

INTERNATIONAL KNOWLEDGE, REPUTATION AND NEW VENTURE  
INTERNATIONALIZATION: THE IMPACT OF INTANGIBLE RESOURCES ATTAINED  
THROUGH INTERNAL AND EXTERNAL SOURCES

Stephanie A. Fernhaber

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ACCEPTANCE

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Dr. Patricia P. McDougall, Chairperson

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Dr. David B. Audretsch

Doctoral Committee

May 2, 2006

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Dr. Alan Rugman

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Dr. Dean Shepherd

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## ABSTRACT

International new ventures are an increasingly prevalent phenomenon. Of particular interest is the ability of these new ventures to develop and exploit a competitive advantage internationally. Recent research drawing on the resource-based view emphasizes how the internal resources of a new venture lead to the development of such a competitive advantage. While insightful, this research has tended to overlook those resources possessed vicariously by a new venture through external sources. Another shortfall of prior research is the lack of consideration for potential interdependencies among resources and the resulting implications on different aspects of new venture internationalization. These represent critical gaps in the literature that could potentially explain how new ventures overcome resource constraints related to the so-called liabilities of smallness and newness to pursue and benefit from what is otherwise considered to be a large scale strategy.

In this dissertation, I addressed these gaps by integrating the resource-based view with the economic geography and network literatures to consider the complex relationships between new venture internationalization and two internal sets of resources (the new venture's international knowledge and reputation) and external sets of resources (the potential international knowledge and reputation available through the new venture's headquartered location, venture capital firms, and alliance partners). A sample of 213 U.S.-based, high-technology new ventures that underwent an IPO between 1995 and 2000 was analyzed. The results underscore the importance of both internal and external sources of international knowledge for new venture internationalization, implying that new ventures internationalize not alone but as a player within their network. Although it was expected that new ventures with higher levels of international

knowledge would develop the absorptive capacity to more effectively exploit and benefit from the resources available externally, the opposite relationship was found. Thus, vicariously exploiting external resources illustrates one way internationalizing new ventures can compensate for internal resource gaps. While the main effects of reputation on new venture internationalization were not supported, the existence of two significant interactions suggests that this relationship may be more complex. The results of the study were fairly consistent across three measures of internationalization.



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## CHAPTER 1: INTRODUCTION

### Overview

Research on international entrepreneurship emerged in the late 1980's with the majority of research initially focusing on the interesting question of why a new venture might choose to internationalize. A few of the many reasons offered relate to the exploitation of a unique product (Burgel & Murray, 1998; Oviatt & McDougall, 1994; Oviatt & McDougall, 1995), capitalizing on the learning advantage of newness (Autio, Sapienza & Almeida, 2000), taking advantage of networking opportunities (Reuber & Fischer, 1997) and the existence of a competitive environment (Kotha, Rindova & Rothaermel, 2001). In more recent years, we have also gained an increased knowledge of the implications of what happens when new ventures internationalize, in terms of performance (Bloodgood, Sapienza & Almeida, 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra, Ireland & Hitt, 2000), increased technological learning (Zahra et al., 2000) and survival (Sapienza, Autio & Zahra, 2003). Today, the interest in this topic remains strong with researchers being encouraged to not only examine the motivations and consequences of new venture internationalization, but also *how* new ventures are able to internationalize (McDougall & Oviatt, 2005; Zahra & George, 2002). Given the performance benefits to new venture internationalization, furthering our understanding on this topic is critical. This dissertation contributes to this line of research by examining the complex role that intangible resources play in new venture internationalization.

## **Gaps in the Literature**

### ***Limited Understanding of Intangible Resources***

In order to internationalize, a firm must possess a competitive advantage that enables the firm to overcome the additional costs of cross-border operations as well as to be competitive in foreign markets (Dunning, 2000; Hymer, 1976; Rugman, 1981). The resource-based view argues that the extent to which a firm's bundle of resources is valuable, rare, inimitable and non-substitutable determines its competitive advantage (Barney, 1991). Due to their young age, new ventures tend to lack substantial financial resources or physical resources such as property, plant and equipment. While older firms have traditionally leveraged these tangible resources in foreign markets, tangible resources have become less important to international competitiveness in recent years (Porter, 1998). This is likely due to the ability of firms to use networks or other alternate governing mechanisms to overcome physical resource barriers (Chen, Chen & Ku, 2004; Dunning, 1995). In today's global environment, intangible resources thus represent a more sustainable source of competitive advantage due to the ambiguity surrounding intangible resources and the difficulties of competitors to easily replicate them (Kotha et al., 2001). This is ideal for new ventures as they are no longer prohibited from pursuing internationalization solely on account of physical resource barriers and can instead compete internationally by exploiting their intangible resources (Knight, Madsen & Servais, 2004; Knight & Cavusgil, 2004).

Given the importance of intangible resources, it is surprising to observe that relatively few studies exist that actually identify and empirically test the impact of intangible resources on new venture internationalization. A notable exception is the growing research emphasizing international knowledge as a key intangible resource leading to new venture internationalization (Bloodgood et al., 1996). In addition, reputation is also emerging as a potentially important

intangible resource (Kotha et al., 2001). Nevertheless, there have been multiple calls for research to expand on this topic and more thoroughly explore the criticality of intangible resources (Zahra & George, 2002; Zahra, Matherne & Carleton, 2003). In doing so, the opportunity arises to further our understanding of how new ventures are indeed able to internationalize and ultimately, achieve higher levels of new venture performance.

### ***External Sources of Intangible Resources***

In particular, a need exists to examine the impact of external sources of intangible resources that may contribute to the internationalization of new ventures. Although the resource-based view traditionally examines the importance of resources located internal to the organizational boundary of a firm, the economic geography and alliance literatures emphasize the frequent reliance on external relationships for attaining resources. By jointly considering both perspectives, a better understanding can be attained as to how new ventures that are typically resource constrained due to the so-called liabilities of smallness and newness are indeed able to pursue larger scale strategies such as internationalization.

### ***The Complexity of Intangible Resources***

The relatively few studies that have touched upon the relationship between intangible resources and new venture internationalization have not yet fully taken into account the complexity of intangible resources implied by strategic management scholars. Carmeli and Tischler (2004) found intangible resources to be highly dependent on each other. The higher the value of a given intangible resource, the greater the effect of any other intangible resource on firm performance. Yet, researchers have not considered whether certain intangible resources leading to new venture internationalization are in fact interdependent. If interdependencies

indeed exist, solely examining the direct relationships between intangible resources and new venture internationalization could be misleading.

### ***Dimensions of New Venture Internationalization***

Research on international entrepreneurship has tended to rely on a single measure of new venture internationalization, most commonly the percentage of foreign sales. Yet, Sullivan (1994) stresses the danger of using this single measure in isolation as it may not be telling the whole story. This is exemplified in the research of Preece, Miles and Baetz (1998) who examined the effect of various explanatory variables on two different new venture internationalization variables: international intensity (i.e. the percentage of foreign sales) and global diversity. While some relationships had the same effect on both international intensity and global diversity, others did not. For instance, while firm age and size were positively related to global diversity, no such relationship was found with international intensity. In line with other scholars (Zahra & George, 2002), Preece and colleagues (1998) argue that future research needs to distinguish between the various measures of new venture internationalization and examine the resulting implications. In the context of this dissertation, this demonstrates the need for an increased understanding of the complex relationship between internal and external sources of intangible resources on multiple dimensions of new venture internationalization.

### **Addressing the Gaps**

This dissertation serves to help fill these gaps. Specifically, I focus in this dissertation on exploring in detail the relationship between new venture internationalization and two key intangible resources: international knowledge and reputation. The competitive implications of the knowledge created by a firm have received a significant amount of attention in recent years (Grant, 1996). In this dissertation, I acknowledge that a new venture's technological knowledge



is important to internationalization (Autio et al., 2000; Zahra et al., 2003), but focus specifically on the knowledge pertaining to internationalization. Typically held by the new venture's management team, the international knowledge of a new venture is suggested to be an important intangible resource leading to new venture internationalization due to the management team's ability to identify international opportunities (Bloodgood et al., 1996). In addition, having a greater level of knowledge or familiarity with the host-country environment reduces the transaction costs associated with foreign entry by the new venture (Dunning, 1988).

Reputation can be valuable to a firm through signaling potential and current exchange partners, such as customers, employees, or investors, as to the firm's quality (Fombrun & Van Riel, 2004). A reputation can also help a firm contract with these exchange partners through allowing the firm to lower costs, increase prices and create competitive barriers (Deepphouse, 2000). It is through these mechanisms that reputation likely leads to higher levels of new venture internationalization and thus, deserves greater exploration in this dissertation.

While many intangible resources exist, international knowledge and reputation were specifically chosen to be studied in this dissertation as neither intangible resource had previously been explored fully in terms of new venture internationalization. Although empirical evidence already supports the linkage between the international knowledge held by the new venture's management team and internationalization (Bloodgood et al., 1996), no prior research has attempted to further our understanding of this key predictor of new venture internationalization by considering the impact of external sources of international knowledge, the interdependencies among internal and external sources of international knowledge, nor the implications of international knowledge on multiple measures of new venture internationalization. In contrast to international knowledge, there has been minimal research examining the relationship between

reputation and new venture internationalization. Empirical confirmation and detailed rationale of the linkage between reputation and new venture internationalization is still needed. In addition, the examination of the role of external sources of reputation, the potential interdependencies with international knowledge and the implication of various measures of new venture internationalization have not been previously examined. A second reason why international knowledge and reputation were purposely chosen to be explored in this study is that the network literature suggests that the provision of information (i.e. knowledge) and credibility (i.e. reputation) are two major benefits achieved through external relationships. Given the interest in external sources of intangible resources in this dissertation, international knowledge and reputation seemed pertinent. Last, the choice of just two intangible resources enabled me to test the potential interdependencies among intangible resources and new venture internationalization while also managing the scope of the study.

Although not yet considered in the literature, it is very likely that new ventures look to external sources to attain both international knowledge and reputation to leverage in foreign markets. The management teams of new ventures continuously interact with individuals and institutions outside of their organizational boundary as they grow and develop. Due to their small size, new ventures typically have a small knowledge base to draw on internally (Stinchcombe, 1965). In addition, new ventures exist in a high degree of uncertainty, leading to a greater reliance placed on external sources of knowledge to improve the new venture's survival and growth prospects (McGrath & MacMillan, 1995).

External sources of reputation are also potentially important in the context of new venture internationalization, as they can “provide confirmation to the rest of the world of the value and worth of the organization” (Pfeffer & Salancik, 2003: 145). In the case of new ventures, in

which a high level of uncertainty regarding the quality of the new venture exists due to its limited track record, external sources of reputation or status are suggested to be especially important (Stuart, Hoang & Hybels, 1999).

The high reliance on external sources suggested by the economic geography and network literatures led me to jointly integrate these perspectives into the resource-based view. Thus, in addition to considering the impact of the international knowledge and reputation of the new venture on the new venture's subsequent internationalization, I also consider three external sources of international knowledge and reputation pertaining to other firms in the new venture's headquartered location, venture capitalists that have invested in the new venture and the new venture's alliance partners. These external sources all represent firms that a new venture is likely to interact with on a regular basis. In addition, these three sources are likely to be visible to potential stakeholders of new ventures.

To address the likely complexity present in the relationship between the internal and external sources of intangible resources and new venture internationalization, I draw on the absorptive capacity literature as well as the resource-based view. Assuming that external sources of knowledge do exist, new ventures likely differ in their ability to take advantage of international knowledge available via external sources. The concept of absorptive capacity introduced by Cohen and Levinthal (1990) suggests firms will be more apt to take advantage of external informational or knowledge benefits when the firm also possesses the necessary knowledge and capacity to absorb the information. This implies that new ventures need international knowledge to benefit from the international knowledge obtained through external sources.

The resource-based view further emphasizes that it is the firm's bundle of resources that determine its competitive advantage (Barney, 1991). In the context of new venture internationalization, this implies it is not only the individual resources that a new venture has but also the combination of resources that may contribute to its international competitiveness. Although existing research has not yet explored the impact of a new venture's bundle of resources on internationalization, it is possible that international knowledge and reputation are similarly interdependent. Specifically, international knowledge could enhance the relationship between reputation and new venture internationalization. Being perceived as a reputable company may be much more important to internationalization when the new venture also has knowledge of international opportunities.

In order to address the gap in the literature pertaining to the limited usage of internationalization variables in international entrepreneurship research, I follow Sullivan (1994) who stresses the point of using multiple measures that consider the performance, structural and attitudinal theoretical categories underlying the internationalization construct. Accordingly, the interpretation and measurement of new venture internationalization in this dissertation reflects the international *performance* of the new venture, the *structure* of the new venture's operations internationally and the *attitude* towards internationalization exhibited by the new venture. In terms of performance, I utilize an international sales intensity variable that assesses the traditional percentage of foreign sales achieved by a new venture. To assess the structure of a new venture's operations internationally, I draw on an international asset intensity variable that measures the new venture's percentage of foreign assets. For the attitude towards internationalization classification, I use an international scope variable that assesses the number of continents a new venture achieves sales through. The exact operationalizations are further

detailed in the methodology section. Although the hypotheses put forth in this dissertation assume the same general type of relationship (i.e. negative or positive) with each internationalization dependent variable, the testing of the research model separately by each internationalization dependent variable ultimately allows me to place better confidence in and interpretation of my findings.

## **Research Questions**

In summary, the following research questions are addressed in this dissertation:

- Research Question #1: What impact does a new venture's international knowledge have on the new venture's international sales intensity, international asset intensity and international scope?
- Research Question #2: What impact do external sources of international knowledge have on the new venture's international sales intensity, international asset intensity and international scope?
- Research Question #3: Does the new venture's international knowledge moderate the relationship between the external sources of international knowledge and the new venture's international sales intensity, international asset intensity and international scope?
- Research Question #4: What impact does a new venture's reputation have on the new venture's international sales intensity, international asset intensity and international scope?
- Research Question #5: What impact do external sources of reputation have on the new venture's international sales intensity, international asset intensity and international scope?
- Research Question #6: Does the new venture's international knowledge moderate the relationship between reputation and the new venture's international sales intensity, international asset intensity and international scope?

## **Definitions**

Consistent with other scholars, I rely on the definition of an international new venture provided by Ovaitt and McDougall (1994: 49): "a business organization that, from inception,

seeks to derive significant competitive advantage from the use of resources and sale of outputs in multiple countries.” International new ventures have also frequently been referred to in the literature as born globals (Knight & Cavusgil, 1996), global start-ups (Oviatt & McDougall, 1994) or simply international ventures (Kuemmerle, 2002).

Although McDougall and Oviatt’s definition suggests an international new venture needs to be international “at inception,” most scholars do not literally interpret this to refer to new ventures that are international from their first day of operations. Instead, the definition is typically viewed as more descriptive and examines firms that internationalize within their first few years of existence (Knight & Cavusgil, 2004; Shrader, Oviatt & McDougall, 2000; Zahra et al., 2000). Within the entrepreneurship literature, new ventures are generally considered to be those firms that are six years old or less as this definition is in line with the U.S. Small Business Administration (1992). Accordingly, this dissertation focuses on the extent of internationalization by new ventures that are six years old or less.

While earlier studies tended to examine internationalization dichotomously as either being pursued or not pursued by a new venture (e.g. McDougall, 1989), this dissertation follows more recent studies that view internationalization as a continuum in which new ventures pursue varying levels of internationalization (e.g. Carpenter, Pollock & Leary, 2003). Thus, it is the extent to which a new venture is international that is of interest, whether the new venture be solely domestic, solely international or somewhere in the middle.

As indicated by Oviatt and McDougall’s definition, internationalization involves the “use of resources and sale of outputs in multiple countries.” However, there are many different ways to interpret and measure their definition of internationalization. In response to this issue, Sullivan (1994) stresses the point of using multiple measures that consider the performance, structural and

attitudinal theoretical categories underlying the internationalization construct. Accordingly, the interpretation and measurement of new venture internationalization in this dissertation reflects the international *performance* of the new venture, the *structure* of the new venture's operations internationally and the *attitude* towards internationalization exhibited by the new venture. This is further detailed in the methodology section.

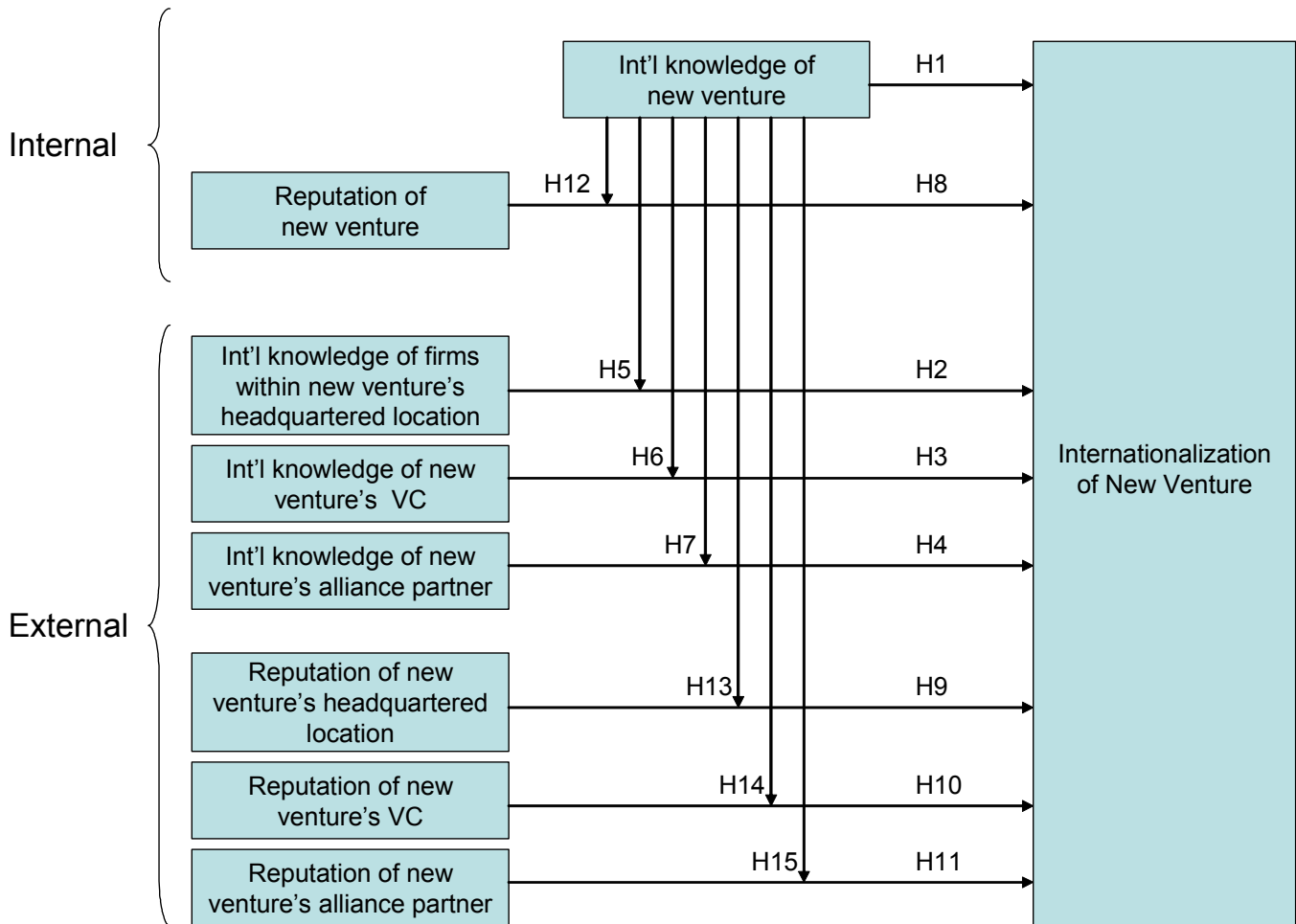
Last, one of the assumptions of this dissertation is that new venture internationalization is a valuable dependent variable worth studying. The ultimate objective of strategic management scholars is to explain why firms differ in their levels of performance (Hitt, Ireland & Hoskisson, 2006). Although research on international entrepreneurship is still emerging, several studies have examined and indeed confirmed that such a linkage between new venture internationalization and performance exists (Bloodgood et al., 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra et al., 2000). Thus, in this dissertation, I assume that new venture internationalization is a key dependent variable of interest given that internationalization is one of the ways new ventures are able to achieve superior levels of performance.

This dissertation is structured as follows: In chapter 2, I provide a literature review on new venture internationalization and introduce the resource-based view. This is followed in chapter 3 by the integration of the resource-based view with the literature on networks and economic geography to hypothesize how internal and external sources of international knowledge and reputation impact new venture internationalization. The research model explored in this dissertation is presented in Figure 1, suggesting that international knowledge and reputation attained through internal and external sources will directly affect new venture internationalization. All of the relationships in the model are expected to be enhanced, or moderated by, the international knowledge of the new venture. I then discuss the methodology in

chapter 4 that includes empirically testing the hypotheses on a sample of U.S.-based, high technology new ventures that have undergone an initial public offering between 1995 and 2000. Chapters 5 and 6 present the results and discussion, respectively. Last, the conclusions are put forth in Chapter 7.



**Figure 1: Hypothesized Relationships**



## CHAPTER 2: LITERATURE REVIEW

### New Venture Internationalization

#### *Background*

International entrepreneurship involves the “discovery, enactment, evaluation, and exploitation of opportunities across national borders to create future goods and services” (Oviatt & McDougall, 2005). The number of theoretical and empirical papers seeking to understand international entrepreneurship has risen considerably since the late 1980’s, resulting in various special issues in leading academic journals devoted to this topic, the recognition of entrepreneurship as one of eight editorial areas within the *Journal of International Business Studies* and the recent establishment of the *Journal of International Entrepreneurship*. Research under the auspices of international entrepreneurship has been applied to new ventures (e.g. McDougall, 1989; Zahra et al., 2000), small and medium size enterprises (e.g. Boter & Homquist, 1996) as well as existing corporations (e.g. Birkinshaw, 2000). Although there are many overlaps within these research contexts, the focus of this dissertation is specifically on new ventures that pursue international markets. New ventures represent an intriguing area of study given their need to overcome considerable constraints related to newness and smallness in order to internationalize (Knight et al., 2004).

Also referred to as born globals (Knight & Cavusgil, 1996; Madsen & Servais, 1997; Moen, 2002), global start-ups (Oviatt & McDougall, 1994) or international ventures (Kuemmerle, 2002), an international new venture is defined as a “business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and

the sale of outputs in multiple countries” (Oviatt & McDougall, 1994: 49). The internationalization of new ventures is largely a worldwide phenomenon. This is evidenced by studies on international new ventures headquartered in each of the triad regions: North America (e.g. McDougall, 1989; Zahra et al., 2000), Europe (e.g. Autio et al., 2000; Moen, 2002) and Asia-Pacific (e.g. Chetty & Campbell-Hunt, 2004; Rennie, 1993). This global presence of international new ventures underscores the interest on this topic by many audiences.

Although McDougall and Oviatt’s definition suggests an international new venture needs to be international “at inception,” most scholars do not literally interpret this to refer to new ventures that are international from their first day of operations. Instead, the definition is typically viewed as more descriptive and examines firms that internationalize within their first few years of existence (Knight & Cavusgil, 2004; Shrader et al., 2000; Zahra et al., 2000).

Various internationalization activities of new ventures have been examined in previous studies. While the level of foreign sales of a new venture has received the most attention in the literature, other studies have examined how rapidly a new venture internationalizes (Autio et al., 2000), the geographic scope of sales (Preece et al., 1998), growth in international sales (Autio et al., 2000), international diversity (Zahra et al., 2000) or the number of primary activities engaged by the new venture internationally (Bloodgood et al., 1996). Yet other scholars have simply examined the features that distinguish international versus domestic new ventures (McDougall, 1989). Sullivan (1994) stresses the importance of using multiple measures constituting the performance, structural and attitudinal theoretical dimensions of the internationalization construct.

### ***Theoretical Approaches***

Many different theoretical approaches have been used in the field of international business to explain firm internationalization. Monopolist advantage theory, product cycle theory, oligopolistic reaction theory, internalization theory and the stage theory of internationalization are perhaps the ones most prevalently utilized. Yet, it has been argued that these theories do not adequately explain the concept of international new ventures (Bloodgood et al., 1996; Coviello & Munro, 1995; McDougall, 1989; McDougall & Oviatt, 1996; McDougall, Shane & Oviatt, 1994). As summarized by McDougall, Shane and Oviatt (1994), these international business theories focus on large, mature firms because they assume firms internationalize long after they are formed. New ventures by contrast, are typically small, and have been shown to internationalize their operations either right at inception or shortly thereafter. The inability of international new ventures to fit neatly into existing international business theories has prompted additional research to better understand this phenomenon as well as the reliance on theories from the field of strategic management, such as the resource-based view (McDougall et al., 1994).

### ***Antecedents of New Venture Internationalization***

Many scholars attribute the emergence of new ventures in the international arena to changes in the global business environment (Knight & Cavusgil, 1996). For example, due to the rise in international competitiveness and globalization of markets (Porter, 1990), there is an increasing role of niche markets. As a result, many new ventures are finding it necessary to focus on specialized or customized products of which many occupy a global market niche (Madsen & Servais, 1997). In addition, the recent advances in process technology are driving the demand for a greater diversity of products on a much smaller scale, allowing new ventures to better compete with multinationals (Dunning, 1995). Advances in communication and transportation technology

have also enabled information to be more accessible worldwide, reducing the high cost barriers to internationalize (Madsen & Servais, 1997). Further, the boundaries of firms, countries and markets are becoming more blurred, resulting in a greater reliance by internationalizing firms on their networks (Dunning, 1995). More often than not, a network is typically dominated by a lead “flagship” firm and consists of many smaller firms in supporting roles (Rugman & D'Cruz, 1996). It is through these relationships that a new venture may be preempted to internationalize.

Given these trends and changes in the global business environment, there are several related firm-specific motivations for new ventures to consider pursuing internationalization. The young age of a new venture has been argued to serve as a motivation to internationalize (Knight & Cavusgil, 1996; Oviatt & McDougall, 1995). This is largely due to a new venture’s “learning advantage of newness,” which suggests younger firms are able to better learn and adapt to changes in the environment than more mature firms (Autio et al., 2000). It is therefore easier for a new venture to adopt a global vision from inception than after routines become set and the firm matures (Oviatt & McDougall, 1995). The presence of a unique product also serves as a motivation for internationalization as a new venture might want to exploit their innovation before their foreign competitors replicate it (Oviatt & McDougall, 1995) or take advantage of a higher global demand (Dimitratos, Johnson, Slow & Young, 2003; Oviatt & McDougall, 1995). Qian and Li (2003) suggest innovative new ventures are likely to internationalize in order to leverage their research and development costs across a greater volume of products and generate extra profits to sustain large-scale R&D operations. New ventures have additionally been argued to consider internationalization as a result of opportunities that arise through past international experience (Bloodgood et al., 1996; Burgel & Murray, 1998; Carpenter et al., 2003; Reuber & Fischer, 1997) or networking relationships (Coviello & Munro, 1995; Coviello & Munro, 1997;

Holmlund & Soren, 1998; Oviatt & McDougall, 1995). New ventures may also view internationalization as a necessity due to their existence within a highly competitive environment (Kotha et al., 2001) or a globally-integrated industry (McDougall, Oviatt & Shrader, 2003).

### ***Consequences of New Venture Internationalization***

In addition to the factors motivating a new venture to internationalize, we are also beginning to gain insight as to the results of their internationalization activity. This is an important area of research as it addresses the implications of pursuing foreign markets at such a young age. First, internationalization by new ventures is suggested to impact performance through profitability (Bloodgood et al., 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra et al., 2000) due to the new venture taking advantage of an increased customer base. Secondly, Zahra, Ireland and Hitt (2000) found internationalization to impact the new venture's breadth, depth and speed of technological learning. By exposing a new venture to a larger diversity of countries, they are exposed to many different sources of innovation and interact in many local environments. This enables the new venture to see more opportunities for technological developments. Lastly, Sapienza, Autio and Zahra (2003) suggest that internationalization influences the survival of a new venture. In the time immediately following internationalization, the probability of survival is likely to decrease for a short time until the new venture adjusts to the new environment and is able to recoup the resources spent on the internationalization process.

Given the suggested implications of new venture internationalization relating to performance, technological learning and survival, how can a new venture successfully compete internationally and take advantage of these benefits? As new ventures face considerable constraints related to both newness and smallness (Stinchcombe, 1965), this is an especially

pertinent question for international entrepreneurship scholars (Knight et al., 2004; Zahra & George, 2002). To shed light on this topic, I next turn to a discussion on the resource-based view.

### **Resource-Based View**

The resource-based view of the firm has become an influential theoretical perspective in international business research (Peng, 2001) and has also proven helpful in explaining the internationalization of new ventures (Bloodgood et al., 1996; Kotha et al., 2001; McDougall et al., 1994; Zahra et al., 2003). According to the resource-based view, firms are seen as a bundle of tangible and intangible resources. The extent that these resources are inimitable, rare, valuable, and non-substitutable determines their competitive advantage (Barney, 1991). In order to internationalize, a firm must possess the resources to form a competitive advantage that enables it to overcome the additional costs of cross-border operations as well as to be competitive in foreign markets (Dunning, 2000). While firms have traditionally been able to develop these international competitive advantages through some sort of monopoly power or advantages of scale, there has been a shift in recent years towards the increasing importance of intangible resources (Dunning, 2000). This is ideal for new ventures as, due to their young age, new ventures tend to lack substantial financial resources or physical resources such as property, plant and equipment.

The importance of intangible resources is starting to become more recognized in the new venture internationalization literature (Coviello & Munro, 1995; Knight et al., 2004; Kotha et al., 2001; Oviatt & McDougall, 1995). For example, marketing competency, differentiation strategy and product quality have been found to be key resources leading to new venture internationalization (Knight et al., 2004). Based on case study research, Oviatt and McDougall (1995) concluded having a unique, intangible resource was a key characteristic of an

international new venture. Kotha and colleagues (2001) examined the importance of reputation, website traffic and knowledge assets in the propensity for Internet firms to develop country-specific web pages. The value of technological networks and reputations has also been highlighted (Zahra et al., 2003). While the existing literature thus implies the importance of intangible resources for new venture internationalization, a gap remains regarding two key intangible resources: international knowledge and reputation. A need exists to thoroughly examine how new venture internationalization is impacted by the international knowledge and reputation of the new venture itself as well as through those firms associated with the new venture. This reliance on external sources for intangible resources has been acknowledged in the networks and economic geography literatures, but not yet applied in this context. A need also exists to examine whether intangible resources, such as international knowledge and reputation, that lead to internationalization are interdependent (Carmeli & Tishler, 2004). As this dissertation serves to directly fill these gaps in the literature, I next offer in chapter 3 a detailed discussion and hypotheses on the complex relationship between international knowledge, reputation and new venture internationalization.



## **CHAPTER 3: HYPOTHESES**

### **International Knowledge and New Venture Internationalization**

The knowledge-based perspective is essentially an outgrowth of the resource-based view, in which knowledge is viewed as the most strategically important of the firm's resources (Grant, 1996). Much of the research in this area considers the competitive implications of the knowledge created by the firm, such as market or technological knowledge (McEvily & Chakravarthy, 2002; Wiklund & Shepherd, 2003). However, entrepreneurship research has also highlighted the importance of knowledge that is derived by a new venture via the founding management team's prior experiences. Examples include knowledge attributed to the prior industry-specific experience (Eisenhardt & Schoonhoven, 1990), start-up experience (Sapienza & Grimm, 1997) and more recently, the international experience (Bloodgood et al., 1996; Reuber & Fischer, 1997) of the venture's management team. This dissertation is specifically concerned with the latter.

The primary source of a firm's international knowledge lies within the prior international experiences of its management team (Grant, 1996). Hambrick and Mason's (1984) upper echelon theory suggests managers are influenced by their backgrounds and ultimately develop biases, attitudes, values, aspirations and behaviors based on their life experiences. Individuals that have spent a significant amount of time abroad, whether related to work, education or pleasure, will develop a greater familiarity and understanding of the respective international market. When these individuals serve as members of a firm's management team, this experience translates into a stock of international knowledge. To fully understand why this stock of international

knowledge fits the resource-based requirement of a competitive advantage, we must turn back to the work of Hayek. In his well-known essay, Hayek (1945) distinguished between two types of knowledge: scientific knowledge and the knowledge of particular circumstances of time and place. Building on the second, Hayek (1945) notes "...practically every individual has some advantages over all others in that he possesses unique information of which beneficial use might be made, but of which use can be made only if the decisions depending on it are left to him or are made with his active cooperation." As each individual thus builds their own corridor of knowledge based on previous experiences over time (Dew, Velamuri & Venkataraman, 2004), the international experience of the venture's management team meets the rarity and inimitability requirements of a competitive advantage. Other firms may not simply imitate the experience that individuals bring to a firm because they are in fact each unique. It is also difficult for a firm to find a substitute for international experience as it is not always possible to identify the relevant portion of the experience that contributes to resulting actions (Kogut & Zander, 1992).

It is likely that new ventures with a greater stock of international knowledge will ultimately pursue a higher level of internationalization for several reasons. First, prior knowledge leads to the identification of opportunities (Shane, 2000; Shepherd & DeTienne, 2005; Wiklund & Shepherd, 2003). Individuals are more alert to opportunities that exist in areas that they have experience (Ardichvili, Cardozo & Ray, 2003), which explain why most entrepreneurs typically start businesses in the industry that they have previous work experience (Eisenhardt & Schoonhoven, 1990). Likewise, if the management team of a new venture has extensive international experience, they are more likely to identify opportunities for the new venture that exist internationally. As the decisions made by a new venture are essentially a reflection of its

management team (Hambrick & Mason, 1984), the end result is a higher level of internationalization pursued by the venture (Bloodgood et al., 1996).

Second, new ventures can leverage the international experience of their management team to form alliances in the international arena (Reuber & Fischer, 1997). As shown by Eisenhardt and Shoonhoven (1996), experienced management teams are more apt to form alliances in their industry due to their ability to attract partners. While older firms can rely on their established firm-level networks to attract partners, new ventures have not yet had time to build these networks and thus, rely more heavily on their personal networks attained through previous endeavors (Hoang & Antoncic, 2003). The formation of international alliances can contribute to greater new venture performance internationally through the provision of credibility in foreign markets (Lu & Beamish, 2001; Shrader, 2001).

Third, new ventures with internationally experienced management teams have also been demonstrated to internationalize sooner in their lifecycle (Reuber & Fischer, 1997). Earlier initiation of internationalization translates into faster international growth (Autio et al., 2000) and a higher level of achieved internationalization (Reuber & Fischer, 1997). This is attributed to a new venture's "learning advantage of newness" that implies younger firms are able to better learn and adapt to changes in the environment than more mature firms (Autio et al., 2000). In addition, the routines and organizational structure of the new venture have integrated the internationalization aspects from inception, resulting in a more efficient structure (Oviatt & McDougall, 1995).

Empirical evidence largely supports the linkage between the international knowledge held by the management team to firm internationalization in studies of both existing firms (Sambharya, 1996) and smaller, entrepreneurial ventures (Bloodgood et al., 1996; Reuber &

Fischer, 1997). Accordingly, the following hypothesis is put forth not to test a new relationship, but rather to offer further confirmation of an already acknowledged relationship in the literature that also serves as the foundation of this dissertation:

*H1: The international knowledge of a new venture will be positively related to the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope.*

While the international experience of a new venture's top management team contributes to the venture's international knowledge, the value of these prior experiences is expected to decrease as the firm ages (Anand, Glick & Manz, 2002). The international environment is continuously changing and the management team will need to find up-to-date information to deal with new situations. Thus, while the top management team may serve as a valid source of international knowledge, a need exists to also consider the role of external sources of international knowledge.

As a result of globalization, rapid technological change and intensifying competitive pressures (Hitt, Keats & DeMarie, 1998), managers are argued to increasingly turn to external sources for information when making decisions. This reliance on external sources for key business information is likely to be even higher for new ventures. New ventures are characterized as having a "high ratio of assumption to knowledge" (McGrath & MacMillan, 1995: 4), leading new ventures to frequently look to external sources to verify that they are on the right path and improve their chances of success.

While there are many potential external sources of international knowledge that a new venture may tap into, I next consider the following: firms within the venture's headquartered location, venture capital firms investing in a new venture and lastly, the new venture's alliance partners. These three sources have been chosen as they represent firms that a new venture will

frequently interact with. Knowledge has also previously been highlighted as playing a critical role among firms within a given location (e.g. Audretsch & Feldman, 1996) as well as via a firm's venture capital (e.g. MacMillan, Kulow & Khoylian, 1988) or alliance partners (e.g. Hite, 2005). However, the attainment of international knowledge through these sources by new ventures has not yet been explored.

### ***Headquartered Location***

Research on industry clusters emphasizes the importance of firms located in a close geographic proximity (Porter, 2003; Poudier & St. John, 1996). For example, firms are said to benefit from local firms in terms of gaining technological expertise (Audretsch & Feldman, 1996; Feldman & Florida, 1994) or building social networks (Saxenian, 1990). Thus, an external source of international knowledge that a new venture may very well tap into is the firms within the venture's headquartered location.

The concept of knowledge spillovers suggests firms can benefit from the knowledge of firms simply by being located in the same geographic proximity (Adams, 2002; Adams & Jaffe, 1996; Audretsch & Feldman, 1996). As noted by Saxenian (1990) in a study of California's Silicon Valley, knowledge can spillover through relationships that are built locally through organizations such as universities, trade associations, venture capital firms or market research firms. A significant level of research on the importance of knowledge spillovers has emerged in recent years. For example, Simmie (2002) demonstrated that firm innovation is higher in cities with a greater level of supplier-side and demand-side knowledge spillovers. Knowledge spillovers have been argued to contribute to the high level of innovative activity in small and new firms that have little or no R&D (Audretsch, 1998). In a study of the knowledge spillovers resulting from universities, Audretsch and Stephan (1996) concluded that geographic proximity

matters when the knowledge spillovers are informal and lesser so when the knowledge spillovers are formalized. While generally applied to more technological knowledge, knowledge spillovers are also relevant to the international knowledge of firms in these locations. If a large number of firms within a new venture's headquartered location are international, the international knowledge of these firms likely will spillover and influence the internationalization of the new venture located therein.

Knowledge spillovers can either be intra-industry or inter-industry (Audretsch, 1998). On one hand, it is argued that firms are likely to take advantage of knowledge spillovers among local firms in their same industry as there is a greater level of absorptive capacity present and lower costs to communicate (Glaeser, Kallal, Scheinkman & Shleifer, 1992). On the other hand, the diversity that exists in firms in different industries can result in new or innovative knowledge that spills over (Audretsch, 1998). In the context of new venture internationalization, I thus argue international knowledge will spillover from industry firms in their headquartered location as well as through firms outside the respective industry.

In addition to the direct sharing of international knowledge among local firms, new ventures may also be influenced to internationalize simply by observing how internationally focused the firms in their headquartered location are. Thus, the international knowledge of firms in the headquartered location can influence new venture internationalization through mimicry processes. The more frequent a practice is undertaken by a group of firms, the more apt it is to be considered a practice that is taken-for-granted as being part of social reality (Zucker, 1997). It no longer becomes a question to a firm if they should undertake the practice, but rather it is simply done because to not do so would be unthinkable. In those locations that have a high level of international firms, thus representing a high level of international knowledge, a new venture

might automatically assume it will also be international for these reasons. Likewise, new ventures in locations with a near complete absence of international activity might not even question whether they should consider international markets.

Moreover, there is additional reason to believe new ventures pay special attention to the international knowledge of local firms. When firms face a high level of uncertainty, as do new ventures with their limited operating history and high reliance on assumptions in their business plans (McGrath & MacMillan, 1995), a proposed way to reduce the uncertainty is to imitate similar firms (DiMaggio & Powell, 1983). Firms that are in a close geographic proximity constitute a reference base of firms that a new venture can relate to, and thus, serve as a credible model for new ventures. As the frequency of use is argued to serve as a valid indicator that a given practice has technical value (Abrahamson & Rosenkopf, 1983), internationalization may also be perceived by a new venture as an effective and valuable business practice if many other local firms that it observes on a regular basis are international. Based on these reasons, new venture will likely be influenced by the international knowledge generally exhibited by other firms in their headquartered location:

*H2: The international knowledge of other firms within a new venture's headquartered location will be positively related to the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope.*

### ***Venture Capital Firms***

A second external source of international knowledge that deserves consideration lies in the venture capital firms that invest in a new venture. Existing research suggests venture capital firms may provide more than just financial assistance to a new venture (Sapienza, 1992). For example, venture capital firms have been argued to add value to a new venture through the provision of management expertise (Baum & Silverman, 2004; Ruhnka, Feldman & Dean,

1992), reputational benefits (Chang, 2004; Gulati & Higgins, 2003), employee recruitment (MacMillan et al., 1988) and strategy formulation (Fried, Bruton & Hisrich, 1998; MacMillan et al., 1988). An additional way in which a venture capital firm can likely benefit a new venture is through the sharing of knowledge pertaining to internationalization.

This sharing of international knowledge is likely a result of the venture capital firm's managerial influence on the new venture. Venture capital firms tend to play an active role in the new ventures that they invest in (Baum & Silverman, 2004; Ruhnka et al., 1992) and have even been considered to be part of a venture's human resources (Florin, Lubatkin & Schulze, 2003). This is largely due to the high level of risk associated with venture capital financing and that these venture capital firms want to not only protect their investment but do whatever it takes to ensure a high return (Fried et al., 1998). In some cases, the investment by a venture capital firm can spur the replacement of certain management positions within the new venture (sometimes even the actual founder), a membership on the board of directors or ongoing forms on monitoring (Carpenter et al., 2003; Fried et al., 1998). In other words, due to their equity stake and provision of scarce financial resources, venture capital firms have a high level of bargaining power in the relationship with a new venture that they invest in (Porter, 1980). As a result, the venture capital firms have many opportunities to influence the direction that a new venture takes. If the venture capital firm has a high level of international expertise or knowledge, the new venture might be encouraged to consider internationalizing.

Furthermore, based on their prior investments and business partners, venture capital firms have a considerable network to draw on. As noted by Fried and Hirsich (1995), venture capital firms can use their networks to provide a new venture with potential candidates for employment



or the identification of key service providers, customers or corporate partners. The extent that these networks are international may also influence the direction of the new venture.

Oviatt and McDougall (1995) point out yet another reason why new venture internationalization is likely to be influenced by the level of international knowledge of the investing venture capital firm. In their search for financial resources, new ventures may be driven to foreign markets to find suitable investors. Oviatt and McDougall thus argue new venture internationalization may be driven by foreign investors who want the new venture to rapidly move into their own market. While I do acknowledge this “pull effect” likely exists, I emphasize here the importance of the international knowledge of the foreign investor that is passed on to the new venture to make internationalization a reality.

*H3: The international knowledge of the venture capital firms that invest in a new venture will be positively related to the new venture’s (a) international sales intensity, (b) international asset intensity and (c) international scope.*

### ***Alliance Partners***

As argued by Oviatt and McDougall (1994), one of the four necessary and sufficient elements for the existence of international new ventures includes a strong reliance on alternative governance structures. An alternative governance structure that is commonly used by new ventures pursuing internationalization is strategic alliances (Kotha et al., 2001; Lu & Beamish, 2001; Shrader, 2001). Defined as cooperative inter-firm agreements that aim to achieve competitive advantages for each partner (Das & Teng, 2000), strategic alliances can help a new venture access the necessary resources to not only grow, but also internationalize. In addition to the provision of resources, alliance partners constitute an external source of international knowledge for new ventures.

Studies of entrepreneurial networks suggest the partners of a new venture provide the “conduits, bridges and pathways through which the firm can find and access external opportunities and resources” (Hite, 2005: 113). In the context of this dissertation, this implies alliance partners can provide a new venture with external opportunities and resources. The extent to which a domestic alliance partner is knowledgeable about international markets will likely influence how international the resulting opportunities and resources for the new venture are. Forming partnerships with international firms will further contribute to internationalization as it eases acceptance into the foreign market (Lu & Beamish, 2001). This suggests:

*H4: The international knowledge of a new venture’s alliance partners will be positively related to the new venture’s (a) international sales intensity, (b) international asset intensity and (c) international scope.*

#### ***Moderating Role of New Venture International Knowledge***

I have thus argued international knowledge is important to new venture internationalization as it can provide access to international opportunities and decrease the transaction costs associated with foreign entry. However, the sole consideration of only the direct impact of international knowledge on new venture internationalization may be misleading. The concept of absorptive capacity introduced by Cohen and Levinthal (1990: 128) describes the abilities of a firm to “recognize the value of new information, assimilate it, and apply it to commercial ends.” These abilities are typically based on the firm’s prior related knowledge and suggest firms will be apt to take advantage of external informational or knowledge benefits if the firm possesses the necessary knowledge and capacity to absorb the information. This implies that the greater the international knowledge of a new venture, the greater the benefit it will derive from external sources of that knowledge. In other words, the relationship between the external sources of international knowledge and new venture internationalization will be more positive

for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.

The international knowledge of other firms in a new venture's headquartered location is argued to lead to higher levels of new venture internationalization primarily due to knowledge spillovers. Yet, the absorptive capacity literature infers that the relationship could differ among new ventures. New ventures with highly internationally experienced management teams would likely be able to better recognize the value of key information being discussed through various informal channels in their local environment. On the other hand, new ventures that lack international experience within their management team are less likely to be able to absorb and as effectively exploit the information. For example, one of the ways knowledge frequently spills over in a local setting is through interactions with local universities. If a seminar is held at a local university in which certain foreign opportunities are discussed, it is the management team members with international experience that are much more likely to be able to comprehend the information being shared and better understand how to exploit such an opportunity in the context of their venture.

*H5: The relationship between the international knowledge of other firms within a new venture's headquartered location and the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

New ventures are also likely to obtain international knowledge to leverage in foreign markets through their relationships with venture capital firms. One of the ways international knowledge is transferred from venture capital firms to new ventures is through their managerial relationship. As venture capital firms have a financial stake in the new venture, they also typically have a say in the strategies being pursued by the new venture's management team such

as internationalization. While all new ventures are thus expected to benefit from the international knowledge of their venture capital firms in terms of internationalization, it is possible that new ventures receive differing levels of benefit. Those new ventures with high levels of international experience may be better able to follow through and exploit the international opportunities recommended by their venture capital partners. Although new ventures with low levels of international experience would still need to follow the recommendations of their venture capital partners, they may not be able to as effectively exploit the opportunities given their limited international knowledge base.

*H6: The relationship between the international knowledge of venture capital firms that invest in a new venture and the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

Alliance partners serve as an additional way in which new ventures attain international knowledge that aptly leads to higher levels of new venture internationalization. An alliance is a relationship between multiple firms in which certain resources are being formally exchanged. In this respect, the international knowledge being attained by the new venture through their alliance partner is not necessarily part of the formal resource exchange, but rather argued to be vicariously exploited by the new venture through this relationship. As the knowledge is not being formally exchanged or contracted for, it is expected that new ventures that are more knowledgeable of foreign markets will be more apt to recognize the value of subsequent international opportunities that emerge through this relationship. Those new ventures with lesser international knowledge may come across similar international opportunities, but may not be able to as effectively evaluate the potential value of the opportunity.

*H7: The relationship between the international knowledge of a new venture's alliance partners and the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

## **Reputation and New Venture Internationalization**

As defined by Fombrun (1996: 72), “a corporate reputation is a perceptual representation of a company's past actions and future prospects that describes the firm's overall appeal to all of its key constituents when compared with other leading rivals.” In general, the value of firm reputation can be seen through signaling potential and current exchange partners, such as customers, employees, or investors (Fombrun & Van Riel, 2004). A reputation can help a firm contract with these exchange partners through allowing the firm to lower costs, increase prices and create competitive barriers (Deephouse, 2000). As perhaps best noted by Fombrun and Van Riel (2004: 3), “a good reputation acts like a magnet: it attracts us to those who have it.”

Reputation is frequently acknowledged as a source of competitive advantage largely due to the difficulties in creating, imitating or substituting reputation (Barney, 1991). First, it is evident that reputation is difficult to create (i.e. rare) due to the variation of reputation among firms. For example, Microsoft was considered to have the best reputation while Bridgestone/Firestone the worst reputation in the United States for the year 2001 (Fombrun & Van Riel, 2004). Due to a firm's reputation being a perceptual representation by key constituents, the development of reputation is also very socially complex, leading to difficulties by firms in imitating the reputation of others (Barney, 1991). While guarantees and other long-term contracts have been suggested to serve as potential substitutes for firm reputation, Barney (1991) argues the implicit psychological contract differs when an arrangement is made due to reputation and guarantees, thus, making reputation also difficult to substitute. In this dissertation,

reputation is considered to be an important intangible resource that may be a source of competitive advantage leading to new venture internationalization.

Reputation is especially important in situations of information asymmetry. As explained by Weigelt and Camerer (1988: 443), “reputation-building behavior is strategically important in incomplete information settings – i.e. settings where all players are not equally informed about parameters that define payoff functions and possible strategies.” Due to their limited operating history, there is minimal information available for potential exchange partners or stakeholders to adequately assess the credibility or quality of a new venture (Stinchcombe, 1965). For a new venture entering a foreign country, there is even less information for these foreign stakeholders to access. Thus, the value of reputation is of utmost importance to new venture internationalization.

To date, there are very few studies that have directly addressed the potential influence of reputation on new venture internationalization (Zahra & George, 2002). Zahra, Matherne and Carleton (2003) offer some insight on the positive interaction of technological reputation and R&D spending on the degree of new venture internationalization. Yet, as technological reputation is a subset of a company’s overall reputation, a need exists to examine more aspects of reputation (Fombrun, 1996). Furthermore, technological reputation was measured by the authors through self-report data which may or may not be an accurate representation of outsiders’ perceptions. In another study, Kotha, Rindova and Rothaermel (2001) examined the influence of intangible resources on the propensity for Internet firms to develop foreign domain websites. One of the intangible resources examined included reputation as measured through the media visibility obtained by the Internet firm. While these studies offer key insights, I suggest a more

robust and theoretical explanation is needed to build on this existing foundation and examine in more detail the impact of reputation on new venture internationalization.

There are many ways in which reputation can positively influence new venture internationalization. First and foremost, new ventures can gain new customers in the international markets as a result of their reputation. Reputation not only influences how attractive products or services are perceived by potential customers, but also solidifies extreme claims made in advertisements (Goldberg & Hartwick, 1990). Reputation can thus generate demand for a new venture's products or services from customers in foreign countries leading a new venture to expand internationally. In addition, the reputation of a new venture can also help overcome legitimacy issues when entering a new market (Aldrich & Fiol, 1994). Those new ventures that build stronger reputations are seen as more legitimate and credible by potential customers in those markets.

Reputation also influences the ability of a firm to attract and keep employees (Fombrun & Van Riel, 2004). This is important to new venture internationalization in two ways. First, as Stinchcombe (1965) points out, one of the greatest challenges for new ventures are related to the new venture's human capital. New roles have to be created and learned in an emerging organization and this process can result in high costs relating to time, worry, conflict and temporary inefficiency. A more reputable new venture will be able to attract and keep skilled employees, lessening the need to relearn roles, and focus more on strategic factors such as internationalization. While a new venture will still experience "growing pains" and the need to continuously revamp the structure of the organization, loyal and committed employees are more likely to be flexible. Secondly, the ability to attract and maintain loyal employees is critical to reducing the transaction costs associated with opening up a foreign location (Brouthers,

Brouthers & Werner, 2003; Dollinger, Golden & Saxton, 1997; Rugman, 1981). A loyal employee is less likely to adhere to opportunism or acting in a self-interested manner.

Furthermore, reputation is important for attracting investors (Fombrun & Van Riel, 2004). As noted by Casson (2003) in his economic theory of entrepreneurship, access to capital is a major constraint to the scale of entrepreneurial activity. This is an even bigger constraint for those new ventures that wish to pursue foreign markets due to the costs involved in setting up these operations. In comparison to domestic new ventures, international new ventures have been found to exhibit higher levels of strategic aggressiveness (McDougall, 1989; McDougall et al., 2003). In support of such aggressiveness, new ventures may access outside financial and production resources to enter multiple geographic markets on a larger scale (Preece et al., 1998). Thus, yet another role in which reputation contributes to new venture internationalization is through the attainment of financial resources.

Reputation also influences the ability of a firm to develop exchange relationships, such as alliances or joint ventures (Larson, 1992). The costs associated with assessing a firm as a potential exchange partner are reduced when that firm is seen as reputable. New ventures pursuing internationalization have been noted to rely on an aggressive or large scale strategy in entering foreign markets (McDougall, 1989; McDougall et al., 2003), which implies the necessity of resources. Through the reliance on reputation, new ventures can more easily enter into exchange relationships to obtain these resources (Fombrun & Van Riel, 2004), which can subsequently lead to higher levels of growth and performance internationally. The positive relationship between alliances, which are one common type of exchange relationship, and new venture growth in international markets has been reported in several studies (Kotha et al., 2001; Lu & Beamish, 2001). Other scholars have frequently noted the increased reliance on such



hybrid structures to preserve scarce resources internationally (Madsen & Servais, 1997; Oviatt & McDougall, 1994).

Lastly, reputation can have positive implications for the operating performance of a company. For example, a reputation enables a firm to ask customers to pay a premium for their products and services (Fombrun, 1996). This is especially the case when customers lack key performance or quality information, such as what can happen when a new venture enters a foreign market. For these reasons, I posit:

*H8: The reputation of a new venture will be positively related to the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope.*

Because new ventures have a limited track record, potential customers and partners may have limited information to base their assessment of the new venture's quality and reliability on. Thus, in addition to considering the emerging reputation of the new venture, these stakeholders may also look to those firms that the new venture is associated with in order to base their assessment (Stuart, 2000). These external sources of reputation are argued to "provide confirmation to the rest of the world of the value and worth of the organization" (Pfeffer & Salancik, 2003: 145). This is supported by sociologists who argue the evaluations of a firm are strongly associated with the social standing of the actors associated with it when uncertainty exists (Podolny, 1994). Fombrun (1996) exemplifies the reliance on external sources of reputation as a process in which firms "rent the reputations of their lawyers, accountants, bankers and consultants as a means of signaling their own credibility and integrity to key constituents." Hence, this implies a new venture "owns" a reputation, but also has the ability to "rent" a reputation through association with elevated firms. Accordingly, I next consider the potential impact of three external sources of reputation on new venture internationalization: the reputation of the headquartered location of the new venture, the reputation of a new venture's venture

capital firm, and, the reputation of the new venture's alliance partners. In doing so, the reputation of a new venture is argued to be "rented" through these sources, resulting in a higher level of internationalization. These three external sources were chosen as the existing literature points to the importance of reputation in each of these contexts, but we are lacking an examination of their implication of new venture internationalization.

### ***Headquartered Location***

As illustrated by the notoriety given to Silicon Valley in the U.S., the leather and fashion industrial districts in Italy and the Multimedia Super-corridor in Malaysia, geographic locations can also have reputations that are specific to an industry. These reputations can be attributed to the geographic location's level of industry clustering, typically assessed by the concentration of industry firms and their buyer and supplier industries (Porter, 2003). Firms are argued to cluster in order to gain access to workers with similar skill sets, to be in close proximity to their buyer or supplier industries, and to receive knowledge spillovers from the concentration of industry activity (Marshall, 1920). New ventures that are headquartered in locations with higher levels of industry clustering are argued to also be more likely to internationalize, spurred by the reputational benefits of the cluster location.

One of the reputational benefits of cluster locations is their international recognition within an industry (Saxenian, 1990). Consequently, new ventures in locations with high levels of industry clustering may be exposed to more inquiries from foreign buyers (Karagozoglu & Lindell, 1998). For example, a firm seeking products or expertise in software design, fine leather, or ergonomics may seek to transact with firms operating from clusters in America, Italy and Europe, respectively. By virtue of its presence in a recognized cluster location for its industry, therefore, a new venture may receive greater exposure to and awareness of foreign markets.

Another reputational benefit of cluster locations leading to new venture internationalization relates to signaling. As argued by Deeds, Decarolis and Coombs (1997: 36), “the location of a firm acts as a signal to investors of the propensity of the firm to absorb new information and to develop the scientific capabilities required to succeed.” Thus, new ventures in locations with high levels of industry clustering may be automatically perceived to be of higher quality than new ventures located outside of cluster locations. This perception of quality can lead to greater access to the financial resources to fund internationalization activities as well as elevated legitimacy in foreign markets.

*H9: The level of industry clustering in a new venture’s headquartered location will be positively related to the new venture’s (a) international sales intensity, (b) international asset intensity and (c) international scope.*

### ***Venture Capital Firms***

In addition to the financial resources that a venture capital firm directly brings to the new venture it invests in, research in recent years has begun to acknowledge the reputational benefits that come with the venture capital firm (Chang, 2004; Fried & Hisrich, 1995; Gulati & Higgins, 2003). For example, the time-to-IPO of public Internet startups was found to be positively associated with the reputation of participating venture capital firms (Chang, 2004). Gulati and Higgins (2003) similarly examined the prominence of a venture capital firm as a predictor of a new venture’s IPO success. While the reputation of a venture capital firm thus influences how and when stakeholders invest in a new venture, the venture capital firm’s reputation also impacts new venture internationalization. One of the most obvious ways is through the attraction of additional investors (i.e. stockholders) that help provide continued financial resources to support international endeavors. In addition, the reputation of the venture capital firm can signal to providers of other needed resources that the new venture is properly managed and likely to

continue following a high growth trajectory, and thus, is a worthy firm to do business with (Fombrun & Van Riel, 2004). Essentially, partnering with a reputable venture capital firm can translate into access to long-term financial resources via an IPO as well as other needed resources to support internationalization.

*H10: The reputation of venture capital firms that invest in a new venture will be positively related to the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope.*

### ***Alliance Partners***

While an alliance partner is important to a new venture because of the access provided to key resources, alliance partners can also play a second role of potentially elevating the reputation of the new venture in the eyes of existing and potential customers as well as other key stakeholders (Rao, 1994; Stuart et al., 1999). Reputable alliance partners suggest a new venture is of high quality. As noted by Stuart (2000: 795), “highly regarded organizations are likely to meticulously evaluate a potential alliance partner before entering into a collaborative venture with it, and this evaluation acts as a certification of the quality of the partner.” Firms that are highly reputable typically have many potential alliance partners to choose from and the simple fact that a given new venture was selected says a lot about its quality (Stuart et al., 1999). In addition, a more prestigious or reputable firm has its own reputation at stake. If the firm conducts business with a low quality or unreliable firm, it is likely to come back and hurt them in the long run (Stuart et al., 1999). The reputation of the alliance partner can accordingly benefit a new venture entering foreign markets through a greater perception of quality by foreign stakeholders.

Stuart (2000) found support that younger and smaller high-tech firms received more benefits from their alliance than older and larger firms. This is consistent with Weigelt and Camerer's (1988) argument that reputation is more important in incomplete information settings

and reiterates the importance of the reputation of a new venture's alliance partner to internationalization. Simply put, when exploiting an international opportunity, being endorsed by a reputable alliance partner is advantageous in being perceived as a legitimate venture in foreign markets. Accordingly, I hypothesize:

*H11: The reputation of a new venture's alliance partners will be positively related to the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope.*

### **International Knowledge, Reputation and New Venture Internationalization**

In this dissertation, I have so far argued new venture internationalization is driven by two intangible resources: international knowledge and reputation. However, existing research suggests the intangible resources of a firm do not necessarily exist independent of each other, but rather exist as an interdependent bundle of resources (Barney, 1991). For example, in their study of six intangible resources and performance, Carmeli and Tishler (2004: 1258) concluded "the positive effect of the interactions among the organizational elements on organizational performance is such that the higher the values of the other intangible organizational elements, the larger the effect of any given intangible organizational element." Likewise, Wiklund and Shepherd (2003) examined market knowledge and technological knowledge jointly as an important bundle of resources leading to a sustainable competitive advantage. In this dissertation, international knowledge and reputation similarly are considered to be interdependent upon each other.

Black and Boal (1994) argue the relationships between the resources of a firm can take three forms: compensatory, enhancing, and suppressing / destroying. In the context of this dissertation, the international knowledge of the new venture is argued to enhance the relationship between reputation and new venture internationalization. Being perceived as a reputable

company is more important to internationalization when the new venture also has a greater knowledge of international opportunities. This is due to the presences of more synergies when international knowledge and reputation are jointly held by a new venture. Regardless of whether a new venture “owns” a reputation or “rents” a reputation, international knowledge is likely to enhance the relationship between the reputation and internationalization.

The reputation of the new venture itself is an important intangible resource leading to internationalization for various reasons including the attraction of foreign customers and ability to retain more loyal employees abroad. If the management team of a new venture is highly knowledge of foreign markets, the management team may also more effectively recognize the value of leveraging their reputation in these foreign markets. Thus, when coupled with a high level of international knowledge, the new venture’s reputation becomes even more valuable as a contributor to new venture internationalization.

*H12: The positive relationship between the reputation of a new venture and the new venture’s (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

In addition to the new venture’s reputation, new ventures are also argued to be able to leverage external sources of reputation to internationalize. In particular, the reputation of the new venture’s headquartered location as portrayed through the location’s level of industry clustering is argued to be a key external reputation source that a new venture is able to leverage in foreign markets. However, the positive nature of this relationship likely varies for new ventures depending upon the new venture’s level of international knowledge. If a new venture’s management team is highly knowledgeable of foreign markets, they are much more likely to realize the value of being headquartered in a location that is recognized around the world as an

expert in their given industry and, accordingly, more likely to effectively exploit this valuable resource. On the other hand, new ventures with less internationally experienced management teams may receive less benefit from being headquartered in a leading edge cluster location as the value is not fully comprehended.

*H13: The positive relationship between the level of industry clustering in a new venture's headquartered location and the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

An additional external source of reputation that likely leads to higher levels of new venture internationalization is the reputation of venture capital firms that have invested in a new venture. In addition to the financial assistance brought to a new venture, venture capital firms also serve as a signal to key stakeholders (including those in foreign markets) as to the quality of the new venture. For new ventures with high levels of international knowledge, the reputation of their venture capital firm is more likely to be realized by the venture's management team as an important leverage in foreign markets. Thus, this partnership serves as an additional tool the new venture can utilize in entering into and growing within a new foreign market. In contrast, new ventures with low levels of international knowledge are less likely to realize these potential benefits due to their limited knowledge base.

*H14: The positive relationship between the reputation of venture capital firms that invest in a new venture and the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

Alliance partners serve as yet another key external source of reputation that is likely to positively impact new venture internationalization. Similar to venture capital firms, the alliance partners of a new venture can act as a signal of the quality of the new venture to other

stakeholders, including those in foreign markets. Likewise, it is probable that new ventures with higher levels of international knowledge will benefit more from having highly reputable alliance partners than new ventures with lower levels of international knowledge. This is due to the greater recognition by highly internationally experienced management team members of the value of leveraging such partnerships internationally. Furthermore, entering into an alliance with a partner that is itself located in a foreign market is invaluable to a new venture that has knowledge of that market and wishes to further pursue such an opportunity.

*H15: The positive relationship between the reputation of a new venture's alliance partners and the new venture's (a) international sales intensity, (b) international asset intensity and (c) international scope will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.*

In summary, I suggest international knowledge and reputation attained through internal and external sources will directly and positively influence new venture internationalization. International knowledge and reputation both serve as important intangible resources that contribute to an internationally recognized competitive advantage. All of the relationships in the model are expected to be enhanced, or moderated by, the international knowledge of the new venture.



## CHAPTER 4: METHODOLOGY

This chapter presents the methodology used to test the hypotheses generated in Chapter 3. It begins with a discussion of the sample selection process, and then proceeds with a review of the data sources and variable operationalization. Finally, the chapter concludes by reviewing the analytical procedures applied.

### **Sampling Technique and Characteristics**

The sample was comprised of high-technology, U.S.-based new ventures that had undergone an initial public offering during the seven year period of 1995 to 2000. A firm was deemed to be a new venture if the firm was six years old or less at the time of IPO. This is consistent with other new venture studies (e.g. Brush, 1995; Robinson, 1999; Shrader et al., 2000), as the first six years are regarded as a crucial period in which survival is determined for a majority of companies (U.S. Small Business Administration, 1992).

New ventures were initially included in the sample only if their primary industry was classified as high-technology by *Securities Data Corp (SDC) Global New Issues* database (Ranft & Lord, 2000; Ranft & Lord, 2002). These industries included biotechnology, communications, computer equipment and electronics. Although considered to be high-technology, firms in the biotechnology were then excluded as it was determined that they were significantly different from the other firms in the high technology industry in terms of their sales, tendency to internationalize, and level of research and development.

High-technology industries were selected because of the high number of recent initial public offerings by new ventures, resulting in a greater sample size, and because the industries

represented technology-intensive businesses in which internationalization had been observed to be pursued by new ventures in previous studies (Burgel & Murray, 2000; Coviello & Munro, 1997; Jolly, Alahuhta & Jeannet, 1992; Kotha et al., 2001; Zahra et al., 2000). Prior research also suggests technological knowledge is a principal means of gaining global market share (Franko, 1989) and cross-border integration (Kobrin, 1991). Porter (1986) further argues that industries that rely on upstream activities, such as research and development, as a means of competitive advantage are much more likely to compete globally than those industries that rely on more downstream activities for competitive advantage. Thus, high-technology industries appeared to be an appropriate context to study new venture internationalization.

New ventures that had undergone an initial public offering in the United States were included largely due to data availability. In addition, new ventures that pursued an initial public offering were likely to be growth oriented and thus, more likely to consider foreign markets in their early years. Following other studies using IPO venture data (e.g. Carpenter et al., 2003; Florin et al., 2003; Robinson & McDougall, 2001), all firms that were corporately held or results of a corporate spin-off were eliminated from the sample. Due to the small number of new ventures that underwent an IPO each year, data was gathered for new ventures that had undergone an IPO between 1995 and 2000 to increase the size of the sample. No new ventures that had undergone an IPO from 2001 forward were included due to the significant decrease in firms going public when the Internet bubble burst.

Based on the above criteria, 308 high-technology new ventures that underwent an IPO between 1995 and 2000 were initially identified. When biotechnology firms were removed from the sample, the remaining firms numbered 241. The sample size was then further reduced to 213

as only firms that exhibited sales revenue in the year following IPO were retained in the sample in order to have a one-year lag time between independent and dependent variables.

This resulting sample represented new ventures in three high technology industries and 38 different metropolitan statistical areas (MSA) throughout the United States. In terms of size, the average new venture as of their IPO year achieved \$181.87 million in assets, \$53.52 million in sales and 411 employees. Examples of some of the better known ventures in the sample included Amazon.com, Netscape Communications, Nvidia Corp, OmniSky, Occam Networks, TiVo, Yahoo! and Vitech America.

Additional data describing the sample are presented in Tables 1 through 3. Table 1 lists the years in which the new ventures were founded, the years in which they underwent their IPO, and the ages at which they underwent their IPO. Since 1989, there appeared to be a general increase in the number of new ventures founded that eventually went public. This trend leveled off and declined after 1995. Data in Table 1 also indicates a significant increase in the number of new ventures that went public in 1999, before starting to drop off in 2000. This is in line with the Internet bubble that peaked in 1999, before bursting shortly thereafter and resulting in a very leery investment attitude towards technology ventures thereafter. In addition, data in Table 1 relating to the age of the new ventures at the time of their IPO suggests that although the average age at IPO is 3.65 years, the age does vary significantly.

**Table 1: Frequency of Sample by Year  
Founded, Year of IPO and Firm Age at IPO**

		n
<b>Year Founded:</b>	1989	2
	1990	4
	1991	7
	1992	12
	1993	29
	1994	36
	1995	46
	1996	42
	1997	25
	1998	8
	1999	2
	Total:	213
<b>Year of IPO:</b>	1995	7
	1996	24
	1997	31
	1998	30
	1999	70
	2000	51
	Total:	213
<b>Firm Age at IPO:</b>	1	14
	2	34
	3	56
	4	46
	5	35
	6	28
	Total:	213

**Table 2: Frequency of Sample by Industry and Geographic Location**

**High-Technology Industry Grouping**

**n Industry**

94 Computer Equipment  
 100 Communications  
 19 Electronics

**Geographic Location**

<b>n MSA</b>	<b>n MSA</b>
1 Allentown-Bethlehem-Easton, PA-NJ	18 New York-Northern New Jersey-Long Island, NY-NJ-PA
8 Atlanta-Sandy Springs-Marietta, GA	3 Philadelphia-Camden-Wilmington, PA-NJ-DE
2 Austin-Round Rock, TX	2 Phoenix-Mesa-Scottsdale, AZ
1 Baltimore-Towson, MD	1 Pittsburgh, PA
9 Boston-Cambridge-Quincy, MA-NH	4 Portland-Vancouver-Beaverton, OR-WA
1 Boulder, CO1/	1 Poughkeepsie-Newburgh-Middletown, NY
1 Bridgeport-Stamford-Norwalk, CT	2 Raleigh-Cary, NC
1 Charlotte-Gastonia-Concord, NC-SC	1 Rochester, MN
4 Chicago-Naperville-Joliet, IL-IN-WI	1 San Antonio, TX
1 Columbus, OH	5 San Diego-Carlsbad-San Marcos, CA
3 Dallas-Fort Worth-Arlington, TX	43 San Francisco-Oakland-Fremont, CA
3 Denver-Aurora, CO1/	48 San Jose-Sunnyvale-Santa Clara, CA
1 Greensboro-High Point, NC	2 Santa Barbara-Santa Maria-Goleta, CA
5 Houston-Baytown-Sugar Land, TX	1 Santa Rosa-Petaluma, CA
1 Indianapolis, IN	1 Sarasota-Bradenton-Venice, FL
1 Kansas City, MO-KS	12 Seattle-Tacoma-Bellevue, WA
6 Los Angeles-Long Beach-Santa Ana, CA	1 St. Louis, MO-IL
6 Miami-Fort Lauderdale-Miami Beach, FL	1 Torrington, CT
2 Minneapolis-St. Paul-Bloomington, MN-WI	9 Washington-Arlington-Alexandria, DC-VA-MD

**Table 3: Frequency of Sample by Internationalization**

<b>International Entry</b>	
<b>n</b>	<b>Sales</b>
101	Domestic
112	International

<b>International Sales Intensity</b>		<b>International Asset Intensity</b>	
<b>n</b>	<b>% of Sales from Foreign Markets</b>	<b>n</b>	<b>% of Assets in Foreign Markets</b>
101	0%	101	0%
17	1-10%	51	1-10%
26	11-20%	21	11-20%
28	21-30%	16	21-30%
13	31-40%	6	31-40%
5	41-50%	9	41-50%
10	51-60%	5	51-60%
3	61-70%	2	61-70%
4	71-80%	1	71-80%
2	81-90%	1	81-90%
4	91-100%	0	91-100%

<b>International Scope</b>	
<b>n</b>	<b># of Triad Regions with Sales</b>
131	1
37	2
45	3

<b>n</b>	<b># of Continents with Sales</b>
101	1
41	2
44	3
22	4
4	5
1	6

Table 2 illustrates the breakout of the sample by both industry grouping and geographic location. The computer equipment and communications industries each accounted for approximately 44% and 47% of the sample, respectively. The remaining portion is attributed to electronics at 9%. The breakout of the sample by geographic location also proves very interesting. While a vast amount of geographic locations are represented, the largest cluster of ventures was located in the San Jose-Sunnyvale-Santa Clara, CA MSA. Otherwise known as Silicon Valley, this location represented 23% of the sample. Other significant areas included the neighboring San Francisco-Oakland-Fremont, CA MSA at 20%, New York-Northern New Jersey-Long Island, NY-NJ-PA MSA at 8% and the Seattle-Tacoma-Bellevue, WA MSA representing 6% of the sample. The high concentration of new ventures in these locations is expected given that these locations are known for high concentration of firms in high technology industries (Porter, 2003).

Table 3 offers greater insight as to the level of internationalization pursued by the new ventures in my sample. Of the 213 ventures, 53% have entered foreign markets. Although the international business literature has tended to only consider a firm to have internationalized if the firm achieves a certain threshold of international sales, such as 10% or 20% of their total sales (Rugman & Verbeke, 2004), in this study any level of internationalization by a new venture is of interest. Of those new ventures that have entered foreign markets, their level of international sales ranged from 1 to 100%. However, the majority tended to achieve 40% or less foreign to total sales. In regards to their international asset intensity, the majority of the new ventures in the sample held 30% or less of their assets in foreign markets. Lastly, the data in Table 3 suggests that 21% of my sample of new venture could be considered “global,” meaning that some sales were achieved in each of the three major triad regions of the world. In contrast, 17% operated in

two of the three major triad regions with the remaining 62% operated solely in the North American region. It is noted that my definition of global is fairly conservative as I only consider whether or not a new venture has entered each of the triad regions, and not whether or not they have achieved a minimum threshold of sales in each region. When considered at the continent level, the majority of new venture that have internationalized appear to have been operating in three continents or less.

### **Data Sources**

The current study relied exclusively on publicly available data. The Global New Issues Database of the Securities Data Corp (SDC), a source that provides research on public offerings, was used to initially identify potential firms to include in the sample. To collect data on the venture capital firms and strategic alliance partners associated with a new venture, the Venture Economics Database and Joint Venture/Strategic Alliance Database of the SDC were drawn upon, respectively. Financial data and other company specific information were obtained either through the ventures' prospectus or Compustat North America. Offered by Standard & Poor's Investment Services, Compustat North America is a standardized database providing fundamental and market information on publicly held companies in the U.S. and Canada. Lexis-Nexis was utilized to assess media visibility for the reputation constructs. Lastly, the Cluster Mapping Project put forth by the Harvard Institute for Competitiveness was drawn upon to create the location reputation variable.

### **Operationalization of Variables**

In order to operationalize the variables involved in the study, a literature review was first conducted. This initial review established that there were many different ways to operationalize the variables of interest (see Appendix 1 for a detailed summary by variable). Accordingly, I had



chosen in the present study to utilize those operationalizations that I felt were the best fit for the theoretical model being use, but also do acknowledge the alternatives that do exist.

### ***Timeframe of Measurement***

Using a sample of publicly held new ventures can be very beneficial due to the public access to key financial information and in this case, internationalization data, that would be very hard to obtain otherwise. However, as relatively few new ventures actually undergo an IPO early on, some trade offs also need to be made in order to arrive at an acceptable sample size. Trade offs by prior scholars in the sample selection process relate to variances in the age of the new venture and timing of the IPO. For example, Shrader (2001) chose to include data in his sample on publicly-held new ventures *as of six years of age*, but the new ventures varied as to how many years previous they had undergone their IPO. In contrast, Carpenter, Pollock and Leary (Carpenter et al., 2003) gathered data on new ventures *as of their IPO year* and simply had to control for variance in the firm age of the new venture. Although there are pros and cons to both approaches, I chose to follow the latter in this study and included data on new ventures as of their IPO year. An IPO represents a significant transition point in the life cycle for any firm, including new ventures, as this undertaking shifts the firm from the private arena to the public arena (Certo, Daily & Dalton, 2001). One of the implications of such a transition for a new venture is an increased level of public scrutiny and public awareness, both of which are likely to impact the reputation of a new venture (Fombrun & Van Riel, 2004). As reputation is a key independent variable in this dissertation, I felt it was more appropriate to gather the data as of the same, rather than varying, transition point.

Unless otherwise stated, all independent variables were gathered at the end of the fiscal year in which the new venture underwent the IPO. All dependent variables were gathered as of

the end of the fiscal year following the IPO year in order to have a one year time lag between independent and dependent variables.

### ***Internationalization Variables***

New venture internationalization refers to the seeking of “significant competitive advantage from the use of resources and sale of outputs in multiple countries” by firms from, or near, inception (Oviatt & McDougall, 1994). Following the recommendation by Sullivan (1994), multiple measures were used in this study to conceptualize new venture internationalization including international sales intensity, international asset intensity and international scope. Respectively, these measures represented the performance, structural and attitudinal theoretical dimensions of internationalization as noted by Sullivan (1994). The data was obtained from Compustat North America.

*International Sales Intensity.* The international sales intensity of a new venture is a measure of the venture’s degree of international involvement based on sales as of the year following its initial public offering. It was operationalized as foreign sales as a percentage of total sales (Carpenter et al., 2003; McDougall & Oviatt, 1996; Preece et al., 1998) and sourced from the segment data of Compustat North America.

*International Asset Intensity.* The international asset intensity similarly assesses the venture’s degree of international involvement, but this time takes into account the location of the venture’s assets as of the year following its initial public offering. The variable was operationalized as foreign assets as a percentage of total assets (Daily, Certo & Dalton, 2000; Sambharya, 1996) and also sourced from the segment data of Compustat North America.

*International Scope.* The international scope variable examines the extent to which a new venture enters foreign markets outside its home region. The variable was operationalized by

taking a count (ranging from 1 to 6) of the number of continents a venture has sales in as of the year following the venture's initial public offering. No sales are assumed to be made to the seventh continent of Antarctica. This measure of international scope therefore represents a more global measure of internationalization than the international sales or asset intensity measures and is similar to that utilized by Preece et al. (Preece et al., 1998). As firms are argued to internationalize to nearby countries (intra-region) more so than to distant countries (extra-region) (Rugman, 2000; Rugman & Verbeke, 2004), this operationalization was deemed to be an appropriate indicator of the extent to which the venture sold beyond adjacent international markets. While a limitation of my variable is that it does not take into account the actual number of countries in which a new venture generated revenue, the benefit of operationalizing the variable at the continent level is that it provides a more conservative measure of internationalization that enables us to understand how global the operations of the ventures are. For each firm, I utilized the segment data of Compustat North America and the prospectus to determine the number of continents from which sales were generated.

Following prior researchers (Rugman & Verbeke, 2004), I also calculated an alternate measure of international scope based on a count of the number of regions within the triad that a new venture has sales in. The three triad regions of the world are considered to be North America, the European Union and Asia. The correlation between international scope based on the number of continents and international scope based on the number of regions entered was high ( $r=0.86$ ,  $p<0.001$ ) and produced similar results in the regression analysis. In this dissertation, I present the results based on international scope measured by the number of continents entered.

### ***International Knowledge Variables***

*New Venture International Knowledge.* To operationalize the international knowledge of the new venture, I assessed the international experience of the new ventures' top management teams by examining the IPO prospectus for each venture (e.g. Bloodgood et al., 1996; Carpenter et al., 2003; Shrader et al., 2000). The prospectus includes a list and brief biography of all members of the top management team. Consistent with previous scholars (Bloodgood et al., 1996; Carpenter et al., 2003), I used these biographies to create a count of persons on the top management team that have international work experience. Members were considered to have had foreign work experience if their biography indicated they had held a position overseeing the international component for a previous employer or had worked in a foreign company or for the foreign subsidiary of a U.S. based company.

*Location International Knowledge.* The location international knowledge variable considers the level of international experience by firms within the new venture's headquartered location as of the year of the new venture's initial public offering. This variable was operationalized by taking the percentage of public firms that had reported international sales within the respective location. The geographic unit of analysis was the metropolitan statistical area (MSA) of the new venture.

As knowledge spillovers within a geographic location have been argued to be both intra-industry and inter-industry (Audretsch, 1998), a second alternative measure of location international knowledge was also gathered based on the percentage of *industry* firms reporting international sales in a new venture's headquartered MSA. As Compustat does not use the same high technology groupings that were initially used to identify the new ventures as high technology from the SDC database, it was necessary to consider the standard industry

classification (SIC) codes reported. Thus, firms in any of the 3-digit SIC codes reported by the new ventures in the sample were considered to be high technology. The correlation between the location international knowledge variable based on the internationalization of *all* firms and that of the subset of only *industry* firms in a new venture's MSA was 0.87 ( $p < 0.001$ ) and produced similar results in the regression analyses. Thus, I rely on the more conservative measure of location international knowledge measured by the percentage of *all* firms that have internationalized in a new venture's MSA and present those results in this study

*Venture Capitalist International Knowledge.* The international knowledge of a venture capital firm was operationalized by taking the percentage of venture capital firms investing in a new venture that had made prior international investments as of the year of the new venture's initial public offering. This data was sourced from the SDC's Venture Economics Database.

*Alliance Partner International Knowledge.* To assess the international knowledge of the alliance partners of a new venture, I determined the number of alliance partners that were (1) headquartered outside of the U.S. or (2) headquartered in the U.S. and had at least 10% of sales outside of the U.S. A 10% threshold was used as the U.S. Securities and Exchange Commission (SEC) requires that public firms report their international sales data only if this threshold is met. This information was obtained via Compustat North America if the firm was public. Otherwise, a telephone inquiry and/or web search was made to determine how to classify the alliance partner. The resulting variable thus represented a count of the alliance partners that met either of the above criteria.

### ***Reputation Variables***

*New Venture Reputation - Volume.* As a firm's reputation is determined by the perceptions of key constituents (Fombrun, 1996), the visibility of a firm in the media is a key

factor in influencing these perceptions. As put by Fombrun and Van Riel (2004: 87): “No matter how good the company is, there’s no real reputation without visibility.” The influence the media can have on key constituents is illustrated in a widely cited study by McCombs and Shaw (1972) in which the mass media was shown to determine the important issues, or the agenda, of a political campaign. For this reason, media visibility is frequently used as a proxy for reputation (Deephouse, 1996; Deephouse, 2000; Kotha et al., 2001; Pollock & Rindova, 2003). In line with these scholars, the reputation of a new venture in this study was operationalized as the count of articles published on the new venture up to and on the actual date of the IPO found in the “Magazines and Journals” databases in Lexis-Nexis (Kotha et al., 2001; Pollock & Rindova, 2003).

*Location Reputation.* The location reputation variable considers the reputation of a new venture’s headquartered location for the entered industry cluster. Following the approach put forth by Porter (Porter, 1990), the reputation of a given location was operationalized by taking the percentage of nationwide employees in the industry that were located within the new venture’s metropolitan statistical area (MSA) as of the new venture’s IPO year. This data was sourced from the Cluster Mapping Project published by the Harvard Institute for Competitiveness.

*Venture Capitalist Reputation.* Following Chang (2004), multiple measures were used to assess the reputation of the venture capitalist including (1) the number of prior startup investments, (2) the total dollars invested and (3) the IPO success rate of the venture capital firm as of the IPO year. This data was taken from the SDC’s Venture Economics Database. Based on a confirmatory factor analysis, the resulting factor score of the three measures produced a cronbach alpha of 0.91 and was used to represent the variable in the study. I gathered the above

measures first for the lead venture capital firm and secondly, to represent an average of the value for each venture capital firm investing in a new venture. As the results were similar, I also followed Chang (2004) and only reported in this study the measure based on the average of all venture capital firms.

*Alliance Partner Reputation - Volume.* The reputation of the alliance partners reflected the number of articles about each alliance partner as published in the “Magazines and Journals” databases in Lexis-Nexis during the year in which the alliance was established (Kotha et al., 2001; Pollock & Rindova, 2003). The alliance partner(s) for each new venture was first identified through SDC’s Joint Venture/Strategic Alliance Database. As some new ventures had multiple alliance partners, the measure was then calculated by taking the sum of the article counts for all the alliance partners.

### ***Control Variables***

This study also included controls for several variables that might affect the hypothesized relationships, including new venture age, new venture size, industry group, venture capital financing, alliance partner usage, R&D intensity, IPO year, new venture reputation tenor and alliance partner reputation tenor.

*Age of New Venture.* Similar to other new venture internationalization studies, control variables were incorporated for the age of the new venture. Age might influence a new venture’s propensity to internationalize as older firms typically have more resources and a greater number of network relationships to rely on (Burgel & Murray, 2000; Kotha et al., 2001; Reuber & Fischer, 2002; Zahra et al., 2000; Zahra, Neubaum & Huse, 1997). The age of the new venture at IPO was determined from the founding date listed in the SDC’s Global New Issues database and cross-validated within the new ventures’ prospectus.

*Size of New Venture.* The size of the new venture was considered due to larger firms having more resource availability that might influence their ability to internationalize (Bloodgood et al., 1996; Burgel & Murray, 2000; Steensma, Marino, Weaver & Dickson, 2000; Zahra et al., 2000; Zahra et al., 1997). Additionally, firms that are larger are suggested to be more reputable. Size was operationalized through the new ventures' total assets in their IPO year.

*Industry Group.* Although all new ventures included in the sample are considered to be high-technology, it is possible that differences exist by industry. Thus, dummy variables were utilized to control for the high-technology industry group that the new venture belongs to. This information was obtained from the SDC's Global New Issues database and included the following industry groups: communications, computer equipment, and electronics.

*Venture Capitalist.* Given the interest in the reputation and international knowledge of the venture capitalist firms that have invested in the new venture on the internationalization of the venture, the presence of venture capital financing received by the new venture prior to IPO was controlled for through the use of a dichotomous variable. Although not all of the new ventures in the sample have venture capital firms, the inclusion of this variable also allowed me to test the hypotheses relating to the international knowledge and reputation of the new venture's venture capital firm with the entire sample (Fischer & Pollock, 2004). This variable was sourced through the Venture Economics Database of the SDC.

*Alliance Partners.* While a primary interest in this study was the reputation and international knowledge of a new venture's alliance partners, it was necessary to control for other benefits achieved through the alliance partner. Thus, I used a dichotomous variable to control for the presence of alliance partners by the new venture as of the IPO year. As not all of the new ventures in the sample have alliance partners, this variable enabled me to include all of



the new ventures in the analysis when testing the hypotheses relating to the international knowledge and reputation of the new venture's alliance partners (Fischer & Pollock, 2004).

*R&D intensity.* The development of unique products has been advanced as an important component of new venture internationalization (Autio et al., 2000; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994). To control for this possibility, the R&D intensity (sales divided by R&D expenditures) of the new venture was included in the model as sourced via Compustat North America.

*IPO year.* Dummy variables were also created to control for the year of IPO as the new ventures identified in the sample had completed an IPO at various times between 1995 and 2000.

*New Venture Reputation - Tenor.* While the new venture reputation variable above represents a count of the media articles through the IPO year, it is possible that the content of the media articles also influence the reputation, and thus, internationalization. Accordingly, a control variable was created that assessed how positive or negative the media visibility was. The articles published on each new venture were coded as to whether they had positive, negative or neutral content. Based on this data, the Janis-Fadner coefficient of imbalance was calculated to determine the tenor of the reputation (Bansal & Clelland, 2004; Deephouse, 1996; Deephouse, 2000; Pollock & Rindova, 2003). This variable is referred to as *New Venture Reputation – Tenor* and was calculated using the following formula:

$$\begin{aligned} \textit{Tenor} &= (P^2 - PN)/V^2 \textit{ if } P > N; \\ &0 \textit{ if } P = N; \\ &(PN - N^2)/V^2 \textit{ if } P < N, \end{aligned}$$

where P is the number of positive articles, N is the number of negative articles and V is the total volume of articles including those that are neutral (Pollock & Rindova, 2003). The variable can range from -1 to +1, where -1 indicates all negative articles and +1 indicates all positive articles.

Multiple raters were used to conduct the content analysis of published articles to code the articles as positive, negative or neutral content. Prior to beginning the content analysis, each rater was asked to complete a random sampling of articles for 15 firms, which accounted for 102 articles. Based on the individual results of each rater, the inter-rater reliabilities as measured by a Pearson correlation was 0.87. The differences between raters were then discussed as a group and joint conclusions were made as to the correct classification going forward.

*Alliance Partner Reputation – Tenor.* Similar to the new venture reputation, a second control variable was created that considered how positive, negative or neutral the articles are regarding the alliance partner. Again, the measure used the Janis-Fadner coefficient of imbalance (Deephouse, 1996; Deephouse, 2000; Pollock & Rindova, 2003). With those new ventures that had multiple alliance partners, the Janis-Fadner coefficient was averaged. The multiple raters used to conduct the content analysis of articles published on the alliance partners were again asked to complete a random sampling of articles for 15 firms, which accounted for 183 articles. The Pearson correlation among raters was acceptable at 0.90. Differences between the raters were jointly discussed and conclusions were made as to the correct classifications to use in the remainder of the analysis.

Table 4 provides summarized details for each variable, including operational definitions, data sources, descriptions of the data coding, and references to studies that provided precedents on which the variables were based.

**Table 4: Variable Operationalizations**

<b>INTERNATIONALIZATION VARIABLES</b>				
<b>VARIABLE</b>	<b>OPERATIONAL DEFINITION</b>	<b>DATA SOURCES</b>	<b>DATA CODING</b>	<b>REFERENCES</b>
International Sales Intensity	Total foreign sales as percentage of total sales by the new venture in the year following IPO.	Compustat North America (Segment Data)	Foreign sales divided by total sales	Carpenter, Pollock & Leary, 2003; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Preece, Miles & Baetz, 1998
International Asset Intensity	Total foreign assets as a percentage of total assets by the new venture in the year following IPO.	Compustat North America (Segment Data)	Foreign assets divided by total assets	Daily, Certo & Dalton, 2000; Sambharya, 1996
International Scope	Dispersion of the new venture's sales among the world in the year following IPO.	Compustat North America (Segment Data)	Count (range from 1 to 6) based on having sales in each of the continents of the world. No sales were obtained in the seventh continent of Antarctica.  An alternate measure was also gathered as a count (ranging from 1 to 3) based on having sales in each of the regions of the triad. The three triads include North America, the European Union and Asia-Pacific.	Preece, Miles & Baetz, 1998; Rugman & Verbeke, 2004; Zahra, Ireland & Hitt, 2000

**Table 4: Variable Operationalizations (continued)**

<b>INTERNATIONAL KNOWLEDGE VARIABLES</b>				
<b>VARIABLE</b>	<b>OPERATIONAL DEFINITION</b>	<b>DATA SOURCES</b>	<b>DATA CODING</b>	<b>REFERENCES</b>
New Venture International Knowledge	Prior international experience of the new venture's top management team.	IPO Prospectus	Count of persons that have international work experience	Bloodgood et al., 1996; Carpenter et al., 2003;
Location International Knowledge	Percentage of all firms with international experience within the new venture's headquartered MSA location as of the new venture's IPO years.	Compustat North America (Segment Data)	The number of public firms with at least 10% international sales reported divided by the total number of public firms within respective MSA location.  An alternative measure was also gathered based on the number of public firms in the new ventures' entered industry with at least 10% international sales reported divided by the total number of public firms within respective MSA location.	
Venture Capitalist International Knowledge	Percentage of the new venture's venture capital firms that have made international investments as of the new venture's IPO year.	SDC Platinum (Venture Economics database)	The number of venture capitalists with prior international investments divided by the number of total number of venture capitalists that have invested in a new venture.	Chang, 2004
Alliance Partner International Knowledge	Count of alliance partner(s) of a new venture as of the new venture's IPO year with international experience.	SDC Platinum (Jt Venture/Strategic Alliance); Prospectus; Compustat North America (Segment Data)	Count of the number of the new venture's alliance partners that are (1) headquartered outside the U.S. or (2) headquartered in the U.S. and have at least 10% international sales in the alliance formation year.	

**Table 4: Variable Operationalizations (continued)**

<b>REPUTATION VARIABLES</b>				
<b>VARIABLE</b>	<b>OPERATIONAL DEFINITION</b>	<b>DATA SOURCES</b>	<b>DATA CODING</b>	<b>REFERENCES</b>
New Venture Reputation - Volume	Volume of media coverage on new venture up to and on the actual date of IPO.	Lexis-Nexis (Magazines and Journals database)	Count of articles on new venture. Variable is transformed by taking the square root.	Kotha et al., 2001; Pollock & Rindova, 2003
Location Reputation	The extent to which a new venture is headquartered in a industry cluster location.	Cluster Mapping Project (Harvard Institute for Competitiveness)	The percentage of nationwide employees in the industry that are located within the new venture's MSA. This variable has been log transformed after adding 0.001 to each number as suggested by Mostellar & Tukey (1977).	Porter, 1990; Birkinshaw & Hood, 2000
Venture Capitalist Reputation	Reputation of the new venture's venture capitalist as determined by the number and dollar of prior startup investments as well as the IPO success rate as of the new venture's IPO year.	SDC Platinum (Venture Economics database)	Factor score based on: (1) Number of prior startup investments as of the new venture's IPO year. Measure is transformed by taking the square root. (2) Total dollars invested as of the new venture's IPO year. Measure if transformed by taking the square root. (3) IPO success rate as of the new venture's IPO year. If more than one venture capitalist has invested in new venture, the values are averaged prior to calculating the factor score. If a new venture has not received any venture capitalist funding, it is coded as 0.	Chang, 2004

**Table 4: Variable Operationalizations (continued)**

<b>REPUTATION VARIABLES</b>				
Alliance Partner Reputation - Volume	Volume of media coverage on alliance partner(s) that new venture obtained through IPO year.	Lexis-Nexis (Magazines and Journals database)	Count of total articles for new venture's alliance partner(s) during alliance formation year. If multiple alliances, the counts are summed. Variable transformed by taking square root.	Kotha et al., 2001; Pollock & Rindova, 2003

**Table 4: Variable Operationalizations (continued)**

<b>CONTROL VARIABLES</b>				
<b>VARIABLE</b>	<b>OPERATIONAL DEFINITION</b>	<b>DATA SOURCES</b>	<b>DATA CODING</b>	<b>REFERENCES</b>
Age of New Venture	Age of the new venture as of the IPO year	SDC Platinum (Global New Issues database)	Age of the new venture as of the IPO year	Burgel & Murray, 2000; Kotha et al., 2001; Reuber & Fischer, 2002
Size of New Venture	Total assets of the new venture as of the IPO year	Compustat North America	Total assets of the new venture as of the IPO year. This variable has been log transformed after adding 0.001 to each number as suggested by Mostellar & Tukey (1977).	Bloodgood et al., 1996; Burgel & Murray, 2000; Steensma et al., 2000; Zahra et al., 2000
Industry Group	Which technology group a new venture belongs to: computer equipment, electronics or communications	SDC Platinum (Global New Issues database)	2 dummy variables have been created with the communications industry serving as the reference group: (1) 1=Computer equipment; 0=Otherwise (2) 1=Electronics; 0=Otherwise	
Venture Capitalist Financing	Whether or not the new venture has received venture capital financing as of the IPO year.	SDC Platinum (Venture Economics database)	0=New venture has NOT received venture capitalist financing 1=New venture has received venture capitalist financing	
Alliance Partners	Whether or not the new venture has formed alliance partners as of the IPO year.	SDC Platinum (Joint Venture/Strategic Alliance database); Prospectus	0=New venture has NOT formed alliance partners 1=New venture has formed alliance partners	

**Table 4: Variable Operationalizations (continued)**

<b>CONTROL VARIABLES</b>				
<b>VARIABLE</b>	<b>OPERATIONAL DEFINITION</b>	<b>DATA SOURCES</b>	<b>DATA CODING</b>	<b>REFERENCES</b>
R&D Intensity	Total R&D expenditures divided by new venture size as of the IPO year.	Compustat North America	Total R&D expenditures divided by total sales. This variable has been log transformed after adding 0.001 to each number as suggested by Mostellar & Tukey (1977).	Autio et al., 2000; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994; Shrader, 2001
IPO Year	Which year a new venture underwent the IPO.	SDC Platinum (Global New Issues database)	5 dummy variables have been created with the 1995 IPO year serving as the reference group: (1) 1=1996; 0=Otherwise (2) 1=1997; 0=Otherwise (3) 1=1998; 0=Otherwise (4) 1=1999; 0=Otherwise (5) 1=2000; 0=Otherwise	
New Venture Reputation - Tenor	The extent to which the media coverage of the new ventures is positive, negative or neutral (i.e. the tenor of media coverage) up to and on the actual date of IPO.	Lexis-Nexis (Magazines and Journals database)	The Janis-Fadner coefficient is calculated based on the number of articles rated as positive, negative or neutral.	Deephouse, 1996, 2000; Pollock & Rindova, 2003
Alliance Partner Reputation - Tenor	The extent to which the media coverage of the alliance partner(s) that the new venture obtained is positive, negative or neutral (i.e. the tenor of media coverage) as of alliance formation year.	Lexis-Nexis (Magazines and Journals database)	The Janis-Fadner coefficient is calculated based on the number of articles rated as positive, negative or neutral. If multiple alliances were formed, the Janis-fadner coefficient is averaged.	Deephouse, 1996, 2000; Pollock & Rindova, 2003



## Analytical Techniques

Multiple methods were used to test the study's research model. As three different dependent variables were used to measure new venture internationalization in the research model, the analytical technique varied based on the respective variable characteristics. Table 5 provides an overview of the different analytical techniques being used.

**Table 5: Overview of Analytical Techniques**

<b>Dependent Variable</b>	<b>Analytical Technique</b>
International Sales Intensity	Interval Regression
International Asset Intensity	Interval Regression
International Scope	Zero-Truncated Poisson Regression

Note: The standard errors were adjusted for intragroup correlations based on location.

The international sales intensity and international asset intensity variables were continuous, but also left censored. Slightly more than half of the new ventures in the sample did not have any international sales or international assets, resulting in a zero being input for these variables. Accordingly, to account for this censoring as well as the continuous nature of the variables, I used an interval regression within Stata. Interval regression is a generalization of tobit regression in Stata that allows for more complex calculations and adjustments to the standard errors in an analysis.

International scope represented the third dependent variable of interest in this study and exhibits unique properties as it is a count variable with values ranging from 1 to 6, depending on how many continents the venture is operating within. Thus, it was determined that a poisson regression was most appropriate. To take into account the left-censoring also present within the international scope variable, a zero-truncated poisson regression was utilized.

Two of the independent variables in this dissertation are based on the geographic location of the new venture. These variables include *location international knowledge* and *location*

*reputation*. As the resulting database is thus comprised of new ventures that are nested within geographic locations, this initially led to the consideration of hierarchical linear modeling for analysis. However, the limited number of distinct locations and consequently limited sample size at the higher order level was too small to generate adequate power to test cross-level interactions (Hofmann, 1997). Consequently, I applied the value for the location data to the lower level unit of the new venture. One of the disadvantages of such an approach is that the observations are no longer independent (Bryk & Raudenbush, 1992), which could lead to biased results from correlated standard errors. To address this concern, I ran the interval and poisson regression analyses using the cluster option within Stata. The cluster option employs a classing feature, in this case based on the new venture's geographic location, which adjusts the standard errors based on intragroup correlations.

Given the moderating relationships within the research model, a second analysis technique that was initially considered was structural equation modeling. However, this technique was ruled out due to the sample size of the database and the fact that nearly all of the variables were measured with a single item.

For testing the moderating relationships, I multiplied the *new venture international knowledge* variable by the *location international knowledge*, *venture capitalist international knowledge*, *alliance partner international knowledge*, *new venture reputation*, *location reputation*, *venture capitalist reputation*, and *alliance partner reputation* variables, respectively. Each variable was mean-centered prior to creating the interaction terms to reduce multicollinearity.

In this study, several hypotheses were put forth based on attributes of the new venture's venture capitalist or alliance partner. However, there were some new ventures that did not have a

venture capitalist or alliance partner. These new ventures remained in the sample, but simply received a zero for the independent variables that measure their attributes. By including dichotomous control variables for whether or not a new venture has a venture capitalist or alliance partner, the hypotheses were essentially testing whether the attributes of the venture capitalist or alliance partner were significant among those new ventures that used them. This approach is similar to other studies using comparable data (Fischer & Pollock, 2004).

Before conducting the analyses, the data were analyzed to ensure they did not depart substantially from normality. Measures of skewness and kurtosis were assessed for each variable in the database. In addition, tests were conducted to assess the influence of any outliers. Based on these results, several transformations were made. First, the assets variable was transformed using a log linear transformation. Second, the R&D intensity variable was also transformed using a log linear transformation. Before doing so, 0.001 was added to each variable as suggested by Mosteller and Tukey (1977) in order to take into account the zero values in the transformation. As multiple outliers were present in the reputational data due to several firms having a rather large count of articles published, the square root was taken for both the *new venture reputation - volume* and *alliance partner reputation - volume* variables. As noted by Cohen, Cohen, West and Aiken (2003), a square root transformation is appropriate with count values that exhibit a positively skewed distribution. Last, the total dollars invested and total investments by the venture capitalists that have invested in a new venture, which make up two of the three measures of the index for the *venture capitalist reputation* variable, were also transformed by taking the square root for similar reasons. Several remaining outliers were identified in the data, but as the subsequent removal of these new ventures did not result in any significant change in the results and were not theoretically justified, they were not omitted.

The basic models used to test the hypotheses in this study were as follows:

$$(1) \text{ International Sales Intensity} = \beta_0 + \beta_1[\text{Controls}] + \beta_2[\text{International Knowledge}] + \beta_3[\text{reputation}] + \beta_4[\text{Interactions}] + \varepsilon$$

$$(2) \text{ International Asset Intensity} = \beta_0 + \beta_1[\text{Controls}] + \beta_2[\text{International Knowledge}] + \beta_3[\text{reputation}] + \beta_4[\text{Interactions}] + \varepsilon$$

$$(3) \text{ International Scope} = \beta_0 + \beta_1[\text{Controls}] + \beta_2[\text{International Knowledge}] + \beta_3[\text{reputation}] + \beta_4[\text{Interactions}] + \varepsilon$$

where:

$$\text{Controls} = \begin{bmatrix} \text{age} \\ \text{size} \\ \text{industry group} \\ \text{venture capitalist financing} \\ \text{alliance partners} \\ \text{R \& D Intensity} \\ \text{IPO Year} \\ \text{new venture reputation – tenor} \\ \text{alliance partner reputation – tenor} \end{bmatrix}$$

$$\text{International Knowledge} = \begin{bmatrix} \text{new venture international knowledge} \\ \text{location international knowledge} \\ \text{venture capitalist international knowledge} \\ \text{alliance partner international knowledge} \end{bmatrix}$$

$$\text{Reputation} = \begin{bmatrix} \text{new venture reputation} \\ \text{location reputation} \\ \text{venture capitalist reputation} \\ \text{alliance partner reputation} \end{bmatrix}$$

$$\text{Interactions} = \left[ \begin{array}{l}
 \textit{new venture int'l knowledge x location int'l knowledge} \\
 \textit{new venture int'l knowledge x venture capitalist int'l knowledge} \\
 \textit{new venture int'l knowledge x alliance partner int'l knowledge} \\
 \textit{new venture int'l knowledge x new venture reputation} \\
 \textit{new venture int'l knowledge x location reputation} \\
 \textit{new venture int'l knowledge x venture capitalist reputation} \\
 \textit{new venture int'l knowledge x alliance partner reputation}
 \end{array} \right]$$

There were 29 independent and control variables included in the full model when considering the inclusion of the necessary dummy and moderating variables. Given the sample size of 213, the ratio of observations per variable is 7.3. This ratio exceeded the general rule of thumb to never fall below five to one (Hair, Anderson, Tatham & Black, 1998) and also nears the more desirable level of ten to one.

## **CHAPTER 5: RESULTS**

This chapter presents the results of the study. First, descriptive statistics regarding the variables used in the analyses are presented. This is followed by summaries of the results of the analyses from each of the dependent variables.

### **Descriptive Statistics**

Table 6 provides descriptive statistics on all the variables. The average age of the new ventures was 3.65 years and ranged from 1 to 6 years. The average size of the new ventures in terms of assets was approximately 181 thousand dollars. Nearly half of the new ventures in the sample held alliance partners while approximately 78% of the ventures had venture capital backing. Of the 213 ventures, 112 reported international sales. The international sales intensity of the sample ranged from 0% to 100% with an average of 16%. In terms of international asset intensity, the sample ranged from 0 to 90% and averaged 10%. The international scope variable ranged from 1 to 6 with an average of 1.6 continents entered. The ventures in our sample generated sales on all continents around the world except Antarctica.

**Table 6: Reliabilities, Means, Standard Deviations and Ranges (n=213)**

	Inter-rater <sup>1</sup>	Inter-item <sup>2</sup>	Mean	S.D.	Min	Max
Age			3.65	1.44	1.00	6.00
Assets (thousands)			\$181.87	\$385.57	\$3.10	\$4,242.46
Computer Equip Industry (dummy)			0.44	0.50	0.00	1.00
Electronics Industry (dummy)			0.09	0.29	0.00	1.00
VC (dummy)			0.78	0.42	0.00	1.00
Alliance (dummy)			0.49	0.50	0.00	1.00
R&D Intensity			0.77	3.47	0.00	46.17
IPO Year 1996 (dummy)			0.11	0.32	0.00	1.00
IPO Year 1997 (dummy)			0.15	0.35	0.00	1.00
IPO Year 1998 (dummy)			0.14	0.35	0.00	1.00
IPO Year 1999 (dummy)			0.33	0.47	0.00	1.00
IPO Year 2000 (dummy)			0.24	0.43	0.00	1.00
NV Reputation (tenor)	0.87		0.54	0.40	-0.25	1.00
Alliance Reputation (tenor)	0.90		0.09	0.18	-0.44	1.00
NV Int'l Knowledge			1.18	1.34	0.00	8.00
NV Reputation (volume)			11.89	21.20	0.00	170.00
Location Int'l Knowledge (all firms)			0.33	0.13	0.00	0.63
Location Reputation			0.05	0.04	0.00	0.13
VC Int'l Knowledge			0.53	0.38	0.00	1.00
VC Total # Investments			114.31	123.66	0.00	1309.00
VC Total \$ Investments (000)			\$533.52	\$815.19	\$0.00	\$6,082.34
VC IPO Success Rate			0.15	0.11	0.00	0.50
VC Reputation		0.91	-0.01	1.01	-1.51	3.58
Alliance Int'l Knowledge			1.06	2.12	0.00	13.00
Alliance Reputation (volume)			293.42	1,015.17	0.00	6760.00
International Sales Intensity			0.16	0.23	0.00	1.00
International Asset Intensity			0.10	0.17	0.00	0.90
International Scope			1.60	0.82	1.00	3.00

<sup>1</sup>Pearson correlations among raters given for subjective measures based on content analysis. <sup>2</sup>Cronbach alpha given for items used to calculate multiple-item index.

**Table 7: Correlations (n=213)**

	1	2	3	4	5	6	7	8	9
1. Age	-								
2. Assets <sup>1</sup>	-0.13	-							
3. Computer Equip Industry (dummy)	0.01	**0.18	-						
4. Electronics Industry (dummy)	**0.20	0.08	**0.28	-					
5. VC (dummy)	0.10	**0.28	-0.07	0.01	-				
6. Alliance (dummy)	-0.01	0.08	0.04	-0.04	**0.27	-			
7. R&D Intensity <sup>1</sup>	*0.14	-0.11	0.05	0.03	**0.25	*0.16	-		
8. IPO Year 1996 (dummy)	-0.04	-0.22	-0.02	0.04	**0.24	-0.02	-0.04	-	
9. IPO Year 1997 (dummy)	-0.13	**0.24	0.09	0.01	-0.13	*0.14	-0.09	*0.15	-
10. IPO Year 1998 (dummy)	-0.08	0.01	-0.03	-0.13	-0.04	-0.07	**0.22	*0.14	*0.17
11. IPO Year 1999 (dummy)	0.05	0.12	0.04	-0.08	0.11	*0.14	0.08	**0.25	**0.29
12. IPO Year 2000 (dummy)	0.13	**0.24	*0.14	0.13	**0.22	0.00	**0.19	**0.20	**0.23
13. NV Int'l Knowledge	0.23	0.06	-0.02	0.08	*0.16	0.06	0.10	0.02	-0.13
14. NV Reputation (volume) <sup>2</sup>	*0.14	**0.31	-0.09	**0.18	**0.34	**0.26	**0.24	**0.21	**0.18
15. NV Reputation (tenor)	*0.14	0.11	-0.06	*0.15	**0.21	**0.21	**0.19	-0.10	*0.16
16. Location Int'l Knowledge	*0.18	0.10	0.02	*0.17	**0.25	0.04	**0.31	**0.22	**0.22
17. Location Reputation <sup>1</sup>	0.03	-0.08	*0.14	0.02	**0.26	0.14	**0.32	-0.09	-0.12
18. VC Int'l Knowledge	0.13	**0.34	-0.07	-0.01	**0.75	**0.21	**0.23	**0.18	-0.12
19. VC Reputation <sup>3</sup>	0.11	**0.30	-0.11	0.05	**0.79	**0.18	**0.26	*0.16	-0.12
20. Alliance Int'l Knowledge	-0.09	*0.15	0.10	-0.09	**0.23	**0.51	*0.16	-0.01	-0.04
21. Alliance Reputation (volume) <sup>2</sup>	-0.07	0.10	0.04	-0.10	**0.23	**0.51	*0.16	-0.03	0.00
22. Alliance Reputation (tenor)	0.02	0.07	0.06	**0.18	*0.14	**0.52	0.09	0.05	-0.1
23. International Sales Intensity	**0.21	0.05	-0.04	**0.53	0.06	-0.05	0.08	0.07	0.00
24. International Asset Intensity	*0.16	-0.04	-0.10	**0.45	-0.04	-0.04	-0.10	**0.22	0.05
25. International Scope	**0.25	0.00	0.05	**0.27	0.11	0.06	0.12	0.10	0.06

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001

<sup>1</sup>Log linear transformation; <sup>2</sup>Square root transformation; <sup>3</sup>Multi-item index



	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	-														
**0.28	-														
**0.23	**0.39	-													
-0.11	0.09	0.10	-												
0.05	0.12	0.13	0.07	-											
0.08	-0.09	**0.24	-0.02	*0.16	-										
*-0.14	*0.17	**0.30	0.06	**0.32	0.10	-									
-0.08	0.09	0.13	0.04	**0.28	0.01	**0.67	-								
-0.10	0.06	**0.28	0.11	**0.25	*0.17	**0.22	*0.17	-							
*-0.15	0.05	**0.31	*0.17	**0.26	0.11	**0.30	**0.24	**0.80	-						
0.01	0.06	-0.08	0.13	**0.30	0.02	0.00	0.10	**0.22	0.13	-					
-0.01	0.03	-0.07	0.12	**0.26	0.04	0.02	0.10	**0.22	0.12	**0.77	-				
-0.11	*0.17	-0.05	0.04	0.12	0.12	0.01	0.06	0.12	0.11	**0.25	**0.21	-			
-0.06	-0.06	0.05	**0.25	*0.16	0.12	**0.20	0.11	0.12	0.10	0.07	-0.05	-0.09	-		
-0.04	*-0.15	-0.02	**0.21	0.03	0.01	0.02	-0.02	0.03	0.04	0.03	-0.06	-0.07	**0.81	-	
-0.06	-0.08	-0.03	**0.27	0.12	0.08	0.10	0.09	*0.16	*0.16	0.13	0.01	0.01	**0.71	**0.64	

Correlations of the 25 variables are given in Table 7. Among these correlations, several deserve additional discussion. The *venture capitalist* variable, which is a dummy variable based on whether or not a new venture has venture capitalist financing, is highly and significantly correlated with *venture capitalist international knowledge* and *venture capitalist reputation* at 0.75 ( $p < 0.001$ ) and 0.79 ( $p < 0.001$ ), respectively. Also, the *alliance partner* variable, which serves as a dummy variable based on whether or not a new venture has an alliance partner(s), is significantly correlated with *alliance partner international knowledge*, *alliance partner reputation – volume*, and *alliance partner reputation – tenor* at 0.51 ( $p < 0.001$ ), 0.51 ( $p < 0.001$ ) and 0.52 ( $p < 0.001$ ), respectively. These highly significant correlations are not ideal, but attributed to the necessary inclusion of dummy variables for both the presence of a venture capitalist or alliance partners in order to include all new ventures in the full sample (Carpenter et al., 2003).

Of greater concern is the significant correlation between *location international knowledge* and *location reputation* at 0.67 ( $p < 0.001$ ), *venture capitalist international knowledge* and *venture capitalist reputation* at 0.80 ( $p < 0.001$ ) as well as the correlation of 0.77 ( $p < 0.001$ ) between *alliance partner international knowledge* and *alliance partner reputation – volume*. These high correlations suggest that the knowledge and reputation attributes of both location and alliance partners may be difficult to draw out jointly and thus, may suppress the results.

Given the noted collinearity among many of the independent variables, an additional table was put together to illustrate which variables each of the independent variables were significantly correlated with. This table is found in Appendix 2 and for each independent variable, the correlated variables are listed by their level of significance. An interesting observation is that *new venture reputation* is significantly correlated with 15 other variables in

the regressions, the highest of all the independent variables. This implies that the media visibility of a new venture tends to depend upon, in part, the new venture's headquartered location, alliance partners and venture capital partners. The *new venture international knowledge*, on the other hand, is the lowest of all the independent variables and is only significantly correlated with 2 other variables. The *venture capitalist international knowledge* and *venture capitalist reputation* variables are of some concern as they exhibit significant correlations with 13 and 12 variables each, respectively. In addition they both exhibit very high correlations ( $R > 0.60$ ) with each other and the venture capital dummy variable.

As other research has reported (Preece et al., 1998), significant correlations were found among the new venture internationalization variables, leading credence to these measures as complementary dimensions of internationalization behavior (Sullivan, 1994). Yet, it was believed that there was enough conceptual independence among the three internationalization variables to warrant separate analyses. The international sales intensity was highly and significantly correlated with both international asset intensity ( $r = 0.81$ ,  $p < 0.001$ ) and international scope ( $r = 0.71$ ,  $p < 0.001$ ). The correlation between international asset intensity and international scope was 0.64 ( $p < 0.001$ ).

## **Regression Results**

Separate regressions were used to test the hypotheses on each new venture internationalization dependent variable. In Model 1 for each dependent variable, the control variables were entered. Model 2 included the control variables and the variables testing the main effects for both international knowledge and reputation, thus, offering an evaluation of hypotheses 1-4 and 8-11. The moderating variables for international knowledge and reputation were then added to the regressions in Models 3 and 4, respectively. These were added separately

as several of the international knowledge and reputation variables exhibited significantly high correlations and I wanted to ensure the analysis was not duly influenced by multicollinearity. This practice is consistent with other studies that assess multiple, moderating hypotheses (George, 2005; Shaw, Duffy, Johnson & Lockhart, 2005). Thus, Model 3 was used to evaluate hypotheses 5-7 and Model 4 to assess hypotheses 12-15. Lastly, in Model 5, all of the control, main effect and moderating variables were included.

**Table 8: Interval Regression Results on International Sales Intensity Dependent Variable**

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>		<i>Model 5</i>			
<b><i>Control Variables</i></b>												
Age	0.037	*	(0.014)	0.017	(0.016)	0.017	(0.015)	0.013	(0.015)	0.018	(0.016)	
Assets	0.019		(0.025)	-0.003	(0.019)	-0.004	(0.021)	-0.005	(0.021)	-0.003	(0.020)	
Computer Equip Industry	0.095		(0.063)	0.047	(0.063)	0.058	(0.062)	0.045	(0.061)	0.054	(0.068)	
Electronics Industry	0.534	***	(0.093)	0.471	***	(0.068)	0.485	***	(0.071)	0.477	***	(0.066)
VC Financing	0.113	†	(0.061)	-0.050	(0.089)	-0.091	(0.097)	-0.073	(0.088)	-0.076	(0.092)	
Alliance Partner	-0.036		(0.055)	-0.044	(0.055)	-0.063	(0.057)	-0.057	(0.056)	-0.067	(0.063)	
R&D Intensity	0.009		(0.010)	0.001	(0.008)	0.004	(0.008)	0.004	(0.008)	0.004	(0.008)	
IPO Year 1996	0.012		(0.097)	-0.106	(0.076)	-0.114	(0.076)	-0.094	(0.071)	-0.107	(0.074)	
IPO Year 1997	-0.041		(0.109)	-0.111	(0.089)	-0.074	(0.087)	-0.086	(0.084)	-0.069	(0.089)	
IPO Year 1998	-0.094		(0.076)	-0.194	*	(0.090)	-0.148	(0.103)	-0.151	(0.098)	-0.141	(0.102)
IPO Year 1999	-0.115	†	(0.064)	-0.263	*	(0.110)	-0.244	*	(0.113)	-0.251	*	(0.112)
IPO Year 2000	-0.148	*	(0.060)	-0.324	**	(0.106)	-0.298	**	(0.105)	-0.313	**	(0.102)
New Venture Rep - Tenor	0.047		(0.059)	0.085	†	(0.045)	0.098	*	(0.045)	0.088	†	(0.047)
Alliance Partner Rep - Tenor	0.018		(0.116)	-0.027	(0.096)	0.006	(0.110)	-0.008	(0.095)	0.009	(0.115)	
<b><i>Independent Variables</i></b>												
NV Int'l Knowledge				0.059	**	(0.021)	0.061	**	(0.021)	0.061	**	(0.020)
Location Int'l Knowledge				0.545	**	(0.173)	0.588	***	(0.175)	0.588	**	(0.201)
VC Int'l Knowledge				0.232	*	(0.111)	0.253	*	(0.111)	0.240	*	(0.112)
Alliance Int'l Knowledge				0.058	***	(0.015)	0.069	***	(0.014)	0.060	***	(0.013)
NV Reputation				0.005		(0.007)	0.005		(0.006)	0.004		(0.006)
Location Reputation				-0.002		(0.023)	-0.010		(0.022)	-0.009		(0.025)

VC Reputation			-0.020	(0.038)	-0.019	(0.035)	-0.017	(0.035)	-0.022	(0.038)
Alliance Reputation			-0.008	*** (0.002)	-0.007	*** (0.002)	-0.007	*** (0.002)	-0.007	*** (0.002)
Moderating Variables										
NV Int'l Knowledge x Location Int'l Knowledge					-0.122	(0.097)			-0.211	(0.166)
NV Int'l Knowledge x VC Int'l Knowledge					-0.050	(0.052)			-0.034	(0.133)
NV Int'l Knowledge x Alliance Int'l Knowledge					-0.018	** (0.007)			-0.024	* (0.010)
NV Int'l Knowledge x NV Reputation - Volume							0.002	(0.009)	0.010	(0.008)
NV Int'l Knowledge x Location Reputation							-0.017	(0.020)	0.004	(0.030)
NV Int'l Knowledge x VC Reputation							-0.017	(0.017)	-0.005	(0.039)
NV Int'l Knowledge x Alliance Reputation - Volume							-0.002	† (0.001)	0.000	(0.001)
Constant	-0.250	† (0.140)	0.173	(0.142)	0.193	(0.142)	0.210	(0.146)	0.190	(0.153)
Log Pseudolikelihood	-93.391		-75.695		-71.477		-73.117		-70.889	
Wald $\chi^2$	359.6	***	1044.2	***	1977.9	***	1004.0	***	1676.1	***
Change ( $\chi^2$ ) from Model 1			68.1	***	95.1	**	122.0	***	136.6	***
Change ( $\chi^2$ ) from Model 2					12.4	**	4.2		21.9	**

† p<0.10; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001 (n=213) Unstandardized estimates are reported. Standard errors are in parentheses.

### ***International Sales Intensity***

The results of the interval regression on the *international sales intensity* dependent variable can be found in Table 8. The log pseudolikelihood increased from -93.391 for the base model to -70.889 for the final model. Similarly, the Wald chi-square experienced a significant increase from 359.6 for the base model to 1676.1 for the final model ( $p < 0.001$ ).

Within Table 8, Model 1 presents the results of the control variables when regressed on international sales intensity. Several of the control variables achieved significance including the age of the new venture ( $\beta = 0.037$ ,  $p < 0.05$ ), the industry dummy variable for the electronics sector ( $\beta = 0.534$ ,  $p < 0.001$ ), presence of venture capital backing ( $\beta = 0.113$ ,  $p < 0.10$ ), and the industry dummy variables for years 1999 ( $\beta = -0.115$ ,  $p < 0.10$ ) and 2000 ( $\beta = -0.148$ ,  $p < 0.05$ ).

Model 2 within Table 8 offer a test of the main effects, including the assessment of hypotheses 1a through 4a that relate to the internal and external sources of international knowledge on the international sales intensity of a new venture. Hypothesis 1a argued that the international knowledge sourced internally by a new venture, as assessed through the prior international experiences of its top management team, is positively related to the international sales intensity of the new venture. This hypothesis was supported ( $\beta = 0.059$ ,  $p < 0.01$ ).

In consideration of external sources of international knowledge, hypothesis 2a next posited a positive relationship between the international knowledge of the new venture's headquartered location and new venture international sales intensity. This hypothesis again received strong support ( $\beta = 0.545$ ,  $p < 0.01$ ). Hypothesis 3a suggested a positive relationship between the international knowledge of the venture capitalists that invest in a new venture and the level of international sales intensity exhibited by the new venture. Significant support was achieved ( $\beta = 0.232$ ,  $p < 0.05$ ). Hypothesis 4a, which argued that the international knowledge of a

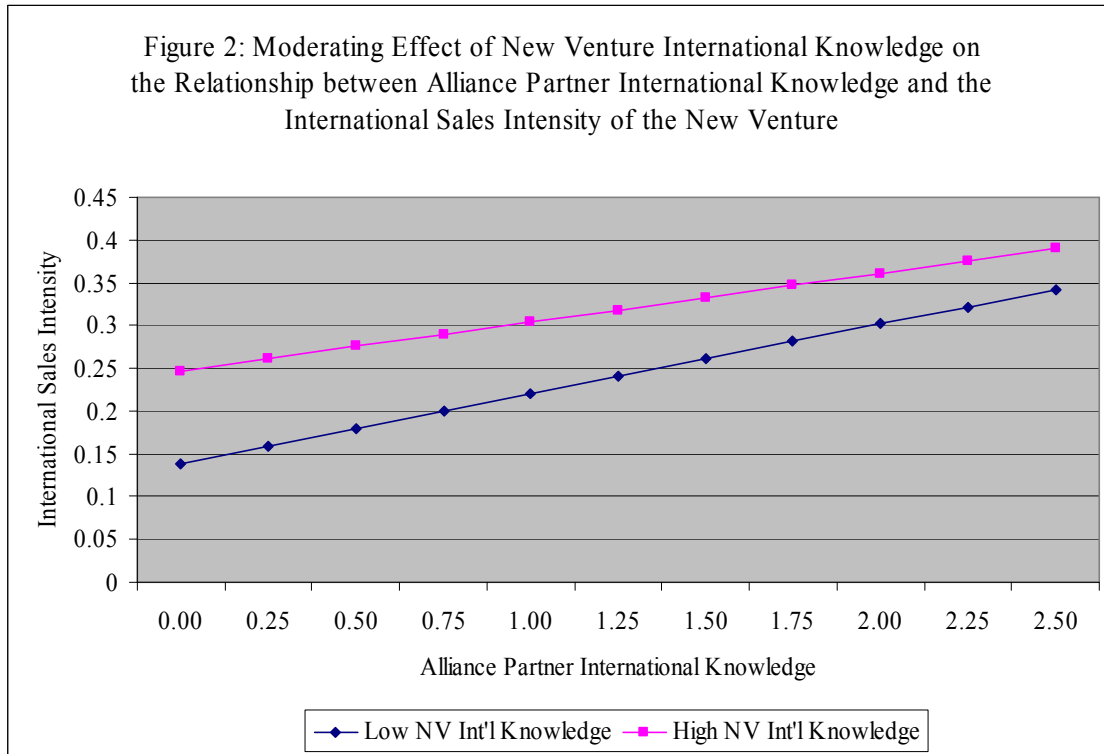
new venture's alliance partners would be positively related to the venture's international sales intensity, was also supported ( $\beta=0.058$ ,  $p<0.001$ ).

Hypotheses 5a, 6a and 7a argued that the international knowledge of the new venture positively moderates, or enhances, the relationship between the external sources of international knowledge and international entry by the new venture. This is based on the arguments of absorptive capacity that new ventures need knowledge in order to gain from external sources of knowledge. These three moderating hypotheses were tested in Model 3 of Table 8. Hypothesis 5a argued that new ventures with higher levels of international knowledge will benefit more in terms of international sales intensity from the international knowledge of firms within the venture's headquartered location. Yet, significance was not achieved.

Hypothesis 6a posited that new ventures with higher levels of international knowledge will benefit more in their level of international sales intensity from the international knowledge of venture capitalist firms that have invested in the new venture. Likewise, this hypothesis did not receive support.

Hypothesis 7a argued that new ventures with higher levels of international knowledge will gain more in terms of their international sales intensity from the international knowledge of its alliance partners. Interestingly, while the hypothesis was not supported, significant was achieved in the opposite direction hypothesized ( $\beta=-0.018$ ,  $p<0.01$ ). As Figure 2 illustrates, a positive relationship exists between the alliance partner international knowledge and the international sales intensity of the new venture. Yet, it is the new ventures with lesser international knowledge that achieve greater international sales intensity benefit as shown by the steeper incline in this relationship.





Hypotheses 8a through 11a suggested a positive relationship between the internal and external sources of reputation and the international sales intensity of a new venture. These hypotheses are assessed in Model 2 of Table 8. Hypothesis 8a argued that the reputation of the new venture, in terms of the volume of media coverage, will be positively related to international entry. However, the hypothesis was not supported.

Hypotheses 9a through 11a next assessed the role of external sources of reputation on new venture internationalization. Hypothesis 9a argued for a positive association between the reputation of a new venture's headquartered location and new venture international sales intensity. Support was not achieved. Hypothesis 10a, which suggested that the reputation of the new venture's venture capitalist will be positively associated with the international sales intensity of the new venture, was also not supported. Last, hypothesis 11a argued that the reputation of the new venture's alliance partners will also be positively associated to new venture international sales intensity. However, while hypothesis 11a was not supported, a strong level of significance

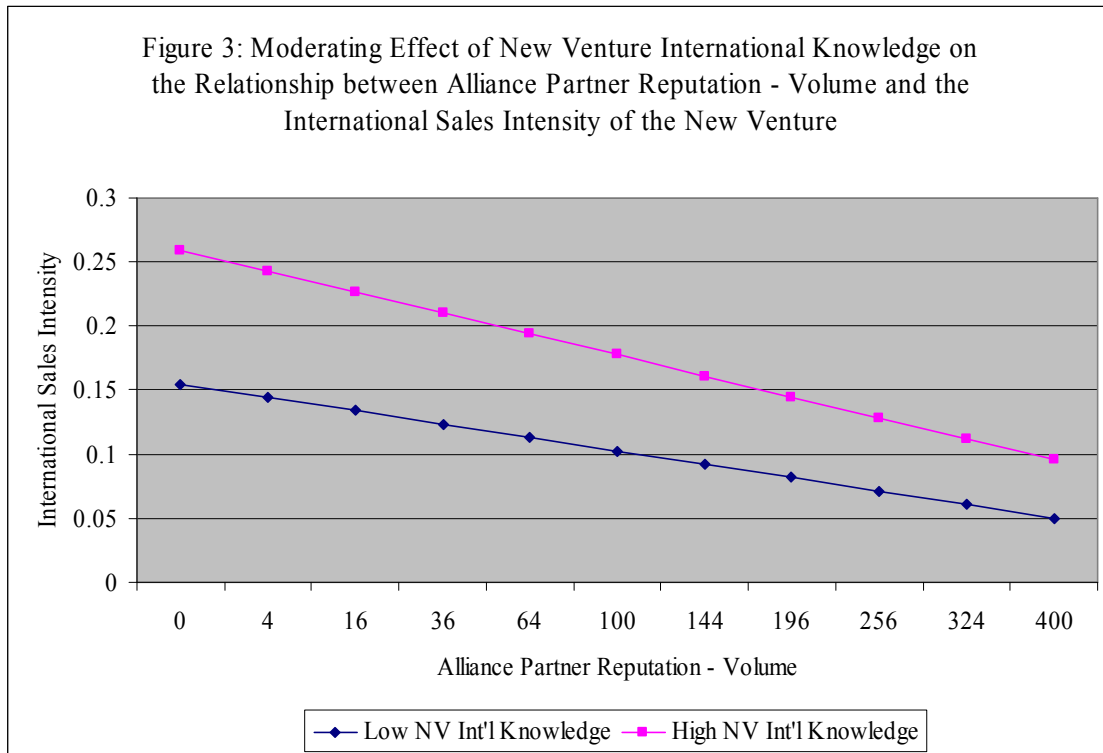
was obtained in the opposite direction ( $\beta=-0.008$ ,  $p<0.001$ ). This suggests that, as new ventures form alliances with more reputable partners, their level of international sales intensity, in fact, decreases.

Hypotheses 12a through 15a argued that the relationships between reputation and international sales intensity are positively moderated by the level of new venture international knowledge. Model 4 within Table 8 is used to assess these hypotheses. Based on arguments from the resource based view that the bundle of resources is more valuable than individual resources alone, hypothesis 12a argued that new ventures with higher levels of international knowledge will benefit more in terms of their international sales intensity when coupled with a greater reputation by the new venture. Hypothesis 12a did not receive support.

Hypothesis 13a posited that new ventures with higher levels of international knowledge will benefit more in terms of their international sales intensity from the reputation of the venture's headquartered location. A significant level of support was not achieved. Hypothesis 14a argued that new ventures with higher levels of international knowledge will gain more in terms of the new venture's level of international sales intensity upon the leveraging the reputation of venture capitalists that have invested within the new venture. Again, the hypothesis was not supported.

Hypothesis 15a suggested that new ventures with higher levels of international knowledge will benefit more in terms of their international sales intensity from being associated with alliance partners that are more reputable. Interestingly, a significant relationship was achieved based on the reputation of the alliance partner, but in the opposite direction than originally hypothesized ( $\beta=-0.002$ ,  $p<0.10$ ). As shown in Figure 3, the graphed relationship between alliance reputation and international sales intensity is negative for new ventures with

either high or low levels of international knowledge. However, the relationship is steeper, or more negative, for new ventures with high international knowledge. In other words, as new ventures forms relationships with more reputable alliance partners, the new ventures with more international knowledge will experience a greater decrease in international sales intensity than new ventures with less international knowledge.



**Table 9: Interval Regression Results on International Asset Intensity Dependent Variable**

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>		<i>Model 5</i>			
<b><i>Control Variables</i></b>												
Age	0.028	*	(0.011)	0.015	(0.012)	0.015	(0.011)	0.010	(0.011)	0.013	(0.012)	
Assets <sup>1</sup>	-0.002		(0.014)	-0.018	(0.012)	-0.018	(0.012)	-0.021	(0.013)	-0.018	(0.013)	
Computer Equip Industry	0.032		(0.043)	0.003	(0.046)	0.015	(0.043)	0.005	(0.044)	0.012	(0.047)	
Electronics Industry	0.336	***	(0.055)	0.299	***	(0.040)	0.311	***	(0.042)	0.309	***	(0.041)
VC Financing	0.075	†	(0.045)	-0.069	(0.072)	-0.114	(0.078)	-0.099	(0.074)	-0.106	(0.073)	
Alliance Partner	0.000		(0.043)	-0.002	(0.038)	-0.021	(0.038)	-0.008	(0.036)	-0.015	(0.041)	
R&D Intensity <sup>1</sup>	-0.007		(0.008)	-0.012	†	(0.007)	-0.010	†	(0.006)	-0.009	†	(0.005)
IPO Year 1996	0.047		(0.090)	-0.041	(0.065)	-0.042	(0.057)	-0.035	(0.056)	-0.034	(0.054)	
IPO Year 1997	-0.038		(0.088)	-0.092	(0.069)	-0.059	(0.065)	-0.074	(0.065)	-0.061	(0.067)	
IPO Year 1998	-0.102		(0.064)	-0.170	***	(0.039)	-0.130	**	(0.047)	-0.134	**	(0.047)
IPO Year 1999	-0.127	**	(0.042)	-0.225	***	(0.063)	-0.207	**	(0.067)	-0.213	***	(0.066)
IPO Year 2000	-0.128	*	(0.051)	-0.250	***	(0.065)	-0.226	***	(0.059)	-0.230	***	(0.062)
New Venture Rep - Tenor	0.006		(0.037)	0.034	(0.028)	0.045	(0.029)	0.040	(0.030)	0.044	(0.031)	
Alliance Partner Rep - Tenor	0.021		(0.085)	-0.011	(0.072)	0.019	(0.085)	0.008	(0.073)	0.013	(0.083)	
<b><i>Independent Variables</i></b>												
NV Int'l Knowledge				0.039	*	(0.015)	0.042	**	(0.015)	0.042	**	(0.015)
Location Int'l Knowledge				0.313	*	(0.155)	0.341	*	(0.163)	0.354	*	(0.167)
VC Int'l Knowledge				0.144		(0.096)	0.165	†	(0.096)	0.154		(0.094)
Alliance Int'l Knowledge				0.042	***	(0.010)	0.052	***	(0.011)	0.044	***	(0.010)
NV Reputation - Volume <sup>2</sup>				0.003		(0.006)	0.003		(0.005)	0.003		(0.005)
Location Reputation <sup>1</sup>				-0.006		(0.018)	-0.013		(0.018)	-0.015		(0.019)
VC Reputation				0.013		(0.035)	0.017		(0.032)	0.015		(0.031)
Alliance Reputation - Volume <sup>2</sup>				-0.006	***	(0.001)	-0.005	***	(0.001)	-0.005	***	(0.001)

<b>Moderating Variables</b>											
NV Int'l Knowledge x Location Int'l Knowledge					-0.077	( 0.075)			-0.021	( 0.104)	
NV Int'l Knowledge x VC Int'l Knowledge					-0.062	† ( 0.034)			-0.029	( 0.080)	
NV Int'l Knowledge x Alliance Int'l Knowledge					-0.015	** ( 0.006)			-0.018	** ( 0.006)	
NV Int'l Knowledge x NV Reputation - Volume								-0.003	( 0.006)	0.000	( 0.006)
NV Int'l Knowledge x Location Reputation								-0.020	( 0.017)	-0.016	( 0.020)
NV Int'l Knowledge x VC Reputation								-0.022	† ( 0.013)	-0.013	( 0.027)
NV Int'l Knowledge x Alliance Reputation - Volume								-0.002	( 0.001)	0.000	( 0.001)
Constant	-0.122	( 0.096)	0.191	† ( 0.107)	0.216	† ( 0.117)	0.244	* ( 0.120)	0.222	† ( 0.127)	
Log Psuedolikelihood	-57.314		-42.732		-36.399		-37.172		-35.701		
Wald $\chi^2$	334.4	***	734.7	***	649.8	***	573.4	***	741.9	***	
Change ( $\chi^2$ ) from Model 1			61.7	***	69.6	***	82.4	***	100.3	***	
Change ( $\chi^2$ ) from Model 2					10.6	**	6.4		42.7	***	

Unstandardized estimates are reported. Standard errors are in parentheses.

† p<0.10; \* p< 0.05; \*\* p < 0.01; \*\*\* p<0.001 (n=213)

<sup>1</sup>Log linear transformation; <sup>2</sup>Square root transformation

### ***International Asset Intensity***

Table 9 presents the results of the interval regression analysis of the hypotheses on the *international asset intensity* dependent variable. From the base model to the full model, the log pseudolikelihood increased from -57.314 to -35.701. Likewise, the Wald chi-square also increased from 333.4 to 741.9 ( $p < 0.001$ ).

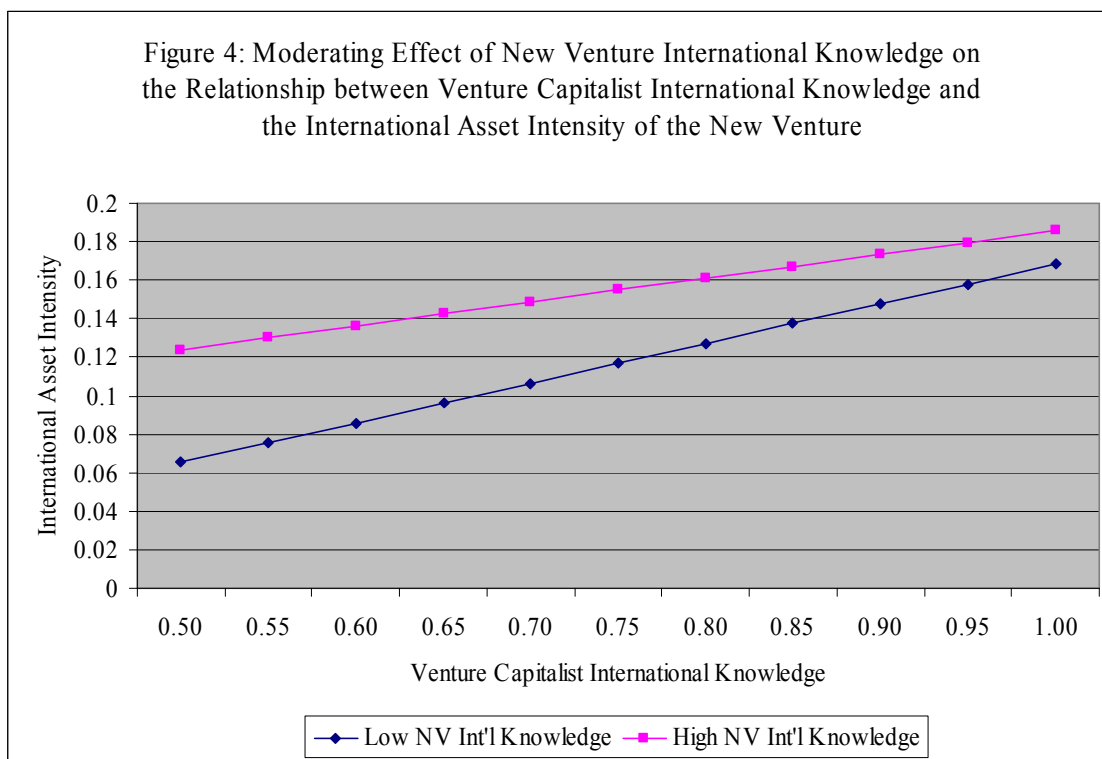
Model 1 of Table 9 offers insight into the role of the control variables on the international asset intensity dependent variable. When regressed in isolation before the independent variables are added to the equation, several control variables achieved significance including the age of the new venture ( $\beta = 0.028$ ,  $p < 0.05$ ), the industry dummy variable relating to the electronics ( $\beta = 0.336$ ,  $p < 0.001$ ) sector, presence of venture capital financing ( $\beta = 0.075$ ,  $p < 0.10$ ), and the dummy variables controlling for new ventures that underwent an IPO in 1999 ( $\beta = -0.127$ ,  $p < 0.01$ ) and 2000 ( $\beta = -0.128$ ,  $p < 0.05$ ).

Within Table 9, Model 2 offers a testing of the hypotheses 1b through 4b that relate to the main effects of both internal and external sources of international knowledge. Hypothesis 1b, which argued that the international knowledge sourced internally by a new venture through the prior international experiences of its top management team is positively related to the venture's international asset intensity, received support ( $\beta = 0.039$ ,  $p < 0.05$ ).

In terms of external sources of international knowledge, hypothesis 2b put forth a positive relationship between the international knowledge of other firms in the new venture's headquartered location and the international asset intensity of the new venture. This hypothesis was supported ( $\beta = 0.313$ ,  $p < 0.05$ ). Although hypothesis 3b suggested a positive relationship between the international knowledge of the venture capitalists that invest in a new venture and new venture international asset intensity, this hypothesis did not achieve significance within this

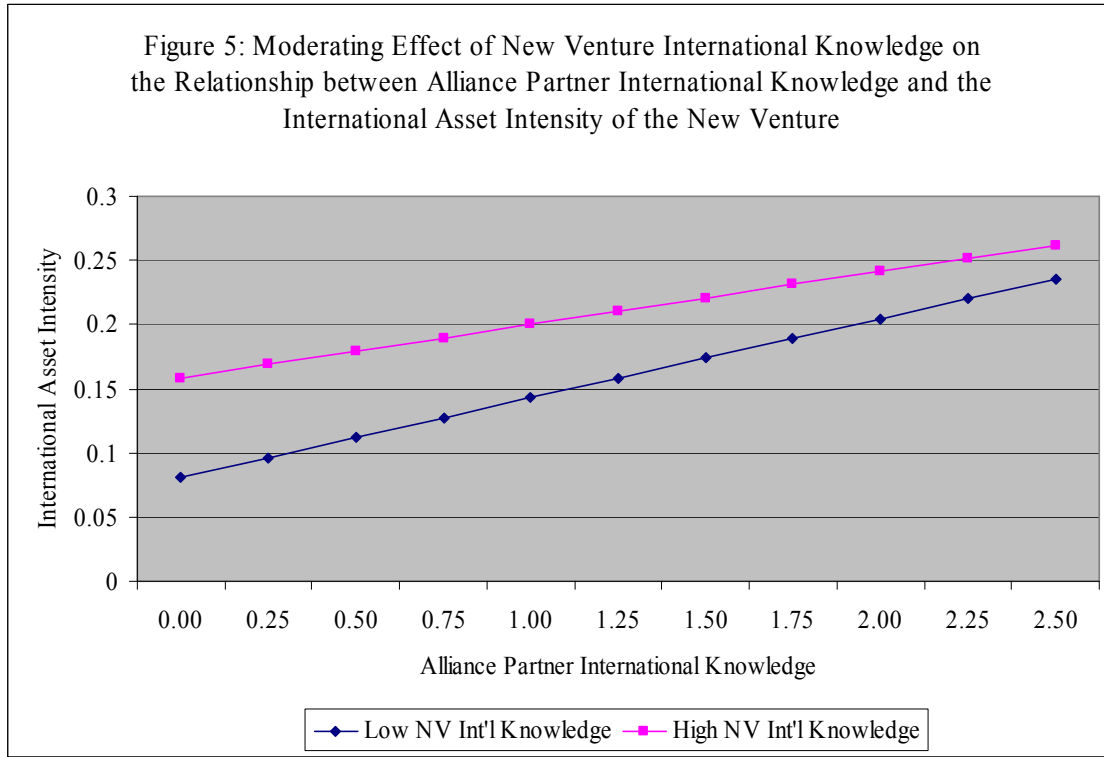
model. Hypothesis 4b argued for a positive relationship between the international knowledge of a new venture's alliance partners and the venture's international asset intensity. This hypothesis received strong support ( $\beta=0.042$ ,  $p<0.001$ ).

Hypotheses 5b, 6b and 7b argued that the international knowledge of the new venture positively moderates, or enhances, the relationship between the external sources of international knowledge and international asset intensity by the new venture. These hypotheses are assessed in Model 3 of Table 9. Hypothesis 5b argued that new ventures with higher levels of international knowledge will benefit more in terms of their international asset intensity from the international knowledge of firms within the venture's headquartered location. This hypothesis was not supported.



Hypothesis 6b posited that new ventures with higher levels of international knowledge will benefit more in terms of their international asset intensity from the international knowledge of venture capitalist firms that have invested in the new venture. This hypothesis was not

supported, but was found to be marginally significant in the oppositely hypothesized direction ( $\beta=-0.062$ ,  $p<0.10$ ). As illustrated in Figure 4 (previous page), as the international knowledge within the headquarter location increases, the level of international asset intensity of the new venture also increases. However, the rate of increase is higher for new ventures with lower international knowledge, indicating a higher level of benefit.



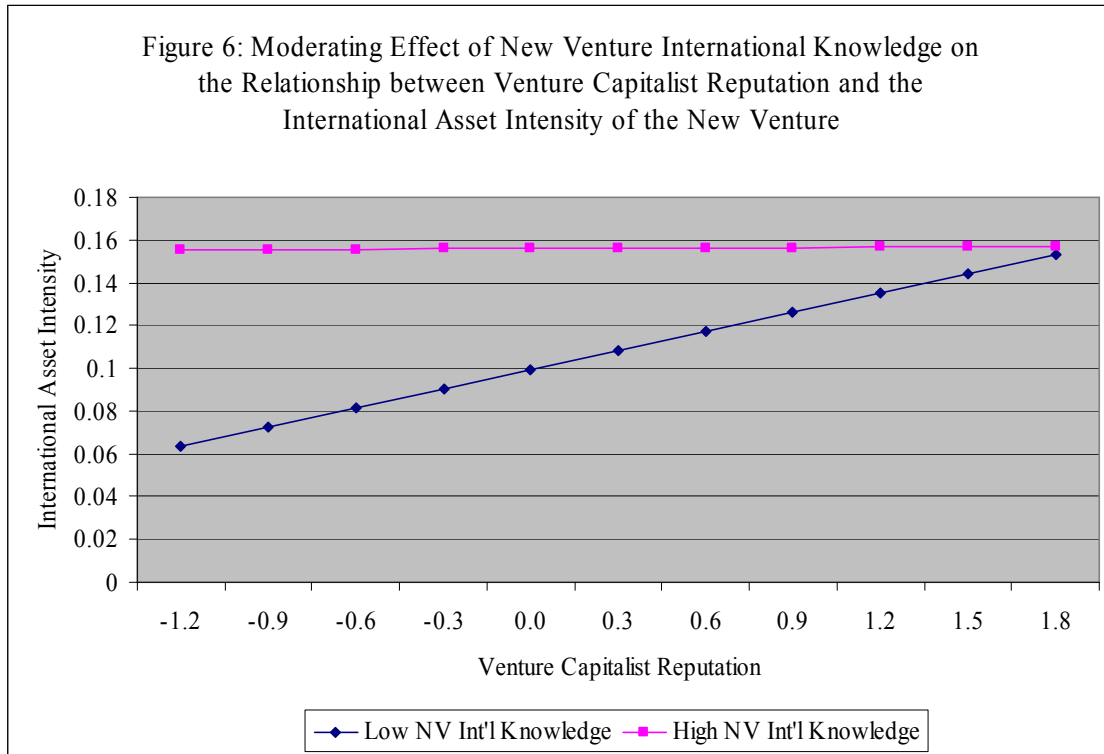
Hypothesis 7b argued that new ventures with higher levels of international knowledge will gain more in terms of their level of international asset intensity from the international knowledge of its alliance partners. This hypothesis did not achieve support. However, a significant relationship was found in the opposite direction than originally hypothesized ( $\beta=-0.015$ ,  $p<0.05$ ). Figure 5 illustrates that the international asset intensity of the new ventures with lower levels of international knowledge increases at a greater rate as the international knowledge of the venture's alliance partners increases.



Hypotheses 8b through 11b relate to the main effects of reputation on the international asset intensity of a new venture and are assessed in Model 2 of Table 9. Hypothesis 8b argued that the reputation of the new venture will be positively related to international asset intensity. No support was achieved for this relationship.

Hypotheses 9c through 11c next assessed the role of external sources of reputation on new venture internationalization. Hypothesis 9b argued for a positive association between the reputation of a new venture's headquartered location and the international asset intensity of the new venture. This hypothesis was not supported. Hypothesis 10c posited that the reputation of the new venture's venture capitalist will be positively associated with the international asset intensity by the new venture, but support was not achieved. Hypothesis 11b argued that the reputation of the new venture's alliance partners will also be positively associated to new venture international asset intensity. This hypothesis was not supported, but significance was achieved in the opposite direction ( $\beta=-0.006$ ,  $p<0.001$ ). This implies that as a new venture forms relationships with more reputable alliance partners, the level of international asset intensity achieved by the new venture decreases.

Hypotheses 12b through 15b argued for the positive moderation of the relationships between reputation and new venture international asset intensity by the international knowledge of the new venture. Model 4 within Table 9 offers a test of these hypotheses. Hypothesis 12b specifically argued that new ventures with higher levels of international knowledge will benefit more in terms of their international asset intensity when coupled with a greater reputation by the new venture. Hypothesis 13b posited that new ventures with higher levels of international knowledge will benefit more in terms of their international asset intensity from the reputation of the venture's headquartered location. Neither hypothesis received support.



Hypothesis 14b argued that new ventures with higher levels of international knowledge will achieve greater levels of international asset intensity upon the leveraging the reputation of venture capitalists that have invested within the new venture. The hypothesis was not supported, but a significant relationship was found in the opposite direction than originally hypothesized ( $\beta=-0.022$ ,  $p<0.10$ ). Figure 6 illustrates the found relationship. As the venture capitalist reputation increases, the international asset intensity for new ventures with high international knowledge remains relatively flat. However, the international asset intensity increased at a fairly high rate for new ventures with low international knowledge.

Hypothesis 15b suggested that new ventures with higher levels of international knowledge will benefit more in terms of the venture's international asset intensity from being associated with alliance partners that are more reputable. The reputation of the alliance partners was assessed based on the volume media visibility, but did not receive adequate support.

**Table 10: Poisson Regression Results on International Scope Dependent Variable**

	<i>Model 1</i>			<i>Model 2</i>			<i>Model 3</i>			<i>Model 4</i>			<i>Model 5</i>		
<b><i>Control Variables</i></b>															
Age	0.147	***	(0.045)	0.104	*	(0.044)	0.104	*	(0.043)	0.088	*	(0.038)	0.098	**	(0.037)
Assets <sup>1</sup>	0.078		(0.054)	0.029		(0.044)	0.030		(0.049)	0.022		(0.049)	0.029		(0.052)
Computer Equip Industry	0.263	†	(0.148)	0.163		(0.141)	0.199		(0.127)	0.164		(0.138)	0.171		(0.145)
Electronics Industry	0.622	***	(0.157)	0.538	***	(0.110)	0.590	***	(0.109)	0.565	***	(0.117)	0.569	***	(0.115)
VC Financing	0.354		(0.235)	-0.128		(0.287)	-0.243		(0.274)	-0.206		(0.273)	-0.205		(0.268)
Alliance Partner	0.032		(0.153)	0.059		(0.157)	0.046		(0.163)	0.064		(0.163)	0.076		(0.187)
R&D Intensity <sup>1</sup>	0.039		(0.028)	0.032		(0.023)	0.043	†	(0.023)	0.043	†	(0.022)	0.047	*	(0.022)
IPO Year 1996	0.196		(0.301)	-0.135		(0.324)	-0.216		(0.339)	-0.170		(0.306)	-0.209		(0.310)
IPO Year 1997	0.010		(0.228)	-0.157		(0.289)	-0.123		(0.301)	-0.159		(0.284)	-0.130		(0.300)
IPO Year 1998	-0.245		(0.154)	-0.458	*	(0.182)	-0.406	†	(0.221)	-0.404	†	(0.221)	-0.399	†	(0.216)
IPO Year 1999	-0.391	*	(0.177)	-0.767	**	(0.283)	-0.768	*	(0.301)	-0.778	*	(0.314)	-0.806	**	(0.305)
IPO Year 2000	-0.471	***	(0.129)	-0.950	***	(0.250)	-0.959	***	(0.253)	-0.979	***	(0.297)	-1.016	***	(0.286)
New Venture Rep - Tenor	0.035		(0.203)	0.138		(0.179)	0.182		(0.182)	0.148		(0.200)	0.145		(0.200)
Alliance Ptr Rep - Tenor	0.066		(0.444)	-0.083		(0.314)	0.038		(0.393)	-0.014		(0.343)	0.021		(0.373)
<b><i>Independent Variables</i></b>															
NV Int'l Knowledge				0.143	***	(0.025)	0.160	***	(0.035)	0.163	***	(0.035)	0.174	***	(0.039)
Location Int'l Knowledge				0.711	†	(0.380)	0.907	*	(0.409)	0.880	*	(0.439)	1.038	*	(0.460)
VC Int'l Knowledge				0.425		(0.298)	0.543	*	(0.270)	0.468	†	(0.285)	0.507	*	(0.245)
Alliance Int'l Knowledge				0.110	*	(0.045)	0.136	**	(0.049)	0.111	*	(0.047)	0.133	*	(0.052)
NV Reputation - Volume <sup>2</sup>				0.017		(0.019)	0.019		(0.017)	0.017		(0.018)	0.015		(0.019)
Location Reputation <sup>1</sup>				0.009		(0.060)	-0.017		(0.064)	-0.015		(0.062)	-0.025		(0.065)
VC Reputation				0.047		(0.089)	0.041		(0.066)	0.063		(0.068)	0.048		(0.062)
Alliance Reputation - Volume <sup>2</sup>				-0.018	*	(0.007)	-0.019	*	(0.008)	-0.016	*	(0.007)	-0.019	*	(0.008)

<b>Moderating Variables</b>											
NV Int'l Knowledge x Location Int'l Knowledge					-0.236	( 0.186)			-0.442	( 0.333)	
NV Int'l Knowledge x VC Int'l Knowledge					-0.121	† ( 0.066)			0.064	( 0.245)	
NV Int'l Knowledge x Alliance Int'l Knowledge					-0.038	* ( 0.015)			-0.050	* ( 0.021)	
NV Int'l Knowledge x NV Reputation - Volume								-0.001	( 0.020)	0.017	( 0.019)
NV Int'l Knowledge x Location Reputation								-0.051	( 0.038)	-0.020	( 0.049)
NV Int'l Knowledge x VC Reputation								-0.050	* ( 0.022)	-0.062	( 0.073)
NV Int'l Knowledge x Alliance Reputation - Volume								-0.005	( 0.003)	0.000	( 0.004)
Constant	-0.648	( 0.423)	0.357	( 0.380)	0.416	( 0.407)	0.524	( 0.398)	0.479	( 0.412)	
Log Pseudolikelihood	-273.043		-261.635		-259.063		-259.309		-258.418		
Wald $\chi^2$	253.4	***	531.6	***	745.9	***	551.8	***	1351.3	***	
Change ( $\chi^2$ ) from Model 1			91.5	***	136.5	***	158.5	***	151.1	***	
Change ( $\chi^2$ ) from Model 2					13.6	**	6.5		27.4	***	

Unstandardized estimates are reported. Standard errors are in parentheses.

† p<0.10; \* p< 0.05; \*\* p < 0.01; \*\*\* p<0.001 (n=213)

<sup>1</sup>Log linear transformation; <sup>2</sup>Square root transformation

### ***International Scope***

The results of the poisson regression analysis that tests the hypotheses on the *international scope* dependent variable can be found in Table 10. The log pseudolikelihood increased from -273.043 for the base model to -258.418 for the full model. Similarly, the Wald chi-square experienced a significant increase from 253.4 to 1351.3 between the base and full models ( $p < 0.001$ ).

Model 1 of Table 10 presents the regression of the control variables on the international scope dependent variable. In this model, several control variables achieved significance including the age of the new venture ( $\beta = 0.147$ ,  $p < 0.001$ ), industry dummy variables relating to the computer equipment ( $\beta = 0.263$ ,  $p < 0.10$ ) and electronics ( $\beta = 0.622$ ,  $p < 0.001$ ) sectors, and the dummy variables controlling for new ventures that underwent an IPO in 1999 ( $\beta = -0.391$ ,  $p < 0.05$ ) and 2000 ( $\beta = -0.471$ ,  $p < 0.001$ ).

Hypotheses 1c through 4c, which relate to the main effects of both internal and external sources of international knowledge, are tested in Model 2 of Table 10. Hypothesis 1c argued that the international knowledge sourced internally by a new venture through the prior international experiences of its top management team was positively related to new venture international scope. This hypothesis received strong support ( $\beta = 0.143$ ,  $p < 0.001$ ).

The next three hypotheses assessed the external sources of international knowledge. Hypothesis 2c put forth a positive relationship between the international knowledge of the new venture's headquartered location and the international scope of the new venture. This hypothesis was significantly supported by international scope ( $\beta = 0.711$ ,  $p < 0.10$ ). Hypothesis 3c, which argued for a positive relationship between the international knowledge of the venture capitalists that invest in a new venture and new venture international scope, did not receive support.

Hypothesis 4c suggested a positive relationship between the international knowledge of a new venture's alliance partners and the international scope of the new venture. This hypothesis received support ( $\beta=0.110$ ,  $p<0.05$ ), lending credence that alliance partners are an important external source of international knowledge for new ventures.

Based on the arguments of absorptive capacity, hypotheses 5c, 6c and 7c argued that the international knowledge of the new venture positively moderates, or enhances, the relationship between the external sources of international knowledge and the international scope of the new venture. Model 3 within Table 10 is drawn upon to test these hypotheses. Hypothesis 5c specifically argued that new ventures with higher levels of international knowledge will benefit more in terms of international scope from the international knowledge of firms within the venture's headquartered location. However, significant was not achieved to support the hypothesis.

Hypothesis 6c posited that new ventures with higher levels of international knowledge will benefit more in terms of their international scope from the international knowledge of venture capitalist firms that have invested in the new venture. However, while the hypothesis is not support, a significant level of support was achieved in the opposite direction ( $\beta=-0.121$ ,  $p<0.10$ ). Figure 7 (next page) demonstrates the nature of this relationship. Essentially, the relationship between the venture capitalist international knowledge and the international scope of a new venture is positive. However, for new ventures with lower levels of international knowledge, the graph shows a steeper, or greater increase, in their level of international scope.

Figure 7: Moderating Effect of New Venture International Knowledge on the Relationship between Venture Capitalist International Knowledge and the International Scope of the New Venture

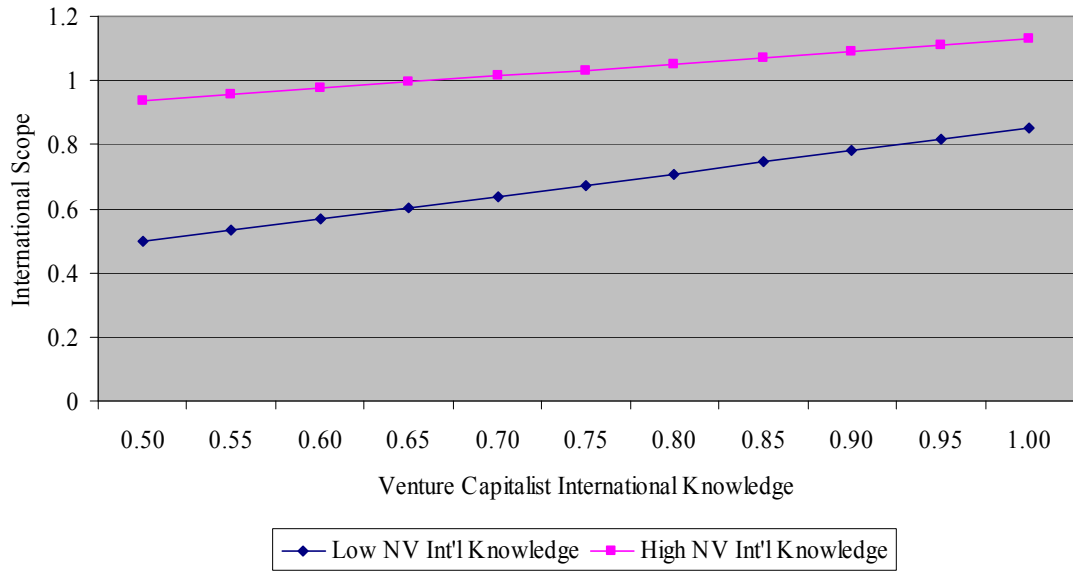
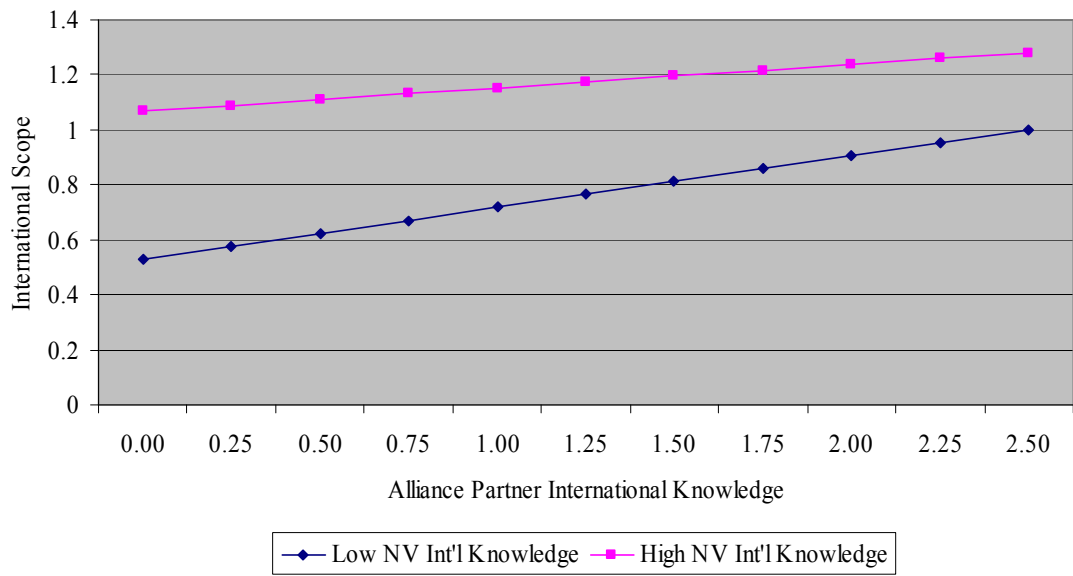


Figure 8: Moderating Effect of New Venture International Knowledge on the Relationship between Alliance Partner International Knowledge and the International Scope of the New Venture



Hypothesis 7c argued that new ventures with higher levels of international knowledge will gain more in terms of the venture's international scope from the international knowledge of its alliance partners. This hypothesis did not achieve support, but significance was found in the opposite direction ( $\beta=-0.038$ ,  $p<0.05$ ). Figure 8 (previous page) depicts the relationship graphically. As the international knowledge of a venture's alliance partner increase, the level of international scope also increases. However, new ventures with low international knowledge experience a greater increase in international scope than new ventures with high international knowledge.

Model 2 in Table 10 also offers a test of hypotheses 8c through 11c relating to the direct effects of reputation on the international scope of a new venture. Hypothesis 8c argued that the reputation of the new venture will be positively related to international entry. No support was achieved for the relationship.

Hypotheses 9c through 11c next assessed the role of external sources of reputation on new venture internationalization. Hypothesis 9c specifically argued for a positive association between the reputation of a new venture's headquartered location and new venture internationalization. This hypothesis did not receive support. Hypothesis 10c suggested that the reputation of the new venture's venture capitalist will be positively associated with internationalization by the new venture, but support was not found for the hypothesis.

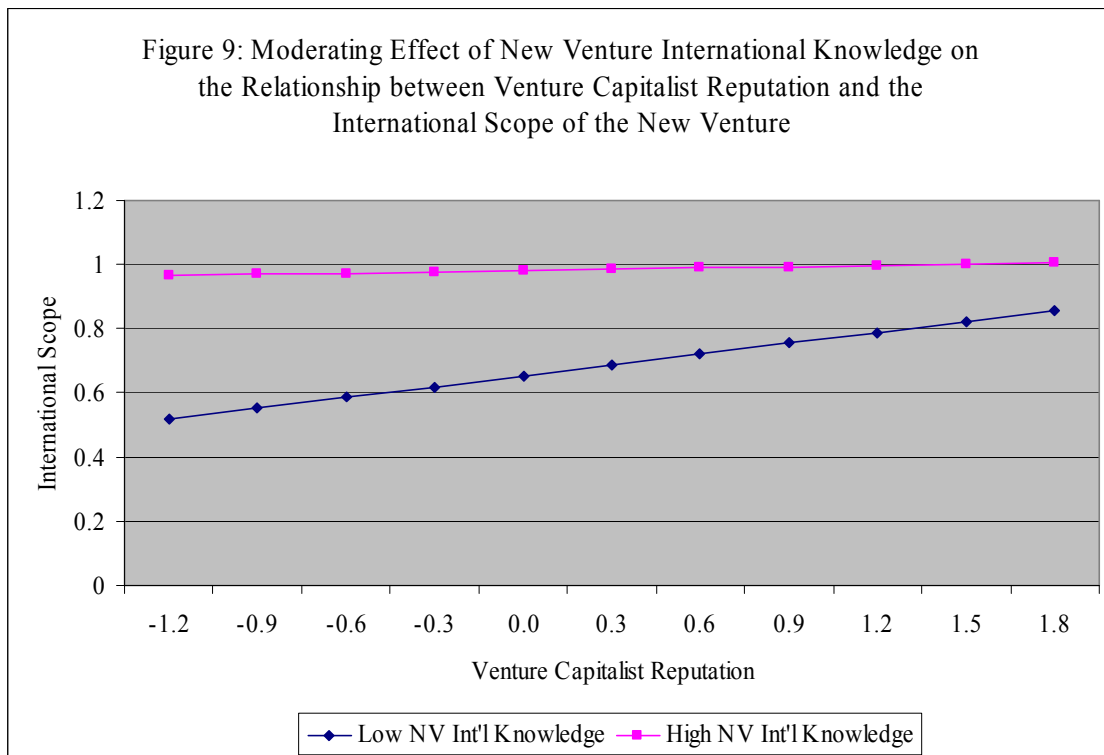
Next, hypothesis 11c argued that the reputation of the new venture's alliance partners will also be positively associated to new venture international scope. In contrast, the alliance partner reputation was found to be negatively associated to international scope ( $\beta=-0.018$ ,  $p<0.05$ ). This finding was rather surprising and implies that the association with alliance partners of more



positive reputation actually leads new ventures to pursue less internationalization in terms of scope.

Hypotheses 12c through 15c argued for the positive moderation of the above relationships by the level of new venture international knowledge and were assessed in Model 4 of Table 10. Based on arguments from the resource based view that the bundle of resources is more valuable than individual resources alone, hypothesis 12c argued that new ventures with higher levels of international knowledge will benefit more in terms of their international scope when coupled with a greater reputation by the new venture. Hypothesis 12c did not receive support.

Hypothesis 13c posited that new ventures with higher levels of international knowledge will benefit more in terms of their international scope from the reputation of the venture's headquartered location. The hypothesis was not supported.



Hypothesis 14c argued that new ventures with higher levels of international knowledge will gain more in terms of their international scope upon the leveraging the reputation of venture capitalists that have invested within the new venture. The hypothesis was not supported, however, significance was achieved in the opposite direction ( $\beta=-0.050$ ,  $p<0.05$ ). Figure 9 (previous page) offers a graphical interpretation of the relationship below. For new ventures with high levels of international knowledge, the relationship between venture capitalist reputation and international scope of the new venture is relatively flat. However, new ventures with low levels of international knowledge experience an increase in their level of international scope as they partner with more reputable venture capitalist partners.

Hypothesis 15c suggested that new ventures with higher levels of international knowledge will benefit more in terms of their level of international scope from being associated with alliance partners that are more reputable. However, significance was not achieved for this hypothesis.

**Table 11: Summary of Results**

Hypotheses	Dependent Variable		
	(a) International Sales Intensity	(b) International Asset Intensity	(c) International Scope
<i>H1: The international knowledge of a new venture will be positively related to the new venture's ...</i>	Significant	Significant	Significant
<i>H2: The international knowledge of all firms within a new venture's headquartered location will be positively related to the new venture's ...</i>	Significant	Significant	Significant
<i>H3: The international knowledge of the venture capital firms that invest in a new venture will be positively related to the new venture's ...</i>	Significant	Not Significant	Not Significant
<i>H4: The international knowledge of a new venture's alliance partners will be positively related to the new venture's ...</i>	Significant	Significant	Significant
<i>H5: The relationship between the international knowledge of all firms within a new venture's headquartered location and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Not Significant	Not Significant	Not Significant
<i>H6: The relationship between the international knowledge of venture capital firms that invest in a new venture and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Not Significant	Significant in Opposite Direction	Significant in Opposite Direction
<i>H7: The relationship between the international knowledge of a new venture's alliance partners and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Significant in Opposite Direction	Significant in Opposite Direction	Significant in Opposite Direction

<i>H8: The reputation of a new venture will be positively related to the new venture's....</i>	Not Significant	Not Significant	Not Significant
<i>H9: The level of industry clustering in a new venture's headquartered location will be positively related to the new venture's ...</i>	Not Significant	Not Significant	Not Significant
<i>H10: The reputation of venture capital firms that invest in a new venture will be positively related to the new venture's ...</i>	Not Significant	Not Significant	Not Significant
<i>H11: The reputation of a new venture's alliance partners will be positively related to the new venture's ...</i>	Significant in Opposite Direction	Significant in Opposite Direction	Significant in Opposite Direction
<i>H12: The positive relationship between the reputation of a new venture and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Not Significant	Not Significant	Not Significant
<i>H13: The positive relationship between the level of industry clustering in a new venture's headquartered location and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Not Significant	Not Significant	Not Significant
<i>H14: The positive relationship between the reputation of venture capital firms that invest in a new venture and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Not Significant	Significant in Opposite Direction	Significant in Opposite Direction
<i>H15: The positive relationship between the reputation of a new venture's alliance partners and the new venture's ... will be more positive for new ventures with a higher level of international knowledge than for new ventures with a lower level of international knowledge.</i>	Significant in Opposite Direction	Not Significant	Not Significant

## *Summary*

A summary of the results by dependent variable is provided in Table 11. This table indicates whether or not the respective hypotheses were significantly supported by the data.

Although some of the moderating hypotheses were found to be what is normally considered “marginally significant” at the  $p < 0.10$  level, these findings should still be considered robust and justly interpretable. Although direct relationships are typically only supported with confidence when a significance level of 0.05 or better is achieved, the statistical significance of two-way interactions has been argued to be acceptable at the 0.10 level or better (Singh, 1996). Thus, it is quite common in major management journals to report and offer considerable discussion and interpretation to such findings (Bromiley, 1991; Schoonhoven, Eisenhardt & Lyman, 1990).

As neither interval regression nor poisson regression offer insight into the level of variance explained, I also analyzed the data using ordinary least squares (OLS) with the standard errors adjusted for intragroup correlations. Within the analysis of the international intensity dependent variable, I found significant changes in the amounts of variance explained: baseline model,  $R^2 = 0.32$  ( $F=36.91$ ,  $p < 0.001$ ); model with main effects added,  $R^2 = 0.42$  ( $F=111.21$ ,  $p < 0.001$ ); full model, including interaction effects,  $R^2 = 0.44$  ( $F=157.58$ ,  $p < 0.001$ ). The amounts of variance explained for the international asset intensity dependent variable were also significant as follows: baseline model,  $R^2 = 0.28$  ( $F=42.44$ ,  $p < 0.001$ ); model with main effects added,  $R^2 = 0.35$  ( $F=53.29$ ,  $p < 0.001$ ); full model, including interaction effects,  $R^2 = 0.41$  ( $F=86.03$ ,  $p < 0.001$ ). Lastly, the variance explained for the international scope dependent variable was significant as well: baseline model,  $R^2 = 0.19$  ( $F=29.17$ ,  $p < 0.001$ ); model with main

effects added,  $R^2 = 0.29$  ( $F=92.48$ ,  $p<0.001$ ); full model, including interaction effects,  $R^2 = 0.31$  ( $F=207.76$ ,  $p<0.001$ ).

### **Impact of Multicollinearity**

As several of the variables in the regression analyses were highly correlated, this raises the question of whether multicollinearity has duly influenced the above reported results. An initial step to proactively reduce the impact of multicollinearity was taken before the analysis by mean centering all of the independent variables prior to creating the interaction terms. In addition, several steps were taken after the analysis to further explore the potential impact of multicollinearity. First, the variance inflation factors (VIF) were explored for each model used in the regressions. The resulting VIFs are presented by model in Appendix 3. All of the VIFs reported were less than 10, which is consistent with the rule of thumb recommended by Hair et al., 1999 and suggests that multicollinearity is unlikely to be a problem. Among the independent variables in Model 5, the highest VIF was 4.46 in the *venture capitalist reputation* variable. Within the moderating variables in Model 5, the highest VIFs were attributed to the interaction between *new venture international knowledge* and *venture capitalist international knowledge* (VIF=4.93) and the interaction between *new venture international knowledge* and *venture capitalist reputation* (VIF=4.37). Thus, while the analysis of the VIFs do show some collinearity among the variables, the fact that all of the VIFs are below 10 still suggests that they should not be a great concern.

As previously noted, the models presented in Tables 8, 9 and 10 were used to interpret the results in this study. Within these tables, the international knowledge and reputation main effect variables were jointly added in Model 2 as this was the more conservative approach that is typically required in journal quality research. The rationale being that a need exists to control for

variance attributed to international knowledge when testing the effects of reputation, and vice versa. However, these international knowledge and reputation variables are highly correlated with each other. Thus, a second step in further exploring the potential impact of multicollinearity was to run a post-hoc analysis with separate models that consider the individual impact of international knowledge and reputation. These results are presented in Appendix 4 for the international sales intensity, international asset intensity, and international scope dependent variables. Overall, the results are relatively consistent whether considered jointly or separately. One notable exception is the negative association found between alliance reputation and new venture internationalization (hypothesis 11) in the joint analyses (i.e. Tables 8, 9 and 10) loses significance for each dependent variable in the separate analyses (i.e. Appendix 2, 3, and 4). A few other variables change slightly in significance at the  $p < 0.10$  level in the separate analyses. Yet, the overall pattern of results remains the same.

Last, in order to ensure that none of the signs for the interaction terms in the moderating hypotheses were flipping due to the presence of multicollinearity, an additional analysis was conducted. The sample was split into two groups based on a high level of new venture international knowledge and a low level of new venture international knowledge. The regressions for the significant moderating hypotheses were then run and graphed for each group to ensure that the direction of the relationships were the same. As the relationships remained the same, this offered greater confidence in the findings, especially those that were significant in the opposite direction.

### **New Venture Internationalization and Performance**

An assumption within this study is that the new venture internationalization is a competitive strategy that is in part determined by the resource bundle of the new venture and that

ultimately, internationalization leads to higher levels of new venture performance. Although the structural relationship between new venture internationalization and new venture performance is not included within the research model being tested, an examination of the data suggests that such a relationship exists. As shown in Table 12, each of the new venture internationalization variables exhibits a significant correlation with both net income and return on assets (ROA). It is interesting to note that the correlation levels were fairly consistent among the three internationalization dependent variables.

**Table 12: Correlations between New Venture Internationalization and Performance**

New venture Internationalization	New Venture Performance	
	Net Income	Return on Assets
(a) International Sales Intensity	0.17 *	0.19 **
(b) International Asset Intensity	0.12 †	0.19 **
(c) International Scope	0.19 **	0.19 **

† p<0.10; \* p< 0.05; \*\* p < 0.01; \*\*\* p<0.001 (n=213)



## CHAPTER 6: DISCUSSION

In this research, I offered the first empirical test of both internal and external sources of intangible resources on new venture internationalization with additional consideration of interdependencies among the resources. The results confirmed that the international knowledge of a new venture was a significant predictor of new venture internationalization. Likewise the international knowledge of external sources positively impacted the new venture's level of internationalization. Interestingly, I found that the value of external sources of international knowledge for internationalization indeed differed depending on the international knowledge of the new venture. Yet, contrary to my hypotheses, it was the new ventures with low international knowledge that benefited more than the new ventures with high international knowledge. In terms of reputation, the data did not support a direct linkage to new venture internationalization. In spite of the lack of a direct effect, new ventures with lower levels of international knowledge were again found to benefit more in terms of internationalization through leveraging some external sources of reputation. Thus, my results point to several interesting, novel and potentially important findings that advance theory and inform practice while also identifying many fruitful areas for future study.

### **Implications for Theory**

#### ***International Knowledge as a Key Intangible Resource***

As expected, this study confirmed that new ventures with higher levels of international knowledge exhibited greater levels of internationalization. This was consistent across all three measures of new venture internationalization, offering a more robust test of the relationship that

supplements prior studies (Bloodgood et al., 1996; Carpenter et al., 2003). Essentially, this finding implies that top management team members of new ventures are able to rely on and exploit their individual knowledge built up from prior international work experiences in order to internationalize their current operations. A prime example is Nuance Communications, a new venture in my sample that offers a voice interface platform that enables information through sources such as the Internet accessible from any telephone. Among the top management team at Nuance Communications at the time of their IPO in 2000, four persons held prior international work experience. Among them, the co-founder and CEO of Nuance Communications had previously served as a consultant in France and throughout Europe. In addition, the Vice President of Technical Services had also held management positions in the United Kingdom. Not surprisingly, Europe served as the top foreign market for Nuance Communications and accounted for 20% of their total revenue in the 2000 fiscal year. In terms of the resource-based view, the internationalization knowledge of top management team members would thus be considered an important and valuable resource that contributes to new venture internationalization.

### ***External Sources of International Knowledge***

Support was also found in the study for the role of external sources of international knowledge that the new ventures were able to leverage to internationalize. When new ventures are headquartered in locations where other firms have international experience and are knowledgeable about such markets, this knowledge is likely to spillover and be exploited by the new ventures located therein. New ventures can then use this international knowledge to more successfully pursue foreign markets. Within my sample, Silicon Image is a developer of semiconductors that likely has leveraged its headquartered location in the San Jose-Sunnyvale-

Santa Clara MSA in California to achieve its 79% foreign sales. In the year 2000, 63% of the firms in this MSA were internationally experienced. The concept of knowledge spillovers has previously tended to be applied to more technological knowledge (Audretsch & Feldman, 1996). However, this dissertation makes a contribution to the economic geography literature by pointing to the possibility that other types of knowledge, such as international knowledge, can also spillover within a close geographic proximity and serve to benefit firms located therein.

The results of the study also imply that new ventures are able to benefit from the international knowledge of their alliance partners. Thus, in addition to the resources being formally exchanged via a new venture's alliance partner, the new venture is also able to extract and leverage knowledge relating to internationalization from the partnering firm. For example, Netscape Communications formed an alliance with Information Dimensions Inc. in 1995 to take advantage of their expertise in document management. Yet, given that Information Dimensions at the time had more than 2,200 large corporate and government organizations using its software around the world, it is probable that some of this international knowledge may have been exploited by Netscape Communications as the percentage of foreign sales achieved by Netscape in 1996 increased from 24% to 39%. One of the challenges frequently noted in the alliance literature is how to assess the performance of an alliance (Gulati, 1998). A contribution by this dissertation is the recognition of other benefits of alliances, such as international knowledge, in addition to the actual tangible resources exchanged. Of particular interest is the fact that these knowledge benefits span country boundaries.

In the case of venture capital firms, a key finding is that new ventures can attain knowledge specific to internationalization on top of the financial resources being formally exchanged. Numerical Technologies Inc., another new venture in my sample, had received a

five million dollar investment from Goldman, Sachs & Co. Interestingly, a closer examination of Goldman, Sachs & Co. reveals that 25% of their prior investments were made outside of the United States. Based on my results, this suggests that Goldman, Sachs & Co. may have influenced the management of Numerical Technologies to further pursue foreign markets, resulting in a third of its sales being obtained internationally. Thus, this dissertation offers insight to the venture capital literature by demonstrating that the knowledge transferred from a venture capital firm to the new venture is likely a result of the venture capital firm's existing networks and portfolio of investments. This conclusion is further supported by Carpenter, Pollock and Leary (2003) who found that the positive relationship between venture financing and new venture internationalization was stronger when the venture capitalist was represented by a board member with international experience.

It is important to note that the international knowledge gained from other firms within their headquartered location as well as their alliance and venture capital partners is not being contracted for, but rather, vicariously exploited by the new ventures. This is a way that new ventures can add to their knowledge base without solely relying on the prior knowledge and experiences of their top management team. In other words, new ventures are not necessarily internationalizing alone, but rather via a network they are creating (Coviello & Munro, 1997). Together, these findings imply that although the resource-based view traditionally only assesses the resources located internally to a firm as contributing to their competitive advantage, the resources located externally can be important and valuable as well. Thus, there is value by jointly integrating the resource-based view with other literature streams such as that of economic geography and networks as it offers a more complete picture of how new ventures truly access resources.

In terms of the international business literature, these findings directly respond to Dunning's (1995) recommendation that: "... the concept of the competitive, or O-specific, advantages of firms, as traditionally perceived, needs to be broadened to take explicit account of the costs and benefits derived from inter-firm relationships and transactions (both at home and abroad), and particularly those that arise from strategic alliances and networks." In addition to the strategic alliance partners of a new venture, this dissertation demonstrates the importance of other players in a firm's network such as their venture capital firm or other firms in their headquartered location.

### ***Internal and External Sources of International Knowledge: Complements or Substitutes?***

While an examination of the main effects may tell an interesting story, the interactive effects I obtained far overshadow them. My figures displayed in Chapter 5 depict several significant, yet very different, patterns of moderated results. Based on the concept of absorptive capacity, I originally argued that new ventures need international knowledge to benefit from external sources of international knowledge. This implied that new ventures with high international knowledge would benefit most in terms of internationalization from external sources of international knowledge because they have the capacity to recognize and exploit the knowledge more effectively. Yet, the results tell a very different story. In the case of the headquartered location, no significance was found among the three internationalization dependent variables, implying that the positive benefit from the international knowledge spillovers in a headquartered location does not differ among new ventures that have either a high or low level of international knowledge. For both the alliance partners and venture capital firms that have partnered with a new venture, the results are actually significant in the opposite direction than what was originally hypothesized. This suggests that new ventures with lower

levels of international knowledge instead benefit more from these external sources of international knowledge than new ventures with higher levels of international knowledge. In either case, the results suggest that, contrary to my original theory, a higher level of international knowledge does not necessarily offer a new venture a greater absorptive capacity to better exploit external sources of related knowledge. Instead of serving as complementary sources of international knowledge that contribute to internationalization by a new venture, it appears as though internal and external sources of international knowledge actually compensate or substitute for each other. In the case of a new venture with high international knowledge and a new venture with low international knowledge, both new ventures will benefit through forming relationships with partners that have international knowledge. Yet, external sources of knowledge will compensate for the new venture with the lesser international knowledgeable managerial team and add more value to this venture's resource bundle. This is a key contribution to the international entrepreneurship literature as it suggests one way for new ventures to make up for gaps in their resource bundle.

These unexpected findings are inconsistent with the absorptive capacity arguments, and accordingly offer potential implications for this body of research. In particular, Cohen and Levinthal (1990) argue that a firm needs prior related knowledge to assimilate and use new knowledge. Yet, my results rather show that new ventures that have limited prior international knowledge are able to assimilate and use new knowledge available in a more effective manner. One likely explanation is that the absorptive capacity concept introduced by Cohen and Levinthal (1990) is more complex than originally put forth. It is possible that new ventures need some knowledge to gain knowledge, but at some point, higher levels of knowledge actually inhibit new ventures from as effectively exploiting external sources of related knowledge. If this

is the case, new ventures with low levels of international knowledge would not have the absorptive capacity to recognize the value of and exploit external sources of international knowledge. New ventures with high levels of international knowledge would have the absorptive capacity, but not have that great of a need to look to external sources of international knowledge because they hold a substantive amount internally. Thus, new ventures with high international knowledge may try to “do it themselves” and not necessarily think that they need to learn from outsiders. In contrast, it would be the new ventures with medium levels of international knowledge that would be able to benefit the most from external sources of international knowledge. The rationale being that new venture with medium levels of international knowledge would have the absorptive capacity to recognize the value of external sources of international knowledge, but would not have so much international knowledge that they still are able to add to their knowledge bucket. Although this possibility of such a curvilinear relationship is left for future research, the opposite findings offer the beginning of a new dialogue within the literature on absorptive capacity.

A second possible explanation is that the concept of absorptive capacity may not be generalizable beyond technological knowledge. In reviewing prior studies on absorptive capacity, it becomes apparent that these studies tend to examine the implications of absorptive capacity on a firm’s technological knowledge and/or innovation (Cohen & Levinthal, 1990; George, Zahra, Wheatley & Khan, 2001; Wenpin, 2001). Knowledge pertaining to internationalization, as explored in the present study, may represent a different type of more general knowledge that is not as difficult to transfer.

In further examining the findings, an insightful observation can also be made that contributes to the research on new venture networks. The external sources of knowledge

considered in this study can either be classified as being captured through formal or informal relationships. In the case of other firms in a new venture's headquartered location, these are considered to be informal relationships where knowledge is argued to be vicariously exploited through more casual interactions such as trade association memberships, networking events or even gym memberships. In contrast, those relationships formed through alliances and venture capital firms are considered to be formal relationships given their contractual nature and exchange of resources. An interesting observation is that the data implies it is the formal relationships where new ventures with low levels of international knowledge are able to benefit more in terms of internationalization than their counterparts with high levels of international knowledge. This suggests that in order for new ventures with lesser international knowledge to effectively exploit a substitute source of external knowledge, a formal relationship may need to be in place. This is a particularly interesting observation as existing research on new venture networks tends to argue that informal networks are more important for entrepreneurs than formal networks. For example, Johannisson (2000: 373) has concluded that "a general reason why informal networks are preferred to formal ties is thus that the former simply are much more potent." In a study of 160 new ventures, Birley (1985) also concluded that informal networks were determined to be the most helpful in developing a new venture. While informal networks may be important, my findings imply that new ventures with limited means may need to instead develop formal relationships with others in their network in order to attain the most value.

Prior research has already empirically examined the direct relationship between new venture international knowledge and new venture internationalization (Bloodgood et al., 1996; Burgel & Murray, 2000; McDougall et al., 2003; Shrader et al., 2000). Within the international business arena, this relationship has likewise been confirmed with more mature, existing firms



(Sambharya, 1996). Yet, the existence of a significant moderating relationship found in this study suggests caution must be made when researchers solely examine the main effects of international knowledge on firm internationalization. This only tells part of the story, and the rest is only understood when both external sources of international knowledge are considered and their relative relationship with the firm's international knowledge.

### ***Does Reputation Matter?***

While I expected positive relationships between the internal and external sources of reputation and new venture internationalization, the data did not confirm such a relationship. The reputation of the new venture, as determined by the visibility in the media, was not found to be a significant predictor of new venture internationalization. Likewise, the impact of external sources of reputation on new venture internationalization was also not supported within the data. The inability to confirm a direct linkage between reputation and new venture internationalization was somewhat surprising as the resource-based view would suggest that reputation is a valuable resource contributing to new venture internationalization through increased customer demand in foreign markets, greater employee loyalty, greater access to investors and higher levels of performance (Fombrun & Van Riel, 2004). Reputation has been argued to be the most important contributor to a firm's resource bundle (Carmeli & Tishler, 2004) and thus, was expected to also contribute to a new venture's strategy such as internationalization. The lack of findings begs the question of whether or not reputation really matters.

In terms of the lack of a significant relationship between the new venture's reputation and internationalization, several potential explanations exist. First, my measure of new venture reputation may be inadequate. Given that reputation is an intangible resource, measuring reputation can be difficult. Although media visibility is frequently used as a proxy for reputation

(Kotha et al., 2001), other alternatives exist including firm ratings such as the Fortune Survey (Dollinger et al., 1997; Fombrun & Shanley, 1990; Saxton, 1997) or self-report measures (Shane & Cable, 2002). A second potential contributor to the lack of findings is that the relationship between the reputation of the new venture and the subsequent internationalization by the venture could be covered up by other relevant predictors. For example, it is reasonable to assume that larger firms achieve greater media visibility. As new venture size is input as a control variable in each of the regressions, it is possible that some of the variance attributed to reputation is already covered by this variable. An examination of the correlation matrix indicates that new venture reputation is significantly correlated with international sales intensity ( $r=0.16$ ,  $p<0.05$ ), but not significantly with international asset intensity ( $r=0.03$ ) or international scope ( $r=0.12$ ). New venture reputation is also significantly correlated with new venture size ( $r=0.31$ ,  $p<0.01$ ). As shown in Appendix 2, new venture reputation exhibited significant correlations with 15 other variables in the regression, more than any other independent variable. Thus, while more research and analysis is required before making a solid conclusion regarding the relationship between new venture reputation and internationalization, it would appear that the most likely explanation to the lack of findings is relating to measurement and collinearity problems rather than theory.

Although it was hypothesized that new ventures are able to leverage the reputation of their headquartered location in foreign markets, significance was not achieved. It is possible to speculate that location is still important, but perhaps in other ways than originally theorized. For example, it is possible that location may interact with some of the other relationships. New ventures may be able to benefit more from external sources of international knowledge and reputation when also headquartered in a highly reputable location for their industry. Alternatively, it is possible that the relationship between location reputation and new venture

internationalization is curvilinear. Other research examining the relationship between industry clustering, which serves as my measure of location reputation, and other aspects of firm behavior have identified an inverted-U shaped relationship. Deeds, Decarolis and Coombs (2000), for one, found some support for an inverted U-shaped relationship between the level of industry clustering and the new products introduced by a cluster firm. It is recommended that additional analyses be conducted as well as other potential measures of location reputation investigated.

The reputation of venture capital firms that have invested in a new venture was also not found to be a significant predictor of new venture internationalization. This was somewhat surprising, given that prior research indicates that the reputation of venture capital firms contributes to other aspects of new venture performance including time to IPO (Chang, 2004) and IPO success (Gulati & Higgins, 2003). It is possible that venture capital firm reputation contributes to new venture performance, but is not able to be leveraged in foreign markets.

It was also hypothesized that the reputation of alliance partners could be leveraged by new ventures to pursue internationalization. This hypothesis was not supported, but interestingly, strong levels of significant support across all three measures of new venture internationalization were found in the opposite direction. This was very much unexpected and implies that new ventures that form relationships with more reputable alliance partners are less likely to internationalize. A potential explanation may lie in that more reputable alliance partners as determined by their level of media visibility tend to be larger in size (Fombrun & Shanley, 1990). Thus, if new ventures form alliances with larger firms, they may have less of a need to pursue additional markets as they may be supporting the larger firm in their area of expertise. This is very insightful to the international entrepreneurship literature as although the formation of alliances has been linked to higher levels of internationalization (Beamish, 1999; Kotha et al.,

2001; Leiblein & Reuer, 2004), my results suggest that it is not the reputation of the alliance that is helping new ventures pursue these new markets.

### ***A More Complex View of Reputation***

Although the results did not support any of the direct relationships between reputation and new venture internationalization, an examination of the interactions suggests in a few cases that a more complex approach must be taken to fully understand the respective relationship. In particular, it was hypothesized that new ventures with higher levels of international knowledge would achieve greater levels of internationalization from partnering with more reputable venture capital firms. However, while the hypothesis was not supported, significance was achieved in the opposite direction for two out of the three internationalization dependent variables. This is quite notable as the absence of a direct relationship between venture capitalist reputation and new venture internationalization might lead a researcher to conclude that venture capital reputation is not important, but a more detailed examination suggests that it is indeed, just in a more complex manner.

The original theory used to put forth this hypothesis argued that international knowledge and reputation are complementary resources that when together, provide added value. In a recent study, Carmeli and Tischler (2004) examined the impact of six intangible resources on firm performance and concluded that the higher the value of one intangible resource, the higher the value of the other intangible resources on performance. In other words, their data implied that intangible resources were complementary to each other. Yet, the results suggest that in contrast, international knowledge and reputation are two intangible resources that may be in fact substitutes and compensate for each other. This is indicated by the results demonstrating that it is the new ventures with low international knowledge that actually receive more of a benefit from

their venture capitalists' reputations. This is a noteworthy finding for the international entrepreneurship literature as although it agrees with existing studies that resources leads to higher levels of internationalization (Kotha et al., 2001; Preece et al., 1998), my results suggest that attempting to exploit all resources available through external sources is not always the most efficient way for a new venture to successfully pursue foreign markets. Instead, an examination of which resources serve as substitutes or complements must be conducted. In this case, it would not be very efficient for new ventures that have a high level of international knowledge to attempt to gain highly reputable venture capital partners for the purpose of internationalizing as it would appear to offer very little additional value. This finding also offers insight to the venture capital literature. On top of the financial resources that a venture capital firm brings to a new venture (Sapienza, 1992), an added benefit for new ventures with low international knowledge lies in leveraging the venture capital firm's reputation.

A second finding that hints at a more complex view of reputation relates to the hypothesis arguing that the positive relationship between alliance partner reputation and new venture internationalization would be more positive for new ventures with higher levels of international knowledge. This hypothesis was not supported, but marginal significance was found in the opposite direction for the international sales intensity dependent variable. The main effect also was found to be significant in the opposite direction, first implying that new ventures that partner with more reputable firms tend to internationalize less. Secondly, the results of this study then imply that new ventures with lesser international knowledge are less negatively impacted in terms of internationalization by being partnered with more reputable firms. This finding is somewhat difficult to interpret and speculate upon given that both the main and moderating

effects go against the original theory put forth in this study. However, it does suggest to the alliance literature that the role of reputation is fairly complex and deserves further study.

### **Implications for Practice**

The results of this dissertation provide insight for entrepreneurs considering internationalization and for government policy makers. As knowledge is often the most valuable resource a firm can possess, Anand, Glick and Manz (2002: 98) advocate firms need to become “knowledgeable about knowledge.” In line with this dissertation, the implication for entrepreneurs considering internationalization is the need to understand the criticality of international knowledge to their success. International knowledge is valuable to new ventures as it can increase their awareness of new opportunities in foreign markets while decreasing the associated foreign entry costs. Given the recognized importance of international knowledge, new ventures with international aspirations should work to build up their international knowledge base and also become efficient at managing and exploiting this valuable resource.

The most evident source for developing a new venture’s international knowledge base lies in the top management team of the new venture. Through bringing together top management team members with prior international work experience, the new venture should be able to rely on the resulting stock of knowledge to recognize and more effectively exploit international opportunities. However, as much more knowledge exists outside organizational boundaries than inside, the results of this dissertation suggest entrepreneurs considering internationalization should also become effective at tapping external sources for international knowledge. Specifically, the results point to the value for a new venture of exploiting international knowledge through other firms in a new venture’s headquartered location, venture capital firms that have invested in the new venture and the new venture’s alliance partners. Thus, while

external relationships are typically acknowledged as a key source for tangible resources contributing to internationalization, new ventures should also be aware of the intangible resources that may not be as obvious. In particular, new ventures should become alert to the potential for vicariously exploiting international knowledge through these and any other external relationships that are in place. Given the existence of such relationships, how can a new venture improve its ability to tap these external sources for international knowledge? Some suggestions include monitoring the new venture's social linkages and/or finding ways to motivate external sources to share knowledge. A more thorough discussion on tapping external sources of knowledge can be found in the research of Anand, Glick & Manz (2002).

For new ventures with top management teams that lack international experience, the results of this dissertation suggest this internal resource limitation may not necessarily preclude the new ventures from internationalizing. Internal and external sources of international knowledge were found to serve as substitute, rather than complementary, resources contributing to new venture internationalization. Thus, new ventures with lower levels of international knowledge can tap external sources of international knowledge. It is through this mechanism that these new ventures can compensate for their internal resource gaps and still pursue internationalization. An interesting finding is that to most effectively exploit external sources of international knowledge, new ventures with less internationally experienced management teams may need to have formal relationships in place. Formal relationships, such as those with venture capitalists or alliance partners, communicate a commitment and a collective exchange of resources that may be necessary in order for these new ventures to recognize the value of and extract the international knowledge. New ventures with higher levels of international knowledge should still pursue external sources of international knowledge, however, it is simply

recognized that it is the new ventures with lower levels of international knowledge that benefit the most from these external relationships.

My results also provide insights for policy makers. As country boundaries become more blurred and the need to consider international markets increases, policy makers are looking for new ways to encourage internationalization by new and small firms. Within the United States, this is evident by programs funded by the U.S. Small Business Administration (such as U.S. Export Assistant Centers and the International Trade Loans program) as well as state programs that attempt to link local and foreign firms together. The results of my dissertation suggest that policy makers may be able to help facilitate internationalization through recognizing that new ventures tend to act collectively, rather than simply alone. For example, forums could be developed locally bringing together flagship firms and smaller, newer firms with the intent of producing international knowledge spillovers. Likewise, incentives for new firms to establish alliances and other external relationships may be helpful for increasing the firm's ability to pursue strategies such as internationalization.

### **Limitations and Future Research**

Like all research, limitations of this study have left some questions unanswered, which in turn suggests future research opportunities. Several questions are of particular importance and I now discuss these in greater detail. The first question concerns firm performance. Among management scholars, the ultimate research objective is to explain why firms differ in their levels of performance (Hitt et al., 2006). Yet, the dependent variable of interest in this study was new venture internationalization, a strategy that I argue is of utmost importance as it is one way new ventures can achieve superior levels of performance. Although the assumption of the positive linkage between new venture internationalization and performance is supported in prior



research (Bloodgood et al., 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra et al., 2000), a need still exists to examine the resulting implications of my research model on performance. For example, does internationalization in fact act as a mediator between a new venture's international knowledge and performance? Does internationalization mediate a relationship between reputation and performance? The type of performance is also of interest as the results may differ whether examining performance variables such as profitability or sales growth (domestic and/or foreign). These questions are best tested through structural equation modeling which does require a larger sample size than what the current study can offer.

A second question relates to my sampling of only U.S. high-technology new ventures that have undergone an IPO. This was done in order to achieve a greater sample size of new ventures with substantive internationalization variance to test the research model. By focusing on publicly held new ventures in the United States, I was also able to get over many data hurdles that typically exist when dealing with new ventures. Regardless, the question of whether my findings generalize to ventures operating in industries that are not high-technology, and to ventures headquartered outside of the U.S remains. Moreover, the use of publicly held firms results in an elite survivor sample as this sample does not include either new ventures that failed nor new ventures that did not do an IPO within their first six years. Additional testing will be required to assess the effect of international knowledge and reputation resources on privately-held new ventures, other industry sectors, as well as to determine whether these results hold for ventures from other countries.

The next question relates to the generalizability concerns just noted, but focuses on the age of the firms studied in this dissertation. New ventures were of particular interest in this study given the identified need in the literature to better explain *how* new ventures internationalize

(Zahra & George, 2002). Some of the unexpected findings in this study question whether the existing theory holds to the case of new ventures. Contrary to my hypotheses based on the theory of absorptive capacity, new ventures with lower levels of international knowledge were found to benefit more in terms of internationalization through exploiting external sources of international knowledge and reputation than new ventures with higher levels of international knowledge. One potential explanation is that this absorptive capacity theory does not hold to new ventures. It would be beneficial to test the research model in a sample of both new and mature firms, and then compare the results.

A fourth question is raised by the chosen operationalization of the reputation variables in this study. As shown in the initial literature review, many different operationalizations exist. For example, firm reputation has been measured in the past through published ratings (Fombrun & Shanley, 1990), survey instruments (Shane & Cable, 2002), media visibility (Kotha et al., 2001) or multiple boardships (Certo et al., 2001). Although I chose the operationalizations that I felt were most strongly justified with the theory in the paper, and that were also available to me through secondary sources, it is possible that better and more appropriate measures may exist. Further research is needed to rule out whether or not the lack of significant results relating to both internal and external sources of reputation on new venture internationalization is indeed an operationalization problem.

The fifth question relates to the intangible resources explored in this study. In order to manage the scope of the study, I had to limit the intangible resources actually examined to international knowledge and reputation. Yet, this raises the question of the effect of other intangible resources on new venture internationalization. A new venture's network is just one intangible resource that the literature is starting to explore, but that no large scale, empirical

evidence exists. Furthermore, I have only examined three potential external sources of international knowledge and reputation in this study including a new venture's headquartered location, alliance partners and venture capital firms. It is likely that other external sources also influence the strategic direction that a new venture takes. For example, it is possible that new ventures also benefit from their suppliers, bankers and/or customers (Reuber & Fischer, 2005). These alternatives still need to be explored in future research.

The discussion on intangible resources gives rise to yet another question that is concerned with the assumption that intangible resources are of utmost importance to the competitiveness of a new venture in foreign markets. This assumption is based on the recognition that new ventures rely heavily on intangible resources due to their "newness" and lack of operating history. In addition, many new ventures suffer from a so-called liability of smallness and are typically not able to as easily compile and compete based on more tangible resources. Longitudinal analyses would be welcomed to shed light on if and when this increased reliance on internal and external sources of intangible resources begins to level off with the age of the firm.

Another interesting research question involves the examination of the resource slack of a new venture and the subsequent impact on internationalization. Resource slack has been found to have a positive influence on firm performance (George, 2005), but it is unclear whether resource slack influences firms to pursue certain competitive strategies such as internationalization. In addition, it would be useful to explore whether resource slack impacts the reliance of a new venture on internal or external sources of intangibles to internationalize.

Although I examined the moderating impact of the new venture's international knowledge on reputation, it would also be interesting to examine the moderating impact of the international knowledge attained through external sources. For example, is the ability to leverage

the reputation of either an alliance or venture capital partner in foreign markets contingent upon the partners' level of international knowledge? Likewise, is the reputation of the headquartered location only helpful to an internationalizing new venture when coupled with the presence of firms with high international knowledge also in that headquartered location? If a new venture attains international knowledge through one external source, such as an alliance partner, are they able to benefit more from the reputation of another external source, such as their location?

Several additional questions are raised related to absorptive capacity based on these surprise findings. For example, is it possible that the creation and exploitation of absorptive capacity depends on the age of the firm? Prior studies that have supported absorptive capacity theory have tended to rely on samples of more mature firms. Similarly, does absorptive capacity depend on the type or depth of knowledge? Technological knowledge is typically explored in studies of absorptive capacity (George et al., 2001; Steensma & Corley, 2000), lending question to whether or not these results are generalizable to more specific types of knowledge such as that pertaining to internationalization. Additional analyses are needed to test these possibilities.

Finally, the direction of causality gives rise to yet another research question. Care was taken in the wording of the hypotheses to posit the relationships in terms of associations. Yet, it is likely that some causal chains indeed exist. While the lagged structure of my data allows me to suggest causal relationships between international knowledge, reputation and new venture internationalization, I have not technically established causality and reverse explanations do exist. For example, it is possible that new ventures hire internationally experienced management team members or form relationships with internationally knowledgeable alliance partners after they enter foreign markets in an attempt to manage their growth. It is recommended that longitudinal field research be conducted that takes researchers inside the new ventures to better

understand and confirm the causal nature between international knowledge, reputation and internationalization. Field research would also be helpful to shed light on the noted lack of significant results between reputation and internationalization.

## CHAPTER 7: CONCLUSIONS

This study was designed to address several gaps in the literature. In response to the limited understanding of the role of intangible resources on new venture internationalization, the impact of both international knowledge and reputation were examined. Although the resource-based view emphasizes the resources internal to the firm as contributing to its competitive advantage, the economic geography and network literatures frequently note the importance of external relationships. Thus, the impact of external sources of intangible resources on new venture internationalization were explored, including the international knowledge and reputation of the other firms in the new venture's headquartered location, the venture capital firms that have invested in a new venture and the new venture's alliance partners. In doing so, the results of this dissertation underscore the reliance by new ventures on external sources to overcome constraints related to legitimacy or limited resources. Thus, new ventures that achieve high levels of growth or pursue strategies such as internationalization do not do so alone, but rather, as a player within their network. The ability of new ventures to vicariously exploit intangible resources to internationalize is therefore a key contribution to the international entrepreneurship literature.

As previous studies have failed to examine the interdependencies among intangible resources in their relation to new venture internationalization, I drew on the absorptive capacity literature that suggested new ventures with higher levels of international knowledge would be able to more effectively exploit external sources of international knowledge and reputation. Yet, a key finding and contribution to the international entrepreneurship literatures is that the opposite relationship was found. Instead of international knowledge and reputation serving as

complementary resources, they instead compensate for each other. Thus, it is the new ventures with lesser international knowledge that benefit more in terms of internationalization through the exploitation of external resources. By empirically linking both internal and external sources of intangible resources to new venture internationalization, as well as the interdependencies among the intangible resources, I provide a more complete picture to international entrepreneurship researchers of *how* new ventures indeed overcome resource constraints to internationalize.

In order to assess whether or not the relationship between intangible resources and new venture internationalization depends upon the proxy being used to assess internationalization, the research model was tested on three different measures of internationalization. These three measures were based upon the performance, structural and attitudinal classifications of the internationalization construct put forth by Sullivan (1994). For the most part, the results were fairly consistent across all three measures. However, in four instances, the results differed. Specifically, in hypotheses 3 and 15, a significant relationship was found for the *international sales intensity* variable, but not for either *international asset intensity* or *international scope*. In hypotheses 6 and 14, a significant relationship was achieved for both the *international asset intensity* and *international scope* variables, but not *international sales intensity*. This implies that for the most part, the differing measures serve as similar proxies for new venture internationalization. However, given the noted exceptions, future research is encouraged to further examine these differences.

Although the main contribution of this study is to international entrepreneurship research stream by offering insight as to *how* new ventures are able to internationalize, this study also lends key insights to the bodies of research on the resource-based view, economic geography and networks. In line with the resource-based view of the firm, this dissertation provides support for

arguments that the resources of a firm define the strategies used to achieve a competitive advantage (Barney, 1991). International knowledge is specifically demonstrated to be a key intangible resource leading new ventures to compete internationally. However, while resource-based scholars have long emphasized the importance of the resources internal to a firm in creating a competitive advantage, this dissertation argues resources external to a firm are important as well. In particular, I find new ventures can internationalize through exploiting international knowledge resources attained through these firms. Thus, the question for resource-based scholars is not only how valuable, rare, inimitable and non-substitutable the resources of a firm are, but also are the resources attainable through external sources.

In terms of the literature on new venture networks, venture capital firms and alliance partners were identified as key players within a new venture's network. A contribution to these bodies of research lies in the recognition of international knowledge as yet another benefit achieved by a new venture through these relationships. The data also revealed the necessity of considering the interactions of these external sources of international knowledge with that of the new venture to arrive at a more complete picture of the relationship.

Contributions were also made to the economic geography literature in recognizing that the concept of knowledge spillovers can be extended to knowledge pertaining to internationalization. In addition, this study offered a test of the reputation effects of a firm's headquartered location.

In conclusion, this dissertation shows the value and importance of both internal and external sources of international knowledge to new venture internationalization. Furthermore, it has shown that new ventures with lower levels of international knowledge are able to benefit more from these external sources of international knowledge than new ventures with higher



levels of international knowledge. Although reputation does not appear to have a direct effect on new venture internationalization, new ventures with lower levels of international knowledge have again been found to be able to benefit more in terms of internationalization through leveraging some external sources of reputation. Thus, the findings of this dissertation help further our understanding of new venture internationalization and have important implications for both theory and practice.

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**APPENDIX 1: LITERATURE REVIEW OF VARIABLES**

<b>INTERNATIONALIZATION VARIABLE</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
International Intensity (Foreign sales as a percentage of sales)	Carpenter, Pollack & Leary (2003, SMJ)	Internationalization	Ratio of foreign sales to total sales
	Lu and Beamish (2001, SMJ)	Export Activities	Export intensity - Percentage of firm sales derived from exports
	McDougall and Oviatt (1996, JBV)	Internationalization	% sales in foreign countries to total venture sales
	Preece, Miles & Baetz (1998, JBV)	International intensity	percentage foreign sales
	Qian (2002, JBV)	Multinationality	Ratio of foreign sales to total sales
International Scope (Number of regions)	Preece, Miles & Baetz (1998, JBV)	Global diversity	Number of markets in which foreign sales were reported (Asia, Canada, Europe, Latin America, USA, Other)
	Zahra, Ireland and Hitt (2000, AMJ)	International diversity	Diversity based on (1) # countries; (2) technological diversity; (3) cultural diversity; (4) geographic diversity; (5) foreign market segments
International versus Domestic	McDougall (1989, JBV)	International versus Domestic	Comparison
	Mcdougall, Oviatt & Shrader (2003, JIE)	International versus Domestic	Comparison
	Burgel & Murray (1998, FE)	International versus Domestic	Comparison
Age at Internationalization	Autio, Sapienza & Almeida (2000, AMJ)	Age at entry	The time (in years) between the firm's founding and first international entry (independent variable)
	Shrader, Oviatt & McDougall (2000, AMJ)	Firm age at international entry	age at international entry (used as control variable)
	Shrader (2001, AMJ)	Firm age at international entry	age at international entry (used as control variable)
Internationalization Growth	Autio, Sapienza & Almeida (2000, AMJ)	Internationalization sales growth	(1) Change in international sales and (2) change in the percentage of international sales
	Reuber and Fischer (2002, ETP)	Foreign sales growth	percentage change in total foreign sales over two year time period (log transformed)

<b>INTERNATIONALIZATION VARIABLE (CONTINUED)</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
Other	Bloodgood, Sapienza & Almeida (1996, ETP)	Extent of Internationalization	Number of primary activities the US firms were engaged in outside the US
	Kotha, Rindova & Rothaermel (2001, JIBS)	Propensity to internationalize	# of country specific websites that were international
	Chen and Martin (2001, JBV)	Foreign expansion	The establishment of new foreign business units (dummy variable)
Multiple Measures	Daily, Certo & Dalton (2000, SMJ)	Firm internationalization	(1) foreign sales as percentage of total sales, (2) foreign assets as percentage of total assets, (3) number of foreign subsidiaries relative to total operating units, (4) dispersion of subsidiaries of a firm across top ten psychic zones of world
	Lu and Beamish (2001, SMJ)	FDI Activities	(1) # of FDIs in which parent company had 10% or more equity in; and (2) number of countries in which company had FDIs
	Moen & Servais (2000, JIM)	International orientation	Distance (geographical, psychic); # markets; export intensity
	Reuber and Fischer (1997, JIBS)	Degree of internationalization	Z-score based on: (1) foreign sales as percentage of total sales; (2) percentage of employees that spend more than 50% time on international activities; (3) geographic scope (Canada only, NA only or outside NA)
	Shrader, Oviatt & McDougall (2000, AMJ)	Internationalization	(1) foreign market revenue exposure (foreign sales / total sales); (2) country risk (averaged public risk ratings); (3) entry mode commitment; (4) number of countries entered
	Zahra, Neubaum & Huse (1997, ETP)	Export performance	Export intensity, Scope, exports to profits, executive satisfaction

<b>INTERNATIONAL KNOWLEDGE</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
Firm International Knowledge	Carpenter, Pollack & Leary (2003, SMJ)	Board Int'l Experience	Number of individuals with (a) international work experience and (b) international education as listed on prospectus (outside members only)
	Carpenter, Pollack & Leary (2003, SMJ)	TMT Int'l Experience	Number of individuals with (a) international work experience and (b) international education as listed on prospectus
	Bloodgood, Sapienza & Almeida (1996, ETP)	Int'l exposure of TMT	(1) number of directors with previous int'l work experience and (2) number of directors with previous int'l schooling
	Daily, Certo & Dalton (2000, SMJ)	CEO Int'l Experience	(1) # years in international assignments and (2) number of international assignments
	Hadley & Wilson (2003, IBR)	Internationalization Knowledge	5 questions seeking information on perceived lack of senior mgt international experience, the difficulty in determining foreign business opportunities, the lack of proprietary knowledge, the lack of international market planning and implementation experience, and the inability to easily modify marketing mix elements for foreign countries.
	Hadley & Wilson (2003, IBR)	Foreign Institutional Knowledge	Two questions concerning firm's lack of foreign language and lack of knowledge about foreign laws/norms/standards.

<b>INTERNATIONAL KNOWLEDGE (CONTINUED)</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
Firm International Knowledge (continued)	Hadley & Wilson (2003, IBR)	Foreign business knowledge	Questions regarding lack of cooperative agreements, lack of subsidiary agreements, lack of knowledge re foreign competitors, foreign distribution channels, foreign business contacts, needs of foreign customers and foreign sales developments.
	Shrader, Oviatt & McDougall (2000, AMJ)	TMT Int'l experience	Average number of years international experience of TMT
	Peng and York (2001, JIBS)	Knowledge of foreign markets	Scale seeking information on (1) export experience of key decision makers, (2) their experience in foreign countries measured by place of birth, language ability and travel frequency, (3) their experience in the particular industry.
VC International Knowledge	Carpenter, Pollack & Leary (2003, SMJ)	VC Board Member Int'l Experience	Coded "1" if a board member representing the VC had international work experience, otherwise "0"
Location International Knowledge	Birkinshaw & Hood (2000, JIBS)	Level of foreign ownership in cluster	Level of foreign ownership of assets in cluster (some data provided by Porter, 1991)



<b>REPUTATION</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
Firm Reputation - Multidimensional Construct based on Survey	Fombrun & Shanley (1990, AMJ)	Reputation	Fortune Survey based on rating following attributes: quality of mgt; quality of products/service; long-term investment value; innovativeness; financial soundness; ability to attract, develop and keep talented people; community and environmental responsibility; use of corporate assets.
	Dollinger, Golden & Saxton (1997, SMJ)	Reputation	A multidimensional construct (product quality and innovation; management integrity; financial soundness) measured through an experiment.
	Saxton (1997, AMJ)	Reputation	Multidimensional construct (financial performance, product quality, management) obtained via survey based on Fortune's scale.
Firm Reputation - Media	Kotha, Rindova & Rothaermel (2001, JIBS)	Reputation	Media visibility - total number of articles written about firm in study year (Major Newspapers database of Lexis-Nexis)
	Pollack and Rindova (2003, AMJ)	Volume of Media Coverage	Uses 3 databases of Lexis- Nexis in year prior to IPO to count # articles.
	Pollack and Rindova (2003, AMJ)	Tenor of Media Coverage	Uses 3 databases of Lexis- Nexis in year prior to IPO to count # of positive / negative articles. Formula used for tenor.
	Deephouse (2000, JOM)	Media reputation	Stratified sample of articles from 2 local newspapers; Used coefficient of media favorableness
	Deephouse (1996, AMJ)	Public endorsement (legitimacy)	Janis-Fadner coefficient - based on positive / negative media articles in local newspapers.

<b>REPUTATION (CONTINUED)</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
Firm Reputation - Management	Shane & Cable (2002, MS)	Reputation	3 question within a survey: Someone on the venture team had a reputation for successfully building public companies. A third party I respected vouched for the team's ability to start a successful company. At least one venture team member is viewed by other investors as giving the venture credibility.
	Certo, Daily & Dalton (2001, ETP)	Board Reputation	Multiple boardships
Firm Reputation - Environmental	Bansal and Clelland (2004, AMJ)	Corporate environmental legitimacy	Janis-Fadner coefficient - based on positive / negative media articles in WSJ on environmental issues
VC Reputation	Chang (2004, JBV)	Reputation of VC Partner	(1) Number of prior start-up investments by VC firm in industry (signaling effect to outsiders of venture prospects); (2) IPO success rate of VC firm - If a venture has multiple VC's, these are averaged.
	Gulati and Higgins (2003, SMJ)	VC Prominence	Obtained a ranking of VCs from VentureXpert (based on total dollars invested) - Considered if firm has at least 5% equity invested by a VC in top 30.
	Dimov, Shepherd & Sutcliffe (working paper)	VC Reputation	Composite Variable of VC past investment activity (total invested capital, total # companies in portfolio and age) and media visibility (# times mentioned in WSJ)

<b>REPUTATION (CONTINUED)</b>			
<b>Category</b>	<b>Reference</b>	<b>Construct Name</b>	<b>Operationalization</b>
Alliance partner Reputation	Chang (2004, JBV)	Prominence of strategic alliance partners	Count of articles about alliance partner in WSJ at time the alliance was formed.
	Gulati and Higgins (2003, SMJ)	Number of prominent alliances.	Total number of alliances with prominent institutions. Used Compustat to determine top 30 institutions (in industry) by sales.
	Stuart, Hoang & Hybels (1999, ASQ)	Prominence of strategic alliance partners	Technological prominence - partner's total number of patents ; Commercial prominence - partner's total number of alliances
	Burns and Wholey (1993, AMJ)	Prestige (hospital)	Academic reputation and visibility of medical school affiliated with hospital.
Location Reputation	Birkinshaw & Hood (2000, JIBS)	Leading edge industry cluster	Follows Porter - All those clusters in which the share of world cluster exports was more than double the average for that country
	Deeds, Decarolis & Coombs (1997, JBV)	Location	% of the national's total biotech firms located in the MSA
	Deeds, Decarolis & Coombs (2000, JBV)	Location	% of the national's total biotech firms located in the MSA
	Deeds, Decarolis & Coombs (1998, JBV)	Location	% of the national's total biotech firms located in the MSA
	Shaver & Flyer (2000, SMJ)	Agglomeration	Proportion of industry establishments that are in the state with plant location

**APPENDIX 2: SIGNIFICANT CORRELATIONS WITH INDEPENDENT VARIABLES**

Independent Variables	Variables with significant correlations				Total Number
	R<0.19	0.20<R<0.39	0.40<R<0.59	R>0.60	
<b>NV Int'l Knowledge</b>	<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•VC reputation</li> </ul>				2
<b>Location Int'l Knowledge</b>	<ul style="list-style-type: none"> <li>•Age</li> <li>•Electronics industry (dummy)</li> <li>•IPO Year 1998 (dummy)</li> <li>•IPO Year 1999 (dummy)</li> </ul>	<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•R&amp;D intensity</li> <li>•IPO Year 1996 (dummy)</li> <li>•IPO Year 1997 (dummy)</li> <li>•IPO year 2000 (dummy)</li> <li>•NV reputation - volume</li> <li>•VC Int'l knowledge</li> <li>•VC reputation</li> </ul>		<ul style="list-style-type: none"> <li>•Location reputation</li> </ul>	13
<b>VC Int'l Knowledge</b>	<ul style="list-style-type: none"> <li>•IPO year 1996 (dummy)</li> <li>•NV reputation - tenor</li> <li>•Location reputation</li> </ul>	<ul style="list-style-type: none"> <li>•Assets</li> <li>•Alliance (dummy)</li> <li>•R&amp;D intensity</li> <li>•IPO year 2000 (dummy)</li> <li>•NV reputation - volume</li> <li>•Location Int'l knowledge</li> <li>•Alliance Int'l knowledge</li> <li>•Alliance reputation</li> </ul>		<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•VC reputation</li> </ul>	13
<b>Alliance Int'l Knowledge</b>	<ul style="list-style-type: none"> <li>•Assets</li> <li>•R&amp;D intensity</li> </ul>	<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•NV reputation - volume</li> <li>•VC int'l knowledge</li> <li>•Alliance reputation - tenor</li> </ul>	<ul style="list-style-type: none"> <li>•Alliance (dummy)</li> </ul>	<ul style="list-style-type: none"> <li>•Alliance reputation - volume</li> </ul>	8

Independent Variables	Variables with significant correlations				
	R<0.19	0.20<R<0.39	0.40<R<0.59	R>0.60	Total Number
<b>NV Reputation</b>	<ul style="list-style-type: none"> <li>•Age</li> <li>•Electronics industry (dummy)</li> <li>•IPO year 1997 (dummy)</li> <li>•NV reputation - tenor</li> </ul>	<ul style="list-style-type: none"> <li>•Assets</li> <li>•VC (dummy)</li> <li>•Alliance (dummy)</li> <li>•R&amp;D Intensity</li> <li>•IPO year 1996 (dummy)</li> <li>•Location int'l knowledge</li> <li>•Location reputation</li> <li>•VC int'l knowledge</li> <li>•VC reputation</li> <li>•Alliance int'l knowledge</li> <li>•Alliance reputation - volume</li> </ul>			15
<b>Location Reputation</b>	<ul style="list-style-type: none"> <li>•VC Int'l knowledge</li> </ul>	<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•R&amp;D intensity</li> <li>•NV reputation - volume</li> <li>•VC reputation</li> </ul>		<ul style="list-style-type: none"> <li>•Location int'l knowledge</li> </ul>	6
<b>VC Reputation</b>	<ul style="list-style-type: none"> <li>•Alliance (dummy)</li> <li>•IPO year 1996 (dummy)</li> <li>•IPO year 1998 (dummy)</li> <li>•NV int'l knowledge</li> </ul>	<ul style="list-style-type: none"> <li>•Assets</li> <li>•R&amp;D intensity</li> <li>•IPO year 2000 (dummy)</li> <li>•NV reputation - volume</li> <li>•Location int'l knowledge</li> <li>•Location reputation</li> </ul>		<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•VC int'l knowledge</li> </ul>	12
<b>Alliance Reputation</b>	<ul style="list-style-type: none"> <li>•R&amp;D intensity</li> </ul>	<ul style="list-style-type: none"> <li>•VC (dummy)</li> <li>•NV reputation - volume</li> <li>•VC int'l knowledge</li> <li>•Alliance reputation - tenor</li> </ul>	<ul style="list-style-type: none"> <li>•Alliance (dummy)</li> </ul>	<ul style="list-style-type: none"> <li>•Alliance int'l knowledge</li> </ul>	7

### APPENDIX 3: VARIANCE INFLATION FACTORS (VIF)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>
<b><i>Control Variables</i></b>					
Age	1.17	1.31	1.35	1.37	1.43
Assets <sup>1</sup>	1.39	1.66	1.69	1.68	1.73
Computer Equip Industry (dummy)	1.17	1.23	1.26	1.25	1.29
Electronics Industry (dummy)	1.26	1.37	1.38	1.41	1.42
VC Financing (dummy)	1.34	3.51	3.75	3.72	3.83
Alliance Partner (dummy)	1.53	2.02	2.10	2.08	2.14
R&D Intensity <sup>1</sup>	1.25	1.40	1.41	1.40	1.42
IPO Year 1996 (dummy)	4.17	4.34	4.37	4.37	4.42
IPO Year 1997 (dummy)	4.89	5.04	5.12	5.07	5.16
IPO Year 1998 (dummy)	4.84	5.09	5.18	5.17	5.19
IPO Year 1999 (dummy)	7.78	8.48	8.58	8.58	8.62
IPO Year 2000 (dummy)	6.83	7.64	7.70	7.74	7.78
New Venture Reputation - Tenor	1.22	1.29	1.31	1.32	1.35
Alliance Partner Reputation - Tenor	1.49	1.50	1.52	1.52	1.54
<b><i>Independent Variables</i></b>					
NV Int'l Knowledge		1.16	1.21	1.32	1.33
Location Int'l Knowledge		2.48	2.53	2.56	2.57
VC Int'l Knowledge		3.46	3.47	3.49	3.53
Alliance Int'l Knowledge		2.78	3.02	2.88	3.40
NV Reputation - Volume <sup>2</sup>		1.58	1.58	1.58	1.58
Location Reputation <sup>1</sup>		2.22	2.25	2.33	2.34
VC Reputation		4.23	4.38	4.26	4.46
Alliance Reputation - Volume <sup>2</sup>		2.72	2.77	3.12	3.21
<b><i>Moderating Variables</i></b>					
NV Int'l Knowledge x Location Int'l Knowledge			1.17		2.57
NV Int'l Knowledge x VC Int'l Knowledge			1.29		4.93
NV Int'l Knowledge x Alliance Int'l Knowledge			1.47		3.46
NV Int'l Knowledge x NV Reputation				1.56	1.91
NV Int'l Knowledge x Location Reputation				1.23	2.17
NV Int'l Knowledge x VC Reputation				1.16	4.37
NV Int'l Knowledge x Alliance Reputation				1.51	2.84
Average VIF	2.88	3.02	2.87	2.84	3.17

<sup>1</sup>Log linear transformation; <sup>2</sup>Square root transformation

## APPENDIX 4: REGRESSION RESULTS – ADDITIONAL MODELS

### Appendix 4-1: Interval Regression Results on International Sales Intensity Dependent Variable - Additional Models

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>	
<b><i>Control Variables</i></b>								
Age	0.019	( 0.015)	0.020	( 0.014)	0.024 †	( 0.014)	0.019	( 0.013)
Assets	0.000	( 0.020)	0.001	( 0.022)	0.014	( 0.023)	0.012	( 0.025)
Computer Equip Industry	0.066	( 0.060)	0.073	( 0.059)	0.081	( 0.059)	0.081	( 0.061)
Electronics Industry	0.502 ***	( 0.073)	0.516 ***	( 0.075)	0.494 ***	( 0.080)	0.511 ***	( 0.082)
VC Financing	-0.067	( 0.081)	-0.115	( 0.089)	0.009	( 0.095)	-0.011	( 0.092)
Alliance Partner	-0.083	( 0.063)	-0.103	( 0.064)	-0.027	( 0.074)	-0.039	( 0.072)
R&D Intensity	0.001	( 0.008)	0.003	( 0.008)	0.005	( 0.009)	0.007	( 0.008)
IPO Year 1996	-0.038	( 0.065)	-0.050	( 0.063)	-0.043	( 0.091)	-0.038	( 0.083)
IPO Year 1997	-0.059	( 0.072)	-0.021	( 0.070)	-0.054	( 0.096)	-0.039	( 0.095)
IPO Year 1998	-0.117	( 0.072)	-0.072	( 0.086)	-0.121	( 0.076)	-0.093	( 0.079)
IPO Year 1999	-0.181 *	( 0.089)	-0.161 †	( 0.098)	-0.174 *	( 0.086)	-0.158 †	( 0.089)
IPO Year 2000	-0.246 **	( 0.082)	-0.222 **	( 0.081)	-0.226 *	( 0.090)	-0.208 *	( 0.091)
New Venture Rep - Tenor	0.090 †	( 0.049)	0.105 *	( 0.051)	0.086	( 0.060)	0.091	( 0.065)
Alliance Partner Rep - Tenor	0.001	( 0.107)	0.037	( 0.118)	0.007	( 0.104)	0.032	( 0.103)
<b><i>Independent Variables</i></b>								
NV Int'l Knowledge	0.055 *	( 0.023)	0.059 *	( 0.023)	0.057 *	( 0.023)	0.063 **	( 0.023)
Location Int'l Knowledge	0.497 ***	( 0.135)	0.495 ***	( 0.133)				
VC Int'l Knowledge	0.198 **	( 0.077)	0.223 **	( 0.085)				
Alliance Int'l Knowledge	0.024 **	( 0.008)	0.038 ***	( 0.009)				
NV Reputation					0.010	( 0.007)	0.011	( 0.007)
Location Reputation					0.030 †	( 0.016)	0.026	( 0.017)
VC Reputation					0.033	( 0.027)	0.035	( 0.026)
Alliance Reputation					-0.001	( 0.002)	0.000	( 0.002)

<b>Moderating Variables</b>							
NV Int'l Knowledge x Location Int'l Knowledge			-0.102	( 0.105)			
NV Int'l Knowledge x VC Int'l Knowledge			-0.051	( 0.050)			
NV Int'l Knowledge x Alliance Int'l Knowledge			-0.020	**	( 0.007)		
NV Int'l Knowledge x NV Reputation - Volume						-0.003	( 0.003)
NV Int'l Knowledge x Location Reputation						-0.015	( 0.020)
NV Int'l Knowledge x VC Reputation						-0.016	( 0.017)
NV Int'l Knowledge x Alliance Reputation - Volume						-0.001	† ( 0.001)
Constant	0.095	( 0.125)	0.114	( 0.126)	-0.073	( 0.161)	-0.029 ( 0.150)
Log Psuedolikelihood	-80.639		-75.967		-86.213		-84.138
Wald $\chi^2$	453.9	***	483.5	***	659.5	***	595.0 ***
Change ( $\chi^2$ ) from Model 1			15.4	**			
Change ( $\chi^2$ ) from Model 3							7.6

† p<0.10; \* p< 0.05; \*\* p < 0.01; \*\*\* p<0.001 (n=213) Unstandardized estimates are reported. Standard errors are in parentheses.



**Appendix 4-2: Interval Regression Results on International Asset Intensity Dependent Variable - Additional Models**

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>	
<b><i>Control Variables</i></b>								
Age	0.016	( 0.011)	0.016	( 0.011)	0.018 †	( 0.010)	0.011	( 0.010)
Assets	-0.015	( 0.013)	-0.014	( 0.013)	-0.007	( 0.013)	-0.012	( 0.014)
Computer Equip Industry	0.014	( 0.044)	0.021	( 0.041)	0.027	( 0.041)	0.030	( 0.042)
Electronics Industry	0.323 ***	( 0.043)	0.336 ***	( 0.044)	0.312 ***	( 0.046)	0.335 ***	( 0.048)
VC Financing	-0.056	( 0.067)	-0.100	( 0.075)	-0.030	( 0.074)	-0.050	( 0.070)
Alliance Partner	-0.032	( 0.045)	-0.050	( 0.044)	0.011	( 0.051)	0.002	( 0.049)
R&D Intensity	-0.012	( 0.007)	-0.010 †	( 0.006)	-0.009	( 0.008)	-0.008	( 0.006)
IPO Year 1996	0.009	( 0.062)	0.003	( 0.050)	0.003	( 0.086)	0.006	( 0.078)
IPO Year 1997	-0.056	( 0.063)	-0.024	( 0.060)	-0.054	( 0.083)	-0.044	( 0.082)
IPO Year 1998	-0.118 *	( 0.047)	-0.080 †	( 0.046)	-0.119 *	( 0.051)	-0.097 †	( 0.052)
IPO Year 1999	-0.168 ***	( 0.051)	-0.151 **	( 0.056)	-0.168 ***	( 0.046)	-0.155 ***	( 0.047)
IPO Year 2000	-0.191 ***	( 0.050)	-0.169 ***	( 0.045)	-0.187 ***	( 0.056)	-0.168 **	( 0.056)
New Venture Rep - Tenor	0.032	( 0.031)	0.043	( 0.033)	0.032	( 0.036)	0.038	( 0.039)
Alliance Partner Rep - Tenor	0.012	( 0.080)	0.045	( 0.090)	0.013	( 0.079)	0.040	( 0.082)
<b><i>Independent Variables</i></b>								
NV Int'l Knowledge	0.038 *	( 0.017)	0.042 *	( 0.016)	0.039 *	( 0.017)	0.045 **	( 0.016)
Location Int'l Knowledge	0.260 *	( 0.129)	0.254 *	( 0.127)				
VC Int'l Knowledge	0.154 *	( 0.067)	0.179 *	( 0.076)				
Alliance Int'l Knowledge	0.016 *	( 0.006)	0.027 ***	( 0.008)				
NV Reputation					0.006	( 0.005)	0.008 †	( 0.005)
Location Reputation					0.011	( 0.014)	0.005	( 0.013)
VC Reputation					0.044 †	( 0.024)	0.044 †	( 0.024)
Alliance Reputation					-0.001	( 0.001)	0.000	( 0.001)

<i>Moderating Variables</i>									
NV Int'l Knowledge x Location Int'l Knowledge									
			-0.075		( 0.077)				
NV Int'l Knowledge x VC Int'l Knowledge			-0.058	†	( 0.034)				
NV Int'l Knowledge x Alliance Int'l Knowledge			-0.016	**	( 0.006)				
NV Int'l Knowledge x NV Reputation - Volume								-0.005	† ( 0.003)
NV Int'l Knowledge x Location Reputation								-0.021	( 0.017)
NV Int'l Knowledge x VC Reputation								-0.021	( 0.013)
NV Int'l Knowledge x Alliance Reputation - Volume								-0.001	( 0.001)
Constant	0.121	( 0.098)	0.145	( 0.108)	0.040	( 0.115)	0.102	( 0.106)	
Log Psuedolikelihood	-47.390		-40.820		-50.999		-45.819		
Wald $\chi^2$	722.2	***	596.1	***	486.6	***	790.7	***	
Change ( $\chi^2$ ) from Model 1			11.6	**					
Change ( $\chi^2$ ) from Model 3							13.4	**	

† p<0.10; \* p< 0.05; \*\* p < 0.01; \*\*\* p<0.001 (n=213) Unstandardized estimates are reported. Standard errors are in parentheses.

**Appendix 4-3: Poisson Regression Results on International Scope Dependent Variable - Additional Models**

	<i>Model 1</i>			<i>Model 2</i>			<i>Model 3</i>			<i>Model 4</i>		
<b><i>Control Variables</i></b>												
Age	0.166	***	( 0.046)	0.179	***	( 0.053)	0.170	***	( 0.053)	0.157	**	( 0.050)
Assets	0.039		( 0.050)	0.052		( 0.049)	0.072		( 0.062)	0.057		( 0.070)
Computer Equip Industry	0.482	**	( 0.163)	0.504	**	( 0.160)	0.493	***	( 0.155)	0.495	**	( 0.161)
Electronics Industry	0.919	***	( 0.159)	0.973	***	( 0.156)	0.820	***	( 0.149)	0.910	***	( 0.162)
VC Financing	0.172		( 0.314)	0.028		( 0.311)	0.364		( 0.329)	0.298		( 0.315)
Alliance Partner	0.120		( 0.204)	0.109		( 0.205)	0.198		( 0.192)	0.198		( 0.226)
R&D Intensity	0.026		( 0.031)	0.037		( 0.030)	0.027		( 0.033)	0.046		( 0.032)
IPO Year 1996	0.096		( 0.364)	0.007		( 0.353)	0.129		( 0.453)	0.076		( 0.421)
IPO Year 1997	-0.127		( 0.236)	-0.073		( 0.235)	-0.071		( 0.321)	-0.044		( 0.311)
IPO Year 1998	-0.459	**	( 0.174)	-0.370	†	( 0.195)	-0.487	*	( 0.209)	-0.402	†	( 0.229)
IPO Year 1999	-0.689	**	( 0.218)	-0.649	**	( 0.225)	-0.699	**	( 0.237)	-0.649	**	( 0.230)
IPO Year 2000	-0.837	***	( 0.166)	-0.821	***	( 0.164)	-0.848	***	( 0.196)	-0.830	***	( 0.202)
New Venture Rep - Tenor	0.189		( 0.160)	0.247		( 0.176)	0.193		( 0.160)	0.229		( 0.180)
Alliance Partner Rep - Tenor	-0.806	*	( 0.357)	-0.678	†	( 0.407)	-0.713	*	( 0.318)	-0.570	†	( 0.332)
<b><i>Independent Variables</i></b>												
NV Int'l Knowledge	0.157	***	( 0.042)	0.172	***	( 0.050)	0.168	***	( 0.042)	0.181	***	( 0.054)
Location Int'l Knowledge	0.390		( 0.353)	0.403		( 0.359)						
VC Int'l Knowledge	0.494		( 0.316)	0.602	†	( 0.339)						
Alliance Int'l Knowledge	0.037		( 0.024)	0.068	†	( 0.036)						
NV Reputation							0.040	*	( 0.016)	0.048	*	( 0.023)
Location Reputation							0.031		( 0.065)	0.014		( 0.065)
VC Reputation							0.061		( 0.057)	0.068		( 0.065)
Alliance Reputation							-0.003		( 0.004)	-0.001		( 0.005)

<b>Moderating Variables</b>										
NV Int'l Knowledge x Location Int'l Knowledge				-0.247		( 0.242)				
NV Int'l Knowledge x VC Int'l Knowledge				-0.112	***	( 0.031)				
NV Int'l Knowledge x Alliance Int'l Knowledge				-0.048	†	( 0.026)				
NV Int'l Knowledge x NV Reputation - Volume								-0.010	( 0.011)	
NV Int'l Knowledge x Location Reputation								-0.077	† ( 0.040)	
NV Int'l Knowledge x VC Reputation								-0.045	* ( 0.018)	
NV Int'l Knowledge x Alliance Reputation - Volume								-0.006	( 0.004)	
Constant	-1.047	**	( 0.404)	-1.078	*	( 0.458)	-1.386	† ( 0.715)	-1.231	† ( 0.676)
	-			-			-		-	
Log Psuedolikelihood	191.3			189.5			192.2		190.0	
	72			80			45		98	
		**					1145.			
Wald $\chi^2$	639.9	*		640.2	***		7	***	821.3	***
Change ( $\chi^2$ ) from Model 1				21.3	***					
Change ( $\chi^2$ ) from Model 3									7.7	†

† p<0.10; \* p< 0.05; \*\* p < 0.01; \*\*\* p<0.001 (n=213) Unstandardized estimates are reported. Standard errors are in parentheses.

## VITA

NAME: Stephanie Ann Fernhaber

BORN: Greenville, Michigan; April 16, 1975

DEGREES: B.S. Ripon College, 1997  
M.B.A. Marquette University, 2000  
Ph.D. Indiana University, 2006