotson, R. G., Sindelar, J. L., & Ritter, J. R. 1988. Initial public offerings. *Journal of Applied Corporate Finance*, 1: 37-45.
- Ibbotson, R. G., Sindelar, J. L., & Ritter, J. R. 1994. The market's problems with the pricing of initial public offerings. *Journal of Applied Corporate Finance*, 7: 66-74.
- Ibbotson, R. G. & Ritter, J. R. 1995. Initial public offerings. In R. A. Jarrow, V. A. Maksimovic & W. T. Ziemba (Eds.), *North-Holland Handbooks of Operations Research and Management Science*, Vol. 9: 993-1016. Amsterdam: North-Holland.
- Ireland, R. D., Hitt, M. A., & Sirmon, D. G. 2003. A model of strategic entrepreneurship: The construct and its dimensions. *Journal of Management*, 29: 963-989.
- Ireland, R. D., Webb, J. W., & Coombs, J. E. 2005. Theory and methodology in entrepreneurship research. In D. J. Ketchen & D. D. Bergh (Eds.), *Research Methodology in Strategy and Management*, Vol. 2: 111-141. Oxford, UK: Elsevier Ltd.
- Itami, H. 1987. *Mobilizing Invisible Assets*. Cambridge, MA: Harvard University Press.
- Jain, B. A. & Kini, O. 1994. The post-issue operating performance of IPO firms. *Journal of Finance*, 49: 1699-1726.
- James, L. R. & Brett, J. M. 1984. Mediators, moderators, and tests for mediation. *Journal of Applied Psychology*, 69: 307-321.
- Jensen, M. C. & Meckling, W. H. 1976. Theory of firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3: 305-360.
- Jensen, M. C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76: 323-329.
- Jensen, M. C. 1989. Eclipse of the public corporation. *Harvard Business Review*, 67: 61-74.

- Jensen, M. C. 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance*, 48: 831-880.
- Johnson, B. R. 1990. Toward a multidimensional model of entrepreneurship: The case of achievement motivation and the entrepreneur. *Entrepreneurship Theory and Practice*, 14: 39-54.
- Jones, G. R. & Hill, C. W. L. 1988. Transaction cost analysis of strategy-structure choice. *Strategic Management Journal*, 9: 159-172.
- Judd, C. M. & Kenny, D. A. 1981. Process analysis: Estimating mediation in treatment evaluations. *Evaluation Review*, 5: 602-619.
- Kale, P., Dyer, J. H., & Singh, H. 2002. Alliance capability, stock market response, and long-term alliance success: The role of the alliance function. *Strategic Management Journal*, 23: 747-767.
- Kaplan, S. 1989. The effects of management buyouts on operating performance and value. *Journal of Financial Economics*, 24: 217-254.
- Katila, R. & Ahuja, G. 2002. Something old, something new: A longitudinal study of search behavior and new product introduction. *Academy of Management Journal*, 45: 1183-1194.
- Katila, R. & Shane, S. 2005. When does lack of resources make new firms innovative? *Academy of Management Journal*, 48: 814-829.
- Katz, J. A. & Shepherd, D. A. 2003. Cognitive approaches to entrepreneurship research. In J. A. Katz & D. A. Shepherd (Eds.), *Cognitive Approaches to Entrepreneurship Research*, Vol. 6: 1-10. Oxford: Elsevier Science Ltd.
- Keats, B. W. & Hitt, M. A. 1988. A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal*, 31: 570-598.
- Khanna, T. & Palepu, K. 1997. Why focused strategies may be wrong for emerging markets. *Harvard Business Review*, 75: 41-51.
- Kirchhoff, B. A. 1991. Entrepreneurship's contribution to economics. *Entrepreneurship Theory and Practice*, 15: 93-112.
- Knight, D., Pearce, C. L., Smith, K. G., Olian, J. D., Sims, H. P., Smith, K. A., & Flood, P. 1999. Top management team diversity, group process, and strategic consensus. *Strategic Management Journal*, 20: 445-465.
- Knott, A. M. 2003. Persistent heterogeneity and sustainable innovation. *Strategic Management Journal*, 24: 687-705.

- Kogut, B. & Zander, U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3: 383-397.
- Kogut, B. & Kulatilaka, N. 2001. Capabilities as real options. *Organization Science*, 12: 744-758.
- Koka, B. R. & Prescott, J. E. 2002. Strategic alliances as social capital: A multidimensional view. *Strategic Management Journal*, 23: 795-816.
- Kolvereid, L. 1996. Prediction of employment status choice intentions. *Entrepreneurship Theory & Practice*, 21: 47-56.
- Kor, Y. Y. 2003. Experience-based top management team competence and sustained growth. *Organization Science*, 14: 707-719.
- Kotter, J. P. 1982. *The General Managers*. New York: The Free Press.
- Kraatz, M. S. 1998. Learning by association? Interorganizational networks and adaptation to environmental change. *Academy of Management Journal*, 41: 621-643.
- Kreft, I. & de Leeuw, J. 1998. *Introducing Multilevel Modeling*. London, UK: Sage.
- Krueger, N. F., Reilly, M. D., & Carsrud, A. L. 2000. Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15: 411-432.
- Krueger, N. F. 2003. The cognitive psychology of entrepreneurship. In Z. J. Acs & D. B. Audretsch (Eds.), *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction*, Vol. 1: 105-140. Boston: Kluwer Academic Publishers.
- Lant, T. K. & Mezias, S. J. 1992. An organizational learning: Model of convergence and reorientation. *Organization Science*, 3: 47-71.
- Larson, A. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly*, 37: 76-104.
- Lavie, D. 2006. Capability reconfiguration: An analysis of incumbent responses to technological change. *Academy of Management Review*, 31: 153-174.
- Lavie, D. & Rosenkopf, L. 2006. Balancing exploration and exploitation in alliance formation. *Academy of Management Journal*, 49: 797-818.
- Lawrence, P. & Lorsch, J. 1967. *Organization and Environment*. Homewood, IL: Irwin Publishing.

- Lee, C., Lee, K., & Pennings, J. M. 2001. Internal capabilities, external networks, and performance: A study on technology-based ventures. *Strategic Management Journal*, 22: 615-640.
- Lee, D. Y. & Tsang, E. W. K. 2001. The effects of entrepreneurial personality, background and network activities on venture growth. *Journal of Management Studies*, 38: 583-602.
- Lei, D., Hitt, M. A., & Bettis, R. 1996. Dynamic core competences through meta-learning and strategic context. *Journal of Management*, 22: 549-569.
- Leibenstein, H. 1978. *General X-efficiency Theory and Economic Development*. New York: Oxford University press.
- Lengnick-Hall, C. A. 1992. Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18: 399-429.
- Leonard-Barton, D. 1992. Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13: 111-125.
- Lev, B. 1969. Industry averages as targets for financial ratios. *Journal of Accounting Research*, 7: 290-299.
- Levinthal, D. A. & March, J. G. 1981. A model of adaptive organizational search. *Journal of Economic Behavior & Organization*, 2: 307-333.
- Levinthal, D. A. & Fichman, M. 1988. Dynamics of interorganizational attachments: Auditor-client relationships. *Administrative Science Quarterly*, 33: 345-369.
- Levinthal, D. A. 1991. Random walks and organizational mortality. *Administrative Science Quarterly*, 36: 397-420.
- Levinthal, D. A. & March, J. G. 1993. The myopia of learning. *Strategic Management Journal*, 14: 95-112.
- Levinthal, D. A. 1997. Adaptation on rugged landscapes. *Management Science*, 43: 934-950.
- Levitt, B. & March, J. G. 1988. Organizational learning. *Annual Review of Sociology*, 14: 319-340.
- Lichtenstein, B. M. B. & Brush, C. G. 2001. How do 'resource bundles' develop and change in new ventures? A dynamic model of longitudinal exploration. *Entrepreneurship Theory & Practice*, 25: 37-58.
- Lieberman, M. B. & Demeester, L. 1999. Inventory reduction and productivity growth: Linkages in the Japanese automotive industry. *Management Science*, 45: 466-485.

- Lieberman, M. B. & Dhawan, R. 2005. Assessing the resource base of Japanese and US auto producers: A Stochastic frontier production function approach. *Management Science*, 51: 1060-1075.
- Liebeskind, J. P. 1996. Knowledge, strategy, and the theory of the firm. *Strategic Management Journal*, 17: 93-107.
- Lippman, S. A. & Rumelt, R. P. 2003. The payments perspective: Micro-foundations of resource analysis. *Strategic Management Journal*, 24: 903-927.
- Loasby, B. J. 1998. The organisation of capabilities. *Journal of Economic Behavior & Organization*, 35: 139-160.
- Locke, E. A. & Latham, G. P. 1990. *A Theory of Goal Setting and Task Performance*. Englewood Cliffs, NJ: Prentice-Hall.
- Locke, E. A. 2000. Motivation, cognition, and action: An analysis of studies of task goals and knowledge. *Applied Psychology: An International Review*, 49: 408-429.
- Low, M. B. & MacMillan, I. C. 1988. Entrepreneurship: Past research and future challenges. *Journal of Management*, 14: 139-161.
- Lumpkin, G. T. & Dess, G. G. 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21: 135-172.
- Luo, Y. D. 2002. Contract, cooperation, and performance in international joint ventures. *Strategic Management Journal*, 23: 903-919.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. 2002. A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7: 83-104.
- MacMillan, I. C., Hambrick, D. C., & Day, D. L. 1982. The product portfolio and profitability: A PIMS-based analysis of industrial-product businesses. *Academy of Management Journal*, 25: 733-755.
- MacMillan, I. C. & McGrath, R. G. 1997. What is strategy? *Harvard Business Review*, 75: 154-&.
- Mahoney, J. & Michael, S. 2005. A subjectivist theory of entrepreneurship. In S. A. Alvarez, R. Agarwal & O. Sorenson (Eds.), *Handbook of Entrepreneurship Research: Interdisciplinary Perspectives*: 33-54. London: Springer-Verlag.
- Makhija, M. 2003. Comparing the resource-based and market-based views of the firm: Empirical evidence from Czech privatization. *Strategic Management Journal*, 24: 433-451.

- March, J. G. & Simon, H. A. 1958. *Organizations* (1<sup>st</sup> ed.). New York: Wiley.
- March, J. G. 1981. Footnotes to organizational change. *Administrative Science Quarterly*, 26: 563-577.
- March, J. G. & Shapira, Z. 1987. Managerial perspectives on risk and risk-taking. *Management Science*, 33: 1404-1418.
- March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2: 71-87.
- March, J. G. 1996. Continuity and change in theories of organizational action. *Administrative Science Quarterly*, 41: 278-287.
- March, J. G. 2006. Rationality, foolishness, and adaptive intelligence. *Strategic Management Journal*, 27: 201-214.
- Marino, K. E. & Lange, D. R. 1983. Measuring organizational slack: A note on the convergence and divergence of alternative operational definitions. *Journal of Management*, 9: 81-92.
- Maritan, C. A. & Brush, T. H. 2003. Heterogeneity and transferring practices: Implementing flow manufacturing in multiple plants. *Strategic Management Journal*, 24: 945-959.
- McClelland, D. C. 1965. N-achievement and entrepreneurship: A longitudinal study. *Journal of Personality and Social Psychology*, 1: 389-392.
- McDonald, R. P. 1996. Path analysis with composite variables. *Multivariate Behavioral Research*, 31: 239-270.
- McDougall, P. & Robinson, R. B. 1990. New venture strategies: An empirical identification of 8 archetypes of competitive strategies for entry. *Strategic Management Journal*, 11: 447-467.
- McDougall, P. P., Robinson, R. B., & DeNisi, A. S. 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., Chen, M. J., & MacMillan, I. C. 1998. Multimarket maneuvering in uncertain spheres of influence: Resource diversion strategies. *Academy of Management Review*, 23: 724-740.
- McKelvey, B. & Aldrich, H. 1983. Populations, natural-selection, and applied organizational science. *Administrative Science Quarterly*, 28: 101-128.



- McNamara, G. M., Luce, R. A., & Thompson, G. H. 2002. Examining the effect of complexity in strategic group knowledge structures on firm performance. *Strategic Management Journal*, 23: 153-170.
- McNamara, G., Vaaler, P. M., & Devers, C. 2003. Same as it ever was: The search for evidence of increasing hypercompetition. *Strategic Management Journal*, 24: 261-278.
- Meyer, J. W. & Rowan, B. 1977. Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83: 340-363.
- Miles, G., Snow, C. C., & Sharfman, M. P. 1993. Industry variety and performance. *Strategic Management Journal*, 14: 163-177.
- Miles, R. E. & Snow, C. C. 1978. *Organizational Strategy, Structure and Process*. New York: McGraw-Hill.
- Miles, R. E. 1982. *Coffin Nails and Corporate Strategies*. Englewood, Cliffs, NJ: Prentice-Hall.
- Miller, A. & Camp, B. 1985. Exploring the determinants of corporate ventures. *Journal of Business Venturing*, 1: 87-105.
- Miller, C. C., Burke, L. M., & Glick, W. H. 1998. Cognitive diversity among upper-echelon executives: Implications for strategic decision processes. *Strategic Management Journal*, 19: 39-58.
- Miller, D. & Friesen, P. 1980. Archetypes of organizational transition. *Administrative Science Quarterly*, 25: 268-299.
- Miller, D. & Friesen, P. H. 1982. Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal*, 3: 1-25.
- Miller, D., Kets de Vries, M. F. R., & Toulouse, J.-M. 1982. Top executive locus of control and its relationship to strategy-making, structure, and environment. *Academy of Management Journal*, 25: 237-253.
- Miller, D. 1983. The correlates of entrepreneurship in three types of firms. *Management Science*, 29: 770-791.
- Miller, D. 1990. Organizational configurations: Cohesion, change, and prediction. *Human Relations*, 43: 771-789.
- Miller, D. & Shamsie, J. 1996. The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of Management Journal*, 39: 519-543.

- Miller, D. & Shamsie, J. 1999. Strategic responses to three kinds of uncertainty: Product line simplicity at the Hollywood film studios. *Journal of Management*, 25: 97-116.
- Miller, D. & Shamsie, J. 2001. Learning across the life cycle: Experimentation and performance among the Hollywood studio heads. *Strategic Management Journal*, 22: 725-745.
- Miller, D., Eisenstat, R., & Foote, N. 2002. Strategy from the inside out: Building capability creating organizations. *California Management Review*, 44: 37-54.
- Miller, D. 2003. An asymmetry-based view of advantage: Towards an attainable sustainability. *Strategic Management Journal*, 24: 961-976.
- Miller, K. D. & Bromiley, P. 1990. Strategic risk and corporate performance: An analysis of alternative risk measures. *Academy of Management Journal*, 33: 756-779.
- Miller, K. D. & Leiblein, M. J. 1996. Corporate risk-return relations: Returns variability versus downside risk. *Academy of Management Journal*, 39: 91-122.
- Milliken, F. J. 1987. Three types of perceived uncertainty about the environment: State, effect, and response uncertainty. *Academy of Management Review*, 12: 133-143.
- Mintzberg, H. 1978. Patterns in strategy formation. *Management Science*, 24: 934-948.
- Mintzberg, H. 1979. *The Structuring of Organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Misangyi, V. F., Elms, H., Greckhamer, T., & Lepine, J. A. 2006. A new perspective on a fundamental debate: A multilevel approach to industry, corporate, and business unit effects. *Strategic Management Journal*, 27: 571-590.
- Mishina, Y., Pollock, T. G., & Porac, J. F. 2004. Are more resources always better for growth? Resource stickiness in market and product expansion. *Strategic Management Journal*, 25: 1179-1197.
- Mitchell, R. K., Smith, B., Seawright, K. W., & Morse, E. A. 2000. Cross-cultural cognitions and the venture creation decision. *Academy of Management Journal*, 43: 974-993.
- Mitchell, R. K., Busenitz, L., Lant, T., McDougall, P. P., Morse, E. A., & Smith, J. B. 2004. The distinctive and inclusive domain of entrepreneurial cognition research. 28: 505-518.
- Mitchell, W. 1991. Dual clocks: Entry order influences on incumbent and newcomer market share and survival when specialized assets retain their value. *Strategic Management Journal*, 12: 85-100.

- Modigliani, F. & Miller, M. H. 1963. Corporate income taxes and the cost of capital: A correction. *American Economic Review*, 53: 433-443.
- Morrow, J. L., Sirmon, D. G., Hitt, M. A., & Holcomb, T. R. 2007. Creating value in the face of declining performance: Firm strategies and organizational recovery. *Strategic Management Journal*, 28: 271-283.
- Mosakowski, E. 1998. Entrepreneurial resources, organizational choices, and competitive outcomes. *Organization Science*, 9: 625-643.
- Mosakowski, E. 2002. Overcoming the resource disadvantages in entrepreneurial firms: When less is more. In M. A. Hitt, R. D. Ireland, S. M. Camp & D. L. Sexton (Eds.), *Strategic Entrepreneurship: Creating a New Mindset*: 106-126. Oxford, UK: Blackwell Publishers.
- Moses, O. D. 1992. Organizational slack and risk-taking behaviour: Tests of product-pricing strategy. *Journal of Organizational Change Management*, 5: 38-54.
- Mowery, D. C., Oxley, J. E., & Silverman, B. S. 1996. Strategic alliances and interfirm knowledge transfer. *Strategic Management Journal*, 17: 77-91.
- Murphy, G. B., Trailer, J. W., & Hill, R. C. 1996. Measuring performance in entrepreneurship research. *Journal of Business Research*, 36: 15-23.
- Muscarella, C. J. & Vetsuypens, M. R. 1990. Efficiency and organizational structure: A study of reverse LBOs. *Journal of Finance*, 45: 1389-1413.
- Nahapiet, J. & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23: 242-266.
- Naman, J. L. & Slevin, D. P. 1993. Entrepreneurship and the concept of fit: A model and empirical tests. *Strategic Management Journal*, 14: 137-153.
- Nelson, R. R. & Winter, S. G. 1982. *An Evolutionary Theory of Economic Change*. Cambridge, MA: The Belknap Press of Harvard University Press.
- Nelson, T. 2003. The persistence of founder influence: Management, ownership, and performance effects at initial public offering. *Strategic Management Journal*, 24: 707-724.
- Nohria, N. & Gulati, R. 1996. Is slack good or bad for innovation? *Academy of Management Journal*, 39: 1245-1264.
- North, D. C. 1981. *Structure and Change in Economic History*. New York: W. W. Norton & Co.

- North, D. C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, England: Cambridge University Press.
- Oehlert, G. W. 1992. A note on the delta method. *American Statistician*, 46: 27-29.
- Oliver, C. 1991. Strategic responses to institutional processes. *Academy of Management Review*, 16: 145-179.
- Oliver, C. 1997. Sustainable competitive advantage: Combining institutional and resource-based views. *Strategic Management Journal*, 18: 697-713.
- Pagano, M., Panetta, F., & Zingales, L. 1998. Why do companies go public? An empirical analysis. *Journal of Finance*, 53: 27-64.
- Park, N. K. & Mezas, J. M. 2005. Before and after the technology sector crash: The effect of environmental munificence on stock market response to alliances of e-commerce firms. *Strategic Management Journal*, 26: 987-1007.
- Park, S. H., Chen, R., & Gallagher, S. 2002. Firm resources as moderators of the relationship between market growth and strategic alliances in semiconductor start-ups. *Academy of Management Journal*, 45: 527-545.
- Pearce, R. J. 1997. Toward understanding joint venture performance and survival: A bargaining and influence approach to transaction cost theory. *Academy of Management Review*, 22: 203-225.
- Péli, G. L. 1997. The niche hiker's guide to population ecology: A logical reconstruction of organizational ecology's niche theory. In A. E. Raftery (Ed.), *Sociological Methodology 1997*: 1-46. Cambridge, MA: Blackwell.
- Peng, M. W. & Luo, Y. D. 2000. Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal*, 43: 486-501.
- Peng, M. W. 2004. Outside directors and firm performance during institutional transitions. *Strategic Management Journal*, 25: 453-471.
- Pennings, J. M. 1992. Structural contingency theory: A reappraisal. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior*, Vol. 14: 267-309. Greenwich, CT: JAI Press Inc.
- Pennings, J. M., Lee, K. M., & van Witteloostuijn, A. 1998. Human capital, social capital, and firm dissolution. *Academy of Management Journal*, 41: 425-440.
- Penrose, E. 1959. *The Theory and Growth of the Firm* (Third ed.). New York: Oxford University Press Inc.

- Peteraf, M. A. 1993. The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14: 179-191.
- Peteraf, M. A. & Bergen, M. E. 2003. Scanning dynamic competitive landscapes: A market-based and resource-based framework. *Strategic Management Journal*, 24: 1027-1041.
- Pfeffer, J. & Salancik, G. R. 1974. Organizational decision making as a political process: Case of a university budget. *Administrative Science Quarterly*, 19: 135-151.
- Pfeffer, J. & Salancik, G. R. 1978. *The External Control of Organizations*. New York: Harper & Row.
- Pfeffer, J. 1981. *Power in Organizations*. Boston, MA: Pitman.
- Pfeffer, J. 1994. *Competitive Advantage through People*. Boston, MA: Harvard Business School Press.
- Pisano, G. P. 1994. Knowledge, integration, and the locus of learning: An empirical analysis of process development. *Strategic Management Journal*, 15: 85-100.
- Polanyi, M. 1967. *The Tacit Dimension*. London: Routledge & Kegan Paul.
- Poon, J. M. L., Ainuddin, R. A., & Junit, S. H. 2006. Effects of self-concept traits and entrepreneurial orientation on firm performance. *International Small Business Journal*, 24: 61-82.
- Porac, J. F. & Thomas, H. 1990. Taxonomic mental models in competitor definition. *Academy of Management Review*, 15: 224-240.
- Porter, M. E. 1980. *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (1st ed.). New York: The Free Press.
- Porter, M. E. 1985. *Competitive Advantage: Creating and Sustaining Superior Performance* (First Free Press ed.). New York: The Free Press.
- Porter, M. E. 1991. Towards a dynamic theory of strategy. *Strategic Management Journal*, 12: 95-117.
- Powell, W. W., Koput, K. W., & Smith-Doerr, L. 1996. Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41: 116-145.
- Preacher, K. J. & Hayes, A. F. in press. Asymptotic and resampling strategies for assessing and comparing indirect effects in simple and multiple mediator models. *Behavior Research Methods Instruments & Computers*: Forthcoming.

- PriceWaterhouseCoopers. 2005. *Roadmap for an IPO: A Guide to Going Public*. New York: Price Waterhouse Coopers.
- Priem, R. L. & Butler, J. E. 2001a. Is the resource-based "view" a useful perspective for strategic management research. *Academy of Management Journal*, 26: 22-40.
- Priem, R. L. & Butler, J. E. 2001b. Tautology in the resource-based view and the implications of externally determined resource value: Further comments. *Academy of Management Review*, 26: 57-66.
- Priem, R. L. in press. A consumer perspective on value creation. *Academy of Management Review*: Forthcoming.
- Rajagopalan, N., Rasheed, A. M. A., & Datta, D. K. 1993. Strategic decision processes: Critical review and future directions. *Journal of Management*, 19: 349-384.
- Ranger-Moore, J. 1997. Bigger may be better, but is older wiser? Organizational age and size in the New York life insurance industry. *American Sociological Review*, 62: 903-920.
- Rao, H. 1994. The social construction of reputation: Certification contests, legitimation, and the survival of organizations in the American automobile industry - 1895-1912. *Strategic Management Journal*, 15: 29-44.
- Raudenbush, S. W. & Bryk, A. S. 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods*. Thousand Oaks, CA: Sage Publications.
- Reger, R. K. & Huff, A. S. 1993. Strategic groups: A cognitive perspective. *Strategic Management Journal*, 14: 103-123.
- Reger, R. K. & Palmer, T. B. 1996. Managerial categorization of competitors: Using old maps to navigate new environments. *Organization Science*, 7: 22-39.
- Rhodes-Kropf, M. & Viswanathan, S. 2004. Market valuation and merger waves. *Journal of Finance*, 59: 2685-2718.
- Ritter, J. R. 1984. Signaling and the valuation of unseasoned new issues: A comment. *Journal of Finance*, 39: 1231-1237.
- Ritter, J. R. 1991. The long-run performance of initial public offerings. *Journal of Finance*, 46: 3-27.
- Rivkin, J. W. & Siggelkow, N. 2003. Balancing search and stability: Interdependencies among elements of organizational design. *Management Science*, 49: 290-311.

- Robins, J. & Wiersema, M. F. 1995. A resource-based approach to the multibusiness firm: Empirical analysis of portfolio interrelationships and corporate financial performance. *Strategic Management Journal*, 16: 277-299.
- Robinson, K. C. 1999. An examination of the influence of industry structure on eight alternative measures of new venture performance for high potential independent new ventures. *Journal of Business Venturing*, 14: 165-187.
- Robinson, K. C. & McDougall, P. P. 2001. Entry barriers and new venture performance: A comparison of universal and contingency approaches. *Strategic Management Journal*, 22: 659-685.
- Rothaermel, F. T., Hitt, M. A., & Jobe, L. A. in press. Balancing vertical integration and strategic outsourcing effects on product portfolio, product success, and firm performance. *Strategic Management Journal*: Forthcoming.
- Rousseau, D. M. 1979. Assessment of technology in organizations: Closed versus open systems approaches. *Academy of Management Review*, 4: 531-542.
- Rowley, T., Behrens, D., & Krackhardt, D. 2000. Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal*, 21: 369-386.
- Rumelt, R. P. 1974. *Strategy, Structure and Economic Performance*. Cambridge, MA: Harvard University Press.
- Salancik, G. R. & Pfeffer, J. 1978. A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 23: 224-253.
- Sandberg, W. R. 1986. *New Venture Performance: The Role of Strategy and Industry Structure*. Lexington, MA: Lexington Books.
- Sandberg, W. R. & Hofer, C. W. 1987. Improving new venture performance: The role of strategy, industry structure, and the entrepreneur. *Journal of Business Venturing*, 2: 5-28.
- Sanders, W. G. & Boivie, S. 2004. Sorting things out: Valuation of new firms in uncertain markets. *Strategic Management Journal*, 25: 167-186.
- Schendel, D. & Patton, G. R. 1978. Simultaneous equation model of corporate strategy. *Management Science*, 24: 1611-1621.
- Schoeffler, S., Buzzell, R. D., & Heany, D. F. 1974. Impact of strategic planning on profit performance. *Harvard Business Review*, 52: 137-145.

- Schoenecker, T. S. & Cooper, A. C. 1998. The role of firm resources and organizational attributes in determining entry timing: A cross-industry study. *Strategic Management Journal*, 19: 1127-1143.
- Schoonhoven, C. B. 1981. Problems with contingency theory: Testing assumptions hidden within the language of contingency theory. *Administrative Science Quarterly*, 26: 349-377.
- Schoonhoven, C. B., Eisenhardt, K. M., & Lyman, K. 1990. Speeding products to market: Waiting time to first product introduction in new firms. *Administrative Science Quarterly*, 35: 177-207.
- Schultz, T. W. 1961. Investment in human capital. *The American Economic Review*, 51: 1-17.
- Schumpeter, J. 1934. *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Schumpeter, J. 1942. *Capitalism, Socialism and Democracy*. New York: Harper.
- Scott, J. H. 1976. Theory of optimal capital structure. *Bell Journal of Economics*, 7: 33-54.
- Scott, W. R. 1987. The adolescence of institutional theory. *Administrative Science Quarterly*, 32: 493-511.
- Scott, W. R. 1992. *Organizations: Rational, Natural, and Open Systems* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Scott, W. R. 1995. *Institutions and Organizations*. Thousand Oaks, CA: Sage.
- Selznick, P. 1996. Institutionalism "old" and "new". *Administrative Science Quarterly*, 41: 270-277.
- Seth, A., Song, K. P., & Pettit, R. R. 2002. Value creation and destruction in cross-border acquisitions: An empirical analysis of foreign acquisitions of US firms. *Strategic Management Journal*, 23: 921-940.
- Sexton, D. L. & Bowman, N. B. 1986. Validation of a personality index: Comparative psychology characteristics analysis of female entrepreneurs, managers, entrepreneurship students, and business students. In R. Ronstadt, J. A. Hornaday, R. Petersen & K. H. Vesper (Eds.), *Frontiers of Entrepreneurship Research*: 40-51. Wellesley, MA: Babson College.
- Sexton, D. L. 2001. Wayne Huizenga: Entrepreneur and wealth creator. *Academy of Management Executive*, 15: 40-48.



- Shane, S. & Kolvereid, L. 1995. National environment, strategy, and new venture performance: A three-country study. *Journal of Small Business Management*, 33: 37-50.
- Shane, S. & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25: 217-226.
- Shane, S. & Stuart, T. 2002. Organizational endowments and the performance of university start-ups. *Management Science*, 48: 154-170.
- Shane, S. 2003. *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*. Cheltenham, UK: Edward Elgar Publishing Limited.
- Shapiro, A. 1975. Displaced, uncomfortable entrepreneur. *Psychology Today*, 9: 83-88.
- Shapiro, A. 1982. Social dimensions of entrepreneurship. In C. Kent (Ed.), *The Encyclopedia of Entrepreneurship*: 72-90. Englewood Cliffs, NJ: Prentice Hall.
- Sharfman, M. P. & Dean, J. W. 1997. Flexibility in strategic decision making: Informational and ideological perspectives. *Journal of Management Studies*, 34: 191-217.
- Shook, C. L., Priem, R. L., & McGee, J. E. 2003. Venture creation and the enterprising individual: A review and synthesis. *Journal of Management*, 29: 379-399.
- Shrader, R. C. & Simon, M. 1997. Corporate versus independent new ventures: Resource, strategy, and performance differences. *Journal of Business Venturing*, 12: 47-66.
- Siegel, P. A. & Hambrick, D. C. 2005. Pay disparities within top management groups: Evidence of harmful effects on performance of high-technology firms. *Organization Science*, 16: 259-274.
- Simerly, R. L. & Li, M. F. 2000. Environmental dynamism, capital structure and performance: A theoretical integration and an empirical test. *Strategic Management Journal*, 21: 31-49.
- Simon, M., Houghton, S. M., & Aquino, K. 2000. Cognitive, biases, risk perception and venture formation: How individuals decide to start companies. *Journal of Business Venturing*, 15: 113-134.
- Singer, J. D. 1998. Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics*, 23: 323-355.
- Singh, J. V. 1986. Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal*, 29: 562-585.

- Singh, J. V., House, R. J., & Tucker, D. J. 1986. Organizational change and organizational mortality. *Administrative Science Quarterly*, 31: 587-611.
- Singh, J. V. 1990. Organizational ecology: Hannan, M. T. and Freeman, J. *Administrative Science Quarterly*, 35: 416-420.
- Singh, J. V. & Lumsden, C. J. 1990. Theory and research in organizational ecology. *Annual Review of Sociology*, 16: 161-195.
- Singh, J. V. 2006. Ecology, strategy and organizational change. In J. A. C. Baum, S. D. Dobrev & A. v. Witteloostuijn (Eds.), *Strategy and Ecology: Advances in Strategic Management*, Vol. 23: Forthcoming. Oxford, UK: JAI/Elsevier.
- Sirmon, D. G., Hitt, M. A., & Ireland, R. D. 2007. Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review*, 32: 273-292.
- Slevin, D. P. & Covin, J. G. 1995. Entrepreneurship as firm behavior: A research model. In J. A. Katz & R. H. Brockhaus, Sr. (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, Vol. 2: 175-224. Greenwich, CT: JAI Press.
- Smith, A. J. 1990. Corporate ownership structure and performance: The case of management buyouts. *Journal of Financial Economics*, 27: 143-164.
- Smith, K. G., Grimm, C. M., & Gannon, M. J. 1993. *Dynamics of Competitive Strategy*. Newberry Park, CA: Sage.
- Snell, S. A. & Dean, J. W. 1992. Integrated manufacturing and human resource management: A human capital perspective. *Academy of Management Journal*, 35: 467-504.
- Sobel, M. E. 1982. Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology 1982*: 290-312. San Francisco: Jossey-Bass.
- Sobel, M. E. 1988. Direct and indirect effects in linear structural equation models. In J. S. Long (Ed.), *Common Problems/Proper Solutions*: 46-64. Beverly Hills, CA: Sage.
- Sorensen, J. B. & Stuart, T. E. 2000. Aging, obsolescence, and organizational innovation. *Administrative Science Quarterly*, 45: 81-112.
- Sorenson, O. 2000. Letting the market work for you: An evolutionary perspective on product strategy. *Strategic Management Journal*, 21: 577-592.
- Spender, J. C. 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17: 45-62.

- Stalk, G., Evans, P., & Shulman, L. E. 1992. Competing on capabilities: The new rules of corporate strategy. *Harvard Business Review*, 70: 57-69.
- Starbuck, W. H. & Milliken, F. 1988. Executive perception filters: What they notice and how they make sense. In D. C. Hambrick (Ed.), *The Executive Effect: Concepts and Methods for Studying Top Managers*: 35-65. Greenwich, CT: JAI Press, Inc.
- Starr, J. A. & MacMillan, I. C. 1990. Resource cooptation via social contracting: Resource acquisition strategies for new ventures. *Strategic Management Journal*, 11: 79-92.
- Staw, B. M., Sandelands, L. E., & Dutton, J. E. 1981. Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly*, 26: 501-524.
- Staw, B. M. & Epstein, L. D. 2000. What bandwagons bring: Effects of popular management techniques on corporate performance, reputation, and CEO pay. *Administrative Science Quarterly*, 45: 523-556.
- Steier, L. & Greenwood, R. 2000. Entrepreneurship and the evolution of angel financial networks. *Organization Studies*, 21: 163-192.
- Stinchcombe, A. L. 1965. Social structure and organizations. In J. G. March (Ed.), *Handbook of Organizations*: 153-193. Chicago, IL: Rand McNally.
- Stuart, T. E., Hoang, H., & Hybels, R. C. 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative Science Quarterly*, 44: 315-349.
- Suarez, F. F. & Utterback, J. M. 1995. Dominant designs and the survival of firms. *Strategic Management Journal*, 16: 415-430.
- Subramaniam, M. & Youndt, M. A. 2005. The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48: 450-463.
- Sutcliffe, K. M. 1994. What executives notice: Accurate perceptions in top management teams. *Academy Of Management Journal*, 37: 1360-1378.
- Swaminathan, A. 1996. Environmental conditions at founding and organizational mortality: A trial-by-fire model. *Academy of Management Journal*, 39: 1350-1377.
- Swaminathan, A. 2001. Resource partitioning and the evolution of specialist organizations: The role of location and identity in the US wine industry. *Academy of Management Journal*, 44: 1169-1185.

- Tabachnick, B. G. & Fidell, L. S. 2001. *Using Multivariate Statistics* (4th ed.). New York: Harper Collins.
- Tan, J. & Peng, M. W. 2003. Organizational slack and firm performance during economic transitions: Two studies from an emerging economy. *Strategic Management Journal*, 24: 1249-1263.
- Teece, D. J. 1980. Economies of scope and the scope of the enterprise. *Journal of Economic Behavior and Organization*, 1: 223-247.
- Teece, D. J. 1982. Towards an economic theory of the multiproduct firm. *Journal of Economic Behavior and Organization*, 3: 39-63.
- Teece, D. J. 1986. Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*, 15: 285-305.
- Teece, D. J., Rumelt, R., Dosi, G., & Winter, S. 1994. Understanding corporate coherence: Theory and evidence. *Journal of Economic Behavior & Organization*, 23: 1-30.
- Teece, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal*, 18: 509-533.
- Teoh, H. Y. & Foo, S. L. 1997. Moderating effects of tolerance for ambiguity and risk-taking propensity on the role conflict-perceived performance relationship: Evidence from Singaporean entrepreneurs. *Journal of Business Venturing*, 12: 67-81.
- Thomas, J. B., Clark, S. M., & Gioia, D. A. 1993. Strategic sensemaking and organizational performance: Linkages among scanning, interpretation, action, and outcomes. *Academy of Management Journal*, 36: 239-270.
- Thompson, J. D. 1967. *Organizations in Action*. New York: McGraw-Hill Book Company.
- 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: 195-211.
- Tolbert, P. S. & Zucker, L. G. 1996. The institutionalization of institutional theory. In S. R. Clegg, C. Hardy & W. Nord (Eds.), *Handbook of Organizational Studies*: 175-190. London: Sage.
- Tsai, W. M. H., MacMillan, I. C., & Low, M. B. 1991. Effects of strategy and environment on corporate venture success in industrial markets. *Journal of Business Venturing*, 6: 9-28.

- Tsai, W. P. & Ghoshal, S. 1998. Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41: 464-476.
- Tushman, M. L. & Anderson, P. 1986. Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31: 439-465.
- Ucbasaran, D., Wright, M., Westhead, P., & Busenitz, L. W. 2003. The impact of entrepreneurial experience on opportunity identification and exploitation: Habitual and novice entrepreneurs. In J. A. Katz & D. A. Shepherd (Eds.), *Cognitive Approaches to Entrepreneurship Research*, Vol. 6: 231-263. Oxford: Elsevier Science Ltd.
- Useem, M. & Karabel, J. 1986. Pathways to top corporate management. *American Sociological Review*, 51: 184-200.
- Uzzi, B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *American Sociological Review*, 61: 674-698.
- Uzzi, B. 1997. Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42: 35-67.
- Van de Ven, A. H., Hudson, R., & Schroeder, D. M. 1984. Designing new business startups: Entrepreneurial, organizational, and ecological considerations. *Journal of Management*, 10: 87-107.
- Venkataraman, S. & Van de Ven, A. H. 1998. Hostile environmental jolts, transaction set, and new business. *Journal of Business Venturing*, 13: 231-255.
- Vesper, K. H. 1980. *New Venture Strategies*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Vroom, V. 1964. *Work and Motivation*. New York: Wiley.
- Vuolteenaho, T. 2002. What drives firm-level stock returns? *Journal of Finance*, 57: 233-264.
- Wagner, W. G., Pfeffer, J., & O'Reilly, C. A. 1984. Organizational demography and turnover in top management groups. *Administrative Science Quarterly*, 29: 74-92.
- Walker, G., Kogut, B., & Shan, W. J. 1997. Social capital, structural holes and the formation of an industry network. *Organization Science*, 8: 109-125.
- Walsh, J. P. & Ungson, G. R. 1991. Organizational memory. *Academy of Management Review*, 16: 57-91.

- Wan, W. P. & Hoskisson, R. E. 2003. Home country environments, corporate diversification strategies, and firm performance. *Academy of Management Journal*, 46: 27-45.
- Wan, W. P. 2005. Country resource environments, firm capabilities, and corporate diversification strategies. *Journal of Management Studies*, 42: 161-182.
- Weiner, B. 1985. An attributional theory of achievement motivation and emotion. *Psychological Review*, 92: 548-573.
- Welbourne, T. M. & Andrews, A. O. 1996. Predicting the performance of initial public offerings: Should human resource management be in the equation? *Academy of Management Journal*, 39: 891-919.
- Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal*, 5: 171-180.
- Wiersema, M. F. & Bantel, K. A. 1992. Top management team demography and corporate strategic change. *Academy of Management Journal*, 35: 91-121.
- Williamson, O. E. 1999. Strategy research: Governance and competence perspectives. *Strategic Management Journal*, 20: 1087-1108.
- Winter, S. G. 1984. Schumpeterian competition in alternative technological regimes. *Journal of Economic Behavior & Organization*, 5: 287-320.
- Winter, S. G. 2000. The satisficing principle in capability learning. *Strategic Management Journal*, 21: 981-996.
- Winter, S. G. 2003. Understanding dynamic capabilities. *Strategic Management Journal*, 24: 991-995.
- Woodward, J. 1977. Management and technology. In D. S. Pugh (Ed.), *Organization Theory*: 56-71. London: Penguin.
- Wright, P. M., Smart, D. L., & McMahan, G. C. 1995. Matches between human resources and strategy among NCAA basketball teams. *Academy of Management Journal*, 38: 1052-1074.
- Wu, S. B., Levitas, E., & Priem, R. L. 2005. CEO tenure and company invention under differing levels of technological dynamism. *Academy of Management Journal*, 48: 859-873.
- Youndt, M. A., Snell, S. A., Dean, J. W., & Lepak, D. P. 1996. Human resource management, manufacturing strategy, and firm performance. *Academy of Management Journal*, 39: 836-866.

- Youndt, M. A., Subramaniam, M., & Snell, S. A. 2004. Intellectual capital profiles: An examination of investments and returns. *Journal of Management Studies*, 41: 335-361.
- Zahra, S. A. 1996. Technology strategy and new venture performance: A study of corporate-sponsored and independent biotechnology ventures. *Journal of Business Venturing*, 11: 289-321.
- Zahra, S. A. & Bogner, W. C. 2000. Technology strategy and software new ventures' performance: Exploring the moderating effect of the competitive environment. *Journal of Business Venturing*, 15: 135-173.
- Zahra, S. A., Ireland, R. D., & Hitt, M. A. 2000. International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal*, 43: 925-950.
- Zahra, S. A., Korri, J. S., & Yu, J. F. 2005. Cognition and international entrepreneurship: implications for research on international opportunity recognition and exploitation. *International Business Review*, 14: 129-146.
- Zajac, E. J., Kraatz, M. S., & Bresser, R. K. F. 2000. Modeling the dynamics of strategic fit: A normative approach to strategic change. *Strategic Management Journal*, 21: 429-453.
- Zhang, Y. & Rajagopalan, N. 2003. Explaining new CEO origin: Firm versus industry antecedents. *Academy of Management Journal*, 46: 327-338.
- Zhao, H., Seibert, S. E., & Hills, G. E. 2005. The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90: 1265-1272.
- Zimmerman, M. A. & Zeitz, G. J. 2002. Beyond survival: Achieving new venture growth by building legitimacy. *Academy of Management Review*, 27: 414-431.
- Zollo, M. & Winter, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13: 339-351.
- Zollo, M. & Singh, H. 2004. Deliberate learning in corporate acquisitions: Post-acquisition strategies and integration capability in US bank mergers. *Strategic Management Journal*, 25: 1233-1256.
- Zott, C. 2003. Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, 24: 97-125.
- Zucker, L. G. 1987. Institutional theories of organization. *Annual Review of Sociology*, 13: 443-464.

Zucker, L. G. 1989. Combining institutional theory and population ecology: No legitimacy, no history. *American Sociological Review*, 54: 542-545.



**APPENDIX A****INSTRUCTIONS FOR THE USE OF SAS MACRO FOR ESTIMATING AND  
COMPARING INDIRECT EFFECTS IN MULTIPLE MEDIATION MODELS**

## SAS MACRO OVERVIEW

The macro described here is used to generate estimates for indirect effects associated with the multiple mediator model reported in Tables 17 and 18 and illustrated in Figure 5, where  $c$  is the *total effect* of  $X \rightarrow Y$ ,  $c'$  is the *direct effect* of  $X \rightarrow Y$ , and the specific indirect effect of  $X$  on  $Y$  through mediator  $M_n$  is defined as  $a_n b_n$ . This macro was developed by Professors Kristopher J. Preacher and Professor Andrew F. Hayes for estimating and comparing indirect effects in multiple mediator models. It was provided by Professor Preacher for use in this dissertation in an email exchange with Professor Preacher (March 23, 2006), and electronic copies of the macros can be obtained at <http://www.comm.ohio-state.edu/ahayes/SPSS%20programs/indirect.htm>. It allows for multiple mediators, statistical control of covariates, and all possible pairwise comparisons between indirect effects, and it also produces bias-corrected bootstrap confidence intervals in addition to percentile-based bootstrap confidence intervals.

The SAS macro (%indirect) has the following syntax:

```
%indirect (data=filename, y=dv, x=ivs, m=mlist covlist, c=cov, boot=z,
conf=ci, normal=n, contrast=t, percent=p, bc=b, bca=d);
```

where *filename* is the name of a SAS file name, *dv* is the name of the dependent variable, *ivs* are the name of the independent variables, and *mlist* is a list of mediator variables. These are the only arguments that are necessary for execution of the macro. If no other options are provided, the macro estimates the paths in the model assuming no control variables, the number of bootstraps is set to 1000, the confidence level defaults to 95, only bias corrected and adjusted confidence intervals for the indirect effects are printed, and no normal theory results or pairwise contrasts are conducted.

Additional options include the following. *covlist* is a list of covariate variables, and *cov* is the number of covariate variables in the *covlist* list, *z* is the number of desired bootstrap resamples desired in increments of 1000 (e.g., *boot* = 2000 yields 2000 bootstrap resamples; set it to 0 to disable bootstrapping), *ci* is the desired confidence level, *p* is set to 1 to print percentile-based confidence intervals, *b* is set to 1 to print bias-corrected confidence intervals, *d* is set to 0 to disable printing of bias corrected and adjusted confidence intervals, *n* is set to 1 to enable printing of normal theory test results, and *t* is set to 1 to do all possible pairwise contrasts between indirect effects. If any of these arguments are not provided, default values will be used (the defaults are  $c = 0$ ,  $z = 1000$ ,  $ci = 95$ ,  $p = 0$ ,  $b = 0$ ,  $d = 1$ ,  $n = 0$ ,  $t = 0$ ). If  $c$  is set to 0, it is assumed that there are no variables listed in *covlist*, and all variables listed after “*m* =” are treated as potential mediators. The macro accepts missing data as “.” and uses listwise deletion to exclude cases with missing data.

## SAS MACRO COMMAND SET

```

%macro
indirect(data=,y=,x=,m=,c=0,boot=100,conf=95,percent=0,bc=0,bca=1,
normal=0,contrast=0);
proc iml;
use &data;
read all var{&y &x &m} into dd;
nm={&y &x &m};
xx=(dd = .);xx=xx[,+];
j=1;do i = 1 to nrow(dd);if xx[i,1]=0
then;do;dd[j,]=dd[i,];j=j+1;end;end;
dd=dd[1:j-1,];
nm = nm`;
n = nrow(dd);
nv = ncol(dd);
nc = &c;
con=j(n,1,1);
dt2 = dd;
dt = dd;
resid = j(n,(nv-nc),0);
info = j((2*(nv-nc-2)+1),(2*(nv-nc-2)+1),0);
imat = j(ncol(info),4,1);
imat[1:(nv-nc-2),1]=(2:(nv-nc-1))`;
imat[1:(nv-nc-2),3]=(2:(nv-nc-1))`;
imat[(nv-nc-1):(ncol(info)-1),2]=(2:(nv-nc-1))`;
imat[(nv-nc-1):(ncol(info)-1),4]=(2:(nv-nc-1))`;
imat[(nv-nc-1):(ncol(info)-1),1]=j((nv-nc-2),1,(nv-nc));
imat[(nv-nc-1):(ncol(info)-1),3]=j((nv-nc-2),1,(nv-nc));
imat[ncol(info),1:4]={1 1 1 1};
imat[ncol(info),1]=nv-nc;
imat[ncol(info),3]=nv-nc;
bzx = j(nv-2-nc,1,0);
bzxse = j(nv-2-nc,1,0);
b=j((nv-1-nc),(nv-1-nc),0);
cname={"C1", "C2", "C3", "C4", "C5", "C6", "C7", "C8", "C9", "C10",
"C11", "C12", "C13", "C14", "C15", "C16"};
cname=cname//{"C17", "C18", "C19", "C20", "C21", "C22", "C23", "C24",
"C25", "C26", "C27", "C28", "C29"};
cname=cname//{"C30", "C31", "C32", "C33", "C34", "C35", "C36", "C37",
"C38", "C39", "C40", "C41", "C42"};
cname=cname//{"C43", "C44", "C45"};
p0 = -0.322232431088;
p1 = -1;
p2 = -0.342242088547;
p3 = -0.0204231210245;
p4 = -.0000453642210148;
q0 = 0.0993484626060;
q1 = 0.588581570495;
q2 = 0.531103462366;
q3 = 0.103537752850;
q4 = 0.0038560700634;

```

```

conf=round(&conf);
lowalp = 0.5*(1-(conf/100));
upalp = 0.5*(1+(conf/100));
zbca = lowalp//upalp;
btn = 1;
if (&boot > 999) then;
  do;
    btn = floor(&boot/1000)*1000;
  end;
blowp = floor(lowalp*btn);
if (blowp < 1) then;
  do;
    blowp = 1;
  end;
bhighp = floor((upalp*btn)+1);
if (bhighp > btn) then;
  do;
    bhighp = btn;
  end;
indeff = j((n+1+btn), (nv-1-nc), 0);
do d = 1 to (n+1+btn);
  if (d = (n+2)) then;
    do;
      dt = dt2;
      con = j(n, 1, 1);
    end;
  if (d > 1) then if (d < (n+2)) then;
    do;
      if (d = 2) then;
        do;
          con = j((n-1), 1, 1);
          dt = dt2[2:n,];
        end;
      if (d = (n+1)) then;
        do;
          dt = dt2[1:(n-1),];
        end;
      if (d > 2) then if (d < (n+1)) then;
        do;
          dt = dt2[1:(d-2),]//dt2[(d:n),];
        end;
      end;
    end;
  if (d > (n+1)) then;
    do;
      do nn = 1 to n;
        v = int(ranuni(0)*n)+1;
        dt[nn, 1:nv]=dt2[v, 1:nv];
      end;
    end;
end;

x = dt[, 2];
m = dt[, 3:(nv-nc)];
y = dt[, 1];
xz = dt[, 2:nv];
xo = con||x;
if (nc > 0) then;

```

```

do;
  c = dt[, (nv-nc+1):nv];
  xo = xo||c;
end;
do k = 3 to (nv-nc);
  ytmp = dt[,k];
  bzxt = inv(xo`*xo)*xo`*ytmp;
  bzx[(k-2),1]=bzxt[2,1];
  if (d = 1) then;
    do;
      resid[, (k-1)]=ytmp-(xo*bzxt);
      mse = sum((ytmp-(xo*bzxt))##2)/(n-2-nc);
      olscm = (mse*inv(xo`*xo));
      bzxse[(k-2),1]=sqrt(olscm[2,2]);
    end;
  end;
end;
if (d = 1) then;
  do;
    if (nc > 0) then;
      do;
        cnt = dd[, (nv-(nc-1)):nv];
        xo = con||x||cnt;
      end;
    if (nc = 0) then;
      do;
        xo = con||x;
      end;
    byx = inv(xo`*xo)*xo`*y;
    mse = sum((y-(xo*byx))##2)/(n-2-nc);
    olscm = (mse*inv(xo`*xo));
    byxse = sqrt(olscm[2,2]);
    byx = byx[2,1];
  end;
  xzo = con||xz;
  byzx = inv(xzo`*xzo)*xzo`*y;
  byzx2 = byzx[3:(nv-nc),1];
  if (d = 1) then;
    do;
      resid[,ncol(resid)]=y-(xzo*byzx);
      mse = sum((y-(xzo*byzx))##2)/(n-nv);
      covmat = mse*inv(xzo`*xzo);
      olscm = vecdiag(covmat);
      sse = mse*(n-nv);
      sst = sum((y-(sum(y)/n))##2);
      r2 = 1-(sse/sst);
      ar2 = 1-(mse/(sst/(n-1)));
      fr = ((n-nv)*r2)/((1-r2)*ncol(xz));
      pfr = 1-probf(fr,ncol(xz),(n-nv));
      if (nc > 0) then;
        do;
          bcon = byzx[(nv-nc+1):nv,1];
          bconse = sqrt(olscm[(nv-nc+1):nv,1]);
        end;
      byzx2se = sqrt(olscm[3:(nv-nc),1]);
      cprime = byzx[2,1];
      cprimese=sqrt(olscm[2,1]);
    end;
  end;
end;

```

```

end;
indef2 = (bzx#byzx2);
zs = (bzx/bzxse)#(byzx2/byzx2se);
temp = t(sum(indef2)//indef2);
indef2[d,]=temp;
if (d = 1) then;
  do;
    vs = nm[1:(nv-nc),1];
    rn = {"DV = " "IV = " "MEDS = "};
    print "Dependent, Independent, and Proposed Mediator Variables";
    print vs [rowname = rn];
    if (nc > 0) then;
      do;
        vs = nm[(nv-nc+1):nv,1];
        print "Statistical Controls";
        rn = {"CONTROLS="};
        print vs [rowname = rn];
      end;
    print "Sample size";
    print n;
    nms = nm[3:(nv-nc),1];
    te = bzx/bzxse;
    df = n-2-nc;
    p = 2*(1-probt(abs(te),df));
    bzxmat = bzx||bzxse||te||p;
    b[2:(nv-1-nc),1]=bzx;
    se2 = bzxse#bzxse;
    cnm = {"Coeff" "se" "t" "p"};
    print "IV to Mediators (a paths)";
    print bzxmat [rowname = nms colname = cnm format = 9.4];
    te = byzx2/byzx2se;
    df = n-nv;
    p = 2*(1-probt(abs(te),df));
    byzx2mat=byzx2||byzx2se||te||p;
    print "Direct Effects of Mediators on DV (b paths)";
    print byzx2mat [rowname = nms colname = cnm format = 9.4];
    te=byx/byxse;
    df = n-2-nc;
    p=2*(1-probt(abs(te),df));
    byxmat = byx||byxse||te||p;
    xnm=nm[2,1];
    print "Total effect of IV on DV (c path)";
    print byxmat [rowname = xnm colname = cnm format = 9.4];
    te=cprime/cprimese;
    df = n-nv;
    p=2*(1-probt(abs(te),df));
    cprimmat = cprime||cprimese||te||p;
    print "Direct Effect of IV on DV (c' path)";
    print cprimmat [rowname = xnm colname = cnm format = 9.4];
    if (nc > 0) then;
      do;
        df = n-nv;
        nms = nm[(nv-nc+1):nv,1];
        te=bcon/bconse;
        p=2*(1-probt(abs(te),df));
        bconmat = bcon||bconse||te||p;

```

```

print "Partial Effect of Control Variables on DV";
print bconmat [rowname = nms colname = cnm format = 9.4];
end;
dvms=r2||ar2||fr||ncol(xz)|| (n-nv)||pfr;
print "Fit Statistics for DV Model";
cnm = {"R-sq" "adj R-sq" "F" "df1" "df2" "p"};
print dvms [colname = cnm format = 9.4];
if (&normal =^ 0) then;if(&c = 0) then;do;
  do;
    bmat=j((nv-nc), (nv-nc), 0);
    bmat[2:(nv-nc-1), 1]=bzx;
    bmat[(nv-nc), 2:(nv-nc-1)]=byzx2`;
    bmat[(nv-nc), 1]=cprime;
    imbinv = inv(i(ncol(bmat))-bmat);
    imbtinv = inv(i(ncol(bmat))-bmat`);
    resid[, 1]=x-(x[+]/n);
    psi = (resid`*resid)/(n-1);
    invpsi = inv(psi);
    ibpsiib = imbinv*psi*imbtinv;
    do ic = 1 to ncol(info);
      do ic2 = 1 to ncol(info);
        info[ic, ic2]=(n-
1)*((imbinv[imat[ic2, 4], imat[ic, 1]]*imbinv[imat[ic, 2], imat[ic2, 3]])+(ib
psiib[imat[ic2, 4], imat[ic, 2]]*invpsi[imat[ic, 1], imat[ic2, 3]]));
      end;
    end;
    varcov=inv(info);
    varcov=varcov[1:(2*(nv-nc-2)), 1:(2*(nv-nc-2))];
    ses = vecdiag(varcov);
    avar = ses[1:nrow(bzxse), 1];
    bvar = ses[(nrow(bzxse)+1):nrow(ses), 1];
    if ((nv-nc-2) > 1) then;do;if(&contrast = 1) then;do;
      prws=j(((nv-nc-2)*(nv-nc-3)/2), 1, 0);
      prwse=prws;
      kk=1;
      do ic = 1 to (nv-nc-3);
        do ic2 = (ic+1) to (nv-nc-2);
          vf2=((byzx2[ic, 1]##2)*varcov[ic, ic])-
(2*byzx2[ic, 1]*byzx2[ic2, 1]*(varcov[ic, ic2]));

          vf2=vf2+((byzx2[ic2, 1]##2)*varcov[ic2, ic2])+((bzx[ic, 1]##2)*(bvar
[ic, 1]));

          vf2=vf2-
(2*bzx[ic, 1]*bzx[ic2, 1]*covmat[(2+ic), (2+ic2)])+(bzx[ic2, 1]##2)*(bvar[
ic2, 1]));

          cnt=indeff2[ic, 1]-indeff2[ic2, 1];
          prws[kk, 1]=cnt;
          prwse[kk, 1]=sqrt(vf2);
          kk=kk+1;
        end;
      end;
    end;
    cnam2=cname[1:(kk-1), 1];
  end;end;
  dermat=byzx2//bzx;
  totse=sqrt((dermat)`*varcov*dermat);
  specse = sqrt((byzx2#byzx2)#(avar)+(bzx#bzx)#(bvar));

```

```

specse = totse//specse;
indsum=indeff2[+];
specz = (indsum//indeff2)/specse;
ind22 = indsum//indeff2;
nms = {"TOTAL"}//nm[3:(nv-nc),1];
if ((nv-nc-2) > 1) then;do;if(&contrast = 1) then;do;
  ind22 = ind22//prws;
  specse = specse//prwse;
  specz2 = prws/prwse;
  specz = specz//specz2;
  nms = nms//cnam2;
end;end;
pspec = 2*(1-probnorm(abs(specz)));
spec = ind22||specse||specz||pspec;
cnm = {"Effect" "se" "Z" "p"};
print "*****";
print "NORMAL THEORY TESTS FOR INDIRECT EFFECTS";
print "Indirect Effects of IV on DV through Mediators (ab
paths)";
print spec [rowname = nms colname = cnm format = 9.4];
end;end;
end;
end;
if (btn > 1) then;do;
  nms = {"TOTAL"}//nm[3:(nv-nc),1];
  if (nv-nc-2) > 1 then do;if (&contrast = 1) then do;
    crst=j((n+1+btn),((nv-nc-2)*(nv-nc-3)/2),0);
    kk=1;
    do ic = 2 to (nv-nc-2);
      do ic2 = (ic+1) to (nv-nc-1);
        crst[,kk]=indeff[,ic]-indeff[,ic2];
        kk=kk+1;
      end;
    end;
    indeff = indeff||crst;
    cnam2=cname[1:(kk-1),1];
    nms = nms//cnam2;
  end;
end;
lvout = indeff[2:(n+1),];
tdotm = lvout[+,]/n;
tm = j(n,ncol(lvout),1)*diag(tdotm);
topa=((n-1)/n)*(tm-lvout)##3;
topa=topa[+,];
bota =(((n-1)/n)*(tm-lvout)##2);
bota=bota[+,];
bota=6*sqrt(bota##3);
ahat = topa/bota;
indsam = indeff[1,]`;
boot = indeff[(n+2):nrow(indeff),];
mnboot = (boot[+,]/btn)`;
xt=boot-j(btn,1)*boot[:,];
cv=(xt`*xt)/btn;
se=sqrt(vecdiag(cv));

create bootstp from boot [colname='indirect'];

```



```

append from boot;
nnn = j(1,ncol(indeff),-999);
boot = nnn//boot;
do e = 1 to (ncol(indeff));
do i = 2 to (btn+1);
  ix = boot[i,e];
  do k = i to 2 by -1;
    k2 = k;
    if (boot[(k-1),e] > ix) then;
      do;
        boot[k,e]=boot[(k-1),e];
      end;
    else;
      if (boot[(k-1),e] <= ix) then;
        do;
          goto stpit;
        end;
      end;
    end;
  stpit:
  boot[k2,e]=ix;
end;
end;
boot = boot[2:(btn+1),];

xp=j((nrow(mnboot)+2),1,0);
do i = 1 to (nrow(mnboot)+2);
  if (i <= nrow(mnboot)) then;
    do;
      pv = (boot[,i] < indsam[i,1]);
      pv = pv[+,]/btn;
    end;
  else;
    pv = zbca[(i-nrow(mnboot)),1];
  p=pv;
  if (pv > 0.5) then;
    do;
      p = 1-pv;
    end;
  y5 = sqrt(-2*log(p));

  xp[i,1]=y5+(((y5*p4+p3)*y5+p2)*y5+p1)*y5+p0)/(((y5*q4+q3)*y5+q2)*y5+q1)*y5+q0);
  if (pv <= 0.5) then;
    do;
      xp[i,1]=-xp[i,1];
    end;
  end;
bbb = nrow(mnboot);
zz = xp[1:bbb,1];
zlo = zz + ((zz+xp[(bbb+1),1])/(1-ahat`#(zz+xp[(bbb+1),1])));
zup = zz + ((zz+xp[(bbb+2),1])/(1-ahat`#(zz+xp[(bbb+2),1])));
ahat = 0;
zlobc = zz + ((zz+xp[(bbb+1),1])/(1-ahat`#(zz+xp[(bbb+1),1])));
zupbc = zz + ((zz+xp[(bbb+2),1])/(1-ahat`#(zz+xp[(bbb+2),1])));
zlo = probnorm(zlo);
zup = probnorm(zup);

```

```

zlobc = probnorm(zlobc);
zupbc = probnorm(zupbc);
blow = int(zlo*(btn+1));
bhigh = int(zup*(btn+1))+1;
blowbc = int(zlobc*(btn+1));
bhighbc = int(zupbc*(btn+1))+1;
lowbca = j(nrow(blow),1,0);
upbca = lowbca;
do i = 1 to nrow(blow);
  if (blow[i,1] < 1) then;
    do;
      blow[i,1]=1;
    end;
    lowbca[i,1]=boot[blow[i,1],i];
    if (bhigh[i,1] > btn) then;
      do;
        bhigh[i,1]=btn;
      end;
      upbca[i,1]=boot[bhigh[i,1],i];
    end;
  lowbc = j(nrow(blow),1,0);
  upbc = lowbca;
  do i = 1 to nrow(blowbc);
    if (blowbc[i,1] < 1) then;
      do;
        blowbc[i,1]=1;
      end;
      lowbc[i,1]=boot[blowbc[i,1],i];
      if (bhighbc[i,1] > btn) then;
        do;
          bhighbc[i,1]=btn;
        end;
        upbc[i,1]=boot[bhighbc[i,1],i];
      end;
    print "*****";
    print "BOOTSTRAP RESULTS FOR INDIRECT EFFECTS";
    res = indsam|mnboot|(mnboot-indsam)||se;
    cn = {"Data" "Boot" "Bias" "SE"};
    print "Indirect Effects of IV on DV through Mediators (ab paths)";
    print res [rowname = nms colname = cn format = 9.4];
    lowerperc = boot[blowp,];
    upperperc = boot[bhighp,];
    ci = lowbca||upbca;
    cn = {"Lower" "Upper"};
    if (&bca ^= 0) then;
      do;
        print "Bias Corrected and Accelerated Confidence Intervals";
        print ci [rowname = nms colname = cn format = 9.4];
      end;
    if (&bc ^= 0) then;
      do;
        ci = lowbc||upbc;
        print "Bias Corrected Confidence Intervals";
        print ci [rowname = nms colname = cn format = 9.4];
      end;
    if (&percent ^= 0) then;

```

```

do;
  ci = lowerc`||upperc`;
  print "Percentile Confidence Intervals";
  print ci [rowname = nms colname = cn format = 9.4];
end;
print "*****";
print "Level of Confidence for Confidence Intervals";
print conf;
print "Number of Bootstrap Resamples";
print btn;
end;
if (&normal = 1) then;do;if (&c = 0) then;do;prt =1;end;end;
if (btn > 999) then;do;prt = 1;end;
if ((nv-nc-2) > 1) then;do;if (&contrast = 1) then;do;
if (prt = 1) then;do;
print "*****";
print "Indirect Effect Contrast Definitions: IndEff_1 minus IndEff2";
kk=1;
prwsv = j(((nv-nc-2)*(nv-nc-3)/2),2,"XXXXXXXX");
do ic = 1 to (nv-nc-3);
  do ic2 = (ic+1) to (nv-nc-2);
    prwsv[kk,1]=nm[ic+2,1];
    prwsv[kk,2]=nm[ic2+2,1];
    kk=kk+1;
  end;
end;
prwsv = cnam2||prwsv;
cn = {"Contrast" "IndEff_1" "IndEff_2"};
print prwsv [colname = cn];
end;end;end;
quit;
%mend;

```

## VITA

## TIMOTHY R. HOLCOMB

Mays Business School  
 Texas A&M University  
 College Station, Texas 77843-4221  
 Email: [tholcomb@mays.tamu.edu](mailto:tholcomb@mays.tamu.edu)

**EDUCATION**

- 
- Mays Business School (Texas A&M University)**, College Station, TX.  
 Doctorate of Philosophy in Business Administration 2007.  
 Major: Strategic Management; Minor: Entrepreneurship, Research Methods.  
**University of Louisiana**, Monroe, LA.  
 Master of Business Administration (Major: Management) 1986.  
 Bachelor of Business Administration (Major: Accounting) 1984.

**REFEREED PUBLICATIONS**

- 
- Certo, S.T., Holcomb, T.R., Holmes, R.M. 2007. The use of IPO firms as a research context: Motivations, challenges, and opportunities. *Business Horizons*.  
 Morrow, J.L., Sirmon, D.G., Hitt, M.A., Holcomb, T.R. 2007. Creating value in the face of declining performance: Firm strategies and organizational recovery. *Strategic Management Journal*. 28(3): 271-283.  
 Holcomb, T.R., Hitt, M.A. 2007. Toward a model of strategic outsourcing. *Journal of Operations Management*. 25(2): 464-481.  
 DeFatta, J.A., Smith, J.A., Holcomb, T.R. 1988. A profile of accounting department advisory boards. *Journal of Education for Business*, 63: 172-174.

**NON-REFEREED PUBLICATIONS**

- 
- Holcomb, T.R., Holmes, R.M., Hitt, M.A. 2006. Diversification to achieve scale and scope: The strategic implications of resource management for value creation. In J. A. C. Baum, S. Dobrev, and A. van Witteloostuijn (Eds.), *Advances in Strategic Management: Ecology and Strategy*, Vol. 23: 549-587. JAI-Elsevier Science: Oxford, U.K.  
 Cannella, A.A., Holcomb, T.R. 2005. A multi-level analysis of the upper-echelons model. In F. Dansereau & F. J. Yammarino (Eds.), *Research in Multi-level Issues: Multi-level Issues in Strategy and Methods*, Vol. 4: 197-238. JAI-Elsevier Science: Oxford, U.K.  
 Cannella, A.A., Holcomb, T.R. 2005. A multi-level analysis of the upper-echelons model: Planting seeds for future research. In F. Dansereau & F. J. Yammarino (Eds.), *Research in Multi-level Issues: Multi-level Issues in Strategy and Methods*, Vol. 4: 263-273. JAI-Elsevier Science: Oxford, U.K.