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Antecedents of New Venture Performance: An Empirical Study of IPO (Initial Public Offering) Ventures

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Dedication

This dissertation is dedicated to my family:
Heesoon, my wife, who gave me her love and sacrifice
Jinsung, my son, who taught me the joy of life
and
My parents, who are my ultimate supporters

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Abstract

To address a ubiquitous phenomenon in the venture area - why certain ventures persistently outperform others, but some of them do not - this research pursued to answer a specific research question: what are antecedents of venture performance? This research brought together two complementary theories, the resource-based view (RBV) and social network theory. By framing its conceptual model with two complementary theories and by using Initial Public Offering data, this research contributed to both academia and practitioners/policy makers with a prescriptive Initial Public Offering (IPO) performance model.

The final sample for this study was 103 IPO firms, which underwent an IPO in 1997. To test eight hypotheses developed from the conceptual model, this research collected its data from reliable secondary sources, such as IPO prospectus, the Center for Research in Security Prices (CRSP) database, the U.S. patent and trademark office, the Wall Street Journal, and the PR Newswires. Several different hierarchical regressions indicated that internal resources ("technology," "reputation," and "top management team (TMT) capability") were antecedents of IPO performance. However, the hypothesized association between human resource and IPO performance was not found in this research. Second, the complementary role of "network cohesiveness" to the resource-based view (RBV) was empirically supported. Especially, "network affiliations" had a strong and positive contribution to IPO performance, and "social capital," had a positive association with IPO performance as well. Finally, the moderating role of network

cohesiveness to the relationship between internal resources and IPO performance were not statistically supported. This data indicated that there was not a positive moderating effect of network cohesiveness to the relationship between internal resources and IPO performance.

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Chapter 1

Introduction

In his seminal work concerning "The distinctive domain of entrepreneurship research," Venkataraman (1997) posited that the domain of entrepreneurship study is "to understand how opportunities to bring into existence future goods and services are discovered, created, and exploited, by whom, and with what consequences" (p.120). Given that small businesses (with fewer than 500 employees) represent approximately 99% of all employers, provide 51% of the private sector output, and offer about 75% of the net new jobs (Small Business Administration, August 2001), the economic and social importance of the domain of entrepreneurship has been recognized by both scholars and practitioners. As noted above, it is widely known that new ventures or small businesses play crucial roles for economic growth and job creation (Kirchhoff, 1991; Small Business Administration, 1999; Winborg & Landstrom, 2001). Additionally, two indispensable contributions of newly founded ventures are that (1) a venture creation process is a key part of market reformation because it diffuses and redefines market economies and (2) ventures are key channels for creating and realizing economic opportunities for lay people (Small Business Administration, 1998).

In spite of these positive aspects of ventures, newly created ventures are also facing huge threats from their business environments. For instance, only 40% of ventures that started between 1989 and 1992 still remained open after 6 years

(Small Business Administration, 2001). While 541,141 new employer firms opened in 1999, 546,518 employer firms closed that same year. These numbers support Romanelli's (1989) observation that ventures are notoriously poor at surviving their early stages. In this regard, it is clear that there are two extremes: (1) some ventures are able to accomplish great success and outperform other competitors including large established firms, but (2) even more ventures fail to survive at even their emerging stages. Alternatively, this demographic statistic may be interpreted as representing the two faces of entrepreneurship, (1) the economic and social importance of ventures and (2) the inherent competitive vulnerability of ventures. Actually, this entrepreneurship phenomenon (positive economic impacts and inherent high mortality risk) is an important research agenda for entrepreneurship scholars.

To address the above entrepreneurial concern, it is helpful to develop a comprehensive and prescriptive framework for venture performance, which may foretell ventures' future potential. In entrepreneurship studies, the venture performance framework should be equipped with (1) a solid theoretical foundation, (2) sophisticated measures, and (3) an ability to give managerial insights to policy makers since (1) there has been ample evidence of realistic discrepancies between beliefs from normative studies and actual phenomenon (Lyon, Lumpkin, & Dess, 2000) and (2) there has been a great demand for entrepreneurship education from practitioners and policy makers (Venkataraman, 1997).

This definitive entrepreneurship research agenda (why certain ventures succeed, and some of them do not) is very similar to the fundamental question of strategic management research – why a certain firm persistently outperforms others (Barney & Arikan, 2001). This question infers concepts of "competitive advantage" or "sustainable competitive advantage" (Porter, 1980; Barney, 1991) since it has a concern of a relative performance, not an absolute level of performance of each firm. As scholars tried to explore the reasons for the deviations of firm performances, they naturally ended up with a quest for antecedents (determinants) of firm performance because antecedents may provide good insights for the verge of firm performance deviations.

To contribute to entrepreneurship and strategy research, especially in modeling performance framework, this dissertation seeks to develop an empirically-based venture performance model. As noted above, venture performance is regarded as a proxy for competitive advantage. Therefore, this research ultimately aims to develop a competitive advantage model for ventures.

Five major categories of antecedents for venture performance were identified in entrepreneurship literature. They are (1) entrepreneurs (Bull & Willard, 1993; Van De Van, 1993), (2) venture strategy (Covin & Slein, 1990; McDougall et al, 1992; Snadberg & Hofer, 1987), (3) industry structure (Poter, 1980; Chen, 1996; Gimeno, 1999), (4) intra-venture resources (Weberfelt, 1984; Barney, 1991), and (5) ecological environments (Low & MacMillan, 1988; Aldrich, 1990). Simultaneously, theoretical limitations of these five streams of venture performance studies were noted. They are (1) the lack of a comprehensive

framework to fill the gaps from fragmented research approaches, (2) the lack of confirmatory and empirical studies to verify conceptually developed theories, and (3) the lack of inter-theoretical syntheses to develop a more comprehensive and powerful prescriptive model for venture performance. This dissertation focused on two emerging, but complementary theories: the resource-based view and social network theory in strategic management. These two theoretical perspectives were chosen because of their different ideas about the origins of competitive advantages.

The resource-based view asserts that differences in venture performance are due to differences of internal resources and capabilities. This view conceptualizes a firm as a bundle of resources, and it posits that the level of competitive advantage of a firm is dependant upon the characteristics of advantageous resource bundles. While the resource-based view only focuses on internal (firm-specific) resource bundles, the social network theory emphasizes relationships among the members of a network of firms. The social network theory notes four important aspects that the resource-based view excludes from its theoretical boundary: (1) the possibility of critical resources residing outside firms (Dyer & Singh, 1998), (2) relational rents (Dyer & Singh, 1998), (3) inter-organizational resource endorsement (Eisenhardt & Schoonhoven, 1996), and (4) channels for resource inflows (Dierickx & Cool, 1989).

The resource-based view and social network theory also have different approaches regarding the origins of competitive advantages of firms. For instance, the resource-based view has an inside-out perspective while social network theory

has an outside-in perspective. Because of the "Yin" and "Yang" relationships of these two theories, it is possible to have synergy effects as they are theoretically integrated. Also, it is plausible that since the two perspectives have different units of analysis and different ideas about venture performance, they may lead to a more comprehensive- prescriptive- framework for venture performance if these two theories are synthesized appropriately.

Research Question and Research Domain

This dissertation endeavored to answer one overarching research question and two subsequent empirical questions. The overarching research question is "what are the antecedents of venture performance?" Previous literature has not provided consistent answers to this general research question. Also, many of the studies used a theoretically singular focus, e.g., industrial organization economic view, the resource-based view, or upper echelon theory, so they did not provide a comprehensive and unswerving idea about the determinants of venture performance. To address this theoretical void, this dissertation pursued to establish a comprehensive venture performance model by adopting two different theoretical perspectives from the organizational studies literature: the resource-based view and social network theory. This research views these two perspectives as complementary, instead of competing theories. By following three sequential steps of building a research model – (1) identifying theoretical gaps in venture performance by exploring literature, (2) combining RBV and social network

theories, and (3) producing an empirical model – this dissertation addressed the overarching research question.

Research in entrepreneurship has many difficulties when testing theories because of the lack of reliable and accurate data. Small and young businesses rarely make their internal information available to the public since that information is imperative in gaining competitive advantages. Most of all, they are private firms that do not have any obligation to uncover any internal information to public. Therefore, it is extremely difficult to obtain both primary and secondary data for ventures. There are some publicly accessible databases, such as Small Business Administration's (SBA) census-based small business database. However, they have significant time lags and are highly fragmented to capitalize the databases (Phillips & Dennis, 1997). Another venue for collecting venture data is through Initial Public Offering (IPO) firms – IPO prospectus. The IPO prospectus of ventures, which is published by IPO underwriters, is filed with the Securities and Exchange Commission (SEC) at the time of public offering of private firms (Brophy, 1997). This prospectus is a useful source of data for entrepreneurship research.

This research is restricted to IPO ventures. IPO ventures start to sell their stocks to public capital markets in order to become a public firm. IPO firms must then follow regulations from both capital markets and government agencies, such as the SEC. As required by the SEC, IPO ventures submit their documented prospectuses. This dissertation collected and used new, publicly available data from IPO firms.

Consequently, the overarching research question of this research was "what are the antecedent of IPO performance". To address this restated research question, two specific and empirical questions based on two complementary theories were developed: (1) how do internal resources of ventures relate to the IPO performance? and (2) how does network cohesiveness complement or moderate the relationships between internal resources and IPO performance?

Purpose of Research

This research aimed to combine two complementary theories to expand theoretical boundaries of RBV and make up inherent theoretical limitations of RBV and the social network theory. Since the first theory, the resource-based view, has an inside-out view, and the social network theory has an outside-in view in the pursuit of a competitive position, these two theories have great potential to increase an explanation power to firm performance if theoretically combined. By doing so, this research contributed to develop a more comprehensive model for venture performance.

Second, this dissertation aimed to develop a prescriptive research model for both scholars and policy makers, instead of a static and descriptive model. From the policy makers' or entrepreneurs' viewpoints, the research model pursued in this dissertation can be regarded as containing good guidelines or references to use in their future decision making, and from the entrepreneurship scholars' perspective, the model may provide a normative framework in venture performance study.

Research Contributions

This research contributed to the entrepreneurship area by providing an inclusive IPO performance model, which was based on theories from strategic management. By doing so, this research created a theoretical linkage between the entrepreneurship and strategic management areas. Second, given that just a handful of empirical studies exist in the resource-based view area, this research added empirical evidences supporting the theoretical paradigm of the resource-based view. Third, this research opened a venue to expand the resource-based view's theoretical boundary further. Even though this research equally weighted two theories, RBV and social network theory, this research initially endeavored to identify a complementary theory for the resource-based view to address its theoretical limitations. In this regard, this research contributed to the resource-based view literature by expanding its theoretical boundary. Also, the results of this research can be generalized as a competitive advantage model since IPO performance can be a good proxy for competitive advantage of IPO firms. Finally, this research provided relevant managerial paradigms in the IPO performance area by providing managerial insights to practitioners.

Dissertation Outline

This research followed three steps in exploring the IPO performance model. Chapter 2 surveys previous literature in and around venture performance, and review normative and empirical findings from the literature, and also identify

theoretical limitations of the literature. In Chapter 3, the resource-based view and the social network theory, were thoroughly reviewed to develop a conceptual research model from which testable hypotheses were developed. In Chapter 4, research design and methodological concerns (e.g., samples, research design, data sources, operationalization, and statistic models) of this research were articulated. In Chapters 5 and 6, research results and their theoretical and managerial implications were discussed. In addition, in Chapter 6, future research suggestions and research limitations will be discussed.

Summary

To address a ubiquitous phenomenon in the venture area – why certain ventures persistently outperform others, but some of them do not – this research pursued to answer a specific research question: what are antecedents of venture performance? To provide answers for this question, this research brought two complementary theories, the resource-based view and social network theory, in developing its research model. This research context was narrowed down to IPO ventures because of the strategic importance of IPO for ventures and data availability. By framing its conceptual model with two complementary theories and by using IPO data, this research contributed to both academia and practitioners/policy makers with an empirically supported, prescriptive IPO performance model, which depicts sources of competitive advantage of ventures.

Definitions and Notes

To avoid unnecessary confusions, several conceptual definitions and research-specific terminological rules are articulated here. First, throughout this dissertation, the resource-based view and RBV will be interchangeably used without further reference. These two terms will be perfectly interchangeable, but either one of them will be conveniently used in order to avoid awkward wordings. Second, the three terms of "resource," "internal resource," and "resource competence" will be used without any conceptual difference. Again, one of these three terms will be conveniently selected in contexts. Third, this research assumed that IPO performance is a good proxy for venture performance, and venture performance will be regarded as a good proxy for competitive advantage of ventures. Thus, it is logical to assume that the higher the IPO performance, the better the competitive advantage. Fourth, the conceptual definition of "resource" includes that of "capability" (Barney, 1991), so there is not a conceptual distinction between resource and capability, and resource will be used as an inclusive term.

Chapter 2

Literature Review

Since a course in entrepreneurship was first opened at Harvard University in 1947, academic interest in entrepreneurship has proliferated (Amit, Glosten, & Muller, 1993; Cooper, Hornaday, & Vesper, 1997). Owing to this academic attention in entrepreneurship study, theoretical and methodological advancements in entrepreneurship research have been noticeable (Amit et al., 1993). Also, because of recognizable economic contributions from entrepreneurs, such as new job creation and economic wealth creation (Kirchhoff, 1991), relevant entrepreneurship research for both entrepreneurs and policy makers has been called for. To address central research questions in this field, e.g. (1) venture creation processes in both demand and supply sides, (2) determinants of venture survival and success, antecedents of venture performance, and (3) dimensions of successful entrepreneurs, entrepreneurship incorporated its theoretical perspectives from various disciplines, such as psychology, sociology, strategy, and economics (Low & MacMillan, 1988). Research domains in entrepreneurship are regarded as relatively young and emerging ones (Cooper et al., 1997). Among many potential research domains, two fundamental research agendas are needed for further explorations (Bygrave & Hofer, 1991): establish theoretical paradigms for entrepreneurship research and identify processes of entrepreneurship. Corresponding to those research proposals, this research endeavored to develop a theoretical framework that predicts venture performance. For this purpose, this

dissertation, first of all, surveyed literature on venture creation and on venture performance/success, and also navigated theoretical paradigms in other disciplines, especially in strategic management areas, to find appropriate theoretical paradigms to be adopted in this research. Subsequently, based on literature and theories, this research identified two theoretical paradigms to answer for this dissertation's research questions, a quest for determinants and antecedents for venture performance.

Strategic Management Theory vs. Entrepreneurship Theory

As mentioned above, the research area of entrepreneurship is still young (Cooper et al., 1997) and needs to build up general theories that integrate fragmented theories, models, frameworks, and empirical findings in its theory building processes (MacMillan & Kats, 1992). In this regard, MacMillan and Kats (1992) particularly suggested a need for the adoption of theoretical paradigms from other disciplinary areas, such as strategy and economics. Also, Chrisman, Bauerschmidt, and Hofer (1998) asserted that entrepreneurship should be treated as a special case of strategic management theory, and the perspectives from the strategic management theories be closely investigated.

To address this call for interdisciplinary effort, the literature surveyed for the theoretical and methodological changes of strategy research is embodied in this chapter, in addition to a review of the literature on entrepreneurship studies.

In the strategic management area, researchers traditionally have a keen interest on "firm performance" (Hoskisson, Hitt, Wan, & Yiu, 1999). Strategy

scholars have looked for critical attributes (either firm level or environmental level) that explain the variation of firm performances among comparable firms, e.g., industry or strategic groups. Similarly, in the entrepreneurship field, the study of determinants of venture performance is regarded as one of the main research domains (McGrath, Venkataraman, & MacMillan, 1994; Shapero & Sokol, 1982). In fact, this research agenda is a research target of this dissertation.

In this chapter, literature that is closely related to the venture creation process and venture performance in entrepreneurship and strategy contexts is reviewed. Followed by this literature review, five major research streams in venture performance are selected and discussed in detail in the rest of this chapter.

Determinants of Venture Creation

Entrepreneurs are individuals who create new combinations of productive resources (Schumpeter, 1934). In line with this definition, entrepreneurship may be understood by the creation process of new combinations (Chrisman, 1999). Accordingly, identifying individual or environmental factors that encourage (or discourage) venture creations is an important issue of entrepreneurship research (Dean & Meyer, 1996). The emphasis on the venture creation process in entrepreneurship studies as a major research domain can be found often in entrepreneurship literature. In their searching for determinants of venture creations, for instance, Shapero and Sokol (1982) emphasized "entrepreneurial events," which they regarded as endpoints of an entrepreneurial process. They also posited that the most obvious and visible evidence of entrepreneurial events

is the creation of ventures (Shapero & Sokol, 1982). Also, Shapero and Sokol (1982) depicted an entrepreneurial event with five sub-elements, (1) initiative-taking phase, (2) consolidation of resources, (3) management of organization, (4) relative autonomy, and (5) risk-taking. In addition to these five sub-elements, they emphasized economic and social sources for entrepreneurial events. Those two different social sources are (1) supply or push factor and (2) demand or pull factor (Dean & Meyer, 1996; Shapero & Sokol, 1982).

The supply factor (or push factor) is a directed force that impacts the creation of new firms (Dean & Meyer, 1996). In detail, the supply factors refer to motivation or propensity of an individual, such as work ethic, need for achievement, creativity, value system, etc., and social or institutional variables that influence an individual's capability to initiate a venture creation, for instance, education infrastructures, capital availability, and unemployment rates. (Dean & Meyer, 1996). On the other hand, demand factor (or pull factor) is a form of environmental inducement to create ventures (Dean & Meyer, 1996). The demand factors include monetary incentives and available resources, which are given by economic, social, and institutional infrastructures or changes (Dean & Meyer, 1996). In other words, the demand factors are market opportunities originated by industry dynamics, economic disequilibrium, technological changes, and so on.

Consequently, literature on venture creations provided an insight about the key criteria for successful venture creation. They are (1) entrepreneurs as initiators (and supply factors), (2) economic environments as demand factors, and (3) resources and management as fundamental necessary factors.

Venture Performance

Particularly, two things will be discussed in this venture performance section. The first one is about the definition of venture performance. The other one is about the measurement issue of venture performance. To explore the antecedents for venture success/failure and performance, the theoretical definition of venture performance should be defined upfront. In line with the definition of venture performance, appropriate measures should be followed.

Maximization of profit is a dominant underlying logic for all for-profit organizations. Therefore, defining and measuring firms' performance have been one of most intrinsic but challenging research questions in strategy research (Venkatraman & Ramanujam, 1986; Hoskisson et al., 1999). In entrepreneurship research, there has been a similar endeavor in defining and measuring venture performance.

In a given argument that calls for considering multiple dimensions of organizations' performance (Venkatraman & Ramanujam, 1986), there is not a universally accepted definition (either in conceptual or operational) for firm performance. In the entrepreneurship field, on the one hand, Cooper (1993) argued that the diversity of definitions on venture performance (consequently the diversity of performance measures) made for some difficulties in maintaining consistency across entrepreneurship studies. However, there was no consensus on the appropriate performance definition for ventures (Cooper, 1993). On the other hand, many entrepreneurship researchers were criticized for their conventional

research practices of selecting dependent variables for which information was easily collected (Wiklund, 1999). While acknowledging ongoing debates on the conceptual and operational definitions on venture performance, this dissertation adopted a definition from Rumelt (1987). Rumelt defined venture performance with a concept of "entrepreneurial rent," which is "the difference between a venture's ex post value (or payment stream) and the ex ante cost (or value) of the resources combined to form the venture" (Rumelt, 1987: p.143). Consequently, the definition of venture performance used throughout this dissertation is "present currency values of the difference between a venture's ex post value and the ex ante cost of resources input to the venture" (Rumelt, 1987).

The selection of appropriate measures for venture performance, which ultimately measures ventures' effectiveness and efficiency, is a critical concern (Robinson, 1999). In addition, the construct and face validity of the measure selected should be regarded as being imperative as well. In entrepreneurship studies, many researchers preferred to use growth measures because they assumed that growth measures are more accurate and reliable than profitability measures in the entrepreneurship area (Tsai, MacMillan, & Low, 1991). For instance, how much monetary profit a venture is able to create for its first couple of business years is not a top concern for the venture; instead, ventures usually place more weight on their survival or mid- or long-term business potential. Ventures are willing to sacrifice their short-term profitability to gain a long-term viability. For this reason, a measure for profitability was not regarded as an accurate measure for venture performance. Instead, two objective growth measures, sales growth

and growth in market share, are heavily adopted in entrepreneurship research (Zahra, 2000). On the other hand, there is an argument that profitability measures, such as ROE (return on equity), should not be neglected because they well represent how a firm effectively and efficiently deployed its resources to make a certain level of profit (Zahra, 2000).

The variable of venture performance is not a unidimensional concept, and it has very complicated underlying structures; so, venture performance should consider both growth and profitability measures (Zahra, 2000). Consequently, there should be enough efforts to integrate different dimensions and aspects of venture performance in entrepreneurship studies (Lumpkin & Dess, 1996). In addition, a selected measure should represent the conceptual definition of venture performance as well. In other words, measure should follow theory.

Origins of Venture Performance

Based upon the above surveys on the definitions and the measures of venture performance, the main issue, the origins of venture performance, was conceived. As discussed earlier, a focal concern both in strategy and entrepreneurship is why a firm/venture succeeds while others do not. This concern seems like a basic and bottom-line question, but pragmatically it is an imperative question for entrepreneurs and policy makers. Therefore, the key determinants of venture success have been sought not only by researchers, but also by practitioners. In their seminal work, Sandberg and Hofer (1987) proposed a comprehensive model of venture performance. While acknowledging two

different dimensions of venture performance, survival and success, Sandberg and Hofer (1987) asserted that the performance of a venture is a consequence of the combination of multiple factors that include (1) entrepreneurs, (2) venture strategy, and (3) industry structure. It means that entrepreneurs (founders), strategy (business domains), and structural positions within an industry are crucial determinants for venture performance. However, Chrisman, Bauerschmidt, and Hofer (1998) argued that Sandberg and Hofer's venture performance model is incomplete because the model does not fully take into consideration the roles of resources and organizational structures/processes/systems, which should be considered direct contributors for venture performance. In his review of venture performance literature, Bamford (1997) summarized four research streams of venture performance by adopting Gartner's (1985) new venture creation framework: individual-process-environments-organization; (1) the entrepreneurs, (2) the structure of the external environments, (3) the strategy pursued, and (4) the resource employed. Also, McGrath, Venkataraman, and MacMillan (1994) proposed another set of five different determinants for venture performance. They are (1) causal insights into the future, (2) founding team capability, (3) resource combination, (4) distinctive competencies (resources and capabilities), and (5) competitive advantage.

Accordingly, based, to a large extent, on the above literature on venture performance, it is theoretically reasonable to believe that there are five distinctive factors (determinants) to explain venture success and performance. They are (1) entrepreneurs (trait approach), (2) venture strategy (strategic scope approach), (3)

industry structure (industrial organization economic approach), (4) internal resources and capabilities (resource-based approach), and (5) venture population (ecological approach). Each of these five distinctive origins for venture performance will be discussed below.

Entrepreneurs and Venture Performance Among numerous seminal works in entrepreneurship research, the entrepreneurial process from Schumpeter (1934, 1950) provided an important underpinning for entrepreneurship study. Schumpeter defined an entrepreneur as a disequilibrator, who destructs the existing equilibrium status, and Schumpeter delimited the boundary of entrepreneurs to only persons who are able to exploit a set of innovations or who are able to locate untried (or unknown) existing technologies. In other words, Schumpeter (1934) regarded entrepreneurs as bearers of "creative destruction" in the stream of economic life. In line with the Schumpeterian approach, a research stream focusing on unique characteristics of successful entrepreneurs was proliferated (as known as entrepreneurial trait study). This trait study sought individual differences or distinctiveness, in terms of psychological traits, with normative implications from successful entrepreneurs (Bull & Willard, 1993; Van De Van, 1993).

The trait approach contributed in understanding the entrepreneurial process to a great extent. However, in its research results, the trait approach did not shown consistent empirical results; generally, this research stream provided at best fragmented and mixed results (Cooper & Gimeno-Gascon, 1992).

Consequently, academic efforts to identify idiosyncratic traits of successful entrepreneurs were unfortunately unsuccessful even though they provided some clinical implications. Based on literature, it is not reasonable to believe that there are universal demographic or psychological characteristics (or propensities) of successful entrepreneurs. Also, Gartner (1988) argued that the research emphasis in entrepreneurship should be on what the entrepreneurs do instead of defining who they are. In addition to Gartner's reorientation effort on entrepreneurship research, Venkataraman (1997) argued that "Economists do not define economics by defining the resource allocator, nor do sociologists define their subject matter by defining society. Likewise, it would be a mistake for us to define our field by defining the entrepreneurs" (1998: p. 120). Ultimately, however, it is an indisputable truth that a pool of human capital as a whole, not entrepreneurs only, is a key determinant of venture performance.

Venture Strategy and Venture Performance Another entrepreneurship research stream is about venture strategy. "Strategic posture" (Covin & Slevin, 1990), and "venture strategy content" (McDougall et al., 1992) have been used as different terminology for "venture strategy" (Sandberg & Hofer, 1987). These studies were focused on the effect of strategic behaviors of ventures on venture performance or venture survival. Some studies (Sandberg & Hofer, 1987; McDougall et al., 1992) adopted Porter's (1980) "generic strategy" types and/or Vesper's (1980) "entry wedges" and/or Miles and Snow's (1978) "strategy typology." Some other studies (e.g., Covin & Slevin, 1990) used either Miller and Friesen's (1982) "strategic

behaviors" or Maidique and Patch's "schemas" (e.g., Boeker, 1989). In general, however, venture strategies can be categorized into two broad entering strategies (McDougall, Covin, Robinson, & Herron, 1994): the narrow-entry (narrow-breadth) strategy and the broad-entry (broad-breadth) strategy.

The first one, the narrow-entry strategy, is similar to Porter's (1980) differentiated or focus strategy. To avoid direct and head-to-head competitions with existing firms, venture founders tend to attack a narrow and focused market with highly differentiated products or services (McDougall et al., 1994). This narrow-breadth strategy generally concentrates on localized business operation with the advantages of highly customized and unique products and services that do not require the advantage of large economies of scale. This type of entry strategy aims to tap a market neglected by existing firms (McDougall et al., 1994).

The other type of entry strategy, the broad-entry strategy, is an aggressive and wide-ranging one which is best represented by numerous target market segments and various types of products/services (McCann, 1991). This broad-breadth strategy usually requires a relatively large firm size, intensive capital, and high risk-taking attribution. Consequently, this broad-breadth strategy faces fierce structural or behavioral retaliations from incumbents simply because the followers of the broad-breadth strategy tend to penetrate markets dominated by incumbents. It seems that a broad-breadth strategy may encounter a relatively more complex and turbulent business environment than a narrow-breadth strategy would.

Therefore, a venture with a broad-breadth strategy is better represented by being relatively more proactive and having higher risk.

In addition to the breadth of entry in strategy typology for ventures, Carter and her colleagues (1994) added one more dimension, product/marketing emphasis, in framing an archetypal strategy for ventures. They used thirteen attributes of competitive strategy identified from previous studies (Dess & Davis, 1984; Hambrick, 1983), and they extracted six factors from the thirteen variables. With these six factors, they finally obtained six clusters, which represent strategic archetypes for ventures. They are "super achievers," "price competitors," "equivocators," "technology valuers," "niche purveyors," and "quality proponents." Consequently, this research stream of venture strategy emphasized strategic behaviors or conducts of ventures in identifying origins of venture performance.

Industry Structure and Venture Performance Industry structure as a determinant of firm performance initially emerged from an economics discipline (Bain, 1968). In this research stream, strategy research started to emphasize more scientific rigors both in theory building and research methodologies than did other research streams (Hoskisson et al., 1999). Strategy researchers who generally came from industrial organization economics (I/O economics) especially shifted their research paradigm to a more positivistic theory-generalization (Hoskisson et al., 1999).

I/O economics viewed environmental settings (e.g., industry structures), instead of the unique strengths of each firm, as a major determinant of competitive advantage, and consequently it emphasized industries or strategic groups as units of analysis rather than that of an enterprise or a firm (Bain, 1968; Porter, 1981). Based on the basic paradigm of I/O economics (Bain, 1968), that is, the structure - conduct - performance (S-C-P) paradigm, a firm's performance is a function of industry structures; in other words, the level of firm performance is determined by the firm's position in a industry, e.g., industry structure (Porter, 1981). Therefore, the major concern for a firm trying to obtain its competitive advantage in an industry is identifying a specific market domain (differentiation or focus) in which the firm is able to locate and establish its profitable position. Furthermore, through implicit collusions with other firms within an industry (or strategic group) and by building entry- and mobility-barriers to screen out potential new players, the configured performance of firms in an industry/strategic group can be maintained for a certain amount of time (Hoskisson et al., 1999; Porter, 1980).

Even though the theoretical and methodological contributions of I/O economics in strategy research were enormous, I/O economics cannot fully answer for a widely known strategic phenomenon, e.g., that certain firms still outperform others/competitors within an industry or a strategic group. This reality can be explained, to some extent, by the concept of hypercompetitive environments (D'Aveni, 1994) and multi-point competition (Chen, 1996; Gimeno, 1999). However, scholars in this strategy area have recognized that the

perspective of "outside-in" had theoretical limitations when explaining this fundamental phenomenon.

Internal Resources and Capabilities and Venture Performance The relationship between internal resources and venture performance can be explained by the resource-based view. A unifying theory of strategy, the resource-based view (RBV), has been promoted by many scholars (Penrose, 1959; Mahoney & Pandian, 1992; Wernerfelt, 1984; Wernerfelt, 1995). Wernerfelt's (1984) seminal work, "A resource-based view of the firm," and Barney's (1991) "Firm resource and sustained competitive advantage" formed a new stream of strategy research, the resource-based view. This RBV, however, received its theoretical background from early strategy researchers, such as Penrose (1959), Ansoff (1965), and Selznick (1957). The resource-based view emphasized intra-firm characteristics instead of industry structure, and it acknowledged a firm's distinctive competencies and heterogeneous capabilities, which are not easily transferable across firms (Mahoney & Pandian, 1992). Through this emphasis of idiosyncratic and firm-specific characteristics as critical determinants of firm performance, the resource-based view gave managers useful managerial insights to craft their firm values (Hambrick & Mason, 1984).

On the one hand, the resource-based view possessed a theoretical uniqueness in terms of answering the question of why firms are different and how firms achieve and sustain their competitive advantage in different ways (Hoskisson et al., 1999: p.437). On the other hand, the resource-based view

positively integrated three major strategy paradigms, (1) traditional business policy study, (2) the organizational economic view, and (3) the I/O economics view (Mahoney & Pandian, 1992). According to Mahoney and Pandian (1992), the resource-based view incorporated traditional views of strategy (policy); for instance, the distinctive competencies of heterogeneous firms (Selznick, 1957). Second, it also accommodated an organizational economics paradigm in that they are sharing notions of competitive processes as dynamic disequilibrium processes instead of static equilibrium approach of neoclassical economics theory (Penrose, 1959; Schumpeter, 1934). Finally, the resource-based view can be a complementary theory for I/O economics since it exclusively focuses on the internal aspects of a firm.

The resource-based view brought theoretical contributions into the strategy area in that it provided a possible answer for the questions of what really are sources of competitive advantage and why a firm differs from others. According to the resource-based view, idiosyncratic resources and capabilities are the only source for competitive advantage.

Ecological Environment and Venture Performance Ecological models of organization suggested relevant implications for venture survival and success (Low & MacMillan, 1988). While the trait approach had a micro perspective that takes a person, an entrepreneur, as a unit of analysis, the ecological approach broadened entrepreneurship study's unit of analysis to organizational populations (Van De Van, 1993). The ecological approach shifted its research focus onto

evolutionary variations and environmental selection perspectives in order to appropriately explain the birth and death rates of organizations (Van De Van, 1993). This ecological approach contributed to entrepreneurship research by answering for a basic question of which social and economic environments encourage/discourage venture creation (ventures' birth rates) or facilitate/deter survivals of ventures (ventures' death rates). Therefore, under this research stream, researchers addressed intra-population processes (e.g., organizational density), cooperative and competitive relationships between/among populations, and institutional factors (e.g., such as government regulations) (Aldrich, 1990; Hannan & Freeman, 1977). The central argument of the ecological approach was whether a firm within a population could swiftly recognize the environmental changes, and then promptly switch its strategic movement to accommodate the environmental changes (Hannan & Freeman, 1984).

An important aspect of the ecological approach was to provide an overall picture of the entrepreneurship process, and it rendered solid theoretical foundations to explain a source of entrepreneurial opportunities (e.g., organizational inertia as a source of entrepreneurial opportunity). However, it also had some limitations in explaining detailed variations of entrepreneurial activities because it ignored behaviors of each entrepreneur.

Limitations in the Prior Literature

The most obvious limitation in the prior literature on venture success and performance is the lack of a comprehensive framework that fills the gaps of

fragmented results on the venture success and performance research. For example, the variables of entrepreneurs showed incontinuous empirical results (Cooper & Gascon, 1992). Variables from I/O economics were criticized since the I/O variables were too deterministic or static to accommodate a dynamic change of environment (Porter, 1980). Population ecology contributed when describing and prescribing ventures' survival and failure rates, but it did not provide a good framework to explain the origins of individual firm's competitive advantage.

Recently many entrepreneurship scholars switched their research perspective from outside-in to inside-out to have a more comprehensive and prescriptive venture performance model, e.g., (Alvarez & Busenitz, 2001; Chrisman, Bauerschmidt, & Hofer, 1998; McGrath et al., 1994). For instance, scholars tried to discover firm-specific characteristics (e.g., resource and capability) that lead to a competitive advantage instead of "fitting" or "matching" contingencies to environments. Conceptually, the research trend seemed to appeal for both scholars and practitioners since it directly articulated reasons for variations of individual firm's performance. The inside-out perspective, e.g., the resource-based view, was widely supported because of its conceptual plausibility.

Second, compared to the absolute number of conceptual approaches in developing a venture success and performance framework, confirmatory and empirical studies were relatively rare. Particularly, not enough prescriptive studies were empirically tested.

Finally, there was a call for identifying a set of complementary theories to develop a more comprehensive and powerful model (Dyer & Singh, 1998). This

argument was in line with the first limitation discussed above (the lack of an overarching research model in the venture performance area). To address these limitations, this dissertation proposes a theoretical synthesis of multiple complementary theories. By doing so, a venture performance model, which is robust, comprehensive, and prescriptive, will be sought.

Summary

In this chapter, extensive literature on strategy and entrepreneurship was reviewed in order to explore the origins of venture performance. As a result, five different research streams of venture performance were identified from strategy and entrepreneurship literature. They were entrepreneurs, venture strategy, industry structure, internal resources and capabilities, and ecological environments. Each dimension of venture performance has its own way of depicting venture performance and contributes in explaining venture performance. Simultaneously, each dimension of venture performance determinants had its theoretical and empirical reservations as well. For this reason, there was a call for theoretical synthesis to compensate those theoretical reservations and to have a holistic picture of venture performance.

In summary, results of the literature survey were recapitulated as (1) the lack of a comprehensive framework to fill up the gaps of fragmented approaches, (2) the lack of confirmatory and empirical studies to address conceptually developed theories, and (3) the lack of inter-theoretical integration to develop a more broadened and powerful prescriptive model for venture performance.

In the next chapter, two complementary theories from the strategy, the resource-based view, and the social network theory will be explored and conceptually integrated to develop a more comprehensive research framework that depicts venture performance.

Chapter 3

Theoretical Framework

The Resource-based View

The resource-based view seeks to find the origin of firm success, e.g. competitive advantage, from intra-firm characteristics instead of firm-to-environment alignments (e.g., strategic fits) (Barney, 1991; Das & Teng, 2000; Wernerfelt, 1984). In other words, this view focuses on "the rents accruing to the owners of scarce firm-specific resources rather than the economic profits from product market positioning" (Teece, Pisano, & Shuen, 1997: p.513). Based on the resource-based view, a firm is configured by various sets of resources and capabilities that the firm possesses (Das & Teng, 2000). Wernerfelt (1984) articulated resources as a set of firm-specific tangible and intangible assets, which are strongly and tacitly tied to a firm. Ultimately the resource-based view regards a set of firm attributes, denoted as resources and capabilities, as major drivers of firm performance and competitive advantage.

The firm specific attributes may be specifically categorized into two different dimensions - resources and capabilities (Amit & Schoemaker, 1993). Capability is conceptually different from resource in that capability is a set of abilities needed to capitalize resources. It is a widely agreed upon notion that a firm's ability to own, deploy, and leverage specific resources is imperative in creating competitive values (Barney, 1991). However, a realistic difficulty exists in conceptually separating these two closely related concepts because there are no

created values (competitive advantages) if either resources or capabilities is absent. Therefore, a broader construct, which combines resources and capabilities together, may better represent major arguments of the supporters of the resource-based view. The central theme of the resource-based view may be reiterated as the following: in order to achieve competitive advantage, or so-called core competency, a firm should possess both resources and capabilities, not just or the other (Barney, 1991; Borch, Huse, & Senneseth, 1999). As such, there is no distinctive differentiation effort to separate the two constructs, resources and capabilities.

What are resources and capabilities? The definition of resource includes that of capability in many studies (Barney, 1991; Barney, 1996), but some researchers conceptually separate capability from resource (Amit & Schoemaker, 1993). For instance, Amit and Shoemaker (1993) argued that resources are things a firm possesses, including physical and invisible assets, and capability is a set of skills needed to take full advantage of the resources. Also, Leonard-Barton (1992) and Miller and Shamsie (1996) emphasized capability as a pool of knowledge, which is imperative in order to determine competitive advantage. On the other hand, Borch, Huse and Senneseth (1999) defined resources as broad super constructs that included assets, capabilities, routines, and knowledge. Also, Barney (1991; 1996) implied that the two terms are fully interchangeable in his several studies.

Even though scholars have, to some extent, different definitions and theoretical boundaries for resource and capability, the resource-based viewers shared a fundamental proposition, "a firm's internal resource and capability determine the level of competitive advantage (distinctive competence) of the firm in its competitive environments" (Barney, 1991; 1996). Accordingly, it is logical to rephrase that the distinctive competencies come from both resources and capabilities (not from only one of them) of a firm, which ultimately determine the overall competitive competence of the firm. For this reason, an integrated broad construct of resource, which conceptually includes that of capability, was adopted and used throughout this dissertation without a keen definitional distinction between resources and capabilities. As a consequence, the term, "resource," will be used as a comprehensive terminology that encompasses capability without a further reference in this dissertation. Therefore, the two terms, "resource" and "resource and capability," will be interchangeable without any difference in term of meanings. In some cases, however, "resource and capability" instead of "resource" will be used in contexts to avoid awkward wording situations. Also, in some cases, "resource and capability" will be used to clarify context and/or to minimize unnecessary confusions.

Theoretical assumptions of the resource-based view Environmental models of competitive advantage, e.g., I/O economics, assumed the homogeneity of strategically relevant resources within an industry or within a strategic group (Porter, 1985), known as the perfect mobility of resources across firms. The I/O

model acknowledged the existence of temporal resource heterogeneity among firms within an industry (or in a strategic group). This resource heterogeneity, however, is already a very short-lived industry phenomenon because resources that firms possess will be easily transferable through reasonably efficient factor markets (Barney, 1986), known as a market homogeneity.

On the other hand, resource-based theorists assumed that a firm's strategic resources that are stocked or accumulated inside the firm will not be easily transferred across firms. This means that barriers exist that deter perfect diffusions of resources across firms, and there is a characteristic of imperfect mobility of resources in nature – known as resource heterogeneity. Based on this logic, if a set of firm-specific resources, which are valuable to get a competitive advantage, can be exclusively secured by a firm for a longer period of time, that firm can sustain the competitive advantage for a longer period of time (Barney, 1991).

Types of resources Wernerfelt (1984) articulated the various types of resources as brand name, in-house knowledge of technology, employment of skilled personnel, trade contracts, machinery, efficient procedures, and financial capital. Barney (1991) attempted to frame resources with physical, human, and capital dimensions. Godfrey and Hill (1995) stated that the resource-based view regards a firm as a collection of heterogeneous resources or factors of production, which are physical resources (plant and equipment), human resources (managerial and technical staffs), and organizational routines (tools for coordinating physical and human resources). Teece and his colleagues (1997) categorized resources into

technological assets, complementary assets, financial assets, reputational assets, structural assets, institutional assets, market assets, and organizational boundaries. Miller and Shamsie (1996) suggested two different categories of resources: property-based resource and knowledge-based resource. Property-based resource is a bundle of resources that are protected by property rights. Thus, property rights control resource flows. Knowledge-based resource is a bundle of resources that are protected by knowledge barriers, e.g., learning processes, tacit skills, know-how, and technology. Miller and Shamsie also suggested two other dimensions of resources as well, (1) discrete resources, which are values independent from organizational contexts (stand-alone), e.g., technology, and (2) systematic resources, which have values as being a part of the systems of organization, e.g., teamwork of a coordinated team within a firm.

Resource-based view in entrepreneurship studies A new venture is created when the founder(s) successfully secures required resources for initiating a business and develops strategic ways for deploying the secured resources. Therefore, if an emerging venture has abundant resources upfront, the venture can be started more easily, and it has higher possibility to survive, grow fast, and make higher profits (Chandler & Hanks, 1994). An obvious research issue in entrepreneurship is the quest for "entrepreneurial rent," which is defined as "the difference between a venture's ex post value (or payment stream) and the ex ante cost (or value) of the resources combined to form the venture" (Rumelt, 1987: p.143). This entrepreneurial rent can be achieved by an effective and efficient

deployment strategy of resources secured by a venture. Alternatively, a combination of resources and capabilities that a venture accumulated inside is a key determinant of its success and growth. In fact, Chandler and Hank (1994) showed empirical evidence of the positive association between "the overall resource based capabilities" and "firm growth" and/or "business volume." Consequently, a venture's ability to survive or successfully compete with its competitors in a certain industry or in a market is to a large extent dependent upon the level and quality of the resources secured by the venture in order to carve its competitive position in the industry/market (Meyer, Alvarez, & Blasick, 1997).

Busenitz and Fiet (1999) especially examined the roles of intangible resources on venture outcomes. Venture outcomes were measured by four different types of venture exits, (1) out-of business, (2) still-private, (3) merged or acquired, and (4) Initial Public Offering (IPO). They classified intangible resources into (1) information capital, (2) human capital, and (3) organizational capital. They categorized information capital into two different types of information, general information and specific information (Busenitz & Fiet, 1999). General information, which makes a venture reduce rules and procedures, does not provide a basis for competitive advantage because it can be easily transferred to others. However, specific information, which involves people, timing, relationships, and special business situations, does provide a solid basis for competitive advantage because of its "stickiness" characteristic. The underlying assumption of this argument is that there is not an efficient enough market for information, and the cost of deal-specific information is enormous.

The next type of resource is human capital, which includes specific functional or career experiences, intuition or judgment, intelligence, education, personal or social networks, and so on (Busenitz & Fiet, 1999). Finally organizational capital is similar to Barney's (1991) construct of "organizational support." This organizational capital can be represented by organizational capabilities, but, specifically, it includes formal and informal reporting structures (or hierarchies), organizational tactics, sub-systems (e.g., control system), culture, and reputation (Busenitz & Fiet, 1999). Busenitz and Fiet (1999) found significant and strong positive relationships between these three types of resources and venture performance (positive venture exit).

Resources as a source of competitive advantage The value of resources can be defined as created or added values directly and/or indirectly from the set of tangible or intangible resources, and the values ultimately allow a firm to have a competitive advantage by obtaining strategic competence, e.g., either cost advantage or differentiation advantage in an industry (Porter, 1980, Barney & Wright, 1998, Wright & McMahan, 1992). The value of a resource is not the value of the superficial resource itself, e.g., the price of a specific resource in a factor market, but its transformed or carved values from a firm's resources with the firm's strategic activities. This argument is similar to the concept of distinctive competence (Selznick, 1957), which gives a firm abilities to identify and exploit opportunity in competitive environments (Snow & Hrebiniak, 1980). In order to have a distinctive competence, in the first place, a firm should evaluate

and appraise its current resources and capabilities, and then the acquisition of necessary resources and capabilities should be followed. Having or acquiring a set of valuable resources is a primary objective of a firm, and applying or deploying these secured resources and capabilities to sharpen its distinctive competence is a top priority in strategic decision making.

According to Barney and Wright (1998), the value of a firm's resources is a necessary, but not a sufficient, criterion for gaining and sustaining competitive advantage. Resource, which is valuable, but common in an industry, provides only competitive parity - normal profit. In other words, possessing a valuable resource just assures that the firm does not have a competitive disadvantage over its competitors. In order to achieve a competitive advantage in an industry or market, a firm should secure other competitive features of resources, which are (1) rareness, (2) inimitability of resource, and (3) organization-wide supports for the resources (Barney, 1991). Rareness can be defined as a valuable resource that is limited in supply with limited supplementary within the industry or market (Barney, 1991). Valuable and rare resources provide above-normal profits for the firm until other competitors copy the valuable and rare resources (temporary or short term competitive advantage). In this case, there is still a possibility for other competitors to imitate the rare resources. For instance, if competitors conceive that the rare resource of the focal firm is a critical success factor in the industry, they will definitely try to obtain (imitate) the resource. So, while competitors are looking for ways to achieve (imitate) the rare resource, the focal firm can enjoy above-normal profit. However, if a firm possesses a set of resources that is

valuable, rare, and not perfectly imitable as well, the firm is able to obtain and maintain competitive advantage over other competitors for a prolonged period of time, having a sustainable competitive advantage. Finally, in order for any characteristic of resources to provide a source of competitive advantage, a firm must be organized or supported to fully take advantage the resource. Alternatively, resources that are valuable, rare, and not perfectly imitable, can be a source of sustainable competitive advantage only if the firm as a whole is engineered and supported to effectively and efficiently capitalize these resources (Barney & Wright, 1998).

Conditions for sustaining the competitive advantage In the previous section, characteristics of resource that provide a firm a source of competitive advantage were discussed. In this section, more detailed theoretical explanations are given on a resource as a source of sustainable competitive advantage. In other words, mechanisms of why a specific bundle of resources provide a solid source of sustainable competitive advantage will be discussed.

First, firms with superior resources will earn Ricardian rents, which is defined as the difference in payments received by factors of the same "type" (Rumelt, 1987: p. 142) if the superior resources remained in limited supply in intermediate factor markets (Barney, 1986; Peteraf, 1993). A bundle of resources that is a source of competitive advantage is also organizationally "sticky" (Teece et al., 1997). According to Teece and his colleagues (1997), there are three reasons for why a bundle of valuable, rare, and inimitable resources is

organizationally "sticky" in nature. First, those resources have a unique development process (history), which is socially complex, within the focal organization; so, it is not easy to be analyzed or replicated in other organizational contexts. Second, traditional factor markets do not provide an appropriate trading place for those resources, e.g., knowledge. Lastly, even though certain parts of those resources could be achieved (purchased) by other competitors through factor markets, purchasers cannot easily and fully capitalize the purchased resources because of the inherited "causal ambiguity" of the adaptation process (Dierickx, Cool, & Barney, 1989) and the "path-dependence" attributes of those resources (Teece et al., 1997).

Merely having or securing a bundle of resources does not necessarily guarantee competitive advantage over a longer period of time. In order to sustain the above normal rents, appropriate endeavors for ex-post limits to competition are necessary (Barney, 1991; Peteraf, 1993). The ex-post limits to competition are efforts to build mobility barriers for resources across firms. In summary, in a given assumption that resource should be valuable, attributes of resources that lead to sustainable competitive advantage are (1) rareness and inimitability (Barney, 1991), (2) barriers to imitation (Mahoney & Pandian, 1992), (3) organizational stickiness (Teece et al., 1997), and (4) imperfect resource mobility (Dierickx et al., 1989). Godfrey and Hill (1995) reiterated the importance of socially embedded, unobservable, and tacit resources in acquiring and sustaining competitive advantage (Reed & DeFillippi, 1990). Also, they asserted that "the more unobservable a value resource, the higher are the barriers to imitation, and

the more sustainable will be a competitive advantage based upon that resource" (Godfrey & Hill, 1995: p. 523).

Rumelt (1987) provided a rationalization for this inimitability issue. In studying the locus of entrepreneurship, Rumelt defined entrepreneurial rent as "the difference between a venture's ex-post value and the ex-ante cost of the combined resource" (p. 143). Also, he articulated conditions for entrepreneurial rents, which are (1) socially efficient innovations, (2) power over buyers and sellers, and (3) isolating mechanisms. In particular, the "isolating mechanisms" protect entrepreneurial rents from imitative competition by building ex-post limits. In detail, those isolating mechanisms are (1) information impactedness (secrecy or tacit knowledge), (2) response lags (between recognition of advantages and its implementation), (3) economies of scale, (4) producer learning (accumulated experience or learning curve), (5) buyer switching cost, (6) reputation, (7) standardization, (8) buyer evaluation cost (limitation of buyers' rational evaluation on alternatives), and (9) advertising and channel crowding (Rumelt 1987). The isolating mechanisms are asymmetries between a focal venture and other competitors, which are "derived from information inequalities or the costs of creating and enforcing complex multiparty contingent contracts that make it increasingly costly for followers to duplicate an innovator's position" (Rumelt, 1987: p.147). Therefore, factors that deter resource mobility are both attributes of resources by nature, e.g., stickiness, and ex-post efforts of the firm, e.g., isolating mechanisms.

Resources as distinctive competence The research stream from the resource-based view is closely related to the theoretical concept of "distinctive competence" (Chandler & Hanks, 1994). Borch, Huse and Senneseth (1999) mentioned that strategy can achieve high performance only if the appropriate resources and distinctive competencies back up strategy. Teece, Pisano, and Shuen (1997) described the resource-based view as a paradigm of strategy that takes advantage of existing firm-specific resources and builds new capabilities. Teece and his colleagues (1997) regarded competitive advantage as a distinctive process (internal coordination and/or combining abilities), which is determined by the firm's resource position (portfolio of difficult-to-trade assets) and dynamic capabilities. Also, ultimately firm managers integrate, build, and reconfigure internal and external competencies to address a rapidly changing environment (Teece et al., 1997). By doing so, they expanded the resource-based view by adding roles of managers who can reconfigure both internal and external firm-specific capabilities.

Consequently, a distinctive competence can be regarded as a particular combination of firm-specific resources and capabilities that make an organization realize its strategic purpose (Teece et al., 1997). Along with classical assertion on distinctive competence, e.g., (Learned, Christensen, Andrews, & Gurth, 1969; Selznick, 1957), the resource-based view provided strategic implications of resource, capability, and their configurations within a firm to carve competitive advantage (Barney, 1991; Dierickx et al., 1989; Peteraf, 1993; Rumelt, 1987; Rumelt, 1991; Wernerfelt, 1984). Alternatively, a firm's distinctive competence

may be decomposed by strategic assets, a set of unique skills, complementary assets, dynamic capabilities, and business practices or routines (Leonard-Barton, 1992; Teece, et al., 1997; McGee & Peterson, 2000). Accordingly, the distinctive competence of a firm, which ultimately determines its competitive advantage, is constructed by a firm's resources, in broad terms. Again, in this research, it is assumed that (1) resource encompasses the classic definition of capability (Barney, 1991) and (2) the resource ultimately determines the distinctive competence of a firm.

The Limitations of the Resource-based View

Even though the resource-based view provides a robust theoretical rationale for sources of competitive advantage, the view still has conceptual and empirical reservations. First, since the resource-based view exclusively looks at intra-firm specific phenomenons, it excludes the possibility of critical resources that may reside outside of firms. The resource-based view defines and understands a firm with a bundle of resources. Consequently, this view limits its theoretical boundary strictly to resources within a firm, and ultimately the view assumes that resources within a firm create strategic values of the firm (Amit & Schoemaker, 1993; Barney, 1991; Eisenhardt & Martin, 2000; Wernerfelt, 1984). Some researchers even stated that the unit of analysis of the resource-based view is "resource and capability" instead of a firm (Fiet, 2000). Therefore, because of this extremely narrowed down unit of analysis and its isolated theoretical perspective limited to a firm, the resource-based view may ignore sociological

dynamics and inter-firm relationships of a focal firm in the context of competitive environments. In other words, the resource-based view stays out of contextual networks of a focal firm. Firms exist in the context of social environments, and a firm is not perfectly independent from its social environments.

A second issue is that the resource-based view ignores the process by which a firm obtains and secures valuable bundles of outside resources (Gulati, Nohria, & Zaheer, 2000). This resource-based view implicitly assumed that a firm develops and exploits its resources in certain ways, but there is no articulation about the streamlines of resource in-flows and/or out-flows (Gulati et al., 2000). In this regard, the resource-based view has a closed-system view.

A third issue is the growing concern and criticism about the resource-based view because of its definitional vagueness and tautological concerns (Eisenhardt & Martin, 2000). In particular, without well-understood categories (or dimensions) of resources and a clear idea of what is and what is not a resource, the theory becomes tautological – successful companies are successful because of their resources, and resources are defined as whatever makes a company successful.

Next, the resource-based view relatively lacks empirical supports in spite of its abundant conceptual works (Miller & Shamsie, 1996). Also, the conceptual and operational definitions about resources are inconsistent among prior studies (Miller & Shamsie, 1996; also refer to Barney & Arikan, 2001 to overview). It is not easy to conceive generalizible research implications by comparing and contrasting inconsistent empirical findings (Miller & Shamsie, 1996). Therefore,

there has been a call for consistent measures for a super construct, "resource," to generalize research findings (Miller & Shamsie, 1996).

Finally, so far, not many researchers have tried to expand the theoretical boundary of the resource-based view by adopting multiple theoretical paradigms when framing their research models, e.g., testing competing theories or complementary theories. By doing so, inherent drawbacks of the resource-based view may be overcome to large extent.

For these reasons, in this dissertation, the resource-based view is regarded as being theoretically not complete. This dissertation pursues (1) to empirically identify comprehensive and accurate dimensions of resources and (2) to broaden (expand) the boundary of the theory, equal to unit of analysis, to incorporate value-creating sources that may reside outside of firms.

From this viewpoint, social network theory, which focus its research interests on relationships embedded in a firm's set of social networks (e.g., suppliers, customers, competitors, or other entities), provides a solid complementary perspective into the resource-based view with respect to ventures' performance.

Social Network Theory

The resource-based view literature (e.g., Barney, 1991; Barney, 1996; Dierickx et al., 1989; Rumelt, 1987; Wernerfelt, 1984) focused on the internal aspects of a firm. However, it has focused less on social networks or relationships that bridge a focal firm and its outside identities. Recent studies showed that a

firm's position in inter-organizational networks influences firm conduct and ultimately firm performance (Ahuja, 2000). In the network literature, one of the most widely consented notions from scholars was that network relationships generate network resources – social capital, – and through the network resources, members exclusively take advantage of sharing those network resources and carving up combined skills and tacit-knowledge (Ahuja, 2000; Shan, Walker, & Kogut, 1994). Furthermore, a network contributes to effective and efficient knowledge-sharing channels (e.g., knowledge spillovers): the network is an information conduit (Ahuja, 2000). Gulati, Nohria, and Zaheer (2000) also argued that

> [S]trategic networks potentially provide a firm with access to information, resources, markets, and technologies: with advantages from learning, scale, and scope economies; and allow firms to achieve strategic objectives, such as sharing risks and outsourcing value-chain stages and organizational functions. (p.203)

From this viewpoint, personal or social networks of a firm bestow a set of "social capitals," and the social capital shared by network members provide them with a critical source for accurate and reliable information and resources. In addition, this social network theory addresses a dynamic process by which a firm obtains, reaches, shares, or creates a bundle of valuable and imperfectly imitable resources through its outside networks.

What is a network? A network is defined as "a firm's set of relationships, both horizontal and vertical, with other organizations – be they suppliers, customers, competitors, or other entities" (Gulati et al., 2000: p. 203). One obvious example of a network is a strategic alliance. In fact, strategic alliance is a popular business phenomenon, and many scholars in social network or inter-organizational relationship research have had keen interests in this business phenomenon (e.g., Dyer & Singh, 1998; Gulati, 1995; Kogut, 1988; Parkhe, 1993). A strategic alliance or joint venture, however, may be represented by its dyadic perspective (Gulati, 1998), but a social network is best represented by a bit broader scope than that of a strategic alliance or joint venture in that a social network includes alliance and/or joint venture partners, long-term buyer-supplier partnerships, and a host of inter-organizational ties as well (Gulati et al., 2000).

While many of the prior researchers on strategic alliance adopted a narrow dyadic perspective, the social network perspective used a broad relational system (network) in which players are embedded as its unit of analysis (Gulati et al., 2000). Gulati argued that "although strategic alliances are essentially dyadic exchanges, key precursors, processes, and outcomes associated with them can be defined and shaped by the social networks within which most firms are embedded" (Gulati, 1998: p. 295). By enlarging the boundary of an atomistic perspective, such as that of an alliance, into a social network level, researchers will be able to closely locate inherent propensities or inducement of inter-organizational relationships and to identify opportunities and constraints on established networks as well (Gulati et al., 2000).

Social Network theory as a complementary framework for the resource-based view There are three reasons for bringing the social network theory as a complementary theoretical framework for the resource-based view. These three assertions are not mutually exclusive, but they are innately related to each other. However, these three conceptual distinctions may be beneficial in understanding the overall role of social networks in the context of the resource-based view framework. The first argument is that the resource-based view strictly looked into intra-firm phenomenon, so the resource-based view ignored and overlooked the existence of critical resources residing outside firms; for instance, network resources or social capitals.

The second argument comes from a similar logic as the first argument: networks may be viewed as a gateway for exploring external opportunities and/or as an interface between firm specific constrains and outside alternatives that relieve the constrains. For instance, a firm seeks to be a member of networks because there are social benefits (e.g., gaining social legitimacy or gaining financial resources through networks).

The final argument is that networks provided an efficient and effective corridor for resource flows (Dierickx et al., 1989). A firm is not an independent system (a closed-system view) from its business contexts. A firm should be understood as a sub-element of a bigger system (an opened-system view). By doing so, channels for resource in- and out- flows can be recognized in a firm's business environments. Below, these three arguments will be discussed in depth,

especially from the perspective of ventures because this dissertation's research domain especially focuses on entrepreneurship.

Network as a tool for tapping outside resources A key role of entrepreneurs is to leverage or capitalize resources that are under their control. However, leveraging current resources is one of the most challenging entrepreneurial activities because leveraging resources often requires the entrepreneur to stretch his/her current resources. In detail, this resource stretching included enhancing deployment efficiency of the current resources and accessing the additional resources residing outside (Tiessen, 1997). Social networks of ventures provided important sources for borrowing resources from outside, and particularly inter-firm relationships via the social networks allowed ventures to access and obtain the resources needed, without sacrificing organizational flexibility (Tiessen, 1997). Gulati, Nohria, and Zaheer (2000) also mentioned strategic networks as a route of acquiring necessary external resources. Ventures need to find ways to complement their internal resource constraints (Larson, 1992), and then the accumulated and combined stocks of resources as a whole allow ventures to successfully tap and exploit market opportunities (Penrose, 1959; Yli-Renko, Autio, Sapienza, & Hay, 1999). Although the resource-based view provided a good theoretical foundation for identifying sources of sustainable competitive advantage (e.g., Barney, 1991; Peteraf, 1993; Wernerfelt, 1984), the view did not articulate the channels of resource acquisitions by a focal firm. For this reason, the social network theory yields a good theoretical complement for

the resource-based view, especially on the routes and channels of acquiring necessary resources from outside (Gulati, 1998; Yli-Renko et al., 1999).

Another benefit of maintaining a social network may be to enhance learning capabilities among network members. A venture's learning capability leads the venture to locate potential opportunities that could not be identified without well coordinated capabilities learned from its social networks. A venture can eventually realize the potential opportunities with (1) its initial resource and capability, (2) social capitals embedded in its networks, and (3) accumulated learning capabilities (Yli-Renko et al., 1999). The process of organizational learning from a venture's social networks should be viewed as a way of creating and accumulating organizational knowledge, and, via personal and social network activities, this learning capability can be enriched further (Gulati et al., 2000; Yli-Renko et al., 1999).

Networks as an inter-organizational resource endorsement (the strategic need of networks) Ventures inherently lack financial and social capital, so it is an imperative social process for entrepreneurs to seek necessary resources from outside. However, ventures, usually young and small firms, do not have enough abilities to access those necessary resources because of their innate limitations, e.g., liability of newness and lack of social legitimacy (Stinchcombe, 1965; Suchman, 1995). Ventures are likely to have high business risks, usually no track or performance records, and not enough social reputation or recognition. Consequently, they have inborn social vulnerabilities over seasoned firms. Also, Eisenhardt and Schoonhoven (1996) noticed that a venture needs to secure

enough initial stock of resources to access additional resources. In other words, a venture should be equipped with a certain level of social or institutional support and endorsement to successfully start and build its business up to the next phase. A venture cannot even achieve a necessary stock of resources upfront if the venture fails to have a certain form of supportive endorsement. Social networks and/or inter-organizational relationships (being a member of networks) render supportive endorsements that positively influence the perception, e.g., social image, of a venture. The actual valuation of a venture is determined not only by the potential of the venture itself, but also by the affiliates of the venture involved (Stuart, Hoang, & Hybels, 1999).

Another reason to be a member of social networks is found in Eisenhardt and Schoonhoven's study (1996). They argued that there are strategic factors that initiate cooperation among firms other than the classic notion of transaction cost efficiency. They provided two antecedents for inter-firm cooperation: a strategic need for cooperation and social opportunity for cooperation. In particular, there is a need for a cooperation when firms are in vulnerable strategic positions. Through a cooperation structure, known as a social network, critical resources, e.g., a set of managerial skills, financial resources, reputation, and social legitimacy, which improve a focal firm's strategic positions, can be brought into the firm. The alternative situation of cooperation is that only firms that already have strong social positions (e.g., large, well connected, and socially known), may have a social advantage to initiate and build cooperative relationships with others. In other words, only firms possessing strong social positions can actually capitalize

their assets to create cooperation opportunities (Eisenhardt & Schoonhoven, 1996; Galati et al, 2000). Either way, social networks of ventures are imperative in successfully launching and executing their strategies.

Networks as corridors for resource flow Dierickx, Cool, and Barney (1989) noted that there is a difference between resource stocks (e.g., reputation) and resource flows (e.g., advertising). According to them, while the resource stock has been accumulated inside a firm, the flow of resources can be understood by continuous efforts to expand critical stocks of existing resources (Dierickx et al., 1989). Thus, the flow of resources was viewed as a dynamic process of resource acquisition, which ensures that the stocks of resources do not become obsolete or dissolute (Chrisman, 1999; Dierickx et al., 1989). Dierickx, Cool, and Barney (1989) noticed the importance of both resource stock and the flow of resources in obtaining competitive advantages, but they pointed out that ultimately the resource stocks are key determinants for sustainable competitive advantages. On the one hand, by emphasizing stocks of resources, Dierickx, Cool and Barney (1989) provided a solid foundation for the resource-based view, e.g., the competitive advantage is a function of a bundle of venture resources. On the other hand, by separating the flows of resources from the stocks of resources, they provided a venue for a social network developed by a focal firm as a crucial corridor of resource flows.

Social networks should be viewed as a route for accessing appropriate and valuable resources outside of firm (e.g., resource flows). Firms that constantly and rapidly change face complex and uncertain environments, particularly in high-

tech areas like computer industry. In addition, this environmental turbulence is especially ubiquitous for ventures because, in general, many ventures emerge from unstable industries or an unstable market (Artz, Ireland, & Hitt, 1999). Handling the turbulent environments is a challenging task for entrepreneurs. Thus a venture's capability to respond to those turbulent environments is a critical factor that decides competitive advantage over other ventures and existing established firms. (Barney, 1991). For instance, in order to scan its business/market environments and properly respond to the enacted environment, a venture is required to obtain proper environmental information. To secure this proper information, the venture should be heavily involved in social networks.

Relational rent in a network Dyer and Singh (1998) argued that a firm's critical resources, which are a focal point of the resource-based view, may reside beyond the firm's boundaries. They also argued that idiosyncratic inter-firm-linkages are a source of relational rents. These rents are defined as "supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partners" (p. 662). In other words, a set of firms in a social network may combine or reconfigure members' existing resources in an idiosyncratic way, and these combined network resources, in turn, bestow competitive advantage of networked firms over others who reside outside the network.

Dyer and Singh (1998) noted four determinants of competitive advantage and relational rents in inter-firm linkages (being a member of a social network). They are (1) investment in relation-specific assets, (2) joint learning process via knowledge exchanges, (3) jointly created resources and capabilities and (4) effective governance systems over competitors' networks.

Investment in relation-specific assets Investment in relation-specific assets is the commitments from partners (or members of a social network). Thus, the members make "nonrecoverable investments" (Parkhe, 1993). By doing so, the members realize the overall effectiveness and efficiency of a network, e.g., (1) lower total value chain cost, (2) greater product differentiation, (3) fewer defects, and (4) faster product development cycles (Dyer & Singh, 1998). These nonrecoverable investments can be articulated by site specificity, physical asset specificity, and human asset specificity (Williamson, 1985; see Dyer & Singh, 1998 for more review: p. 662). Site specificity refers to location proximity, which renders efficient inventory and transportation arrangements. Physical asset specificity refers to transaction-specific investment that customizes processes fitting to specific exchanges. Human specificity refers to tailored know-how or knowledge among members of a network .

Dyer and Singh (1998) also suggested two sub-criteria that facilitate relational rents in the investment in relation-specific assets. They are (1) duration of safeguard, which means the history of a governance mechanism that prevents opportunism of members and (2) the volume of interfirm transactions. The greater the volume of interfirm transactions, the greater potential relational rents.

Joint learning process via knowledge exchanges With respect to the joint learning process, information and knowledge can be transferred or disseminated through social networks. Through this information and knowledge flow, network members may establish network routines that allow them to transfer, recombine, or recreate a set of specialized knowledge. With these collaborative knowledge exchange routines, members can not only share knowledge, but also enhance their organizational learning capabilities. However, this quest for knowledge exchange channels, in which members transfer or share knowledge of being "sticky," "complex," and difficult to "codify," is not a simple task for a focal firm, but it is a very challenging issue (Dyer & Singh, 1998; Szulanski, 1996). To address this concern, members should develop a partner-specific absorptive capacity, which refers to the exclusive ability of members to recognize knowledge from external sources (senders) and to assimilate through the recipient. In addition to the partner-specific absorptive capacity, a network should be equipped with a mechanism that encourages constructive knowledge- sharing or discourages free-riding (Dyer & Singh, 1998).

Jointly created resources and capabilities Jointly created resources and capabilities refer to network members' resource endowments by complementary resources. A complementary resource can be defined as a distinctive and combined network resource, which bestows a greater rent network as a whole than the sum of individual rents of network members. Alternatively, combined resources of network members can create a distinctive bundle of inter-firm resources and/or capabilities. This distinctive bundle of resources lead members

of a network to hold a stronger competitive position over non-network members. To realize this network benefit, a network should have an ability to identify and leverage potential complementarities. Complementarities are resources that have potential synergy effects when combined or reconfigured by network members. Also, in addition to, there should be organizational complementarities, which is the organizational compatibility of network members, to realize this network benefit.

Effective governance systems over competitors' networks Having an effective governance system over that of competitors or competitors' networks simply means preventing opportunistic behaviors of network members and encouraging network members positively engaged in value-creation initiatives. In order to generate relational rents, a "self-enforcing agreement and informal governance system" rooted in goodwill and trust/embeddedness is a superior form of governance system to "third-party involved agreement and formal governance system" that focuses on the legal contracts and economic incentives of each member.

According to Amit and his colleagues (1993), "network theory views the entrepreneurial process as embedded in a shifting network of continuing social relations that facilitate and constrain links between entrepreneurs, resources and opportunities. Networks have three characteristics, amount of resources within them, their diversity and their accessibility" (pp. 822-823).

Network structures Network structures can be depicted as (1) the number of network members, (2) the direct ties (or direct relationships of partners) maintained by members, (3) indirect ties of a focal firm (through these indirect ties, a focal firm can reach firms with which it does not make direct ties), and (4) structural holes (the degree to which a focal firm's partners are directly related to each other) (Seibert, Kraimer, & Liden, 2001). Social network theory has had two competing views concerning normative implications of network structures. The first view is the interconnected network perspective, which emphasizes the density of direct relationships among members, known as "closure" networks (Walker, Kogut, & Shan, 1997). The second view is the disconnected network perspective, which argues the importance of "structural holes" (Burt, 1992). Based on the former argument, an optimum network position, which maximizes advantages of resource sharing and of knowledge spillovers among members of the network, is the location of a network that has the most direct and dense linkages and connections among members, so called a densely embedded network (Walker et al., 1997). Thus, the more direct and/or indirect ties within a network, the more network benefits.

On the other hand, the latter argument involving the concept of structural holes suggested that an optimum network structure is the structure that maximizes the number of disconnections (structural holes) in a network (Burt, 1992). However, the bottom line of these two competing arguments is that the structural position of a focal firm within a network is a critical factor for determining efficiency and effectiveness of the network for the focal firm.

Hypotheses Development

Internal resource competence and IPO performance As discussed earlier, an internal resource is a comprehensive construct that can be represented by a pool of firm specific assets (both tangible and intangible), know-how, skills, and tacit knowledge. To define this super construct (internal resource), first of all, empirical evidences and implications of this construct on competitive advantage will be explored. Important dimensions of internal resource will be surveyed, and then, corresponding hypotheses to these conceptual dimensions of internal resource will be developed.

Penrose (1959) viewed a firm as a collection of various resources, and Wernerfelt (1984) and Barney (1991) articulated roles of resources in obtaining above-normal profits. Also, numerous conceptual studies emphasized intra-firm resources as key determinants of competitive advantage in an industry or a market (Barney, 1991; Barney, 1996; Chandler & Hanks, 1994; Dierickx et al., 1989; Godfrey & Hill, 1995; Leonard-Barton, 1992; Mahoney & Pandian, 1992; Miller & Shamsie, 1996).

Under the assumption of the heterogeneity of firm resources across an industry, which is backed by the assumption of the absence of efficient factor markets for resources (Barney, 1986; Dierickx et al., 1989), Barney (1991, 1996) argued that a set of firm specific resources become a distinctive competence that leads to sustainable competitive advantage. Barney proposed four major conditions of value creating resources, which are necessary components of

resources for obtaining sustainable competitive advantage: the resources should be valuable, rare in an industry, imperfectly imitable, and supported by the organization as a whole (Barney, 1991; 1996).

In search of predictors for venture performance, Cooper, Gimerno-Gasconn, and Woo (1994) found a positive association between four types of resources and ventures' survival and growth rates. The four types of intra-venture resource were (1) human capital, (2) management know-how, (3) industry know-how, and (4) financial capital. Greene, Brush, and Hart (1999) categorized resources with dimensions of (1) human resource, (2) social resource (valuable resource inflows via social networks), (3) organizational resource (organizational structures and information/knowledge), (4) physical resource, and (5) financial resources. Consequently, sub-dimensions of resources were defined from a rough distinction, e.g., tangible and intangible resource (Carter, Williams, & Reynolds, 1997), to a comprehensive classification, e.g., human resource, social resource, organizational resource, technological resource, financial resource, and physical resource (Borch et al., 1999; Cooper, Gimeno-Gascon, & Woo, 1994; Greene, Brush, & Hart, 1999).

According to the resource-based view literature, the dimensions of resource can be categorized into (1) internally accumulated know-how or specific tacit knowledge capital, (2) human capital, and (3) public capital. In this dissertation, the following four dimensions of resource were derived based on these three broad classifications of resources. They are (1) technology resource (know-how and knowledge based resource), (2) human resource (human capital),

(3) reputational resource (public capital), and (4) top management team (TMT) capability (tacit knowledge capital and human capital).

First, technology resource represents internally accumulated know-how or knowledge capital. This technology resource is an appropriate resource dimension especially in high-tech industry, which this dissertation is focusing on. Second, the human capital is operationally divided into two different dimensions, human resource and TMT resource. Human resource represents strategic values of human resource practices, and TMT resource is separately accentuated because founders' or entrepreneurs' entrepreneurial capabilities are critical in the initial stage of ventures. Finally, reputation resource is developed to determine the amount of public capital, which ultimately means the level of accrued reputation coming from public recognition through media. These four dimensions of internal resource are parsimonious and comprehensive enough to survey all aspects of internal resources.

In the strategy literature, (1) the fundamental of the resource-based view is that a firm's bundle of resources determines its competitive advantage and (2) the level of firm performance is frequently used as a proxy for competitive advantage, e.g., above-normal profit (Barney, 1991). Consequently, it is logical to propose that the strength of four resource dimensions, (1) technology resource, (2) human resource, (3) reputation resource, and (4) TMT resource, is positively related to IPO performance. As a result, the following overall proposition, proposition 1, regarding internal resource is espoused, and figure 3-1 graphically illustrates this proposition.

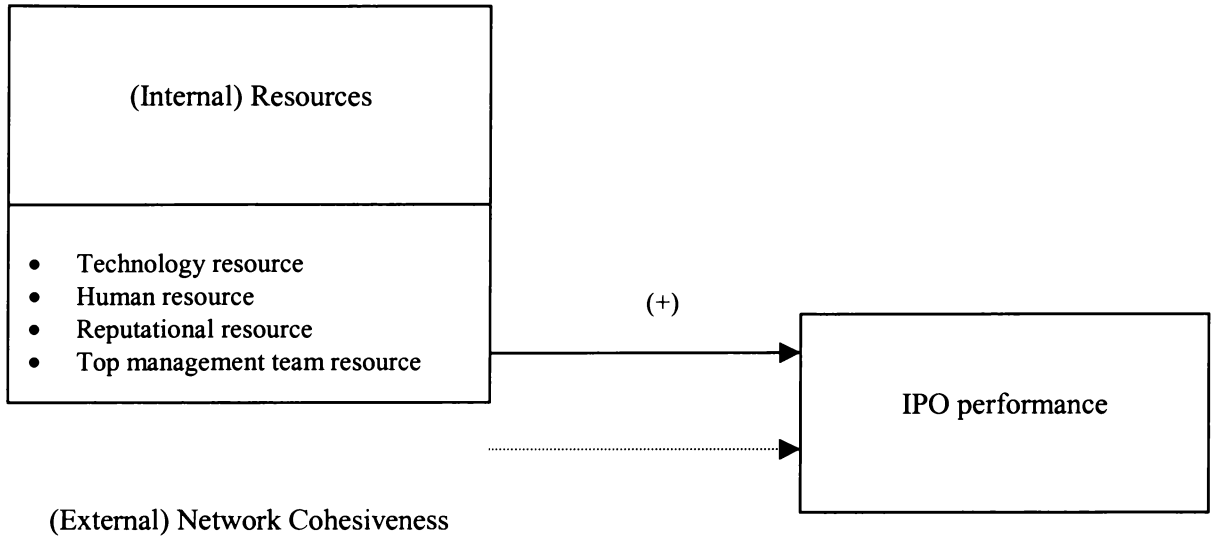

Figure 3-1

Proposition 1
The Relationship between Internal Resource and IPO performance

Proposition 1: The level of a venture's internal resource competence is positively related to post-IPO performance.

In order to develop testable hypotheses corresponding to proposition 1, the following hypotheses were developed. Each hypothesis represents a dimension of internal resource.

Technology resource The level of technology resource provides critical distinctive competence to a venture, especially for ventures in a high-tech industry. The endeavor and visible evidences to develop and secure key technologies/techniques are critical to demonstrate internal competence to outside stakeholders including potential investors. Success in a high-tech industry, such as a computer based or related product industry, in particular, is dependent upon the level of cutting-edge technology the venture possesses, due to the nature of highly complex and knowledge-based industry settings (Deeds, DeCarolis, & Coombs, 1999; Pisano, 1994).

The relationship between technology resource and performance also provided ample direct and indirect evidences to support an argument that technology resource competence is critical to venture performance.

For instance, Bloodgood, Sapienza, and Almeida (1996) asserted that a venture's investment to hold technology resources, e.g., research and development (R&D) spending, is a good proxy for potential innovation, a critical output for high-tech ventures. Deeds, Decarolis and Coombs (1997) also empirically proved that internal technology resources measured by R&D expenses are positively related to IPO value.

In addition to the R&D expenses, intellectual capital (e.g., patents, licenses, trademarks, and copyrights) also provides distinctive competence to the firm (Lee, Lee, & Pennings, 2001). In an industry that manufactures technology-based products and provides technology-oriented services to markets, it is nonsense for a focal firm to expect to outperform its competitors without having cutting-edge technology. Also, in terms of soliciting potential investors from the capital markets, e.g., IPO, the focal firm cannot convince potential investors if the firm solicits huge capital without proving to investors that the firm has technological competence in high-tech industries. Therefore, technology resource is a key distinctive competence that determines competitive advantage for high-tech firms.

Given theoretical expectation and empirical observations, the following hypothesis regarding technology resource and IPO performance is espoused.

Hypothesis 1a: The value of a venture's technology resource is positively associated with IPO performance.

Human resources Barney (1991;1996), Dierickx, Cool, and Barney (1989) and Teece, Pisano, and Shuen (1997) particularly stressed that human resources accumulated within a firm have causal ambiguity, so human resource has a strong path-dependent attribute. Thus, firm-specific human resource is not a subject to be easily imitated, and consequently valuable human resources can be a critical source of sustainable competitive advantage.

Welbourne and Andrews (1996) found that human resource management practices (HRM) enhance IPO performance, and Busenitz and Fiet (1999) found that human resource, which includes the repository of valuable and tacit knowledge, is positively related to the long-term value of a venture. Also, Miller and Shamsie (1996) noted that the knowledge-based resource, which is an output of human resource, enhances financial performance, and it was more sustainable to compare to the property-based resource in the context of rapidly changing industry environments.

These empirical results are plausible because investments in human resource (e.g., recruiting, training, maintaining, and supporting key employees) are essential in order to create a higher level of organizational outputs. In general, ventures preparing IPO usually have tightly scheduled organizational resources, and they do not have a lot of organizational slacks. This implies that a venture should have a tool that encourages and motivates employees' strong work commitments to maximize the utility function of limited human resource. Alternatively, there is a fervent need for stretching human resources to achieve organizational efficiency. Without enough endeavors to train, educate, and

coordinate its human resources, a venture cannot achieve this stretch in efficiently utilizing human resources. Finally, the ultimate goal of IPO is to bring additional capital into a venture. It is a natural tendency for potential investors to examine human resources or human resource management (HRM) practices of a focal firm before investing their money to a firm. Consequently, the following second hypothesis is derived.

Hypothesis 1b: The value of a venture's human resource is positively associated with post-IPO performance.

Reputational resources Reputation is an organizational resource that enhances public image, credibility, and legitimacy, in order to ultimately lead a firm to a favorable position in an industry. Thus, reputation resource is a source of competitive advantage, and it ultimately improves the profitability of a firm (Fombrun, 1996; Fombrun & Shanley, 1990). According to Fombrun (1996), reputation is "the perceptual representation of a company's past actions and future prospects that describes the firm's overall appeal to all its key constituents when compared to other leading rivals" (p.72). Fombrun and Shanley (1990) found a positive relationship between reputation and profitability. Hall (1993) argued that the reputation of a firm should be regarded as an invisible resource, and that it leads a firm to enjoy positional capability, which is a consequence of past actions. Therefore, reputational resource built within a firm is a source of distinctive competence.

There is no reason for customers to buy a product and service from relatively unknown or small and new firms if well-known and seasoned competitors providing the same products and services are available. Also, potential investors may have more skewed perceptions of a firm that has obvious and proven track records. Generally speaking, reputation resource mitigates "liability of newness" (Stinchcombe, 1965) to some extent, and the reputation resource contributes to brand equity and viability of a firm's offerings (Murphy & Smart, 2000).

In fact, there is a reversed logic about the casual relationship between reputation and firm performance as well: in reality, the accumulated competitive advantage of a firm leads the firm to enjoy a better reputation and more favorable firm image, instead of a good reputation being a basis for competitive advantage. However, appropriate efforts to obtain reputation (active reputation management), instead of the firm's absolute level of reputation (not a passive reputation status), obviously help to achieve competitive advantage. The bottom line argument is that a venture can get benefits, e.g., reduced liability of newness and enhanced public image, from this type of public capital. Consequently, the following hypothesis is formed.

Hypothesis 1c: The value of a venture's reputation resource is positively associated with post-IPO performance.

Top management team resource In general, the roles of entrepreneurs are substantial for ventures in terms of their initial strategy formulation, resource configurations and deployment, and strategic decision making. Firms preparing IPO are still relatively young and are generally still under the control of their founders. Therefore it is appropriate to assume that the top management teams of IPO firms includes founders (entrepreneurs).

In a broad terminology, top management team capability can be included in a dimension of human resource, but potential organizational influences of top management teams are practically and theoretically so important that they can be separated from the dimension of human resource. The more complete and powerful the top management team, the higher likelihood of having a competitive advantage. So, direct and indirect influences of top management teams for IPO firms are enormous.

In literature, Hambrick and Mason (1984) argued that a top management team (TMT) including a board of directors has great power to predict organizational output. They asserted that observable managerial characteristics of TMT, such as age, tenure, functional/educational background, and socioeconomic contexts of TMT members, are indicators of the firm's organizational output. In line with this argument, demographic and social characteristics of TMT members should be regarded as one of the most important dimensions of a valuable firm-specific resource. In their upper echelon theory, Finkelstein and Hambrick (1996) developed a prescriptive and normative research model that shows direct links between strategic leadership and organizational outputs. The framework

suggested how a firm can outperform other competitors by having strategic leaders (TMT). Eisenhardt and Schoonhoven (1990) showed that top management teams' size, experience, and heterogeneity positively influence venture growth. Also, Bloodgood, Sapienza, and Almeida (1996) viewed the capability of a top management team as a intangible resource stock, and they noted that the capability of a top management team is a key source of competitive advantage.

Based on the findings from previous studies, the demographic and social characteristics of TMT members, such as age, tenure, functional/educational background, socioeconomic contexts, and social status, contribute to competitive advantages of a firm. Alternatively those demographic and societal characteristics of TMT members are essential in rendering their managerial capabilities, e.g., managerial intuitions. Therefore, the managerial capability positively changes a firm's competitive position.

Thus, the following hypothesis is formed to test the relationship between top management team resource and IPO performance.

Hypothesis 1d: The level of a firm's top management resource is positively associated with IPO performance.

Network cohesiveness and IPO performance The previous hypotheses articulated the effects of resource competence on IPO performance. Those hypotheses primarily focused on intra-firm specific phenomenon. As discussed in the previous sections, however, the resource-based view is incomplete in that it

overlooks the possibility of critical resources residing outside of firms and ignores processes by which a firm obtains a bundle of resources. To complement these theoretical limitations of the resource-based view and to develop a more comprehensive competitive advantage framework in venture study, this dissertation adopted the social network theory as a complementary theoretical framework for the resource-based view (Ahuja, 2000; Eisenhardt & Schoonhoven, 1996; Gulati et al., 2000; Kogut, 1988).

By adopting a social network theory, the resources and capabilities residing outside of firms can be acknowledged and incorporated into this research model. Also, by adding the social network perspective, the integrated research model may provide appropriate answers for questions, such as which routes or channels are used to acquire required resources. Furthermore, this comprehensive research model may confer a good normative explanation to elucidate the reasons for ubiquitous phenomenons of relationship-oriented business practices among firms (e.g., strategic alliances or joint ventures).

The combination of two complementary theories provides a more complete picture of the determinants of venture performance. Since two theories have (1) different units of analysis, a firm (the resource-based view) and an embedded social network (social network theory), and (2) different levels of analysis, intra-structural level (the resource-based view) and social-psychological level (social network theory), there is an apparent theoretical advantage if these two theories are combined. In other words, neither the resource-based theory nor

social network theory alone sufficiently explains the variance of competitive advantage across firms.

A social network includes personal networks of top management teams, supply chains, strategic alliances, joint ventures, long-term buyer/seller relationships, and other official or unofficial relationships maintained by network members. In fact, through this socially embedded network, firms can exchange useful information, swap resources, share capabilities, and hedge risks (Zhao & Aram, 1995). Consequently, the social network, which emphasizes dynamic relationships among network members, generates "relational rents" for direct and indirect members (Dyer & Singh, 1998).

The social network theory provides great implications, especially in the venture area since social networks provide a venue for a fundamental entrepreneurial process, known as the identification and realization of untapped opportunities, through liaisons of social networks and/or relationships among network members (Bull & Willard, 1993).

Membership of a network, strengths or complexity of the network, and types of structural linkages (e.g., structural holes) represent the network structure as a whole. Given that these elements of network structure are key determinants of network resources, the relational rents generated by these network resources ultimately contribute to competitive advantage (Dyer & Singh, 1998; Gulati, 1995; Gulati et al., 2000; Kogut, 1988). Social networks provide a distinctive competence for network members that (1) generate innovation (Lipparini & Sobrero, 1994), (2) enhance the probability of survival (Westhead, 1995), (3)

provide social legitimacy (Aldrich & Fiol, 1994), and (4) supply necessary social capital (Greene et al., 1999).

Another dimension, which provides reasons for maintaining networks, is that young and small firms, such as ventures, may need to have strong affiliates in order to get favorable evaluations from outside stakeholders (Stuart et al., 1999). Because of the lack of objective and visible performance records, reputations, and social legitimacy, the overall quality or potential of ventures may not be easily observed by outside stakeholders. Achieving inter-network endorsements (organizational endorsements) through social networks is a way to visualize potential to outside stakeholders.

Consequently, in this dissertation, network cohesiveness is defined as a distinctive competence bestowed from network structures. Alternatively, network cohesiveness can be conceptualized as richness of a network in terms of density of network, strength and complexity, network endorsement, etc. Based on this definition, proposition 2 is developed. To address proposition 2, three specific testable hypotheses will be formed below. Also, figure 3-2 graphically illustrates proposition 2.

Proposition 2: A complementary relationship exists between internal resource competence and network cohesiveness which can predict IPO performance.

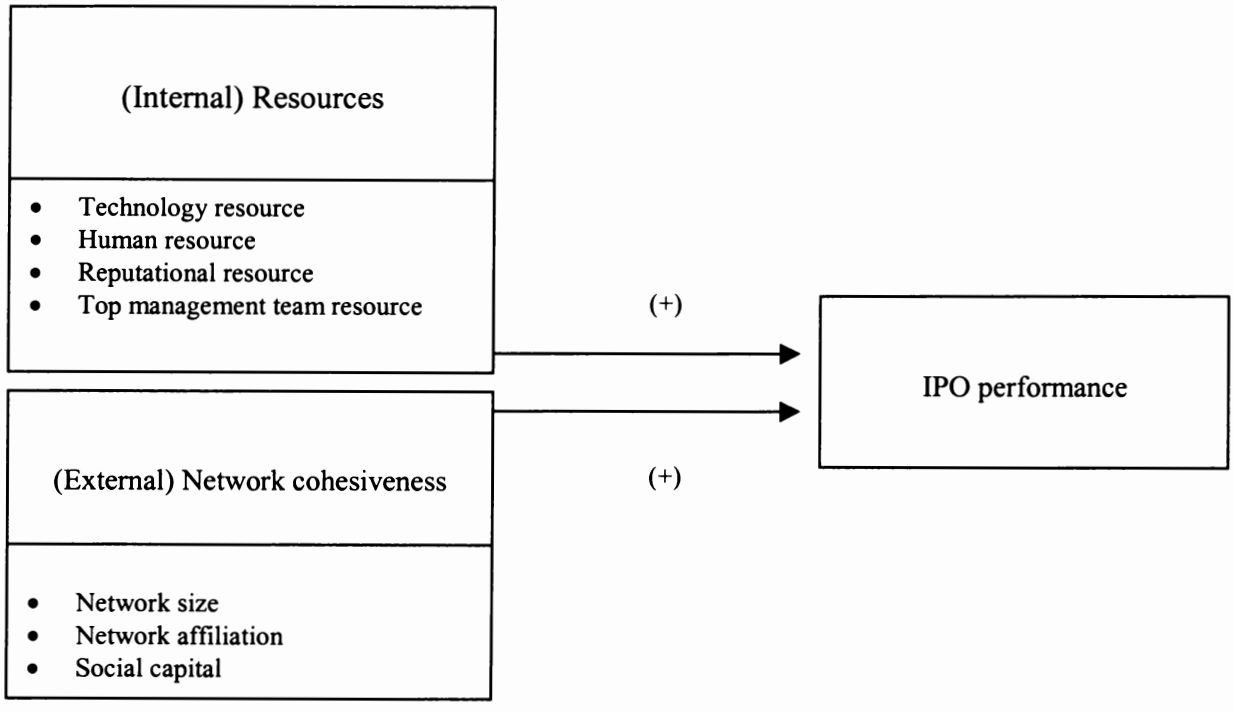

Figure 3-2

Proposition 2
Complementary Effects of Network Cohesiveness on IPO performance

Conceptually, both theories contributed to the prediction of IPO performance, but social network theory was adopted to predict variance in IPO performance above and beyond that explained by the constructs from the resource-based view. This integrated framework of two theories should yield superior explanatory power of IPO performance. Therefore, proposition 2 can be restated as follows:

Proposition 2': Given a venture's internal resource competence, the strength of network cohesiveness is positively associated with IPO performance.

For new ventures, having or maintaining a cohesive network is a way to achieve competitive advantage over others. This construct of network cohesiveness is divided into three sub-dimensions: network size, network affiliation, and social capital. The first dimension is a new venture's network size – the absolute amount of relationships of a focal venture within a network. The number of direct and/or indirect partners of a focal venture in a network influences the cohesiveness of its network (Ahuja, 2000; Shan et al., 1994). The second dimension is the network affiliation of a focal venture within its networks. Network affiliation can be conceptualized as the proactiveness of a focal firm toward its network through its top management team members. In other words, active interactions of TMT members in a network, such as a directorate interlocking system, also decide the cohesiveness of the venture's networks. The last dimension is social capital, which can be defined as socially approved

relational capital embedded in a network (Yli-Renko, Autio, & Sapienza, 2001). The conceptual boundary of social capital may be stretched to network benefits as a whole. However, in this research, the boundary of social capital is limited to "societal prestige coming from a specific tie to an outside institution." By having this societal prestige from a network tie, a firm can get not only direct economic benefit, but also social benefits, e.g., legitimacy. Consequently, this means that for ventures, (1) having a big network, (2) being an active member of networks, and (3) having prestigious network ties are critical success factors that determine venture performance.

Network size Network size can be defined as the number of relationships of a focal venture within a network. Therefore, a focal venture's network size can be decided by direct and indirect ties and the number of structural holes (Ahuja, 2000; Burt, 1992; Shan et al., 1994). Shan, Walker, and Kogut (1994) found that the number of collaborative relationships, the network size, was positively related to small firm performance. Also, Ahuja (2000) tested influences of the number of direct and indirect ties of a focal firm in its collaboration network on the level of innovation, and he found a positive association between direct and indirect ties and the level of innovation, but he did not confirm the positive influence of structural holes in collaborative networks on performance. Based on the previous empirical studies, it is reasonable to expect a positive relationship between network size and IPO performance within a given venture's internal resource

competence. Therefore, the following hypothesis regarding network size is espoused.

Hypothesis 2a: Given a venture's internal resource competence, the network size of the venture is positively associated with IPO performance

Network affiliation Network affiliation simply means the level of active interfaces with network members, such as the (1) TMT members' memberships in trade, professional, and/or social organizations (Ostgaard & Birley, 1994), (2) their frequency of seeking outside assistance or consulting (Chrisman & McMullan, 2000), and/or (3) directorate interlocking systems (Barringer & Harrison, 2000). The major difference between network size and network affiliation is the level of analysis. While the network size variable includes the firm level network, the network affiliation variable takes into account TMT members' personal level networks.

In line with Dierickx, Cool and Barney's (1989) concept of the "flows" of resources, entrepreneurs need to do active environmental scanning to bring more valuable information or knowledge into the ventures. Also, the resource dependency theory, which emphasizes TMT members' needs of environmental scanning to obtain appropriate resources, provided a good foundation for inter-organizational relationship study as well (Barringer & Harrison, 2000). In fact, outside affiliates can give a firm the opportunity to locate another set of networks,

to obtain routes for tacit and explicit knowledge, and to develop long-term survival capabilities (Chrisman & McMullan, 2000).

One significant influence of the entrepreneurial process is the interaction between insiders and outside affiliates (Carter, Gartner, & Reynolds, 1996). Also, there is a widely accepted notion that outside affiliates (e.g., public programs, private individuals, or venture capitalists) contribute to the venture process (Chrisman, 1999). In fact, Hustedde and Pulver (1992) asserted that, in an equity market, outside affiliates are an important factor in determining overall success in securing enough capital. In other words, there is a positive association expected between outside affiliates and venture performance (Chrisman, 1999; Chrisman, Hoy, & Robinson, 1987; Nahavandi & Chesteen, 1988). Through proactive contacts to networks, entrepreneurs make up for their limitations in terms of skill, knowledge, and resources/capabilities (Chrisman, 1999). Accordingly, in this dissertation, a large number of outside affiliates is another dimension that strengthens a venture's network cohesiveness. In summary, the second hypothesis tests the effects of a focal venture's network affiliation on IPO performance.

> **Hypothesis 2b**: Given a venture's internal resource competence, the network affiliation of the venture is positively associated with IPO performance

Social capital Finally, social capital, which can be defined as socially approved relational capital embedded in a network (Yli-Renko, Autio, &

Sapienza, 2001), is expected to have a positive influence on IPO performance. In the previous section, the roles and purposes of a social network were discussed. Stakeholders' strategic evaluation of ventures may strongly imply the importance of this social capital for emerging firms like IPO ventures. Stuart, Hoang, and Hybels (1999) asserted that the actual strategic value of ventures is determined not only by the potential of the venture itself, but also by the affiliates with which the venture is involved. Also, a venture may not obtain a necessary stock of resources upfront if the venture fails to secure a certain visual form of supportive endorsement from outside institutions (Eisenhardt & Schoonhoven, 1996). Therefore, a specific network tie with a prestigious outside institution will definitely have a positive influence on IPO performance in the form of a reduced level of "liability of newness" and the enhanced credibility from the prestige endorsement. Therefore, the following hypothesis can be developed to test this relationship.

Hypothesis 2c: Given a venture's internal resource competence, the social capital of the venture is positively associated with IPO performance

Moderating effects of network cohesiveness There are many different ways to test the complementary relationships of two constructs (e.g., moderating effects, mediating effects, or reciprocal causal relationships). The major argument for the complementary relationship of the resource-based view and the social

network theory in this dissertation is that both theories are necessary but separately insufficient to predict IPO performance.

A way to test this argument is to test joint effects of resource competence and network cohesiveness on IPO performance. Therefore, this dissertation will examine the moderating effects of an interaction term (resource competence × network cohesiveness) on the relationship between resource competence and IPO performance as well. The root of this logic is that the social network theory is adopted to resolve theoretical and empirical drawbacks of the resource-based view. Figure 3-3 visually illustrates this relationship.

> **Hypothesis 3**: The impact of resource competence on the IPO performance will be moderated by the network cohesiveness of a venture: the stronger network cohesiveness, the greater IPO performance from internal resource competence.

Summary

To address the overarching research question of this dissertation, this chapter reviewed two complementary theories, the resource-based view and the social network theory. These two theories are complementary because of their different units of analysis (a firm vs. a cluster of firms) and analytical directions (inside-out vs. outside-in).

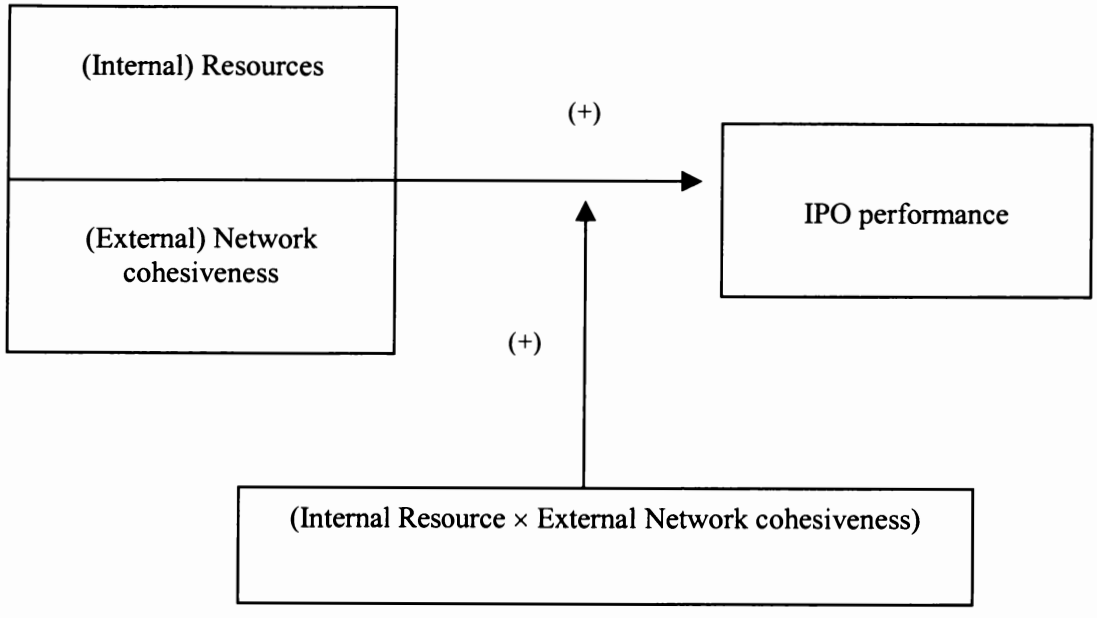

Figure 3-3

Hypothesis 3
Network Cohesiveness as a Moderator of the Internal Resource and IPO Performance Relationship

From the resource-based view, four major internal resource dimensions were identified. They were technology resource, human resource, reputation resource, and TMT resource. These four dimensions were plausible because these dimensions cover most of the important aspects developed from the resource-based view, and they had enough empirical relevance, especially in a high-tech industry, a target research domain of this dissertation. In spite of conceptual comprehensiveness of the four resource dimensions, the resource-based view undergoes its theoretically incompleteness critique due to its narrowed unit of analysis and conceptual vagueness. In order to address theoretical drawbacks of the resource-based view, social network theory was incorporated as a complementary theory in this dissertation.

Social network theory complements the resource-based view in that it expands the resource-based view's explanatory power by adding explanation powers from inter-organizational relationships. Also, the social network theory mitigated the static nature of the resource-based view by addressing the channels of resource inflow to ventures. Accordingly, the resource-based view becomes a more comprehensive and dynamic research framework by incorporating a complementary theory, the social network theory, into its theoretical boundary.

Two conceptual propositions and eight testable hypotheses including a moderating effect model were developed in this chapter. In the next chapter, methodological issues (e.g., samples, research design, and data collection processes of this dissertation) are addressed, and specific measurement issues (operationalization) will be discussed.

Chapter 4

Methodology

In the previous chapter, two complementary theories, the resource-based view and the social network theory, were surveyed to frame an IPO performance model of new ventures. Also, testable hypotheses based on two propositions were developed. In this chapter, research methodology including sampling, research design, data collection, and operationalization for variables, will be discussed. In addition, a statistical model validation process will be endeavored to examine generalizability of this research. First, population and target sample will be addressed, and then, all issues on methodology will be brought up and discussed.

Sample

This dissertation empirically tests two complementary theories, the resource-based view and the social network theory. While there have been proliferated conceptual works in the resource-based view, there have not been enough empirical studies due to difficulties in clarifying and developing measures for the key constructs from the resource-based view (Eisenhardt & Martin, 2000; Godfrey & Hill, 1995; Miller & Shamsie, 1996). According to Miller and Shamsie (1996), the resource-based view can be transited from a "view" to a "theory" if it successfully establishes a formulation of falsifiable propositions instead of evocative descriptions. There was a call for empirical studies to test the theory.

To address inherent drawbacks of the resource-based view in empirical research, Godfrey and Hill (1995) suggested the need of (1) replicated clinical studies, (2) large-sample econometric work, (3) longitudinal studies, (4) industry-bounded sampling, and (5) comparative studies that test complementary relationships between industry and firm-specific factors in performance variances. They articulated that "a firm is a natural laboratory in which the theoretical propositions of the RBV are already being tested" (Godfrey & Hill, 1995: p.530). Also, they argued that the challenges of researchers are to (1) select firms that are under similar environments (e.g., within an industry), (2) identify differences in regarding their resources, and (3) establish a link between differences in resources and capabilities and their persistence of performances (Godfrey & Hill, 1995).

To address the above methodological concerns and suggestions regarding empirical studies in the resource-based view, this dissertation narrowed down its sample into one environmental context, a computer based or related product and service industry. This industry included generally eight industry sections from the 3500 SIC index (3570, 3571, 3672, 3575, 3576, 3577, 3578, and 3579 in the four-digit SIC index) and ten industry sections from the 7300 SIC index (7370, 7371, 7372, 7373, 7374, 7375, 7376, 7277, 7378, and 7379 in the four-digit SIC index). The specific reasons for selecting this industry as a sampling target will be discussed in the following section.

Another important sampling issue in this dissertation is the boundary of ventures since the scope of this dissertation is the analysis of ventures or entrepreneurial firms, not the strategic conducts of large and seasoned

corporations. One way to define the boundary of a venture is obviously the ages of the firm. However, the age variable is not accurate enough to decide the maturity of a venture (Chrisman et al., 1998). The length of time for a venture to mature is heavily dependant upon industry, and strategy, etc. For this reason, in this dissertation, firms that are preparing to go through Initial Public Offering (IPO) are assumed and defined as ventures. Of course, this definition is not a generally accepted definition for venture, but this research adopted this definition because of multiple reasons, e.g., data availability and the strategic importance of IPO for ventures. Therefore, to accommodate these two sampling issues, (1) the need of consistent industry contexts in empirical studies for the resource-based view and (2) the issue of venture boundaries, the target sample of this research has been decided as firms undergoing their initial public sales of stock in the computer and computer related industry.

The sample of this research has a strategic importance in entrepreneurship research because an IPO is an imperative event for young and small firms (Deeds, Decarolis, & Coombs, 1997). By going public, a firm can trade its stock in capital markets, which tremendously improves the accessibility to capital markets and enhances the possibility of immediately infusing a significant amount of capital into the firm. In addition, an IPO event itself is a challenging strategic conduct of entrepreneurial firms. Consequently IPO does have a big strategic impact in the firm's business history, and an IPO sample is a meaningful research sample for entrepreneurs, policy makers, and scholars.

Computer Related Industry

As noted above, in this research, one industry setting was selected as a target sample: computer based or related product and service industry. This industry-bounded sampling method may minimize the possible cross-industry effects, which may lead to compounding effects in empirical studies. Also, this sampling method has a theoretical relevance in testing the resource-based view because the resource-based view does not assert the role of industry effects, but asserts firm-specific effects on the level of competitive advantages (Godfrey and Hill, 1995).

This industry (computer based or related product and service industry) is known for its rapidly changing technology and business environments (Eisenhardt, 1989). Generally, this industry includes (1) the information processing, (2) the packaged software development, and (3) the on-line communication related equipment sectors. This industry is known as one in which the competitive positions are determined largely by the level of technological innovation, knowledge capabilities, and inter-organizational arrangements (Deeds et al., 1999; Eisenhardt & Schoonhoven, 1996).

Three critical success factors in this industry should be noted. The first one is the importance of advanced technology. The speed of new technology adoptions and the fast cycle of decision making processes are key determinants for competitive advantage in this industry (Eisenhardt, 1989; Lawless & Anderson, 1996). The second factor concerns cooperation strategies. The industrial context of high-tech industry compels firms to cooperate or ally with

each other in order to share risks and costs for developing new technologies and for tapping new markets. The last industry characteristic is the emergence of social and economic importance for high-tech ventures. High-tech ventures provide a great deal of new employment opportunities and make twice as many product innovations as large high-tech firms, and these ventures carry a crucial role in commercializing technological innovations (Small Business Administration, 1999).

Consequently, the characteristics of internal resources and social networks (inter-organizational relationships) of ventures in this industry are key determinants for venture performance. Because of critical success factors and the social/economic importance of this industry, this industry setting is a relevant place to test hypotheses developed in this research. Finally, there is a methodological benefit, such as large performance variance of small and young ventures (Welbourne & Andrews, 1996), to conducting an empirical study in high-tech industry.

Sampling and Data Mining Processes

The initial population of this research was 732 firms that underwent IPOs in 1997. This number, 732, was inflated because it comprehensively (liberally) included all companies listed from two different data sources, The Wall Street Journal (WSJ) and an Internet based IPO database company, IPO Data System. Neither source was accurate because, in some cases, WSJ reported twice or did not report a specific IPO, and IPO Data System also made the same kind of errors.

Therefore, the initial population size (723) included all companies listed on WSJ or on IPO Data System. By maintaining this inflated initial population size, this research minimized the chance omitting an IPO that actually went IPO in 1997.

All IPO information about the 732 companies that underwent IPO in 1997 was collected. All the companies that did not actually undergo IPO in 1997 or were duplicated on a list dropped from the next data pool. This comprehensive population provided a good starting point for the next sampling process. Among these 732 IPO firms, all 150 firms from the target industry, computer based or related product and service industry, were finally selected as a sample of this research: 150 firms actually underwent their IPO in 1997 and were also a part of the computer based or related product and service industry. This final sample size was 20.5% out of the total IPO companies (732 IPOs) in 1997. Given that computer based or computer related industry is just a part of various types of industries, the sample size of this research (150 IPOs) is a big portion of the population.

Before finalizing the sample, one more step of the sample screening process was incorporated to maintain a homogenous sample and to satisfy the definition of venture. The first criterion used in this sample screening process was the exclusion of foreign IPOs. The foreign IPO represented IPO companies that were not U.S. based companies. In many cases, these companies had already underwent IPO in their home countries, and filed for U.S. IPO later on. To maintain a homogenous sample environment and to avoid unnecessary complications, such as the difficulty of applying an appropriate foreign exchange

rate in converting monetary and financial data, these foreign IPOs were excluded from the final sample. The second criterion was company age. Even though company age might not be the most accurate criterion to decide the maturity of firms (Chrisman et al., 1998), it is obvious that there is a significant difference between 5 year-old firms and 25 year-old companies regarding strategies, business practices, and financial slacks. For this reason, this research excluded IPO companies that were over 12 years old. Finally, firms that did not have enough data were purposefully eliminated after putting forth appropriate and diligent efforts to collect needed data. Therefore, upon careful consideration of 150 IPOs, 106 cases were finally retained and 44 cases of the original 150 cases were dropped from the sample for the above reasons.

With respect to identifying outliers (influential observations), this research reviewed data structures by various statistics, such as Cook's D, Rstudent, and Covariance Ratio from the SAS package and scrutinized histograms, normal Q-Q plots, and stem and leaf plots found in the "explore" option in the SPSS package. In selecting extreme outliers (influential observations), this research adopted a very conservative approach since outliers may reflect industry phenomenons as well. Fortunately there were only three extreme outliers if appropriate data treatments were taken, e.g., mathematic or econometric transformation. Therefore, 103 cases were finally retained in the sample for further analysis

Research Design

This research used archival data from the IPO prospectus, the Center for Research in Security Prices (CRSP), the WSJ, the US patent and trademark office, and PR News wires. Among the archival data sources, IPO prospectuses of samples were the primary data source in this dissertation. An IPO prospectus contains company history, management philosophy, products and services, operational issues, strategy, subjective industry analysis, articulation of current and potential competitors, financial statements including consolidated financial statements, employees, the top management team (TMT), governance systems (the board of directors), and so on. An IPO prospectus contains virtually every possible managerial aspect or profile of a venture because an IPO firm and its underwriters thoroughly prepare the prospectus since the first impression of potential investors can be decided by a prospectus.

To fully take advantage of this information-rich data source, data was collected by a two-step process, the coding scheme development phase and the coding phase. An independent coder had the major responsibility of coding items from the IPO prospectus and PR News wires, and the author of this manuscript was the major coder for rest of the data sources (CRSP, WSJ, US patent and trademark office, and PR News wires). However, two coders including the author of this manuscript were involved in all items for the first 12 cases in order to check inter-rater reliability. The inter-rater reliability was fairly high at approximately 90 percent. With respect to inter-rater reliability, there were four

possible techniques to overcome discrepant coding results. Bullock and Tubbs (1987) suggested using (1) one expert rater, (2) a modal score, (3) an average score, or (4) consensus ratings. In this dissertation, the fourth alternative, consensus rating, was adopted to resolve inter-rater discrepancy. After coding 12 cases, two coders identified sources of discrepancy, if any, and reached a consensus to adjust their coding anchors for the rest of the coding work.

In subsequent coding processes, the newly adjusted coding rules were applied by each coder. All coding schemes except a few variables, such as human resources, reputation resources, and network size, were straightforward information, so there was no serious inter-rater reliability issue involved. Also, to avoid cognitive confounding effects (bias) or post hoc rationalizations, the IPO performance variables were not coded until all independent variables were coded.

Coding schemes (items) were carefully constructed by the author. Most of the coding schemes were adopted from the previous studies (established items), but they were slightly modified to correctly capture the constructs developed this research. Another advantage of adopting established items was that there was not a serious concern about construct validity. The entire coding schemes (operationalization processes) will be illustrated in the following measurement sections.

Data Sources

As noted above, the primary data source was the IPO prospectus. Therefore, IPO prospectuses for the all target samples, "computer based or related

product and service ventures" that underwent their IPOs in 1997, were collected to be coded. Fortunately, the U.S. Securities and Exchange Commission (SEC) and the Lexis-Nexis database provided text-forms of IPO prospectuses for all firms. Thus, without directly contacting underwriters to request IPO prospectuses, the full versions of prospectuses of most cases were able be collected via the internet. In some cases, IPO prospectuses that could not be obtained via the internet were purchased from IPO Data System.

All data for calculating dependent variables were collected from IPO prospectuses and the CRSP database of 1997, and for control and independent variables, IPO prospectuses, the U.S. patent and trademark office (1965 – 1997), the WSJ (1996 – 1997), and PR News wires (1996 – 1997) were used. The following Table 4 – 1 summarizes data sources for this dissertation.

Operationalization

This section will describe each variables (items) that were used in the research model for this dissertation and will explain how those variables were operationalized.

IPO performance (Dependent variable) IPO performance is the dependent variable of this research, instead of the commonly used venture performances, e.g., (1) survival/failure rates or (2) growth rates (sales growth, employee growth, or asset growth) and (3) profitability and financial multiples, (Cooper et al., 1994; McGee & Dowling, 1994).

Table 4-1

Summarized Data Sources

Types of Variables	Constructs	Data Sources
Dependent variables (IPO performance)	Tobin's q	IPO prospectus and CRSP
Independent variables (Internal resource)	Technology resources	U.S. patent and trademark office
	Human resource	IPO prospectus
	Reputational resource	Wall Street Journal
	TMT capability	IPO prospectus
Independent variables (Network cohesiveness)	Network size	P.R. News wire
	Network affiliation	IPO prospectus
	Social capital	IPO prospectus
Others (Controls)	Organizational size	IPO prospectus
	Industry type	IPO prospectus
	Prior performance	IPO prospectus
	S&P 500	CRSP

Chandler and Hanks (1993) brought a couple of concerns in measuring venture performance. First, financial multiples, such as the return on asset (ROA) and the return on equity (ROE), may not be suitable to analyze a venture's performance because the multiples may be distorted due to relatively small amounts of initial physical assets or investments. Second, ventures, generally newly started firms, may follow erratic growth trends, such as enormous growth rates, so it is very hard to predict or statistically estimate their future status. Finally, it is practically impossible to get consistent longitudinal financial data through archival data sources, and there are potential biases for subjective (perceived) performance measures as well. For these reasons, a performance measure for ventures should be approached from multiple directions, and there is a call for a triangulated approach in order to establish relatively accurate and realizable performance measures.

Because this research is interested in IPO performance, a measure that reflects public assessment for an IPO from capital markets was especially considered. IPO firms were relatively young and new to the stock market, so the normally used profitability ratios in strategy research, such as the earning per share (EPS), abnormal return, and ROA, were not easily employed (Welbourne & Andrews, 1996). Therefore, this dissertation adopted another financial performance index, Tobin's q, which is the deviation between the market value of a firm and the replacement value of its assets (Schever & Ross, 1990; Welbourne & Andrews, 1996). Schever and Ross (1990) suggested that Tobin's q is highly correlated to other accounting measures of return, but it is a good measure for

indicating supra-normal profit in the long run. Also, this research used this measure because it represented the entrepreneurship theory very well. Rumelt (1987) defined entrepreneurial rent as "the difference between a venture's ex post value (or payment stream) and the ex ante cost (or value) of the resources combined to form the venture" (p.143). There is a good correlation between the two conceptual definitions of entrepreneurial rent and Tobin's q.

Tobin's q = a traditional measure of the perceived potential of a firm.

Schever and Ross (1990) suggested to calculate Tobin' q as

$$\frac{M_c - M_p + M_d}{A_g} \quad \text{.....(4.1)}$$

where:
M_c = Market value of common stock
M_p = Market value of preferred stock
M_d = Total value of outstanding debt
A_g = Cost of replacing assets

However, the A_g, the cost of replacing assets, is not easy to calculate. So, this research used another proxy for Tobin's q (Lang & Stulz, 1994; Powers, 2001), which is

$$\frac{TA - BVC + MVC - DT}{TA} \quad \text{.....(4.2)}$$

where:
TA = Total asset
BVC = Book value of common
MVC = Market value of common
DT = Deferred Taxes

In this formula, DT, deferred taxes, were immaterial in IPO firms, so DT was omitted in the final proxy. Therefore, the following is the final proxy for Tobin's q adopted in this research and the sources of raw data to calculate Tobin's q.

$$\frac{TA - BVC + MVC}{TA} \quad \text{.....(4.3)}$$

TA = Total assets from the "Pro forma as adjusted" statement in an IPO prospectus

BVC = Book value of common = total equity of shareholders = (sum of the par value + capital surplus + retained earning), and all of these raw data from the "Pro Forma as adjusted" statement in IPO prospectus

MVC = Market value of common = stock prices (the closing price of the first trading day and the closing price of the seventh trading day) × total number of outstanding stocks, and these data from the CRSP

As noted above, the data for calculating Tobin's q were collected from IPO prospectuses and CRSP, and Tobin's q was calculated during two intervals: (1) the initial return period (at the time of IPO) – the closing price of the first trading day and (2) seventh-day return period – the closing price of the seventh trading day. The purposes of two different measuring intervals are to accommodate (1) immediate reactions of investors (primarily institutional investors), (2) market reactions after a venture was traded, and (3) short-term underpricing bias of IPO stocks.

Internal resource competence (Independent variables) By definition and by nature of resource variables (Barney, 1991; Dierickx et al., 1989), the variables are not easily observable. In fact, if a set of valuable resources is easily observable, they can be easily copied or imitated by competitors. Then, the resources will be industry commodities, instead of an idiosyncratic set of determinants for competitive advantage: "the observation of the resource, in whatever degree, immediately erodes the height of the barrier to imitation" (Godfrey & Hill, 1995: p.523). The resource-based view assumed firm specific- and heterogeneous- resource characteristics, under the assumption of an imperfect/inefficient factor market and the existence of barriers to imitation (Godfrey & Hill, 1995). Thus, ultimately, the persistence of profit rate (the sustainable above-normal profit), π, is a function of the degree of unobservability (barriers to imitations) of resources and capabilities, Φ. Therefore, the dependent variable of normative strategy studies, performance or profit rate, is not easily measurable since Φ is not observable (Godfrey & Hill, 1995). For this reason, methodologically researchers have to find proper proxies for the degree of unobservability of resources, Φ (Godfrey & Hill, 1995). Alternatively, another mathematical function is needed to substitute the degree of unobservability of resources, Φ (Godfrey & Hill, 1995).

$\pi = f(\Phi)$
$\Phi = f\ (X_1, X_2, X_3, \text{---}\ X_n)$

"$X_1, X_2, X_3, \text{---}\ X_n$" are observable conditions (proxies) for Φ

Actually, Godfrey & Hill used this logic to explain X_1, X_2, X_3, --- X_n as proxies for determining the height of barriers to imitation, but, this research twisted this logic in a bit different direction. This research posited that, if solid and reliable dimensions of valuable and unobservable internal resources are identified, they can be regarded as good proxies for unobservability (Φ) of resources, X_1, X_2, X_3, --- X_n. In this dissertation, several proxies (variables) for unobservable resources were identified from literature (Chapter 3). They are (1) Technology resource (TR), (2) Human resource (HR), (3) Reputational resource (RR), and (4) TMT resource (MR). These four constructs were operationalized as follows.

1) **Technology resource (TR):** Many studies used total R&D expenditure or equivalent expenditures as a proxy for intangible technology assets (e.g., Deeds et al., 1997). Instead of total R&D expenditures, sometimes R&D expenditures as a percentage of total expenses or as a percentage of total sales (R&D intensity) were used (Bloodgood, Sapienza, & Almeida, 1996). Also, these proxies (R&D expenditure or R&D intensity) predicted firm success in terms of innovative activities very well (Bloodgood et al., 1996; Gamble, 2000). In this dissertation, however, technology resource was operationalized as the "total numbers of patents applied to US patent and trademark office as of the end of 1997," instead of R&D

expenditures or R&D intensity. The technology knowledge, know-how, and intellectual property confers viable competitive advantages to the focal firm since they are protected by tacit knowledge and/or intellectual property laws (Lee, Lee, & Pennings, 2001). Technology resources that are protected by law from imitation provide a focal firm with an exclusive ability to commercialize the resources. Therefore, the technology resource (TR) was measured as follows.

TR = The total number of patents applied to the U.S. patent and trademark office (as of the end of 1997).

2) **Human resource (HR):** Welbourne and Andrews (1996) used five items (dichotomies = 0 or 1) about human resource practices, and they used the sum of the items to measure the overall value of the human resource practices of an IPO firm. In this dissertation, four items from Welbourne and Andrews (1996) were used and slightly adjusted to measure human resource practices of a firm at the time of IPO, 1997. They were

(1) Whether the company's strategy and mission statement explicitly cited employees as a competitive advantage (yes = 1, no = 0).
(2) Whether the company mentions a specific training program for employees (yes = 1, no = 0)

(3) Whether at least one member of the board of directors with responsibility for human resource management or with human resource management experience is present (yes = 1, no = 0)

(4) Whether fulltime employees are regularly used (yes = 1, no = 0)

Consequently, the human resource (HR) was measured as follows.

HR = the sum of four indexes for human resource practices (range, 0 – 4).

Different from other variables, this construct required some subjective judgment from coders. For this reason, two coders were employed for the first 12 cases, and a cross-checking process for inter-rater reliability was intensively employed. All information for these variables were available from IPO prospectuses.

3) **Reputational resource (RR):** Reputational resource, which is achieved through a firm's reputation management endeavors or image management to public, can be a valuable intangible resource for an IPO firm (Fombrun & Shanley, 1990). In this dissertation, the reputational resource of each venture was measured by endorsement by a major medium, The Wall Street Journal. All articles for samples released from the WSJ for a 2 year-period (1996 – 1997) were

collected and coded by (1) total number of articles, (2) total number of positive (endorsing) articles, and (3) total number of negative (challenging) articles. The database of WSJ was accessible online through Dow Jones interactive. The time period of collected articles was chosen because the reputation stock and reputation management efforts can be accumulated. Thus, articles were collected from one year prior to the IPO year, 1996, to the year of IPO, 1997. Deephouse (1996) used the Janis-Fadner coefficient as a measure for media reputation. And the Janis-Fadner coefficient was calculated as following:

$$(e^2 - ec)/(t^2) \text{ if } e > c,$$
$$(ec - c^2)/(t^2) \text{ if } c > e,$$
$$0 \text{ if } e = c$$

where,

e= number of endorsing recording in given years,
c = number of challenging recording in given years

and

$$t = e + c$$

However, in this research, a more simplified measure for media reputation was adopted. It was the simple mathematical difference between the number of endorsing WSJ articles and challenging WSJ articles for the two year period (1996 – 1997). Therefore, the measure for reputational resource (RR) is as follows.

RR = (the number of total endorsing WSJ articles from 1996 to 1997) – (the number of total challenging WSJ articles from 1996 to 1997)

4) **TMT resource (MR):** Based on the upper echelon theory of Finkelstein and Hambrick (1996) and Hambrick and Mason (1984), demographic variables of TMT members were suggested to measure TMT resource. Bloodgood, Sapienza, and Almeida (1996) measured the capability of top management teams with work experience and the education level of directors. Eisenhardt and Schoonhoven (1990) measured the competence of top management teams with (1) joint experience (the ratio of "the number of executives who had worked with another executive for at least six months prior to joining the company" to "the total number of executives"), (2) team size, and (3) heterogeneity of industry experience. In summary, cognitive and demographic characteristics of TMT members shaped by individual TMT members' personal experience and value systems include (1) age (Pegels & Yang, 2000; Bantel, 1994; Wiersema & Bantel, 1992), (2) tenure (Finkelstein & Hambrick, 1990; Katz, 1982), (3) functional/educational background (Cohen & Levinthal, 1990; Govindarajan, 1989), (4) socioeconomic contexts of TMT members (Hambrick & Mason, 1984), and (5) heterogeneity of TMT members (Castanias & Helfat, 1991). In this research, however, among various dimensions of TMT resource variables, TMT age was selected as the

best proxy for TMT resource because (1) the age was the most central to demographic theory (Bantel, 1994) and (2) age has shown encouraging empirical results in TMT research areas (Pegels & Yang, 2000). In this regard, this research measured TMT resource by TMT youth (a reverse measure of TMT age). Therefore, TMT resource operationalizd by TMT youth (MR) was

MR = (the grand mean of average TMT members' age – average TMT members' age)

Network cohesiveness In addition to variables for measuring intra-firm specific resources, the research model of this dissertation has three inter-firm oriented, network cohesiveness variables. They are (1) network size, (2) network affiliation, and (3) social capital variables. These three variables were measured by (1) the total number of network ties – firm level (Ahuja, 2000; Shan et al., 1994), (2) the total number of outside companies served by a focal IPO firm's board members – individual TMT member level (Geletkanycz & Hambrick, 1997; Carter et al., 1996; Chrisman, 1999; Hustedde & Pulver, 1992), and (3) reputation rank of the lead underwriter in IPO, respectively (Carter, Dark, & Singh, 1998; Carter & Manaster, 1990; Rasheed, Datta, & Chinta, 1997). Generally, in the literature, four heavily tested aspects of social networks were size, strength of ties, density, and range of networks (Low & Abrahamson, 1997). Size was the number of total relationships in a network, and the strength of tie

was the frequency and intensity of contacts with other network members. Density was the ratio of the total number of relationships among the network members to all possible relationships. Finally the range was the diversity of network relationships.

In this dissertation, measures for network cohesiveness variables are not exactly the same as these frequently used measures for social networks. However, these measures have several similarities. A single item per each network cohesiveness variable (network size, network affiliation, and social capital) was selected after considering the parsimony principle and data availability.

5) **Network size (NS):** Network size is the amount of inter-firm relationships in which a focal venture is involved. In most network research, an ego-network questionnaire was usually adapted to measure network size, the number of weak ties, or the number of structural holes (Singh, Hills, Hybels, & Lumpkin, 1999). However, the data source of this dissertation was archival, PR News wires (1996 – 1997). Thus, the total number of alliance partners and all contractual agreements between the focal venture and external for-profit and non-profit organizations were counted and used as a proxy for network size at the time of IPO (Deeds et al., 1999). Therefore, the first network cohesiveness variable, network size (NS) was measured as follows.

NS = the total number of direct or indirect partners, which were mentioned in two years' of PR News wire articles (1996 – 1997). This number included the number of alliance partners, joint venture partners, channel partners, licensees, franchisers, and any specific long-term contract identities.

6) **Network affiliation (NA):** Network affiliation is the total number of personal ties of executive members' outside services. By maintaining external ties or inter-organizational relationships of its executives including board directors, an IPO firm can establish channels for information and resource inflow, reduce environmental uncertainty, and gain valuable managerial insights (Geletkanycz & Hambrick, 1997). External ties of executives included (1) outside directors serving on the board, (2) ties via professional associations, (3) TMT members' outside directorships or service, and (4) interlocking directorships (Geletkanycz & Hambrick, 1997). However, in this research, network affiliation (NA) was measured as

NA = the total number of outside companies in which a focal firm's TMT members served on the boards.

7) **Social capital (SC):** Social capital is a socially approved relational capital embedded in a network (Yli-Renko, Autio, & Sapienza, 2001).

There were various ways to access and internalize social capitals (Nahapiet & Ghoshal, 1998). In broad terms, the boundary of social capital can be expanded to network benefits as a whole. However, the concept of social capital in this research was limited to "a societal prestige coming from a specific tie to an outside institution." By having this societal prestige, the IPO firm is able to internalize the benefits of lowering the liability of newness and of increasing the possibility of economic benefit, e.g., the low chance of underpricing of IPO stocks (Carter & Dark, 1992). Roles of lead managers (underwriters) to represent, advertise, and syndicate all key IPO processes are imperative for IPO firms. Thus, investors' first impressions for an IPO firm may be affected by their general perceptions about IPO lead managers. In this regard, social capital (SC) of IPO firms was measured by lead managers' (lead underwriters) reputation rank from Riter's research (2001). Riter's reputation index was selected because (1) it was in line with the reputation indexes of Carter and Manster (1990) and Carter, Dark and Singh (1998), which are the most frequently used indexes and (2) it also had the updated list of underwriters. The information about lead managers was obtained from IPO prospectuses.

SC = a lead manager's reputation rank (0 – 9) from Riter's index.

Control variables To exclude the possible influences from exogenous variables, which were beyond the dissertation's interest, three control variables were used. They are (1) size, (2) prior performance, and (3) S&P 500. Other possible control variables were industry type and firm age. However, this dissertation already controlled industry effects by narrowing its sample to only one industry. Also, all samples were under twelve years old. Thus, these two possible control variables, industry and age, were not included. Finally, market growth effects were controlled by design through adopting prior performance as a control variable.

(1) **Size.** Size of an IPO firm was measured by total number of employees. In particular, the number of employees at the time of IPO (1997) was counted and used as a size variable.

(2) **Prior performance** In order to control possible confounding influences other than internal resource and network cohesiveness variables to IPO performance, net income of 1996 (prior year of IPO) was calculated and used as a control variable. In general, an IPO prospectus reports 2 to 5 prior years' financial statements. Therefore, this net income information was easily obtained from IPO prospectuses. As usual, many ventures including IPO firms do not have positive net income; so, in this dissertation, a dichotomy variable (0=negative net income of 1996, 1 = positive net income of 1996) was used to control prior performance.

(3) **S&P 500** In order to control capital market effects on IPO performance, the S&P 500 index for each case's IPO date was obtained from the CRSP database.

All variables and their operationalization are summarized in Table 4 – 2.

Data Analysis

In order to test hypotheses, multiple hierarchical regression models were developed. The following Table 4 – 3 illustrates the steps of the hierarchical regression in this research.

Model Validation

The sample of this research was not collected with a random sampling method. In fact, the 103 observations represented a virtual population, which includes all U.S. computer related IPO companies that underwent an IPO in 1997. In this regard, this research saw to it that the selected regression models were reasonable and generalizable onto other contexts by validating the selected regression models.

Table 4-2

The Summary Table for Operationalization

	VARIABLES	OPERATIONALIZATION
Dependent Variables	Tobin's q	$\frac{TA - BVC + MVC}{TA}$ TA = Total asset from "Pro forma as adjusted" statement in IPO prospectus BVC = Book value of common = total equity of shareholders = (sum of the par value + capital surplus + retained earning), from "Pro Forma as adjusted" statement in IPO prospectus MVC = Market value of common = stock prices (the closing price of the first trading day or the closing price of the seventh trading day) × total number of outstanding stocks
Independent Variables	Technology	The total number of patent applied to U.S. patent and trademark office as of the end of 1997
	Human resource	Welbourne and Andrews' (1996) four items about human resource practices
	Reputational resource	(The number of total endorsing WSJ articles for 1996 – 1997) – (the number of total challenging WSJ articles for 1996 – 1997)
	TMT age	(The grand mean of average TMT members' age – average age of TMT members)
	Network size	The total number of direct or indirect partners, which were specified in two years' articles of PR News wire (1996 – 1997)
	Network affiliation	The total number of outside companies served by a focal firm's TMT executive members including board members
	Social capital	A lead manager's (a lead underwriter) reputation rank (0 – 9) from Riter's index. The information about lead managers was obtained from IPO prospectuses
Control Variables	Size	The number of employees
	Prior performance	Net income
	S&P 500	S&P 500 index

Table 4-2

The Summary Table for Operationalization (Continued)

	VARIABLES	YEAR
Dependent Variable	Tobin's q	(1) Initial return period (2) Seventh return period
Independent Variables	Technology	As of 12/31/1997
	Human resource	At the time of IPO (1997)
	Reputational resource	1996 – 1997
	TMT age	At the time of IPO (1997)
	Network size	1996 – 1997
	Network affiliation	At the time of IPO (1997)
	Social capital	At the time of IPO (1997)
Control Variables	Size	At the time of IPO (1997)
	Prior performance	1996
	S&P 500	At the time of IPO

Table 4-3

Hierarchical Regression Analysis: Order of Variable Entry

Step	Category or Construct	Purpose
Step 1	Controls	Developing a base model
Step 2	Adding internal resource to Step 1	Testing hypothesis 1
Step 3	Adding network cohesiveness to Step 2	Testing hypothesis 2
Step 4	Adding the interaction term of internal resource and network cohesiveness to Step 3	Testing hypothesis 3 (moderating effects)

There are various methods to check the validity of models. For example, we could (1) collect new data to check the models developed, (2) compare between actual results and theoretical expectations, and (3) split the actual sample into two sub-sets of a "model-building" sample and a "holdout" sample to validate the models (Snee, 1997; Neter, Kutner, Nachtsheim, and Wasserman, 1996). In this research, the third method, the data splitting method, was adopted to validate the selected regression model. However, in subsequent hypothesis tests, theoretical comparisons between prior literatures and/or empirical results to regression results of this research will be carried out as well.

Selected regression model and data splitting As noted in the previous section, the following regression model was selected as a final fitted regression model for this research. The fitted regression model (selected) in this research is

$$Y = \beta_0 + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + \cdots\cdots + \beta_{10} \cdot X_{10} + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (4.4)$$

Where:

$\beta_0, \beta_1, \ldots\ldots, \beta_{p-1}$ = Parameters
X_1 = Organizational Size
X_2 = Prior Performance
X_3 = S&P 500 Index
X_4 = Technology Resource
X_5 = Human Resource
X_6 = Reputation Resource
X_7 = Top Management Resource
X_8 = Network Size
X_9 = Network Affiliation
X_{10} = Social Capital

To validate this fitted model, the sample of this research was divided into two different sub-samples. First, a "model-building" sample was chosen in which 60 cases out of 103 cases were randomly selected. As a result, the remaining 43 cases were automatically secured as a "holdout" sample.

Model validation process In the first phase, all pertinent regression statistics of the selected regression model (Table 4 – 4) in two different samples (model-building and holdout samples) were calculated. Then, In a given condition of different sample sizes (n = 60 in model-building and n = 43 in holdout), pertinent regression statistics of these two regression models were compared.

In the second phase, as a means of calibrating the predictive ability of the regression model developed from the model-building sample, the three particular regression statistics were calculated and reviewed. They were (1) t-test statistics of predicted errors, (2) the mean squared prediction error (MSPE) of the holdout sample, and (3) the mean squared error (MSE) of the model-building sample. These tests will be discussed below in detail. Ultimately, this research hypothesized that there is not a significant difference, in terms of predicting capabilities, of the selected regression model in two different samples.

Fitted regression models for two different samples Table 4 – 4 summarizes two regression results fitted in two different samples.

Table 4 – 4

Regression Results Based on Model-building and Holdout Samples

Statistics	Fitted Regression Model to Model-Building Sample (n=60)	Fitted Regression Model to Holdout Sample (n=43)
b_1	-.032	.075
b_2	-.029	-.368
b_3	-.002	-.192
b_4	.491	.362
b_5	-.080	-.127
b_6	.169	.113
b_7	.198	.330
b_8	-.048	-.446
b_9	.444	.277
b_{10}	.153	.380
SSE	73.218	45.513
MSE	1.703	1.686
Adjusted R^2	.620	.500

There was a relatively good agreement between the two sets of regression results. Of course, there was an obvious discrepancy in terms of the absolute amount of estimated regression coefficients and adjusted-R^2 between two regression models. However, after considering the difference of sample sizes, the table showed a fairly good agreement.

Also, all imperative independent variables ($b_4 - b_{10}$) of the two samples move in the same directions, and these two samples had close enough figures of sum of squares for error (SSE) and mean square of error (MSE). Therefore, it was cautiously concluded that the results of the selected regression model (4.4) fitted to both samples were well externally matched.

Test of predicted error If the developed model in the model-building sample was valid and had generalizable capacity, the model should have well explained the variance of the dependent variable (Tobin's q) in the holdout sample. Otherwise, the validity of the model developed in the model-building sample cannot be supported. In line with this logic, the regression model developed in the model-building sample was used to predict the dependent variable of the holdout sample. As noted in Table 4 – 4, the regression model developed in the model-building sample was as follows (by using unstandardized coefficients).

2.547 +
(-0.05335* Organizational Size) +
(-0.130* Prior Performance) +
(-0.00006899* S&P 500 Index) +
(0.09434* Technology Resource) +
(-.182 * Human Resource) +
(0.06112* Reputation Resource) +
(0.08697* TMT Resource) +
(-0.008300 * Network Size) +
(.159 * Network Affiliation) +
(.123 * Social Capital) ..... (4.5)

After plugging this regression model into the holdout sample to predict the holdout sample's dependent variable, the predicted errors (the difference between actual values and fitted values) were calculated. The predicted errors of the holdout sample based on the regression model developed in the model-building sample could be denoted as follows.

$$PE_{holdout} = Y_{holdout} - Y^*_{pv} \quad \text{.....(4.6)}$$

Where:
$PE_{holdout}$ is predicted errors
$Y_{holdout}$ is the value of the dependent variable in the holdout sample
Y^*_{pv} is the predicted value for the holdout sample based on the model-building sample

After calculating $PE_{holdout}$, one sample T-test on this value ($PE_{holdout}$) was done to test the null hypothesis (H_0: Mean of $PE_{holdout} = 0$). In this test, the null hypothesis was not rejected at $\alpha = .01$ level ($p > .9179$). Solely based on this one sample T-test result, the validity of the selected regression model was supported, and the

predictive ability of the regression model fitted from the model-building sample was statistically supported.

Test of mean squared prediction error (MSPE) and mean squared error (MSE) Another way to calibrate the predictive capacity of the regression model fitted from the model-building sample was to compare mean squared prediction error (MSPE) of the holdout sample to mean squared error (MSE) of model-building. MSPE of the holdout sample was calculated as follows.

$$\text{MSPE} = \frac{\sum_{i=1}^{n}(Y_i - Y^*_i)^2}{n} \quad \text{..... (4.7)}$$

Where:

Y_i is the value of the dependent variable in the $_i^{th}$ holdout sample

Y^*_i is the predicted value for the $_i^{th}$ holdout sample based on the model-building sample

n is the number of cases in the holdout sample

Based on equation (4.7), the MSPE was approximately 16.649. According to Table 4 – 4, the MSE of the fitted regression model in the model-building sample was 1.703. Given that there was a big difference in sample size, the discrepancy between these two values (16.649 and 1.677) might be viewed as immaterial. However, there should be extra consciousness in interpretation and generalization of results.

Based on these two phases of model validation process, the sample and the regression model of this research were validated. Consequently, there were good and valid evidences to generalize research results to other contexts.

Summary

In this chapter, research methodology was discussed. First, the population and the target sample used in this dissertation were documented. The population of this research was ventures that underwent IPO in 1997. Among those 732 ventures (the population), 103 IPO firms were finally selected as the target sample of the research. The samples were ventures that came from a computer based or related product and service industry. This industry-bounded sampling method was used to maintain homogeneity of samples and control cross-industry effects.

In data collection, this dissertation used all archival data. The primary data source was IPO prospectuses of samples. The U.S. patent trademark office, WSJ, CRSP, and PR News wires were also used to collect data that were not available from IPO prospectuses. The author and an independent coder had the major responsibility of coding these archival data by using the developed coding schemes. There was a carefully designed inter-rater reliability check. All items in the coding schemes were adopted from established items.

In this research, two time frames of IPO performance were collected, and the IPO performance was operationalized as Tobin's q. In the internal resource, four internal types of resources (technology resource, human resource, reputation resource, and TMT resource) were operationalized, and, in network cohesiveness, three characteristics of network cohesiveness (network size, network affiliations, and social capital) were operationalized. Also, venture size, prior performance, and S&P 500 were used as control variables. Finally, two different phases of the

model validation process were executed to test the validity of the research sample and research model.

Chapter 5

Results

Descriptive Statistics

To sketch out the structure of the sample of this research, descriptive statistics were summarized in Table 5 – 1. As can be seen, there were some significant inter-correlations among the variables. Some of them were actually expected and seemed logical, for example, a significant positive correlation between Tobin's q using the closing price of the first trading day (1st T) and using the closing price of the seventh trading day (7th T). However, significant high correlations among independent variables and control variables warranted a test for potential "multicollinearity" problems among the variables. Therefore, in the subsequent multiple regression models, appropriate collinearity statistics, such as variance inflation factors (VIF) were calculated and reviewed.

Specifically, one of the three control variables that was developed to exclude possible effects from exogenous variables other than independent variables, "organizational size," is significantly and highly correlated with the measures of "human resource," and "social capital" at .255 ($p < .01$) and .374 ($p < .01$) respectively. Another control variable, "prior performance" (actual $ value of net income of 96) had strong correlations with "reputation resource," "network size," and "network affiliation," at -.252 ($p < .05$), -.551 ($p < .01$), and -.316 ($p < .01$) respectively.

Table 5 – 1

Descriptive Statistics and Correlations
(N = 103)

	Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12
1	Tobin's q – 1st T	3.74	1.98	1											
2	Tobin's q – 7th T	3.76	2.04	.966**	1.										
3	Organizational size	235.95	462.33	.052	.034	1									
4	Prior performance	-2.29	9.04	-.132	-.140	.320**	1								
5	S&P 500 index	876.78	77.11	-.103	-.091	.197**	-.074	1							
6	Technology resource	2.69	9.12	.527**	.505**	-.059	-.060	-.016	1						
7	Human resource	2.03	.90	-.024	.001	.255**	.140	-.057	.082	1					
8	Reputational resource	4.42	4.90	.460**	.376**	.023	-.252*	-.120	.260**	.050	1				
9	TMT resource	45.66	4.72	.184	.169	-.078	-.058	-.030	-.070	-.057	.174	1			
10	Network size	6.79	12.14	.162	.157	.129	-.551**	.006	.017	.039	.368**	.053	1		
11	Network affiliation	4.63	5.21	.424**	.450**	.128	-.316**	-.074	.053	.055	.258**	-.173	.453**	1	
12	Social capital	5.88	2.68	.377**	.363**	.374**	-.080	.133	.218**	.289**	.278**	-.029	.320**	.278**	1

- $p < .05$; ** $p < .01$
- Organizational size: actual number of employees
- Prior performance: actual $ value of net income of 1996
- TMT resource: TMT youth (The grand mean of TMT members' age – Average age of TMT Members)

An interesting result from these descriptive statistics was the fairly independent relationship between the S&P 500 index and the other variables.

In fact, relatively high correlations between the market effect measure (the S&P 500) and dependent variables (Tobin's q) were expected since one of major factors in calculating Tobin's q in this research was closing prices of securities. Possible implications of this result will be discussed after reviewing further analyses.

Multicollinearity Check

Based on variance inflation factor (VIF) analyses, there was no need for concern with respect to multicollinearity in the all subsequent regression models. In most models (Model 1, 2, 3, and 4), the highest VIF score was 2.215, which was absolutely within acceptable parameters (Peng & Luo, 2000; Reuter & Leiblein, 2000; Werner & Lester, 2001). These VIF scores were within the acceptable ranges since they were below the rule-of-thumb cutoff of 10; so, multicollinearity was not judged to be a serious concern in this study (Reuter & Leiblein, 2000).

Test of Hypotheses

Control variables In this research, three different types of control variables were used to exclude the possible influences from exogenous variables other than independent variables of this research.

The control variables were organizational size, prior performance, and the S&P 500 Index. Both "company age" and "industry type" variables are frequently used control variables and were regarded as necessary control variables in this study. However, in its sampling process, this research already controlled the company age and industry effects by adopting two obvious sampling criteria, firms that were (1) less than 12 year old IPO firms and (2) in a computer based or related industry. So, these two possible exogenous variables were positively excluded in the sampling process. However, within the computer based or related industry, there was still a possibility of sub-industries effects; for example, hardware, software, and online and network industries. To rule out possible industry segment effects, the level of performance (Tobin's q) among these three possible sub-industries were compared by using ANOVA tests. As noted in Table 5 – 2 (Tobin's q with the closing price of the first trading day) and in Table 5 – 3 (Tobin's q with the closing price of the seventh trading day), the null hypotheses,

$$H_0: \mu_{Hardware} = \mu_{software} = \mu_{Online\ or\ network\ businesses}\ \text{of Tobin's q}$$

were not rejected at $\alpha = .01$ level. So, there was no significant difference among different sub-industries in regarding their performance (Tobin's q). Also, in Post Hoc Tests, in both cases (Table 5 – 2 and 5 –3), there was not a single sub-industry that was significantly different from other sub-industries with respect to its Tobin's q. In summary, it was reasonable to assume that there was not a sub-industry effect in subsequent analysis models.

Table 5 – 2

Difference among Industry Types in Tobin's q with the Closing Prices of the First Trading Day

Industry Types	Tobin's q (1st T)			
	N	Mean	Std. Dev.	Std. Error
Hardware Industry	24	3.7571	2.7706	.5655
Software Industry	40	3.9631	1.6270	.2573
Online Business or Network Business	39	3.5134	1.7502	.2803
Total	103	3.7449	1.9808	.1952

ANOVA Table

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.998	2	1.999	.505	.605
Within Groups	396.197	100	3.962		
Total	400.195	102			

Table 5 – 2

Difference among Industry Types in Tobin's q with the Closing Prices of the First Trading Day (Continued)

Post Hoc Test (Multiple Comparison)

Industry type (I) 1: Hardware 2: Software 3: Online Business or Network Business	Industry type (J) 1: Hardware 2: Software 3: Online Business or Network Business	Mean Difference (I-J)	Std. Error	Sig.
1.00	2.00	-.2060	.5139	.689
	3.00	.2437	.5164	.638
2.00	1.00	.2060	.5139	.689
	3.00	.4497	.4479	.318
3.00	1.00	-.2437	.5164	.638
	2.00	-.4497	.4479	.318

Table 5 – 3

Difference among Industry Types in Tobin's q with the Closing Price of Seventh Trading Day

Industry Types	Tobin's q (7th T)			
	N	Mean	Std. Dev.	Std. Error
Hardware Industry	24	3.6603	2.7656	.5645
Software Industry	40	3.9805	1.6210	.2563
Online Business or Network Business	39	3.5884	1.9271	.3086
Total	103	3.7574	2.0361	.2006

ANOVA Table

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.330	2	1.665	.397	.673
Within Groups	419.513	100	4.195		
Total	422.843	102			

Table 5 – 3

Difference among Industry Types in Tobin's q with the Closing Price of Seventh Trading Day (Continued)

Post Hoc Test (Multiple Comparison)

Industry type (I) 1: Hardware 2: Software 3: Online Business or Network Business	Industry type (J) 1: Hardware 2: Software 3: Online Business or Network Business	Mean Difference (I-J)	Std. Error	Sig.
1.00	2.00	-.3201	.5288	.546
	3.00	.07191	.5314	.893
2.00	1.00	.3201	.5288	.546
	3.00	.3920	.4609	.397
3.00	1.00	-.0719	.5314	.893
	2.00	-.3920	.4609	.397

Hypothesis testing The first phase regression model was ultimately for controlling possible exogenous effects of sources other than independent variables. Based on the summary of the first phase regression model – Model 1 (1st T) in Table 5 – 4 and Model 1 (7th T) in Table 5 – 5, there were significant effects ($F = 5.901$, $p < .01$ and $F = 4.460$, $p > .01$ respectively) in both time periods. Specifically, the "organizational size" variable ($t = 2.846$, $p < .01$ and $t = 2.472$, $p < .01$) had a positive association with both Model 1 (1st T) and Model 1 (7th T). Also, in Model 1 (1st T), both "prior performance" (dichotomy variable: 0 = negative prior performance or 1 = positive prior performance) and the "S&P 500" variables were negatively associated with IPO performance ($t = -3.581$, $p < .01$ and $t = -1.720$, $p < .01$ respectively). In Model 2 (7th T), however, only "prior performance" had a negative effect on IPO performance ($t = -3.131$, $p < .01$). These results (Model 1 (1st T) and Model 1 (7th T)) should be regarded as marginal regression results because of their relatively low Adjusted R-Squares (.139 and .102 respectively). However, it is safe to assert that there were significant contributions from the control variables on the dependent variables and that this Model 1 established a good foundation for further analyses.

Given the condition of having three control variables, each of four hypotheses under proposition 1 (resource-based view) and three hypotheses under proposition 2 (social network theory) were tested.

Table 5 – 4

Regression Models on Tobin's q with the Closing Price of the First Trading Day (1st T)
(N = 103)

Variables	Model 1 (1st T)			Model 2 (1st T)			Model 3 (1st T)		
	Beta	t	sig.	Beta	t	sig.	Beta	t	sig.
Organizational Size	.292	2.846	***	.230	2.580	**	.046	.469	
Prior Performance	-.365	-3.581	***	-.192	-2.204	**	-.150	-1.923	*
S&P 500 Index	-.169	-1.720	***	-.108	-1.330		-.079	-1.132	
Technology Resource				.462	5.588	***	.428	5.861	***
Human Resource				-.071	-.814		-.097	-1.309	
Reputation Resource				.224	2.581	**	.164	2.105	**
TMT Resource				.175	2.182	**	.264	3.762	***
Network Size							-.241	-2.889	***
Network Affiliation							.423	5.153	***
Social Capital							.220	2.237	**
Institutional Resource (RF1)									
Capability Resource (RF2)									
Network (NF)									
RF 1 × NF									
RF 2 × NF									
Adjusted R-Square	.139			.447			.602		
F	5.901	***		11.487	***		14.781	***	
Adj. R-Square Change				.308	***		.155	***	

* p < .1; ** p < .05; *** p < .01

Table 5 – 5

Regression Models on Tobin's q with the Closing Price of the Seventh Trading Day (7th T)
(N = 103)

Variables	Model 1 (7th T)			Model 2 (7th T)			Model 3 (7th T)		
	Beta	t	sig.	Beta	t	sig.	Beta	t	sig.
Organizational Size	.259	2.472	**	.206	2.141	**	-.004	-.036	
Prior Performance	-.326	-3.131	***	-.183	-1.936	*	-.122	-1.467	
S&P 500 Index	-.146	-1.455		-.095	-1.083		-.060	-.808	
Technology Resource				.458	5.121	***	.428	5.519	***
Human Resource				-.036	-.381		-.065	-.823	
Reputation Resource				.137	1.467		.060	.724	
TMT Resource				.179	2.063	**	.282	3.770	***
Network Size							-.232	-2.622	***
Network Affiliation							.486	5.574	***
Social Capital							.228	2.186	**
Institutional Resource (RF1)									
Capability Resource (RF2)									
Network (NF)									
RF 1 × NF									
RF 2 × NF									
Adjusted R-Square	.102			.353			.551		
F	4.460	***		8.078	***		12.171	***	
Adj. R-Square Change				.251	***		.198	***	

* p < .1; ** p < .05; *** p < .01

Also, hypothesis 3, which posited moderating effects of network cohesiveness on the relationship between internal resources and IPO performance, was tested in the fourth phase of the regression model.

Specifically, Proposition 1 proposed positive relationships between an IPO firm's internal resources and its IPO performance (Model 2s). Proposition 2 articulated the positive relationship between network cohesiveness and IPO performance above and beyond the effects of IPO firms' internal resources on IPO performance. The method adopted to test three hypotheses from Proposition 2 was the classical hierarchical regression model (Model 3s).

By calculating the change of R^2 and F values above and beyond Model 2s, the level of contribution of network cohesiveness variables on IPO performance were tested. Finally hypothesis 3, which proposed the possible moderating effects of network cohesiveness on the relationship between internal resource and IPO performance, was tested (Model 4s).

Hypothesis 1 Tables 5 – 4 and 5 – 5 summarized the results of all hierarchical regression models. In the two tables, Model 2 (1st T) and Model 2 (7th T) showed results from testing hypotheses 1a through 1d. The results generally indicated that the depth and range of internal resources for IPO firms was positively associated with IPO performances of two different time frames, after considering various control variables. Specifically, hypothesis 1a was strongly supported in two different time frames of IPO performance ($t = 5.588$, $p < .01$ and $t = 5.121$, $p < .01$ respectively). Hypothesis 1b, which hypothesized a positive

association between "human resource" and IPO performance was supported in neither of the two different time frames of IPO performance at the $\alpha = .1$ level ($t = -.814$, $p = .418$ and $t = -.381$, $p = .704$ respectively).

Hypothesis 1c, which articulated a positive association between "reputation resource" and IPO performance, was strongly supported in Model 2 (1st T) ($t = 2.581$, $p < .05$), but not in Model 2 (7th T) ($t = 1.467$, $p = .146$). Finally hypothesis 1d, which posited a positive relationship between "top management team (TMT) resource" and IPO performance, was strongly supported in the both measures of IPO performances ($t = 2.182$, $p < .05$ and $t = 2.063$, $p < .05$). With respect to overall explanation powers, such as Adjusted R-squares, regression coefficients, and model robustness, the second phase regression models, Model 2 (1st T) and Model 2 (7th T), indicated fairly strong support across variables from the resource-based view. Three of four hypotheses (1a, 1c, and 1d) regarding the relationships between the competence of internal resource and IPO performance were supported.

In addition, the Adjusted R^2 of the second phase regression models, Model 2 (1st T) and Model 2 (7th T), were significantly increased from Model 1 (1st T) and Model 1 (7th T) after adding the four variables of the resource-based view (ΔAdj. $R^2 = .308$, $p < .01$; ΔAdj. $R^2 = .251$, $p < .01$ respectively). Therefore, it was concluded that IPO firms' internal resources appeared to have important influences on IPO performance.

Hypothesis 2 As noted above, the third step of hierarchical regression was employed to test hypotheses under Proposition 2. Model 3 (1st T) and Model 3 (7th T) in Table 5 – 4 and Table 5 –5 indicated the results of the regression models for both time frames of IPO performances. With respect to complementary roles of "network cohesiveness" in given internal resources, the changes in Adjusted R^2 in both regression models, Model 3 (1st T) and Model 3 (7th T), in Table 5 – 4 and Table 5 – 5 strongly supported the positive complementary roles of "network cohesiveness" (ΔAdj. $R^2 = .155$, $p < .01$; ΔAdj. $R^2 = 198$, $p < .01$ respectively). In other words, "network cohesiveness" variables contributed to IPO performance well beyond that of internal resources, such as technology, human, reputation, and TMT resources.

Specifically, "network size" was significantly but negatively related to both time frames of IPO performances ($t = -2.889$, $p < .01$; $t = -2.622$, $p < .01$ respectively). In testing hypothesis 2a, statistically significant evidence of a reverse prediction was found. Next, "network affiliation" was significantly and positively related to both time frames of IPO performances ($t = 5.132$, $p < .01$; $t = 5.574$, $p < .01$ respectively). These results strongly supported hypothesis 2b. Finally, the relationships between "social capital" and both time frames of IPO performances were found to have positive associations ($t = 2.237$, $p < .05$; $t = 2.186$, $p < .05$). Therefore, hypothesis 2c was also supported by this data.

With the method employing classical hierarchical regression models, Model 3 (1st T) and Model 3 (7th T), it was concluded that there are significant effects of "network cohesiveness" variables on IPO performance; and network

cohesiveness variables positively and significantly complemented the relationship between internal resource variables and IPO performance.

Hypothesis 3 Hypothesis 3 explored the moderating effects of "network cohesiveness" given the relationship between resources and IPO performances. A simple way to test moderating effects was to add moderating terms (inter-action terms) to existing regression models. Since this research had four internal resource variables and three network cohesiveness variables, there may be 12 possible moderating variables (inter-action terms) as shown in the following (5.4):

$$Y = \beta_0 + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + \cdots\cdots + \beta_{10} \cdot X_{10} + \beta_{11} \cdot X_3 \cdot X_8 + \beta_{12} \cdot X_3 \cdot X_9 + \beta_{13} \cdot X_3 \cdot X_{10} + \cdots\cdots + \beta_{22} \cdot X_7 \cdot X_{10} + \varepsilon \quad \text{.....(5.4)}$$

Where:
$\beta_0, \beta_1, \ldots\ldots, \beta_{10}$ = Parameters
X_1 = Organizational Size
X_2 = Prior Performance
X_3 = S&P 500 Index
X_4 = Technology Resource
X_5 = Human Resource
X_6 = Reputation Resource
X_7 = Top Management Resource
X_8 = Network Size
X_9 = Network Affiliation
X_{10} = Social Capital
$X_4 \cdot X_8$ = Interaction between Technology Resource and Network Size
$X_4 \cdot X_9$ = Interaction between Technology Resource and Network Affiliation
$X_4 \cdot X_{10}$ = Interaction between Technology Resource and Social Capital
....

$X_7 \cdot X_{10}$ = Interaction between TMT Resource and Social Capital

There would be very complex and interpretational difficulties if all of these 12 possible interaction terms were considered. If the above equation (5.4) is adopted, the fourth phase of the regression model has 22 predicting variables. Given limited sample size, this number of predicting variables was not possible, and significant and strong multicollinearity was obviously expected. To address these methodological concerns, two separate factor analyses were computed. Using the extraction method of principal component and the rotation method of varimax, two factors with "internal resource" variables were obtained. Table 5 – 6 indicates factor names (institutional-backed resource and capability resource) and their factor loading values. These two factors explained approximately 61% of the variance of the four independent variables. The first factor, named institutional-back resource, represented two internal resource variables, technology and reputation resources. Because these two types of resources became valuable internal resources by getting institutional approvals, e.g., endorsement from news media (The Wall Street Journal) and acceptance from the U.S. patent and trademark office, this factor was named as an institution-backed resource. The second factor, which was represented by two other variables of human and TMT resources, was named as a capability resource because these two variables well summarized internal abilities to leverage other types of valuable resources or assets.

In the second factor analysis with the three network cohesiveness variables, a factor was obtained as indicated in Table 5 – 7, and named "network," and this factor explains 57% of the total variance.

Table 5 – 6

Factor Analysis for Resource-based View Variables

	Factor 1 (Institution-backed Resource)	Factor 2 (Capability Resource)
Technology Resource	**.7271**	-.3085
Reputation Resource	**.7963**	.2665
Human Resource	.3032	**-.5222**
TMT Resource	.2155	**.8233**
Proportion of Variance Explained	.6045 (60.45%)	

Table 5 – 7

Factor Analysis for Network Cohesiveness Variables

	Factor 1 (Network)
Network Size	.8045
Network Affiliation	.7804
Social Capital	.6711
Proportion of Variance Explained	.5688 (56.88%)

By using these three factors, institutional-backed resource, capability resource, and network, instead of seven independent variables, two moderating terms (interaction terms) were calculated and entered into the regression model to test moderating effects of "network cohesiveness" on the relationship between "internal resource" and IPO performance.

Model 4 (1st T) and Model 5 (1st T) in Table 5 – 8 and Model 4 (7th T) and Model 5 (7th T) in Table 5 – 9, indicated that, generally speaking, there was not statistically significant moderating effects of "network cohesiveness" on the relationship between "internal resource" and IPO performances. As seen in Table 5 – 8, there was not a significant Adjusted R^2 change between Model 4 and Model 5, which means that the relationship between "internal resources" and IPO performance is not conditional on the "network," and there was not any statistically significant variable in Model 5 (1st T). However, in Model 5 (7th T) in Table 5 – 9, the interaction term by the "capability resource" factor and the "network" factor showed a significant but negative association to IPO performance ($t = -1.720$, $p < .1$). Also, there was a marginal improvement of Adjusted R^2 between Model 4 (7th T) and Model 5 (7th T) in Table 5 – 9. This means that the relationship between "internal resources" and IPO performance is marginally conditional on the "network."

Table 5 – 8

Results Regression for Testing Hypothesis 3 (1st T)
(N = 103)

Variables	Model 4 (1st T)			Model 5 (1st T)		
	Beta	t	sig.	Beta	t	sig.
Organizational Size	.047	.453		.034	.328	
Prior Performance	-.174	-1.933	*	-.185	-2.038	**
S&P 500 Index	-.060	-.726		-.049	-.598	
Technology Resource						
Human Resource						
Reputation Resource						
TMT Resource						
Network Size						
Network Affiliation						
Social Capital						
Institutional Resource (RF1)	.503	5.841	***	.546	5.138	***
Capability Resource (RF2)	.075	.924		.077	.927	
Network (NF)	.208	2.065	**	.233	2.286	**
RF 1 × NF				-.045	-.387	
RF 2 × NF				-.119	-1.296	
Adjusted R-Square	.428			.433		
F	12.330	***		9.692	***	
Adj. R-Square Change				.005		

* p < .1; ** p < .05; *** p < .01

Table 5 – 9

Results Regression for Testing Hypothesis 3 (7th T)
(N = 103)

Variables	Model 4 (7th T)			Model 5 (7th T)		
	Beta	t	sig.	Beta	t	sig.
Organizational Size	-.003	-.023		-.032	-.292	
Prior Performance	-.140	-1.450		-.151	-1.593	
S&P 500 Index	-.043	-.486		-.030	-.346	
Technology Resource						
Human Resource						
Reputation Resource						
TMT Resource						
Network Size						
Network Affiliation						
Social Capital						
Institutional Resource (RF1)	.436	4.720	***	.533	4.795	***
Capability Resource (RF2)	.041	.465		.052	.598	
Network (NF)	.255	2.372	**	.304	2.844	***
RF 1 × NF				-.127	-1.048	
RF 2 × NF				-.165	-1.720	*
Adjusted R-Square	.342			.379		
F	8.890	***		7.945	***	
Adj. R-Square Change				.037	**	

* p < .1; ** p < .05; *** p < .01

In summary, (1) Model 5 (1st T) did not indicate significant improvement by adding two interaction terms, (2) Model 5 (7th T) had very marginal improvement by adding interaction terms (ΔAdj. $R^2 = .037$, $p < .05$), (3) only one interaction term (RF 1 × NF) in Model 5 (7th T) was statistically significant ($t = -1.720$, $p < .1$), and (4) the sign of the significant interaction term (RF 1 × NF) in Model 5 (7th T) was in the opposite direction of the expected effect. For those reasons, there should be a very conservative and cautious approach on this result. Therefore, it can be conservatively asserted that hypothesis 3 was not supported on either time frame of IPO performance.

Summary

In this section, eight hypotheses were tested with multiple types and phases of hierarchical regression. After testing the hypotheses posited in Chapter 3, the overarching research question of this research: what are the antecedents of IPO performance? was statistically addressed. The overarching research question was translated into two corresponding empirical research questions: (1) how does internal resource competence of ventures relate to the IPO performance? (hypotheses 1a, 1b, 1c, and 1d) and (2) how does network cohesiveness complement or moderate the relationship between resource competence and post-IPO performance? (hypotheses 2a, 2b, 2c, and 3).

With significant and strong support for hypotheses 1a, 1c, and 1d, the positive associations of internal resources (particularly technology, reputation, and TMT resources) on IPO performance were empirically supported. Also, with

strong support of hypothesis 2b and 2c, the positive and complementary effects of network cohesiveness (particularly network affiliation and social capital) on IPO performance were supported as well. However, hypothesis 3, which proposed the moderating effect of network cohesiveness on the relationship between internal resources and IPO performances, was not supported. The hypotheses that were not supported in this research, hypotheses 1b, 2a, and 3, may imply other important theoretical and managerial insights or may warrant some theoretical or methodological limitations of this research. In the following section, all possible theoretical and empirical implications will be discussed.

Chapter 6

Discussion and Conclusions

The purpose of this research was to address the overarching research question: what are the antecedents of venture performance? Empirically testable research models based on two complementary theories, the resource-based view and the social network theory, were used to explore this question. This research posited a positive relationship between internal resource variables, from the resource-based view, and IPO performance (Barney, 1991; Barney, 1996; Chandler & Hanks, 1994; Dierickx et al., 1989; Godfrey & Hill, 1995; Leonard-Barton, 1992; Mahoney & Pandian, 1992; Miller & Shamsie, 1996). In addition, network cohesiveness variables from social network theory were added to develop a more comprehensive model for predicting IPO performance (Ahuja, 2000; Eisenhardt & Schoonhoven, 1996; Gulati et al., 2000; Kogut, 1988; Dyer & Singh, 1998; Gulati, 1995). Finally, the third hypothesis tested the moderating effects of network cohesiveness variables to the relationship between internal resources and IPO performance.

The discussion below recapitulates the research findings of this study with respect to the testing results of each hypothesis. In addition, theoretical and empirical implications and managerial insights for practitioners are discussed in detail. Finally, several limitations of this research and future research suggestions will be sought out and discussed.

Internal Resources as a Source of Venture Performance

Barney, Wright, and Ketchen (2001) best summarized the resource-based view as follows:

> [S]ustained competitive advantage derives from the resources and capabilities a firm controls that are valuable, rare, imperfectly imitable, and not substitutable. These resources and capabilities can be viewed as bundles of tangible and intangible assets, including a firm's management skills, its organizational processes, and routines, and the information and knowledge it controls. (p.625)

Penrose (1959) viewed a firm as a collection of various resources, and Wernerfelt (1984) and Barney (1991) articulated the purposes of resources as obtaining above-normal profits. Based on the assumptions on internal resources' idiosyncratic characteristics, such as causal ambiguity of the adaptation process (Dierickx, Cool, and Barney, 1989), path-dependence attributes (Teece et al, 1997), isolating mechanisms (Rumelt, 1987), and market heterogeneity (Barney,1986), the resource-based viewers argued that bundles of a firm's internal resources are key determinants for the firm's competitive advantage in an industry. Basing its theoretical perspective on this resource-based view, this research pursued to examine the primary assertions of the resource-based view with an IPO data set.

This research did not endeavor to investigate the roles of the four major characteristics of resources (value, rareness, inimitability, and un-substitutability) in achieving a sustainable competitive advantage. However, by adopting theoretically proven dimensions of internal resources from literature, which inheritably encompass the four resource characteristics, this research particularly explored the contributions of internal resources on IPO performance. Simultaneously, a base regression model for the second phase of analysis was fitted, which posited a complementary contribution of network cohesiveness to internal resources on IPO performance.

In the resource-based view literature, four imperative types of resources were identified (Borch et al., 1999; Cooper, Gimeno-Gascon, & Woo, 1994; Greene, Brush, & Hart, 1999), and corresponding hypotheses were identified in Chapter 3. These four resource dimensions were "Technology," "Human," "Reputation," and "top management team (TMT)" resources. In the following section, each internal resource variable's contribution to IPO performance are discussed.

Technology resource and IPO performance Technology or technological resource is a key source of competitive advantage since, by nature, technological resource is not a set of assets that can be easily imitated, e.g., knowledge based sets of skills (Lee, Lee, & Pennings, 2001). Especially if the technological resources were protected by law, such as intellectual property rights, a firm that had exclusive legal rights to leverage the technologic resources

in commercial areas would have solely upheld a competitive advantage over other competitors. Particularly, for firms in industries that have dynamic and turbulent technology environments, such as computer and biotechnology industries, technology resources including creativity and innovation capabilities are critical success factors (Deeds, DeCarolis, and Coombs, 1999). In this regard, this research argued in hypothesis 1a that the technology resource of an IPO firm is positively associated to its IPO performance. This argument, stated in hypothesis 1a, was strongly supported by the result of this research. This result indicated that technology resource was an obvious source of distinctive competence and, by possessing a solid technology resource, such as patent rights or trademarks, a firm could show its internal competencies to potential investors. In other words, public and potential investors evaluated the IPO firm's current and future potential with the IPO firm's technology resources. Therefore, technology resource, such as patent rights, was a good proxy or predictor for IPO performance.

Human resource and IPO performance In the literature, human resource was depicted as a repository of valuable and tacit knowledge (Busenitz & Fiet, 1999), and as an ultimate supplier of knowledge-based resources, e.g., patents, (Miller & Shamsie, 1996). Superior human resources are imperative in having a sustainable competitive advantage. In fact, since the emergence of the resource-based view, human resource management (HRM) or strategic human resource management (SHRM) has been looked at as a strategically important aspect in achieving firm success (Wright, Dunford, & Snell, 2001). This trend

was inevitable because key concepts in the resource-based view, such as knowledge, dynamic capabilities, learning organizations, and leadership, are closely related to HRM issues.

However, there has been a call to substantiate which aspects of HRM or SHRM are veritable sources of competitive advantage because of the two different strategic focuses in HRM or SHRM (Wright, Dunford, & Snell, 2001; Wright, McMahan, & McWilliams, 1994). These two different strategic focuses included (1) a firm's actual human resource (the pool of human capital) and (2) a firm's HR practices (tool sets for managing the pools of human capital). Researchers argued the importance of HRM practices (Welbourne & Andrew, 1996; Lado & Wilson, 1994) as concrete sources of competitive advantage because the HR system itself is not a subject to be easily imitable. On the other hand, Wright et al. (1994) proposed that HR practices cannot be a source of competitive advantage because tangible systems like HR practices can be easily copied. Instead, an actual pool of human capital (skilled work forces) should be regarded as a source of competitive advantage, according to Wright at al. (1994).

This research adopted Welbourn and Andrew's (1996) four items (out of their original five items) for capturing HR practices in order to measure the variable of human resource competence. Therefore, the variable of human resource competence measured in this research was about HRM practices, not a dimension of human capital. In this regard, the result in this research warranted interesting and important theoretical implications. Notably, the hypothesis for HR competence was not supported. Therefore, solely based on this regression result,

it may be conservatively argued that HRM practices may not be a concrete source for IPO performance. In other words, HRM practices may have a very limited ability to garner competitive advantage for a firm. While Lodo and Wilson's (1994) argument that HRM practice was an idiosyncratic, complex, and causally ambiguous system, was fully acknowledged, the finding of this research suggests that the pool of human capital, which can be best represented by capability of actual work forces (Honig, 2001), may be a more solid source of competitive advantage than HRM practices. This result may be interpreted with this assumption: HRM practice is an organizational infrastructure (system resource), and a pool of human capital is a versatile and practical resource-in-use. It is obvious that both types or aspects of resources are important and need to have competitive advantage. However, especially for IPO firms, investors may perceive that an HRM practice without an excellent pool of human capital will be useless.

Reputation resource and IPO performance Reputation is "a global perception of the extent to which an organization is held in high esteem and regards" (Weiss, Anderson, & Maclnnis, 1999: p. 75), and reputation is given to a firm by its interactions with various stakeholders and by information shared among these stakeholders (Deephouse, 2000). Also, as a form of intangible resource belonging to a firm (Fombrun, 1996; Barney, 1991), reputation leads a firm to enjoy higher profitability and ultimately to have a competitive advantage over other firms (Deephouse, 2000, Barney, 1991, Formbrun, 1996).

In this research, an IPO firm's reputation resource was measured by media reputation (Deephouse, 1996; Deephouse, 2000). A simplified form of the Janis-Fadner coefficient was calculated and used to measure reputation resource. In line with theoretical predictions from Barney (1991), Hall (1993), and Formburn (1996), this data supported hypothesis 1c, which posited a positive association between reputation resource and IPO performance with a dependent variable of Tobin's q calculated by the closing price of the first trading day (1st T). However, in the model with a dependent variable of Tobin's q with the closing price of the seventh trading day (7th T), the hypothesis was marginally rejected. Because the (1st T) model was strongly supported and the other model (7th T) was somewhat supported by our data, we can cautiously conclude that reputation resource contributed to a large extent to IPO performance.

By having a good reputation, a firm could establish a positive image and brand equity to the public. This good public image and brand equity directly and indirectly delivered the IPO firm's internal competence to the public. Consequently the reputation resource of an IPO firm had positive contributions to IPO performance. Another possible explanation of this result is that, through exchanging and circulating positive information about a focal firm with various outside stakeholder groups, the firm mitigated "liability of newness" or "liability of smallness" to a large extent. Reputation resources constructed among outside stakeholder groups granted institutional legitimacy to the focal firm (Stinchcombe, 1965; Suchman, 1995).

TMT resource and IPO performance Top management team (TMT) resource competence is a strategically important intr a-firm resource that determines the firm's performance (Hambrick & Mason, 1984). Also, TMT resource competence can be a critical source of competitive advantage (Bloodgood, Sapienza, & Almeida, 1996; Finkelstein & Hambrick, 1996; Pegels & Yang, 2000). Upper echelon theory asserted that observable demographic characteristics of TMT members affect TMT members' decision making process, which consequently affects firm performance. These cognitive bases and demographic characteristics of TMT members shaped by the individual TMT member's personal experience and value systems include (1) age (Pegels & Yang, 2000; Bantel, 1994; Wiersema & Bantel, 1992), (2) tenure (Finkelstein & Hambrick, 1990; Katz, 1982), (3) functional/educational background (Cohen & Levinthal, 1990; Govindarajan, 1989), (4) socioeconomic context (Hambrick & Mason, 1984), and (5) heterogeneity (Castanias & Helfat, 1991). In this research, among various dimensions of TMT resource variables, TMT age was selected as a proxy for TMT resource. The variable of age has been argued to be the most central to demographic theory (Bantel, 1994), and TMT age has shown obvious and encouraging empirical results in other TMT research areas (Pegels & Yang, 2000).

This research hypothesized that an IPO firm with younger TMT members shows higher IPO performance: a positive association between TMT youth (a reverse measure of TMT age) and IPO performance. This argument, stated in hypothesis 1d, was strongly supported by the results of this research. This result

was in line with previous theories which proposed that TMT age has a negative association with organizational performance (Hambrick & Mason, 1984; Pegels & Yang, 2000). The fundamental rationale for this finding was that older TMT members tended to have less physical and mental stamina, slower and less learning capabilities, a stronger commitment to status quo, risk-averse propensity, and slower decision making (Hambrick & Mason, 1984). Consequently younger TMT members tended to be more innovative and aggressive in taking risks and tended to achieve greater performance, particularly in the small and young firm context.

In conclusion, TMT youth measured as "grand mean of average TMT age – average TMT age of the focal venture" had a positive association with IPO performance, and this result indicated that TMT resource was a source of distinctive competence. In other words, by possessing a younger TMT, an IPO firm showed better quality of its top management teams to the public, and it successfully and positively transformed investors' perceptions of the IPO firm's future value.

Network Cohesiveness as a Source of Venture Performance

The resource-based view has some theoretical reservations and limitations because of its (1) extremely narrowed-down unit of analysis, a unit of resource and capability instead of a unit of a firm (Fiet, 2000), (2) oversight on channels of resource inflow and outflow (Galati et al, 2000), (3) tautological concern, e.g., what is and what is not a resource (Eisenhardt & Martin, 2000; Barney, Wright,

Ketchen, 2001), and (4) its need of consistent and comprehensive empirical research (Miller & Shamsie, 1996). Given that these theoretical reservations do not necessarily limit RBV as a strategy paradigm, there was still a need to complement the RBV in order to have a more complete theoretical paradigm. This research brought "network perspective" or "social network theory" as a good candidate to complement RBV.

The social network theory was brought into this research's framework for three major reasons, (1) network as a tool for tapping resources residing outside, (2) network as an inter-organizational resource endorsement, and (3) network as a corridor for resource flow. Some researchers regard RBV as a theoretical rationale to explain firms' efforts to establish and maintain their networks, e.g., strategic alliances, by applying a logic of creating values out of one's existing resources by combining these with others' resources (Das & Teng, 2000). However, it is viable and reasonable to separate theoretical boundaries of RBV from the that of social network theory in order to clarify the sources of competitive advantage, which are internal resources or networks including inter-organizational relationships.

In this research model, a complementary relationship was used between RBV and social network theory, not a competing relationship between those two theories. Therefore, regression models were used to test a complementary relationship between these two theories. The classic hierarchical regression model tested whether adding variables from social network theory into a base model that has control variables and internal resource variables increased explanation powers

for IPO performance. As summarized in Table 5 – 4 and Table 5 – 5, Model 3 (1st T) and Model 3 (7th T) had significantly improved Adjusted R-squares from the base models, Model 2 (1st T) and Model 2 (7th T). These results indicated that (1) within the data from this research, network cohesiveness complemented internal resources on IPO performance and (2) proposed variables representing network cohesiveness were a solid source of IPO performance (competitive advantage). With this method, proposition 2, which posited the complementary contribution of network cohesiveness to internal resources, was empirically proved. Therefore, in short, it is valid and reasonable to assert that networks, measured by network cohesiveness, of an IPO firm were critical to establish competitive advantage over other competitors. Furthermore, network cohesiveness well complemented the internal resource competence.

Consequently, with these hierarchical regression models (Model 4 (1st T) and Model 4 (7th T)), a complementary role of network cohesiveness to RBV was strongly suggested. In the subsequent sections, contributions or means of the individual variables of network cohesiveness on IPO performance will be discussed.

Network size and IPO performance In the classic hierarchical regression, the network size variable had a significant but negative association with IPO performance. In measuring the network size, all interorganizational relationships between the focal firm and its network components were counted (see chapter 4 for detailed criteria used). The information about network

components was collected from the P.R. Newswire database, and, in short, the network components included were all external identities with which the focal firm was tied, e.g., strategic partners, joint ventures, long-term contractors, investors, public institutions, and key suppliers. For this data, hypothesis 2a was not supported.

This was a very interesting result since most previous research proposed a positive association between broad network ties of a firm and the firm's or network's performance (Coleman, 1988, 1990). It is relatively widely known that a focal firm with strongly developed network ties with well-known and prestigious companies may improve its firm legitimacy and public image (Stuart, Hoang, & Hybels, 1999). Therefore, the result of this research called for an alternative explanation to an existing body of research.

Burt (1992, 1997) argued the importance of dispersed network ties instead of cohesive network ties. He suggested that indirect or weak ties, known as "structural holes," in a network are more important than tightly coupled, direct, and strong ties. The central idea of this argument is that the benefits of networks come from the information embedded throughout a network and brokerage opportunities materialized from the lack of connections between separate groups in a network (Gargiulo & Benassi, 2000). According to Burt (1992), a firm that has tight, direct, and strong ties with its network components has some constraints in efficiently getting network benefits because of the firm's unnecessary and redundant contacts with its network components. Burt (1997) also posited that new and emerging firms, such as IPO firms, pursuing growth strategies in their

early stages of the firm life cycle must move beyond direct and cohesive network ties to get benefits from bridging structural holes.

The underlying logic of this argument is that firms in their early growth phase require more extensive and broader types of information and resources, which can be more efficiently provided by weak ties or structural holes instead of direct and strong network ties (Hite & Hesterly, 2001). Also, Hite and Hesterly (2001) posited that a "calculative network," which can be characterized by weak ties, sparse ties, and structural holes, has advantages to an identity-based network, which is an egocentric network that is socially embedded. Through weakly tied network components and structural holes, a focal firm is able to enjoy non-redundant network information in its network, and it is ultimately able to mitigate environmental uncertainty with valuable information and resources coming out of the network.

In conclusion, the regression results from a classic hierarchical regression implied that simple size of network, which can be rephrased by density or strength of a focal firm's network, did not positively contribute to IPO performance – Model 3 (1st T) in the Table 5 – 4, and Model 3 (7th T) in Table 5 – 5. However, we speculate that a calculative network possessing structural holes and abundant weak ties, instead of simple size of network, may have a positive contribution to IPO performance. In sum, firms pursuing a growth strategy and facing an early growth phase may have advantages from networks that have weak ties and structural holes.

Network affiliation and IPO performance While the network size variable is about firm level, this network affiliation variable is about TMT members' personal levels. Therefore, network affiliation simply means the level of active interfaces of TMT members with outside identities. The number of outside affiliates of TMT members was regarded as another dimension that strengthens a venture's network cohesiveness. In this research, the network affiliation was measured by the total number of outside companies that are served by TMT members as directors. Network affiliation of the venture was found to be positively associated with IPO performance. This hypothesis was strongly supported in two hierarchical regression models.

By maintaining external ties or inter-organizational relationships of its executives including board directors, an IPO firm can establish channels for information and resource inflow, scan environmental changes quickly, reduce the uncertainty associated with inter-firm resource transfer, and gain valuable managerial insights (Geletkanycz & Hambrick, 1997). External ties or inter-organizational relationships of executives may include (1) outside directors' serving on its board, (2) ties via professional associations, (3) TMT members' outside directorships or service, and (4) interlocking directorships (Geletkanycz & Hambrick, 1997). The result of this research supported this literature.

The network affiliations measured by "the total number of companies served by a focal firm's TMT members" made a positive contribution to IPO performance. The context of this result can be summarized as follows. Through network affiliations, various types of valuable information that complemented

current executives' experience were brought into the focal IPO firm (Geletkanycz & Hambrick, 1997). Also, through network affiliations, executives' social interactions were able to establish a conduit for introducing and exchanging environmental insights and managerial wisdom with affiliates (Geletkanycz & Hambrick, 1997). Also owing to established social interactions with affiliated outside institutions and because of the abundant information and experiences coming from the network affiliations, the focal firm could improve its institutional legitimacy (Geletkanycz & Hambrick, 1997; Deephouse, 1996).

In general, relatively young and small firms undergo "liability of newness" and "liability of smallness" (Stinchcombe, 1965; Suchman, 1995). By developing good network affiliations, these inherited liabilities were reduced, and by doing so, the viability of the focal firm was increased from the perspectives of investors. In line with this argument, Kassinis and Vafeas (2002) asserted that

> [B]oards with directors holding more board seats will be less likely to become lawsuit targets because directors holding more boards seats have, on average, more experience in protecting the firm. Furthermore, given director competence, holding many board seats makes directors less willing to allow illegal behavior because their valuable reputation capital is at stake. (p.402)

In conclusion, through network affiliations, a focal firm can build its stock of crucial and strategic information and establish channels for obtaining

imperative resources residing outside. Simultaneously the focal firm would be free from burdens of "liability of newness" and "liability of smallness" to a large extent through the enhancement of its institutional legitimacy.

Social capital and IPO performance One of the main purposes of going public (IPO) is to gain capital through the public equity market. So, how much initial capital the IPO firm is able to secure in its IPO is a critical issue. Of course, in the long term, an IPO firm can increase its firm value in various ways by having strategic competitiveness. However, an IPO is the first public evaluation of the IPO firm in the form of risk premium of its stocks. In this regard, maintaining appropriate social capital in order to show its socially endorsed competency to the public or to investors is crucial in having a good initial public appraisal.

Jacobs (1965) defined social capital as relational resources embedded in network ties. Also, Yli-Renko, Autio, and Sapienza (2001) asserted that social interaction, relationship quality, and customer ties were key aspects of social capital for young firms to obtain external knowledge. Therefore, how an IPO firm maintains and develops its network to secure a high quality of and enough social capital is a fundamental question for IPO firms. There are many different dimensions of social capital (Nahapiet & Ghoshal, 1998), and there are various ways to access and internalize social capital. In broad terms, social capital can be defined as network benefits on the whole. However, the variable of social capital in this research limited its scope to "societal prestige coming from a specific tie to

an outside institution." By having this societal prestige, the IPO firm is able to have the benefits of lowering liability of newness and of increasing possibility of economic benefit, e.g., lowered chance of underpricing of IPO stocks (Carter & Dark, 1992).

Within the data of this research, the social capital measured by a lead manager's (a lead underwriter) reputation had a positive association with IPO. This suggests that the role of lead manager in the IPO process influenced IPO performance. This finding may be interpreted in two ways. The first possible explanation is that by having a prestigious underwriter as a lead manager, an IPO could establish valuable social capital. Subsequently the social capital from a tie with a specific underwriter influenced IPO performance positively. The second possible explanation is based on the assumption from the finance literature: prestigious underwriters selectively underwrite less risky IPOs in order to maintain their reputations (Carter & Manaster, 1990; Carter & Dark, 1992). So, investors knew about this unwritten rule in capital markets and used it as a market signal that IPOs underwritten by prestigious underwriters were low risk IPOs.

The other side of this story is that IPO firms are able to reveal their strategic robustness (low risk) by selecting prestigious underwriters. In other words, by having a highly prestigious underwriter as a lead IPO manager, the IPO firms were able to internalize strong social capital, and they communicated their strategic potential and long-term viabilities to investors and the public. Ultimately the IPO firms that had prestigious underwriters, had benefits from established social capitals, e.g., reducing the liability of newness, enhancing public image,

and increasing direct economic benefit, which lowering the underpricing possibility at the time of IPO (Carter & Manaster, 1990).

Moderating Effects of Network Cohesiveness

The results of this research on hypothesis 3 indicated that the impact of resource competence on IPO performance will not be positively moderated by the network cohesiveness of a venture: thus stronger network cohesiveness does not necessary mean that IPO performance from internal resource competence will be greater. However, even though general regression results did not statistically support hypothesis 3, the interaction term (RF 2 × NF) in Model 5 (7th T) in Table 5 – 9 should be focused on. It is marginally significant ($t = -1.720$, $p < .1$), but this means that, for IPO firms having stronger "network: network cohesiveness," the relationship "capability resource: human resource and TMT resource" and IPO performance is strengthened. However, for an IPO firm that has relatively weaker "network: network cohesiveness," the relationship between "capability resource: human resource and TMT resource" and IPO performance is relatively weakened. Again, given that (1) Model 5 (1st T) did not have significant improvement when adding two interaction terms, (2) Model 5 (7th T) had very marginal improvement when adding interaction terms (ΔAdj. $R^2 = .037$, $p < .05$), (3) only one interaction term (RF 1 × NF) in Model 5 (7th) was statistically significant ($t = -1.720$, $p < .1$), and (4) the sign of the significant interaction term

(RF 1 × NF) in Model 5 (7th) was in the opposite direction of the expected effect, this result should be regarded as a non-finding result.

First, the non-finding result in this hypothesis test indicated that two super constructs, internal resource and network cohesiveness, were relatively independent. In other words, the nature of the relationship between internal resource and IPO performance and the nature of the relationship between network cohesiveness and IPO performance were mutually exclusive. This result indirectly supported the main theme of this research, the complementary relationship between RBV and social network theory. Secondly, it should be understood that this non-finding result did not fully reject hypothesis 3. It should be conservatively understood that, within the data of this research or given research contexts, the moderating effects of network cohesiveness on the relationship between internal resources and IPO performance was not statistically proved. Finally, this result should be regarded as a warrant of possible existence of more complicated interactions. For instance, there may be three-way interactions instead of the two-way interactions tested in this research. Also, there may be variable-specific interactions, e.g., Technology × Network size, Technology × Network affiliations, etc., instead of interactions of data reduced factors, e.g., Institution backed resource × Network and Capability resource × Network. This final issue should be considered with that of operationalization. This will be further discussed in the limitations section.

Summary of Research Results

For our data, internal resources (technology, reputation, and TMT resources) were clear antecedents of IPO performance. Specifically, by possessing solid technology resources, such as patent rights or trademarks, an IPO firm successfully communicated its internal competencies to potential investors. By having a good reputation with the media, an IPO firm established a positive firm image and brand equity to the public. Finally, TMT resource was an obvious source of distinctive competence. And by possessing younger TMT resources, an IPO firm showed its quality of top management teams to the public, and it enhanced investors' perceptions of the IPO firm's future value.

However, the positive association between human resource and IPO performance was not found in this research. This result may be stretched to a notion that HRM practices, used as the measure of human resource in this research, had a very limited ability to garner competitive advantage for an IPO firm. Instead, the pool of human capital, which is measured by "work forces" capabilities, e.g., education levels (Honig, 2001), was speculated as a more concrete source of competitive advantage in this research.

Second, the complementary role of network cohesiveness to RBV was empirically supported. Specifically, instead of direct and positive associations between network size and IPO performance, we speculated that calculative networks possessing structural holes and abundant weak ties might have positive contributions to IPO performance. It was suggested that firms pursuing a growth strategy and facing an early growth phase, e.g., IPO firms, may have advantages

from networks that have weak ties and structural holes. Next, network affiliations had a strong and positive contribution to IPO performance. This result indicated that a focal IPO firm could build its strategic competence via this network affiliation as well. The last network cohesiveness variable in this research, social capital, also had a positive association with IPO performance. An IPO firm revealed its strategic robustness (low risk) by selecting prestigious underwriters, and ultimately the IPO firm had benefits from established social capitals.

Finally, hypothesis 3 was not statistically supported. This result indicated with reservations that there was not a positive moderating effect of network cohesiveness to the relationship between internal resources and IPO performance.

Research Limitations and Future Research Suggestions

While this research offered, in many significant ways, theoretical and practical contributions, it should be acknowledged that this research still had theoretical and methodological concerns which limited the generalizability of its research findings.

While many RBV studies called for empirical studies to test the effects of resource characteristics (value, rareness, inimitability, non-substitutability) that were espoused to be fundamental sources for sustainable competitive advantage, this research did not aim to pursue this research track. Instead, it surveyed literature to identify critical dimensions of crucial resources that may lead to sustainable competitive advantage. In this regard, this research may not be totally free from a tautological concern because it did not empirically categorize types of

resources. In the future, this research should be expanded to include an empirical investigation on the characteristics of internal resource competence on the sustainability of competitive advantage.

Second, this research used a theoretical sampling method (target sampling method) and narrowed its sample domain with multiple sampling criteria (IPO year, industry, age, etc.). By doing so, this research intentionally tried to maintain a homogeneous context of its sample. There were theoretical and methodological benefits of this specific targeted sample (see chapter 4 for review), but there were methodological reservations as well, e.g., lack of generalizability and lack of dynamic implications of research findings. Therefore, there was an urgent call for longitudinal and cross-industry research to make up these limitations. In fact, one reason to go back to the 1997 IPO sample in this research, instead of the 1999 or 2000 IPO sample, was to secure enough longitudinal data. Therefore, a subsequent follow-up research will be lined up.

Third, there may be a limitation for generalizing results of this research across industries because this research only tested the research model in a single industry, computer based or computer related industry. Even though our samples included more than fifteen industries in terms of the four digit SIC, all of them came from computer related industries. Therefore, there is a possible single industry bias for this research.

Fourth, all data for this research was collected from archival sources. Given that collecting primary data in entrepreneurship is notoriously difficult, this research tried to access various types of archival data sources. However, there is a

reservation in examining intimate and innate phenomenons of firm behavior only with archival measures. Also, it was extremely difficult to have multiple items (variables) to measure the constructs of this research because of the limited range of archival measures. For this reason, there was a limitation for testing the reliability of measures.

Finally, the research design and major statistical method used in this research were not enough to infer "causality" of variables. Especially with regression analysis, we could not conclude causality relationships between independent and dependent variables; instead we found positive or negative associations. To test the causality relationship, (quasi) experiment design or longitudinal field study will be more appropriate than a cross-sectional study.

Research Contributions

This research contributed to the existing body of knowledge and to practitioners or policy makers in a number of ways. First, given that just a handful of empirical studies in the RBV area existed, this research added empirical evidence supporting the theoretical paradigm of RBV. This research did not aim to test the four major characteristics of resources or strategic assets that lead a firm to have a sustainable competitive advantage, e.g., value, rareness, inimitability, and non-substitutability. However, this research sought to identify major dimensions or types of internal resources that, by nature, posses the four major characteristics of resources, and this research proved the positive association between those internal resources and IPO performance.

Second, this research also contributed to empirically frame a complementary relationship between RBV and social network theory. While the presence of variables from the social network theory (network cohesiveness) significantly increases the overall explanation power on IPO performance, each individual variable of network cohesiveness also indicated imperative implications (positive associations with IPO performance). Therefore, given that network cohesiveness itself was a critical contributor to IPO performance, the social network theory as a whole well made up the limitations of RBV. In this regard, this research expanded the theoretical boundary of RBV.

Third, this research provided a conceptual and managerial paradigm for IPO performance study since this research model suggested a comprehensive and prescriptive IPO performance. Also, with respect to measuring IPO performance, this research adopted unique performance measure, Tobin's q, which well represented the theoretical definition of venture performance (refer to Chapter 4). Even though its theoretical fitness was acknowledged in venture performance studies, only a limited number of empirical studies actually used Tobin's q as a performance measure because of the complexity of its calculation method. However, this research developed a good proxy for Tobin's q and successfully adopted it as a performance measure. In this regard, this research suggested a relatively simple calculation method for Tobin's q, and opened a venue for further usage of Tobin's q in future venture performance studies.

Finally, this research put its endeavor not only in developing a new theoretical framework, but also in providing managerial insights for practitioners.

For entrepreneurs, IPO is a critical turning point in their venture life cycle. Also, through the IPO process, a small and young private company newly starts its business as a public company. For these reasons, founders of IPO firms may face totally different business and competitive environments at the time of IPO. This research provided a set of guidelines or some golden-rules for entrepreneurs or founders of IPO firms in preparing and lining up their future strategies by answering the question: what are the antecedents of IPO performance? Examples of those golden-rules for IPO managers are (1) internal resource competencies are imperative for future success, and, in the short term, they are key assessment criteria for investors, (2) a firm's network position is important in order to take full advantage of network benefits, (3) personal networks through network affiliates and social capital via a specific tie with an esteemed institution are very helpful in obtaining information and knowledge, and (4) successful IPO managers should know what they have, what they do not have, what they need to have, who has things they need, and how they can access them.

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