



2007

Exploring the Role of Industry Structure in New Venture Internationalization

Stephanie A. Fernhaber
Butler University, sfernhab@butler.edu

Patricia P. McDougall

Benjamin M. Oviart

Follow this and additional works at: https://digitalcommons.butler.edu/cob_papers



Part of the [Entrepreneurial and Small Business Operations Commons](#), and the [International Business Commons](#)

Recommended Citation

Fernhaber, Stephanie A.; McDougall, Patricia P.; and Oviart, Benjamin M., "Exploring the Role of Industry Structure in New Venture Internationalization" (2007). *Scholarship and Professional Work - Business*. 91.
https://digitalcommons.butler.edu/cob_papers/91

This Article is brought to you for free and open access by the Lacy School of Business at Digital Commons @ Butler University. It has been accepted for inclusion in Scholarship and Professional Work - Business by an authorized administrator of Digital Commons @ Butler University. For more information, please contact digitalscholarship@butler.edu.

Exploring the role of industry structure in new venture internationalization.

Stephanie A. Fernhaber, Patricia P. McDougall, Benjamin M. Oviatt

While we have gained considerable knowledge since the late 1980s regarding the phenomena of international new ventures, less is known about the influence of industry structure on these ventures. In the present paper, we draw on literature from industrial economics, international business and entrepreneurship to identify industry structure variables that fit within the theoretical framework of international new ventures. We then offer propositions as to how the identified industry structure variables individually and jointly influence the likelihood of new venture internationalization.

Research into the phenomena of international new ventures has increased dramatically since the late 1980s. As defined by Oviatt and McDougall (1994), international new ventures seek to derive competitive advantage from the use of resources and the sale of outputs in multiple countries from inception. Also referred to as born globals (Knight & Cavusgil, 1996; Madsen & Servais, 1997; Moen, 2002), global start-ups (Oviatt & McDougall, 1994), instant exporters (McAuley, 1999), micro multinationals (Dimitratos, Johnson, Slow, & Young, 2003) or simply international ventures (Kuemmerle, 2002), these new ventures have created such attention due to their tendency not to follow traditional international business theory (McDougall, Shane, & Oviatt, 1994). While a multitude of research has since emerged, shedding valuable insight on the organizational and strategic factors influencing new venture internationalization, Zahra and George (2002) note the limited amount of research exploring the role of environmental factors on new venture internationalization. They attribute this limitation to the complexity and variety of environmental variable combinations that may influence a new venture to internationalize. The purpose of this paper is to shed light on the complex role of a specific environmental factor, namely the structure of a new venture's chosen industry. Industry structure is defined as the basic, underlying characteristics that shape the competitive strategy for a group of firms producing products that are close substitutes for each other (Porter, 1980).

The role of industry structure is of particular interest as industry structure has consistently been found to influence new ventures, in terms of new venture formation (e.g., Dean & Meyer, 1996), performance (e.g., McDougall, Robinson, & DiNisi, 1992; Sandberg & Hofer, 1987), and their strategic behavior (e.g., McDougall, Covin, Robinson, & Herron, 1994). While there have been limited studies specifically addressing the role of industry structure on new venture internationalization, the importance of this relationship is implied by existing research (e.g., Bloodgood, Sapienza, & Almeida, 1996; Shrader, Oviatt, & McDougall, 2000). Yet, we are lacking a theoretical explanation and a more detailed understanding of how the characteristics of industry structure are indeed influential. Because internationalizing new ventures often do not follow the traditional theories of internationalization (Knight & Cavusgil, 1996; McDougall et al., 1994), the need for a deeper understanding of how industry structure specifically impacts internationalization in the context of new ventures is imperative.

To identify which structural characteristics of an industry potentially enhance new venture internationalization, we began with a literature review of industry structure variables examined in both the international business and entrepreneurship fields of study. That review resulted in the identification of nearly 20 industry structure variables. We then considered those variables within the context of the four necessary and sufficient elements described in the international new venture framework put forth by Oviatt and McDougall (1994). These elements include (1) organizational formation through internalization of some transactions, (2) a strong reliance on alternative or hybrid governance structures, (3) the creation of foreign location advantages, and (4) control over unique resources. By only considering those industry structure variables that best fit within the international new venture framework, we were able to narrow our focus in this paper to address how new venture internationalization is influenced by the following structural characteristics of an industry: the stage of industry evolution, level of industry concentration,

knowledge-intensity of the industry, local industry internationalization, industry global integration, level of venture capital and the regime of appropriability within an industry.

Before moving forward, we must first clarify what we mean by the internationalization of new ventures. 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, Ireland, & Hitt, 2000). For example, both Shrader et al. (2000) and Zahra et al. (2000) examined the internationalization of firms that were 6 years old or younger. Within the entrepreneurship literature, new ventures are generally considered to be those firms that are 6 years old or less, as this definition is in line with the U.S. Small Business Administration (1992). Thus, we similarly are interested, in this paper, in the internationalization of new ventures within their first 6 years of existence.

Second, we must clarify our interpretation of internationalization. As indicated by Oviatt and McDougall's definition, internationalization involves the "use of resources and sale of outputs in multiple countries." However, as shown in international business and international entrepreneurship research, there are many different ways to interpret and measure their definition of internationalization. While some scholars have examined whether a new venture is international (McDougall, Oviatt, & Shrader, 2003), others have explored the intensity, or percentage, of international sales (Reuber & Fischer, 2002), scope of internationalization (Preece, Miles, & Baetz, 1998), primary activities in foreign markets (Bloodgood et al., 1996), international sales growth (Autio, Sapienza, & Almeida, 2000), type of internationalization (Kuemmerle, 2002), and internationalization success (Mitchell, Shaver, & Yeung, 1994). While we recognize the importance of these multiple interpretations, we have chosen to focus in this paper on whether a new venture is more likely to enter a foreign market given the presence of certain industry characteristics.

This paper extends prior research in several ways. Foremost, we respond to calls from prior studies to further explore the role of environmental factors on new venture internationalization (Andersson, 2004; Zahra & George, 2002). In doing so, we build on the theoretical framework of international new ventures put forth by Oviatt and McDougall (1994) by considering how industry structure fits into the elements of this framework. We also contribute by integrating and offering insights from several different literature streams including industrial economics, international business and entrepreneurship.

The following section of the paper reviews the literature surrounding new venture internationalization and the implied influence of industry structure. An explanation is provided about our selection of industry structure characteristics. Next, we present our model and the development of our propositions in which we draw on theory from multiple disciplines. Key contributions and future research are then discussed.

Literature Review

In the context of general entrepreneurship research, industry structure has been argued to influence the formation rate of new ventures. Dean and Meyer (1996) examined 382 U.S. industries and found that the new venture formation rate was greater in industries characterized as having high demand growth, changing consumer demands, and technological development. New ventures are also influenced by the structure of their industry after formation in their choices of strategy and their varying levels of performance. Industry characteristics positively associated with new venture performance include the emerging stages of an industry life cycle, high industry growth, rapid technological change, and high levels of product differentiation (Keeley & Roure, 1990; McDougall et al., 1992; Robinson & McDougall, 1998; Robinson, 1999; Sandberg & Hofer, 1987). The contingent effect of choosing the right strategy for the industry conditions has also emerged as critical for new ventures (Robinson & McDougall, 2001; Sandberg & Hofer, 1987).

A close review of research on international new ventures also suggests the importance of industry structure. Many of the single-industry studies tend to focus on high-technology industries (e.g., Bell, 1995; Carpenter, Pollock, & Leary, 2003; Reuber & Fischer, 1997), which is likely due to the role of innovative product characteristics and industry structure in internationalization. When multiple industries are used, the statistical significance of the

industry control variables also suggests an influential relationship. For example, Bloodgood et al. (1996) found industry profitability to be positively and significantly related to new venture internationalization through the use of a control variable. Shrader et al. (2000) used a sample of new ventures from a variety of low- and high-technology industries and controlled for global integration, technological change, competitive intensity, and the growth of the respective industry. These industry structure characteristics were found to be influential in the new venture's foreign revenue exposure, country risk and entry mode commitment.

Nonetheless, there are very few studies that have directly addressed the potential influence of industry structure on new venture internationalization. Boter and Homquist (1996) offer some insight from the small business literature, in which they compared the internationalization activity of three conventional manufacturing firms with three manufacturing firms that focus on innovation. Their results indicate that internationalization indeed needs to be understood within the context and requirements of the respective industry. Within the Scottish arts and crafts industry, McAuley (1999) identified the global reach of the industry as being influential in the decision of these new firms to export. Several studies have also conducted a comparison between international and domestic new ventures, and found significant differences in the level of global industry integration (McDougall et al., 2003) and the intensity of international competition (McDougall, 1989). While these studies offer key insight, we suggest a more robust and theoretical explanation is needed to build on this existing foundation and to examine how different industry structure characteristics jointly and independently influence new venture internationalization.

Industry Structure Characteristics

Table 1

Frequently Examined Industry Structure Variables

Variable	Representative studies
Industry advertising intensity	Kobrin, 1991; McDougall et al., 1992
Industry asset intensity	Luo & Tan, 1997
Industry buyer concentration	Keeley & Rount, 1990
Industry competition	Chang, 2001; Karagozgla & Lindell, 1998; Keeley & Rount, 1990
Industry concentration	Chatterjee, 1990; Dean & Meyer, 1996; Mascarenhas, 1996; McDougall et al., 1992; Robinson & McDougall, 1998
Industry density	Mascarenhas, 1995; Aldrich, 1990
Industry economies of scale	Dean & Meyer, 1996; Kobrin, 1991; McDougall et al., 1992; Robinson & McDougall, 2001
Industry evolution	Aldrich & Fiol, 1994; Eisenhardt & Schoonhoven, 1990; Robinson, 1999; Robinson & McDougall, 1998; 2001; Sandberg & Hofer, 1987; Vernon, 1966
Industry globalization	Kobrin, 1991; McDougall, Oviatt & Shrader, 2003; Mitchell et al., 1993; Morrison & Roth, 1992; Porter, 1986
Industry growth	Chatterjee, 1990; Dean & Meyer, 1996; Luo & Tan, 1997; McDougall et al., 1994; McDougall, Robinson & DiNisi, 1992
Industry legitimacy	Deeds, Mang & Frandsen, 2004
Industry practice imitation	Honig & Karlsson, 2004; Guillen, 2002; Lu, 2002; Yiu & Makino, 2002
Industry product differentiation	Dean & Meyer, 1996; Robinson & McDougall, 1998; 2001
Industry profitability	Bloodgood et al., 1996; Luo & Tan, 1997
Industry uncertainty	Luo & Tan, 1997
Knowledge intensity of industry	Covin, Slevin, & Covin, 1990; Kobrin, 1991
Sales dynamics of industry niches	Dean & Meyer, 1996
Technological development in industry	Dean & Meyer, 1996
Transition industries	Mitchell et al., 1994

To identify which aspects of an industry environment are potentially important for international new ventures, we began with a literature review of industry structure variables examined in both the international business and entrepreneurship fields of study. As described in Table 1, we identified nearly 20 industry structure variables. We then considered those variables within the context of the four necessary and sufficient elements of Oviatt and McDougall's (1994) international new venture framework. This framework was originally developed to explain the phenomenon of international new ventures which they argued challenged many of the established wisdoms of traditional international business theory. Oviatt and McDougall integrated accepted theory on multinational enterprises with entrepreneurship and strategic management theory to develop a framework to provide a theoretical understanding of international new ventures. Since that time, the framework has been widely recognized as "laying an important theoretical foundation for the field of international entrepreneurship" (Zahra, 2005, p. 20) and a valuable contribution to international business research (Autio, 2005). We considered the industry structure variable

within the context of this framework based on the assumption that assessing industry structure is a part of assessing the value creation opportunities relating to internationalization by a new venture. We acknowledge, however, that although preliminary evidence implies a link between new venture internationalization and higher levels of new venture performance (Bloodgood et al., 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra et al., 2000), the assumption that varying industry conditions influences the ultimate performance of an international new venture has not yet been tested. A summary of the resulting industry structure variables that were ultimately classified within the international new venture framework is found in Table 2 with the related definition and typical operationalizations in Table 3.

The first element of Oviatt and McDougall's framework leading to the existence of an international new venture lies in organizational formation through internalization of some transactions. Internalization through organizational formation occurs when firms are the most efficient institution to organize interdependencies, and thus, more efficient than markets and contracts (Dunning, 1988; Williamson, 1975). Internalization is a defining element of all organizations, regardless of the age of the organization or extent of internationalization. In other words, ventures do not exist without internalization. The entrepreneurship literature suggests that the rate of new venture formation can be directly linked to the level of concentration and evolutionary stage of an industry (Dean & Meyer, 1996). For example, industries with a high level of concentration discourage new venture formation due to the ability of industry firms to collude against new entry (Oster, 1999). However, entering an industry in the growth stage of its evolution seems to have the opposite effect of encouraging new venture formation through the increasing availability of opportunities (Dean & Meyer, 1996; Oster, 1999). Thus, internalization through new venture formation can be explained in part by both the level of concentration as well as the industry's evolutionary stage.

While an industry's level of concentration and stage of evolution may influence the rate of venture formation, the industry sector in which a venture forms may also influence its internationalization. International practices in an industry are often imitated by new entrants (Lu, 2002; Yiu & Makino, 2002). Thus, new ventures entering industries with high levels of internationalization would tend to internationalize to take advantage of transaction efficiencies already identified by existing firms. In addition, new ventures whose founders have a global vision from inception are likely to be attracted to internationally integrated industries because they may spur the recognition of opportunities to internalize transactions in a global setting.

Table 2

Industry Structure Characteristics and Elements of International New Ventures

(1) Internalization of transactions	(2) Alternative governance mechanisms	(3) Foreign location advantage	(4) Control over unique resources
<ul style="list-style-type: none"> • Industry concentration • Industry evolution • Local industry internationalization 	<ul style="list-style-type: none"> • Level of venture capital in industry • Regime of appropriability in industry 	<ul style="list-style-type: none"> • Industry concentration • Industry evolution • Global integration of industry • Knowledge-intensity of industry 	<ul style="list-style-type: none"> • Knowledge-intensity of industry • Regime of appropriability in industry

Thus, although internalization occurs at the firm level, not the industry level, it appears clear that industry conditions influence the rate of internalization and the probability that transactions across national borders will be internalized in a venture. Since the internalization of some transactions is the initial element of Oviatt and McDougall's (1994) framework and it serves as our guide for the selection of influential industry factors it seems appropriate that an industry's level of concentration, stage of evolution and degree of industry internationalization be included in any study of the industry factors that influence new venture internationalization.

The second element of the international new venture framework highlights the importance of alternative governing mechanisms. Because new ventures typically are limited in their resources (Stinchcombe, 1965), they often are

forced to internalize a smaller percentage of their resources than more mature firms. This results in the use of hybrid ownership structures often involving alliances with other organizations in order for new ventures to access a sufficient level of resources to grow.

If new ventures are to have the financial resources to grow internationally they may need a relationship with a venture capital firm. Such firms provide relatively large amounts of funding and assume significant risks in exchange for a share of ownership and often a seat on the venture's board of directors. Venture capital firms only invest in ventures when they believe there is an opportunity for a very large return on their investment, which often means international sales. When their goal of large returns appears threatened, venture capital partners may even seek to replace the venture founders with new managers. Thus, allying with a venture capital firm means having a complex hybrid governance structure. Important for this research is the fact that the availability of venture capital varies widely among industries (Green, 2004). And as we found with the first element of the new venture internationalization framework, governance structure is also a firm-level variable, but an industry influence can be seen to affect the nature of the hybrid governance structure employed by a venture. Thus, we believe an industry's level of venture capital investment is an important industry structure influence on new venture internationalization. Among other things, the regime of appropriability is an important determinant of how much venture capital money is available in an industry and is thus also considered.

The third element of the framework leading to the existence of international new ventures includes a foreign location advantage. Having a foreign location advantage distinguishes a domestic new venture from an international new venture. We suggest that industry concentration and industry evolution not only allow for the formation of an international new venture, but also add to their foreign location advantage. For example, new ventures that form within highly concentrated industries tend to pursue niche markets (Oster, 1999) and it has been argued that it is these niche markets that can potentially be leveraged internationally by a new venture (Knight & Cavusgil, 1996). Similarly, a new venture in a growing industry can pursue more risky endeavors (Mascarenhas, 1995), such as the creation and exploitation of advantages internationally, because munificent growth may mask the consequences of mistakes that could be fatal in less generous stages of industry evolution. As knowledge is a key determinant of a firm's foreign location advantage (Kobrin, 1991), the knowledge-intensity of an industry is also considered a potentially important influence. Likewise, the global integration of an industry is considered because competing in global industries usually necessitates the development of a foreign location advantage (Porter, 1980).

Table 3

Definitions and Typical Operationalization of Industry Structure Variables Used in Model

Variable	Definition	Typical operationalization
Industry evolution	Refers to whether an industry is just emerging, experiencing rapid growth or in a state of maturity	Assessment of gross entry rates into an industry (Agarwal et al., 2002)
Industry concentration	Indicates the number and relative power of firms in an industry	The percentage of sales or employment accounted for by top four firms within an industry (Dean & Meyer, 1996)
Knowledge-intensity of industry	The extent to which organizational knowledge and learning is relied upon by industry firms	Average R&D expenditures as a percentage of sales for all industry firms (Kobrin, 1991)
Local industry internationalization	The extent to which home country firms in an industry have internationalized or partake in certain internationalization practices	The number of home country firms in an industry that use a specific entry mode to enter a foreign country (Lu, 2002; Yiu & Makino, 2002)
Global integration of industry	The degree to which an industry competes on a global rather than multidomestic basis	Intra-firm trade as a percentage of all international sales within an industry (Kobrin, 1991)
Industry venture capital	The extent to which venture capital is invested in firms within an industry	The percentage of all venture capital funds that is invested into a given industry (Green, 2004)
Regime of appropriability in industry	Ability of industry firms to capture the profits generated by an innovation	Survey of industry firms to assess perceived means of appropriability for innovations (Lexim et al., 1987)

The fourth element, which completes the necessary and sufficient framework for international new ventures, consists of having control over unique resources. This emphasizes the ability, or inability, of a new venture to develop a sustainable competitive advantage in foreign markets. The knowledge-intensity of an industry most

notably fits within this element as knowledge is considered by some to be the most important of all resources leading to a competitive advantage (Grant, 1996), and knowledge is argued to be especially critical to internationalization (Kobrin, 1991). However, as Oviatt and McDougall (1994) point out, it is the ability of a new venture to keep knowledge proprietary and thus, unique, that leads to a sustainable advantage. Thus, we also consider the regime of appropriability within an industry. Its likely affect on new venture internationalization is explained later.

In summary, our literature review led us to the detailed consideration of the following industry structure characteristics: industry concentration, industry evolution, degree of industry internationalization, level of industry venture capital, knowledge-intensity of an industry, global integration of an industry, and regime of appropriability. We acknowledge that the previously mentioned list of industry structure characteristics is not an exclusive list. Some of the industry structure characteristics that were identified in our initial literature review are not considered in this paper in order to focus on those that seem most fundamental to new venture internationalization, and to avoid redundancy. For example, high barriers to entry are likely associated with more concentrated industries (Besanko, Dranove, & Shanley, 1996). Therefore, we have chosen to consider the influence of industry concentration, rather than alternate measures of barriers to entry. By focusing on those industry structure characteristics that are suggested to be most fundamental to new venture internationalization by Oviatt and McDougall's framework, we are able to explore a complex set of relationships while managing the scope of the paper. Using our set of industry structure characteristics, we next present our theoretical model and propositions.

Theoretical Overview and Propositions

As depicted in Figure 1, our model demonstrates how seven industry characteristics are proposed to exhibit direct relationships with new venture internationalization as well as a series of indirect relationships.

Industry Evolution

The evolutionary stage of an industry refers to whether an industry is just emerging, is experiencing rapid growth or is in a state of maturity. As an industry evolves from emergence to maturity, industrial economists focus on how the nature of the competition and sources of opportunity for creating value change (Anderson & Zeithaml, 1984; Oster, 1999). The introductory stage is characterized by low demand and high uncertainty as efforts are made to prove market viability and industry standards (Anderson & Zeithaml, 1984). Entrepreneurs in these emerging or introductory stage industries exist with little precedence. Within the growth stage, demand grows rapidly as the legitimacy of the industry also grows. Many resource opportunities exist for new firms in the growth stage of an industry and the resulting competitive pressures are somewhat lessened (Eisenhardt & Schoonhoven, 1990). As industries begin to mature, there is less change in competition, products and technology (Anderson & Zeithaml, 1984). Customers are familiar with the products and services and the markets become relatively stable.

According to the product cycle theory originally put forth by Vernon (1966), firms pursue foreign direct investment when the product has matured and competition becomes cost-based. This is done in order to protect markets that were originally being served through exporting. If a new venture exists in a mature stage of an industry, product cycle theory would thus suggest the venture would be more likely to pursue internationalization. However, through the use of case studies, McDougall et al. (1994) demonstrated that international new ventures do not necessarily follow this logic. Instead, many new ventures pursue foreign markets before competition is yet standardized and cost based. Additionally, these new ventures do not automatically pursue exporting prior to the purchase of foreign assets.

In contrast to product cycle theory, which highlights industry maturity, we suggest a new venture is more likely to pursue internationalization during the growth stage of an industry for several reasons (Andersson, 2004). First, the growth stage of an industry exhibits the highest level of increasing demand and related opportunities (Eisenhardt & Schoonhoven, 1990). New ventures can therefore attempt to capture some of this demand, some of which may be coming from foreign markets.

Second, there is more room for "strategic error" in an industry's growth stage (Mascarenhas, 1995). As a result, a new venture has the opportunity to attempt a more risky strategy with fewer negative consequences. This is important as new ventures are known to have a high failure rate (Stinchcombe, 1965). If a new venture has been considering the possibility of foreign markets, the venture might be likely to pursue such a strategy because there is more room to experiment and still survive.

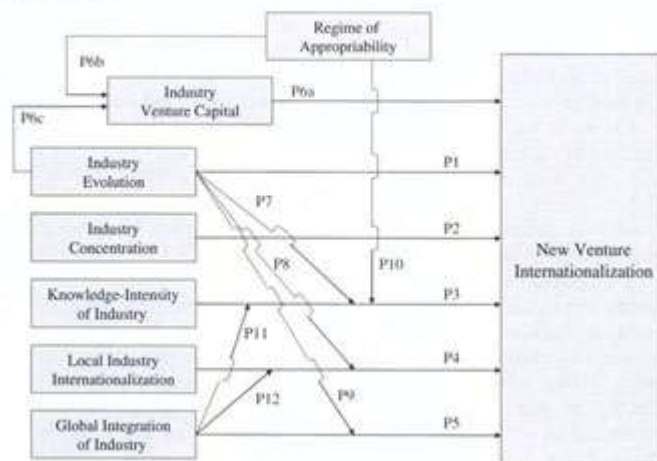
Furthermore, international new ventures often compete on their innovative capabilities or product differentiation strategy (Bloodgood et al., 1996; Oviatt & McDougall, 1995). As the growth stage of an industry typically exhibits an entrepreneurial regime (Agarwal, Sarkar, & Echambadi, 2002) in which new entrants are more likely to contribute to the innovative activity of the industry than existing firms (Audretsch, 1995), new ventures are more likely to be the innovators and can exploit this competitive advantage internationally. The innovation and emphasis of product differentiation can also allow the new ventures to exist below the minimum efficient scale of production (Oster, 1999).

Lastly, an industry in the growth stage is suggested to provide many resource opportunities for new firms (Eisenhardt & Schoonhoven, 1990). Resources are necessary for new ventures to be able to exploit internationalization (Preece et al., 1998) and pursue a more aggressive entry strategy (McDougall, 1989). Thus, we propose:

Proposition 1: New ventures operating within a growth stage of an industry are more likely to internationalize than new ventures operating within an emerging or mature stage of an industry.

Figure 1

Industry Structure and New Venture Internationalization P1–P12,
Propositions 1–12



It is important to note that although we believe, in general, that new ventures are more likely to internationalize within the growth stage of an industry, there are also certain cases in which this will not necessarily hold true. We introduce several of these conditions later on in this paper when we discuss potential moderating effects.

Industry Concentration

The level of firm concentration within an industry is frequently examined and deemed to be very influential by industrial economics scholars in explaining interindustry differences and the kinds of actions firms might take in their search for profits (Besanko et al., 1996; Caves, 1987; Oster, 1999; Porter, 1986). Typically measured by calculating the sales or employment accounted for by the largest four or eight firms in the industry, the resulting firm concentration ratio is indicative of the number and relative power of firms in an industry. In a highly

concentrated industry, such as automobiles or airplanes, there are a few dominant firms that take up a large portion of the market share. These dominant firms are typically able to compete based on cost advantages achieved through the high economies of scale present within the industry (Besanko et al., 1996). In contrast, less concentrated industries are often characterized by a lack of dominant firms and market share is divided throughout the industry. Also referred to as industry fragmentation, examples of less concentrated industries would include full service restaurants or dry cleaners. In these industries, there is a relatively low economy of scale present suggesting a lack of financial benefit, and thus motivation, for becoming a large-scale producer (Besanko et al., 1996). Somewhere in the middle of this continuum of high and low levels of firm concentration exist industries where large firms exhibit great influence, but there are also important small and medium sized players. The insurance and computer software industries are examples. In these industries, a higher economy of scale allows some large firms to become dominant in size. However, firms are also able to compete based on alternate strategies, and there is often significant demand for their products or services. Recalling the computer software example, such conditions are possible because there is mixed demand for both standardized and customized products.

Entrepreneurship research argues that new ventures are more likely to form (Dean & Meyer, 1996) and perhaps achieve higher levels of performance (McDougall et al., 1992; Robinson & McDougall, 1998) in less concentrated industries. This is due to the lower economies of scale necessary to enter a less concentrated industry (Besanko et al., 1996). However, several factors suggest that a new venture is more likely to pursue internationalization in a more concentrated industry. First, in a less concentrated industry where economies of scale are relatively low, new ventures may thrive in small markets. There may be no motivation or need to consider pursuing additional markets (Oster, 1999), especially markets in foreign countries. Additionally, it may be difficult and costly for a new venture to research the different competitors that exist in each market. If we consider the example of a dry cleaning business, the entrepreneur would not have to reach that large of a market to achieve profitability and would not receive any cost advantages by operating in multiple locations. It would also be quite costly for the entrepreneur to understand the competition and pursue multiple cities, much less foreign markets.

Secondly, in more concentrated industries, new ventures cannot compete with the larger firms based on cost and have to find a way to survive at less than the minimum efficiency scale of production (Oster, 1999). Instead, new ventures consider alternative strategies such as product differentiation, locational monopoly or market niches where they can exist with higher production costs and higher pricing than the larger firms. This is supported by resource partitioning theory that suggests specialists are more likely to exist when the concentration in the generalist mass market is high (Carroll, Dobrev, & Swaminathan, 2002). Given the limited size of such specialty markets, it is quite often necessary to look outside of the new venture's domestic market to access a larger customer base.

While we have argued above that a more concentrated industry is likely to result in a higher rate of new venture internationalization than a less concentrated industry, it is likely that too much concentration may actually inhibit internationalization. Toulan (1996) points out that firms entering either a very high or very low concentrated industry will tend to follow relatively similar strategies, respectively. This is attributed to either the presence of collusion or high competitive pressures among firms in a highly concentrated industry vying for market share. Similarly, firms in an industry with low concentration will also tend to exhibit similar strategies due to the low barriers to enter and limited growth possibilities. In contrast, firms in industries with medium concentration are argued to exhibit a wider variety of strategies as the existence of collusion is less likely to be present in this environment. Thus, we propose that too much concentration in an industry may limit the ability for new ventures to develop strategies based on differentiation that could lead to internationalization. If we consider the example of the airline industry, which is highly concentrated, a new entrant to the industry is more apt to compete based on locational advantages rather than differentiation. This is largely due to the inability to achieve the high economies of scale necessary to internationalize. If we consider the software industry, which exhibits more of a medium level of firm concentration, a new entrant could likely compete internationally through product differentiation and lower economies of scale. Accordingly, we posit:

Proposition 2: There will be an inverted U-shaped relationship between the level of industry concentration and likelihood of new venture internationalization within the industry.

Knowledge-Intensity of an Industry

The majority of existing research in the context of international entrepreneurship has utilized high-technology ventures as their unit of analysis (e.g., Burgel & Murray, 2000; Coviello & Munro, 1997; Jolly, Alahuhta, & Jeannet, 1992; Kotha, Rindova, & Rothaermel, 2001; Zahra et al., 2000). While this could be due simply to data availability and the rapid rise of firms in the information technology sectors in the 1990s, we suggest these particular firms are also more likely to exhibit internationalization behavior due to the role of knowledge in developing technology (Oviatt & McDougall, 1994). Indeed, growing empirical evidence has found firm-specific measures related to knowledge intensity (Autio et al., 2000) and technological learning (Zahra et al., 2000) to be positively related to new venture internationalization.

Dunning's (1988, 2000) eclectic paradigm asserts that the key determinants of a firm's international activity consist of three interrelated factors based on ownership, internalization and location. While the initial value of the eclectic paradigm was to explain international investment differences between firms, Dunning (2000) widely acknowledges that the paradigm is context specific and internationalization is therefore likely to vary across industries. Accordingly, we next take a more in-depth analysis into each of these factors of internationalization activity and how they relate specifically to new ventures competing in knowledge-intensive industries. The knowledge-intensity of an industry is defined as the extent to which industry firms rely on organizational knowledge and learning in order to compete.

The first determinant of internationalization considers the competitive or ownership advantages of the firm (Dunning, 1988). When a firm enters a new foreign market, it must be able to establish a competitive advantage in the given market while compensating for the additional costs involved in the internationalization process. 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 toward the increasing recognition of unique bundles of resources and capabilities (Barney, 1991; Dunning, 2000; Kobrin, 1991). In particular, prior research suggests knowledge represents a unique capability that offers a firm a key international competitive advantage because of its uniqueness, transportability and combinative abilities with less mobile assets (e.g., Franko, 1989; Kobrin, 1991; Martin & Salomon, 2003; Murtha, Lenway, & Hart, 2001; Oviatt & McDougall, 1994; Porter, 1986). This shift of the basis of an international competitive advantage away from advantages of scale and toward unique assets and capabilities, such as knowledge, is ideal for those new ventures that possess this capability. It does not rule out a new venture from pursuing foreign markets solely based on size, but instead considers the uniqueness of their assets and capabilities (Oster, 1999).

The second factor that determines a firm's international activity describes the propensity for firms with competitive advantages to transfer them across national boundaries within their organization, as opposed to licensing or other market-based mechanisms (Dunning, 1988). In other words, it is not sufficient that a firm simply is capable of internationalizing, but it must also contain a willingness to do so. New ventures in knowledge-intensive industries may be more willing to internationalize to earn profits that will sustain essential research and development operations (Qian & Lee, 2003). In addition, due to the uniqueness involved in knowledge creation, there is likely a greater global demand for the products and services associated with knowledge-intensive industries due to their uniqueness (Dimitratos et al., 2003). Furthermore, given the increase in worldwide communications, it is likely that foreign competitors can quickly learn about new products and exploit the opportunity in their specific market (Oviatt & McDougall, 1995). Therefore, a new venture in a knowledge-intensive industry may want to internationalize in order to exploit their accomplishments more completely.

The third and last factor that determines a firm's international activity in knowledge-intensive industries relates to the locational advantages of particular countries that offer complementary assets (Dunning, 1988). A firm will choose to internationalize if its managers perceive a given host country will offer them strategic advantages. Boter and Homquist (1996) compared the internationalization processes of three conventional manufacturing firms to three manufacturing firms oriented to innovation, and in doing so, observed that the production needs in the innovative firms were very flexible and were likely to have multiple locations and switch locations if need be. In contrast, the conventional firms were less flexible with their production, but this was also a crucial piece of their competitive advantage. It is therefore likely that the flexibility with production of new ventures in a knowledge-intensive industry would not constrain them to their home country and that they are able to shift to whatever location is most strategic (McKendrick, 2001). This is also supported by Martin and Salomon (2003), who argued the more tacit the knowledge or technology of a firm, the more apt the firm is to internalize that knowledge abroad. Boter and

Homquist (1996) also observed that conventional firms utilized existing technology that they can readily purchase or acquire as need be while innovative firms were actually developing technology that required close contact with customers and organizations within their industry. Therefore, a new venture in a knowledge-intensive industry is more likely to internationalize in order to be strategically located near key customers or partners in the knowledge-creation process. Accordingly, we propose:

Proposition 3: The greater the knowledge-intensity of an industry, the more likely new ventures operating within that industry will internationalize.

Local Industry Internationalization

When a new venture enters an industry, decisions about the degree, speed, and direction of internationalization may be significantly affected by the nature of internationalization among incumbent firms in the industry, and especially by those that are located in close proximity. We refer to this effect as local industry internationalization, and to fully understand the importance of this industry structure influence to new venture internationalization, we turn to institutional theory, which seeks to explain why firms exhibit similar characteristics or similar practices (DiMaggio & Powell, 1983). Isomorphism is an important concept in institutional theory and in our context is a social process in which firms conform to practices of other firms in their population in order to "maximize their legitimacy and increase their resources and survival capabilities" (Meyer & Rowan, 1977, p. 352). Mimetic isomorphism is a process of conformity that essentially involves one firm copying characteristics or behaviors of other firms. Such imitative behavior by firms within a given population is a standard response to the high levels of uncertainty that firms face (DiMaggio & Powell, 1983). As new ventures are not yet established firms, and can thus be argued to be in periods of uncertainty or flux as they attempt to meet the challenges of growth and survival (Greiner, 1998), mimetic isomorphism appears highly relevant.

Haunschild and Miner (1997) found that greater uncertainty causes firms to imitate practices that are very common, as compared to imitating practices of firms with certain features or certain outcomes. That finding implies that new ventures are likely to pay greatest attention to and to imitate the behaviors most frequently exhibited by firms located near them in their industry. New ventures operate with a "high ratio of assumption to knowledge" (McGrath & MacMillan, 1995). Therefore, new ventures may perceive it more beneficial and safer to follow the common behavior of familiar firms in their industry in order to feel more secure in their business plan assumptions.

Existing research provides evidence of the existence of mimetic isomorphism relevant to our work. For example, Mauri and Michaels (1998) found that firms tend to imitate common strategies within their industry. Although they focused on marketing and technology strategies, Yiu and Makino (2002) and Lu (2002) conducted studies on foreign entry mode choices in Japan, and their results supported an institutional perspective in that the firms they studied looked to others in a similar position to help them make foreign entry decisions. Lu (2002) found that firms with less foreign entry experience tended to rely on the frequency of other firms' past entry mode choices. Interestingly, Yiu, and Makino (2002) found support for isomorphic behavior based specifically on those incumbents in the firm's home country. As new ventures do not have experience to rely on, it is likely that they will rely on their observations of others within their industry and home country to guide their decision to internationalize. Thus:

Proposition 4: The greater the local industry internationalization, the more likely new ventures operating within the industry will internationalize.

Industry Global Integration

Porter (1986) argues industries vary in their international competitiveness along a spectrum from multidomestic to global. The industry global integration variable refers to where an industry falls along this spectrum. A multidomestic industry competes on a country-by-country basis with few linkages between them. Examples include industries such as consumer banking or retail sectors. In these multidomestic industries, the decision to compete internationally is discretionary (Porter, 1986).

In contrast, competition within a global industry is connected in that a firm's competitive position in one country significantly affects its position elsewhere (Porter, 1986). Examples of global industries might include commercial aircraft or automobiles. Globally integrated industries typically evolve based on scale economies, comparative advantage and clustering effects in various countries (Oster, 1999). Yip (1989) further discusses how market, cost, environmental and competitive factors serve as industry drivers towards globalization, and thus, can be used to determine whether or not a firm should create a global strategy. For example, competitive factors that serve as industry globalization drivers include interdependence of countries and globalized competitors.

While Porter (1986) acknowledged it is possible for firms utilizing a country-centered and global strategy to coexist in an industry, he also argues global strategies frequently force other firms to follow suite in order to remain competitive.

We thus argue that a new venture is much more likely to internationalize when entering a global industry as it becomes a necessity to survival. McKendrick (2001) credits the ability of younger firms to adapt a global strategy as needed in such industries due to structural inertia theory. This is consistent with the concept of the "learning advantage of newness" proposed by Autio et al. (2000), which suggests new ventures are able to pursue internationalization given their flexibility and ability to learn and adapt to foreign markets. Our argument is further supported by prior empirical studies that found a significant linkage between the global integration of an industry and new venture internationalization (McDougall et al., 2003; Shrader et al., 2000).

Proposition 5: The greater the global integration of an industry, the more likely new ventures operating within the industry will internationalize.

Industry Venture Capital

Existing research has examined how venture capital firms function (e.g., MacMillan, Siegel, & Narasimha, 1985; Shepherd, 1999) as well as the implications of venture capital financing on the performance and growth of new ventures (e.g., Chang, 2004; Davila, Foster, & Gupta, 2003). In the present paper, we focus on the level of venture capital invested into firms within a given industry and how varying levels may affect new venture internationalization. Industries vary widely in the level to which venture capital is invested. For example, a recent study by Green (2004) noted that the top industries for venture capital investment within the United States from 1995 to 2002 included software (17%), telecommunications (15.4%), networking (10%), and media (9.1%). The level of venture capital invested within an industry has significant implications for firms therein (Zook, 2002). Porter (1980) discusses how the bargaining power of suppliers influences industry competition and the subsequent strategies undertaken by firms within the industry. An important supplier of financial resources to growth-oriented new ventures in an industry is venture capital firms. This implies that at an industry level, the level of venture capital available can impact the subsequent strategy and behavior of industry firms. Although the level of venture capital in an industry is not frequently explored in studies of firm internationalization, we suggest the level of industry venture capital is important to consider in the propensity for new ventures within the entered industry to internationalize.

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 et al., 2003; McDougall, 1989). In support of such aggressiveness, new ventures may access outside financial and production resources to enter multiple geographic markets on a larger scale. Venture capital may, therefore, be a significant resource for new ventures pursuing internationalization.

Proposition 6a: The greater the level of venture capital within an industry, the more likely new ventures operating within the industry will internationalize.

All industries are not equal in the level of venture capital invested or potentially available to new ventures and we propose that the level is endogenously determined by two factors: (1) an industry's regime of appropriability and (2) its stage of industry evolution. As defined by Teece (1987, p. 188), the regime of appropriability refers to

"environmental factors, excluding firm and market structure, that govern an innovator's ability to capture the profits generated by an innovation." An innovation that cannot be protected by patents, for example, may be easily copied by competitors who then appropriate the expected profits. Suppliers and buyers may be able to access unprotected information contributing to a new venture's competitive advantage, thereby giving them greater bargaining power in the relationship (Coff, 1999). Furthermore, a new venture must often give up key information in order to persuade a venture capital firm that they are worth investing in (Teece, 1996). However, an unscrupulous venture capital firm might appropriate such information for themselves and leave the venture in a very weak position.

Industries range in their regime of appropriability from tight, in which technology is easy to protect (i.e., patented biotechnologies), to weak (i.e., many consulting services), in which technology is nearly impossible to protect. When a new venture exists in an industry characterized by a weaker regime of appropriability, the entrepreneur of the new venture may be left to rely on secrecy, lead time, or the development of a culture that makes the innovation causally ambiguous and therefore difficult to replicate. Along with a lack of proven legitimacy, the risky nature of an investment in such an innovation can make financing difficult. Venture capital firms typically prefer some type of patentability or exclusivity that is found in a tighter regime of appropriability. Whereas venture capitalists can assist with weak management, commercialization, and distribution in a new venture, the absence of exclusivity or strong legal protection for a new venture's innovation is often viewed as a fatal flaw by venture capitalists who want to be certain that any profits from an innovation flow primarily to the venture in which they are investing.

The stage of industry evolution is also important because venture capitalists believe industries in a high growth stage, which often means growth in multiple countries, present more opportunities and less risk than industries at other stages (MacMillan et al., 1985). High revenue growth can cover up strategic errors that might be lethal to a venture in other circumstances (Mascarenhas, 1995). That alone makes investing in a high growth environment desirable to venture capitalists. However, even in the best circumstances, many investments made by venture capitalists fail, and a limited number of successes must cover losses from the failures. Therefore, investments with relatively large potential positive cash flows, most often found in industries with significant international growth, are preferred to smaller investments. We therefore posit that an industry's regime of appropriability and growth rate (or stage of industry evolution) are likely to influence new venture internationalization through the creation of venture capital.

Proposition 6b: The stronger an industry's regime of appropriability, the greater the level of venture capital within an industry.

Proposition 6c: The higher an industry's growth rate, the greater the level of venture capital within an industry.

Moderating Effects

Industry Revolution and Knowledge-Intensity. As an industry evolves, the level of competitive intensity will naturally increase as more firms enter the industry and develop an established customer base (Oster, 1999). In knowledge-intensive industries, the level of competitive intensity can have a significant impact on a new venture's strategic decision making. Most prominent is their decision to internationalize. As one of the incentives for knowledge-intensive new ventures to internationalize is to exploit an innovative product before it can be replicated by competitors, there may be less of an incentive to immediately do so when there is less competition. In essence, less competition results in a perception of more flexibility and time to fully exploit an opportunity.

Additionally, as a knowledge-intensive industry evolves, so does the existence and importance of a dominant design (Teece, 1987). When there is uncertainty as to which design will emerge as dominant in the industry, competitors are somewhat more reluctant in the early stages to invest too much effort into developing economies of scale or investing in significant market expansion. However, once the dominant design becomes evident, competition tends to shift to price, economies of scale, learning and exploiting innovations consistent with this design. This also causes a significant shift in the demand for products within the growing industry. Accordingly, both the increasing level of competition and the existence of a dominant design associated with increasing industry maturity are likely to cause new ventures in knowledge-intensive industries to exhibit a greater propensity to internationalize as the industry evolves.

Proposition 7: The knowledge-intensity of an industry is more positively associated with new venture internationalization in more mature industries than in less mature industries.

Industry Evolution and Local Internationalization. While we are able to conclude that new ventures are likely to imitate the internationalization behavior of incumbent firms in their home country, we also suggest that this effect will be greater in more established industries. While Mauri and Michaels (1998) found support that firms tend to imitate strategies within their industry, they noted that imitation became more common as the industry evolved. Similarly, Meyer and Rowan (1977, p. 352) argue that organizations need to exist in "highly elaborated institutional environments" in order to benefit from increased legitimacy and survival by becoming isomorphic. When an industry is still emerging, it is likely that the norms and standards are not yet developed. Accordingly, it is only as an industry develops that practices and processes emerge, such as internationalization, which can be imitated.

Proposition 8: Local industry internationalization is more positively associated with new venture internationalization in more mature industries than in less mature industries.

Industry Evolution and Global Integration. Previously, we put forth separate propositions regarding the influence of firm behavior within a new venture's industry based on a national or home-based perspective as well as a more global perspective. In a study of the hard disk drive industry, McKendrick (2001) further explored the effects of these different sources of potential influence. As expected, the results indicate that firms from the same home-country base are more likely to adopt similar global strategies than firms from different home-country bases, even where all the firms under consideration are in the same industry. However, as the industry evolves and becomes more globally integrated, the pressures favoring industry isomorphism among all firms overwhelm the pressures for isomorphism from the home base. This suggests that the evolution of the industry may influence how global integration of an industry affects new venture internationalization. We therefore posit:

Proposition 9: Global integration of an industry is more positively associated with new venture internationalization in more mature industries than in less mature industries.

Regime of Appropriability and Knowledge-Intensity. While we have argued that new ventures in knowledge-intensive industries are more likely to internationalize, the strength of this relationship is likely to depend on the regime of appropriability within the given industry. One of the reasons why new ventures might pursue foreign markets is to exploit their innovations before their competitors do so (Oviatt & McDougall, 1995). In the presence of an industry characterized by weaker regimes of appropriability, this is even more of an incentive for a new venture to internationalize as they receive less protection on their innovation. New ventures may have a more difficult time than existing firms relying on secrecy to protect their innovations because they typically need to utilize alliances or other forms of alternative governing structures in order to achieve growth with limited resources (Oviatt & McDougall, 1994). Similarly, it takes time to develop innovative cultures that are difficult for competitors to replicate and are ambiguous as to the sources of competitive advantages. Alvarez and Barney (2001) also point out that opportunism can especially be an issue for new ventures, in that larger firms can take advantage or exploit the intellectual property of new ventures. Thus, we argue that new ventures are more apt to respond to the pressures of a weak regime of appropriability in their industry by attempting to fully exploit their innovation as quickly as possible.

As a whole, knowledge-intensive industries tend to vary widely in how tight or weak their regime of appropriability is. Levin, Klevorick, Nelson, and Winter (1987) illustrated this difference by examining the effectiveness of firms in different industries in being able to protect their competitive advantage. Pharmaceutical firms were more able to rely on patents, but less able to rely on secrecy, than all the other industries combined. Thus, we argue that the type of knowledge used to innovate as well as the ability to protect such knowledge will influence the relationship between new ventures in knowledge-intensive industries and their resulting internationalization activity.

Proposition 10: The knowledge-intensity of an industry is more positively associated with new venture internationalization in industries with a weaker regime of appropriability than in industries with a tighter regime of appropriability.

Global Integration and Knowledge-Intensity. New ventures that enter industries with higher levels of knowledge-intensity are more likely to enter niche markets (Qian & Li, 2003). This is largely due to the inability to compete head-on with the dominant players of the industry, as they are substantially larger with more resources and also have a significantly larger market share. By entering a niche market, new ventures can exploit opportunities that the big players do not find worthwhile. While the pursuit of niche markets has received attention in the international entrepreneurship literature (Knight & Cavusgil, 1996; Moen, 2002; Preece et al., 1998), it is alone not a sufficient reason for a new venture to internationalize. The competitive advantage created through this niche market must also be one that can be exploited in foreign markets (Dunning, 1988). In global industries, more opportunities exist in foreign markets. In addition, niche markets are more likely to be similar across countries in more global industries. Thus, we posit that how globally integrated an industry is will influence the ability of a new venture in a knowledge-intensive industry to internationalize.

Proposition 11: The knowledge-intensity of an industry is more positively associated with new venture internationalization in more globally integrated industries than less globally integrated industries.

Global Integration of Industry and Local Industry Internationalization. As noted earlier, in a study of the hard disk drive industry, McKendrick (2001) examined whether nationality or industry has the greater influence on a firm's global strategy. The findings suggest that firms in the same industry initially globalize by copying the behaviors of industry competitors in their home country. Eventually, however, the industry competitors headquartered in all countries tend to converge on a dominant strategy. This implies that in globally integrated industries, competitors in all countries, including new ventures, will all view internationalization as essential. Thus, all firms in the local industry of a new venture are influenced by the behavior of industry competitors around the world. This implies:

Proposition 12: Local industry internationalization is more positively associated with new venture internationalization in more globally integrated industries than in less globally integrated industries.

Discussion

The purpose of this paper was to shed light on the complex role of industry structure on new venture internationalization. By drawing on the four necessary and sufficient elements described in Oviatt and McDougall's (1994) framework on international new ventures, we were able to identify and offer propositions regarding how each of seven industry structure variables both individually and jointly influences the likelihood of new venture internationalization.

As new ventures have been argued to differ from existing firms by not following the traditional theories of internationalization (Knight & Cavusgil, 1996; McDougall et al., 1994), it raises the question of whether the relationships between industry structure and new venture internationalization theorized in our model diverge from the traditional literature on the role of industry structure on the internationalization of established firms. On one hand, some of the relationships between industry structure and new venture internationalization in our model are in line with the traditional literature. For example, a positive relationship between the knowledge-intensity of an industry and new venture internationalization is proposed in our model. Yet, the importance of knowledge has already been widely acknowledged to exist for firm internationalization (e.g., Kobrin, 1991). In this situation, our contribution to the traditional literature lies in explaining in a detailed manner why this relationship is still relevant for new ventures as well as examining what other aspects of industry structure might affect or modify this relationship. On the other hand, some of the relationships between industry structure and new venture internationalization in our model deviate from the traditional literature on firm internationalization. This is shown in the relationship between the evolution of an industry and internationalization. While traditional internationalization theory, which is based on existing and mature firms, suggests firms internationalize in the mature stage of an industry, our work shows why new ventures, instead, tend to internationalize during the growth stage of an industry unless certain conditions are obtained.

It is important to note that various aspects of our research model can be tied to existing research on environmental munificence, which refers to the scarcity or abundance of resources (Castrogiovanni, 1991) and often influences the strategic options a firm may pursue (Tushman & Anderson, 1986). Some of the same arguments we make for the

relationship between industry structure and new venture internationalization may also be captured by considering the level of environmental munificence in those industry contexts. For example, industries that are in their growth stage are much more abundant in the resources needed to grow, which can lead new ventures to pursue growth internationally. Likewise, an abundance of internationalization knowledge exists in industries with high levels of local industry internationalization or global integration. Our contribution above and beyond the research on environmental munificence is in our identification of specific industry conditions that make an environment attractive or munificent for new venture internationalization.

In addition to the propositions put forth in this paper, there are a few implications of this model that deserve further discussion. First, the complexity of our model suggests scholars should be very careful in their interpretations of multi industry studies of venture internationalization that do not have adequate controls for industry effects. The ability to control for industry might require the usage of multiple variables and/or interactions of these variables. Care should also be taken in

generalizing from single-industry studies.

Second, the relationship between the knowledge-intensity of an industry and new venture internationalization is suggested in our model to be contingent upon several factors. These include the levels of concentration, maturity, and appropriability in the industry. Therefore, scholars who conduct new venture internationalization research using technology-based samples from multiple industries must be especially careful to use controls for industry effects.

Third, we have provided no proposition concerning which industry structure characteristics have the strongest effects on venture internationalization. A definitive statement about their relative strengths must await empirical testing. However, even without clear evidence of their relative strengths, a case can be made that industry evolution may be one of the most influential industry characteristics. In addition to its direct effect on new venture internationalization, industry evolution is hypothesized to moderate the effects of knowledge intensity, local internationalization, and global integration on new venture internationalization. An interesting observation is that while, in general, new ventures are argued to internationalize in the growth stage of an industry, it is the maturity of an industry that enhances, or positively moderates, these relationships. This demonstrates that the effect of industry evolution on new venture internationalization is fairly complex and must be considered within the entire industry context.

Future Research

In terms of future research, there are many avenues for researchers to explore. First and foremost, research is needed to test the propositions offered in this research. However, there are many different options one could take in doing so. In this paper, we have discussed new venture internationalization in a very broad sense. There are many different ways to theoretically position and operationalize this construct. For example, previous researchers have explored the decision to internationalize (McDougall et al., 2003), the intensity, or percentage, of international sales (Reuber & Fischer, 2002), the scope of internationalization (Preece et al., 1998), primary activities in foreign markets (Bloodgood et al., 1996), international sales growth (Autio et al., 2000), type of internationalization (Kuemmerle, 2002), and internationalization success (Mitchell et al., 1994). It is likely that the results may differ depending on which position is taken.

A second direction for future research is to examine how strategy interacts with industry structure in the internationalization of new ventures. Entrepreneurship scholars have found the interaction between industry and strategy to have a very influential impact on new venture performance (McDougall et al., 1994; Robinson & McDougall, 2001; Sandberg & Hofer, 1987). The interaction has also been deemed influential in the fields of international business (Johansson & Yip, 1994; Morrison & Roth, 1992), industrial economics (Mascarenhas, 1995; McGahan & Porter, 1997), and strategic management (Dess, Ireland, & Hitt, 1990; Mauri & Michaels, 1998). The nature of the relationship between strategy and industry structure on the success of new venture internationalization could have great implications for practitioners.

Our proposed model of industry structure and new venture internationalization takes into account seven industry structure characteristics. While we deem these seven characteristics as the most critical, other characteristics could be influential. An inherent limitation of our model is the assumption that these characteristics account for the majority of the variance. Future research should explore additional relationships between industry structure and new venture internationalization.

In conclusion, our analysis suggests that industry structure indeed matters to new venture internationalization. This is not a simple relationship, but rather a complex set of relationships that interact together.

REFERENCES

- Agarwal, R., Sarkar, M.B., & Echambadi, R. (2002). The conditioning effect of time on firm survival: An industry life cycle approach. *Academy of Management Journal*, 45, 971-994.
- Aldrich, H.E. (1990). *Organizations evolving*. London: Sage Publications.
- Aldrich, H.E. & Fiol, C.M. (1994). Fools rush in? The institutional context of industry creation. *Academy of Management Review*, 19, 645-670.
- Alvarez, S.A. & Barney, J.B. (2001). How entrepreneurial firms can benefit from alliances with large partners. *Academy of Management Executive*, 15, 139-148.
- Anderson, C.R. & Zeithaml, C.P. (1984). Stage of the product life cycle, business strategy, and business performance. *Academy of Management Journal*, 27, 5-24.
- Andersson, S. (2004). Internationalization in different industrial contexts. *Journal of Business Venturing*, 19, 851-875.
- Audretsch, D.B. (1995). *Innovation and industry evolution*. Cambridge, MA: MIT Press.
- Autio, E. (2005). Creative tension: The significance of Ben Oviatt's and Patricia McDougall's article "Toward a theory of international new ventures." *Journal of International Business Studies*, 36, 9-19.
- Autio, E., Sapienza, H.J., & Almeida, J.G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal*, 43, 909-925.
- Barney, J.B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Bell, J. (1995). The internationalization of small computer software firms. *European Journal of Marketing*, 29, 60-75.
- Besanko, D., Dranove, D., & Shanley, M. (1996). *Economics of strategy*. New York: John Wiley & Sons, Inc.
- Bloodgood, J.M., Sapienza, H.J., & Almeida, J.G. (1996). The internationalization of new high-potential US ventures: Antecedents and outcomes. *Entrepreneurship Theory and Practice*, 20, 61-76.
- Boter, H. & Homquist, C. (1996). Industry characteristics and internationalization processes in small firms. *Journal of Business Venturing*, 11, 471-487.
- Burgel, O. & Murray, G.C. (2000). The international market entry choices of start-up companies in high-technology industries. *Journal of International Marketing*, 8, 33-62.

- Carpenter, M.A., Pollock, T.G., & Leafy, M.M. (2003). Testing a model of reasoned risk-taking: Governance, the experience of principals and agents, and global strategy in high-technology IPO firms. *Strategic Management Journal*, 24, 803-820.
- Carroll, G.R., Dobrev, S.D., & Swaminathan, A. (2002). Organizational processes of resource partitioning. *Research in Organizational Behavior*, 24, 1-40.
- Casson, M. (2003). *The entrepreneur*. Northampton, MA: Edgar Elgar.
- Castrogiovanni, G.J. (1991). Environmental munificence: A theoretical assessment. *Academy of Management Review*, 16, 542-566.
- Caves, R. (1987). *American industry: Structure, conduct, performance*. Englewood Cliffs, NJ: Prentice-Hill, Inc.
- Chang, S.J. (2004). Venture capital financing, strategic alliances, and the initial public offerings of Internet startups. *Journal of Business Venturing*, 19, 721-741.
- Chatterjee, S. (1990). Excess resources, utilization costs and mode of entry. *Academy of Management Journal*, 33, 780-800.
- Chung, W. (2001). Identifying technology transfer in foreign direct investment: Influence of industry conditions and investing firm motives. *Journal of International Business Studies*, 32, 211-229.
- Coff, R.W. (1999). When competitive advantage doesn't lead to performance: The resource-based view and stakeholder bargaining power. *Organization Science*, 10, 119-213.
- Coviello, N. & Munro, H. (1997). Network relationships and the internationalisation process of small software firms. *International Business Review*, 6, 361-386.
- Covin, J.G., Slevin, D.P., & Covin, T.J. (1990). Content and performance of growth-seeking strategies: A comparison of small firms in high- and low-technology industries. *Journal of Business Venturing*, 5, 391-412.
- Davila, A., Foster, G., & Gupta, M. (2003). Venture capital financing and the growth of startup firms. *Journal of Business Venturing*, 18, 689-708.
- Dean, T.J. & Meyer, G.D. (1996). Industry environments and new venture formations in U.S. manufacturing: A conceptual and empirical analysis of demand determinants. *Journal of Business Venturing*, 11, 107-132.
- Deeds, D., Mang, P.Y., & Frandsen, M.L. (2004). The influence of firms' and industries' legitimacy on the flow of capital into high-technology ventures. *Strategic Organization*, 2, 9-34.
- Dess, G.G., Ireland, R.D., & Hitt, M.A. (1990). Industry effects and strategic management research. *Journal of Management*, 16, 7-27.
- DiMaggio, P.J. & Powell, W.W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, 147-160.
- Dimitratos, P., Johnson, J., Slow, J., & Young, S. (2003). Micromultinationals: New types of firms for the global competitive landscape. *European Management Journal*, 21, 164-174.
- Dunning, J.H. (1988). The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of International Business Studies*, 19, 1-31.

- Dunning, J.H. (2000). The eclectic paradigm as an envelope for economic and business theories of MNE activity. *International Business Review*, 9, 163-190.
- Eisenhardt, K.M. & Schoonhoven, C.B. (1990). Organizational growth: Linking founding team, strategy, environment, and growth among U.S. semiconductor ventures, 1978-1988. *Administrative Science Quarterly*, 35, 504-529.
- Franko, L.G. (1989). Global corporate competition: Who's winning, who's losing, and the R&D factor as one reason why. *Strategic Management Journal*, 10, 449-474.
- Grant, R.M. (1996). Towards a knowledge-based theory of the firm. *Strategic Management Journal*, 17, 109-122.
- Green, M.B. (2004). Venture capital investment in the United States, 1995-2002. *Industrial Geographer*, 2, 2-31.
- Greiner, L.E. (1998). Evolution and revolution as organizations grow. *Harvard Business Review*, 76(3), 55-67.
- Guillen, M.F. (2002). Structural inertia, imitation, and foreign expansion: South Korean firms and business groups in China, 1987-95. *Academy of Management Journal*, 45, 509-525.
- Haunschild, P.R. & Miner, A.S. (1997). Modes of interorganizational imitation: The effects of outcome salience and uncertainty. *Administrative Science Quarterly*, 42, 472-500.
- Honig, B. & Karlsson, T. (2004). Institutional forces and the written business plan. *Journal of Management*, 30, 29-48.
- Johansson, J.K. & Yip, G.S. (1994). Exploiting globalization potential: U.S. and Japanese strategies. *Strategic Management Journal*, 15, 579-601.
- Jolly, V.K., Alahuhta, M., & Jeannet, J. (1992). Challenging the incumbents: How high technology start-ups compete globally. *Journal of Strategic Change*, 1, 71-82.
- Karagozoglu, N. & Lindell, M. (1998). Internationalization of small and medium-sized technology-based firms: An exploratory study. *Journal of Small Business Management*, 36, 44-60.
- Keeley, R.H. & Roure, J.B. (1990). Management, strategy, and industry structure as influences on the success of new firms: A structural model. *Management Science*, 36, 1256-1267.
- Knight, G.A. & Cavusgil, S.T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing*, 8, 11-26.
- Knight, G.A. & Cavusgil, S.T. (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies*, 35, 124-141.
- Kobrin, S.J. (1991). An empirical analysis of the determinants of global integration. *Strategic Management Journal*, 12, 17-31.
- Kotha, S., Rindova, V.P., & Rothaermel, F.T. (2001). Assets and actions: Firm-specific factors in the internationalization of U.S. Internet firms. *Journal of International Business Studies*, 32, 769-791.
- Kuemmerle, W. (2002). Home base and knowledge management in international ventures. *Journal of Business Venturing*, 17, 99-122.

- Levin, R.C., Klevorick, A.K., Nelson, R.R., & Winter, S.G. (1987). Appropriating the returns from industrial research and development. *Brookings Papers on Economic Activity*, 3, 783-820.
- Lu, J.W. (2002). Intra- and inter-organizational imitative behavior: Institutional influences on Japanese firms' entry mode choice. *Journal of International Business Studies*, 33, 19-37.
- Lu, J.W. & Beamish, P.W. (2001). The internationalization and performance of SMEs. *Strategic Management Journal*, 22, 565-586.
- Luo, Y. & Tan, J.J. (1997). How much does industry structure impact foreign direct investment in China? *International Business Review*, 6, 337-359.
- MacMillan, I., Siegel, R., & Narasimha, P.N. (1985). Criteria used by venture capitalists to evaluate new venture proposals. *Journal of Business Venturing*, 1, 119-129.
- Madsen, T.K. & Servais, P. (1997). The internationalization of born globals: An evolutionary process? *International Business Review*, 6, 561-584.
- Martin, X. & Salomon, R. (2003). Tacitness, learning, and international expansion: A study of foreign direct investment in a knowledge-intensive industry. *Organization Science*, 14, 297-311.
- Mascarenhas, B. (1995). International industry evolution patterns. *International Business Review*, 4, 233-246.
- Mascarenhas, B. (1996). The founding of specialist firms in a global fragmenting industry. *Journal of International Business Studies*, 27, 27-42.
- Mauri, A.J. & Michaels, M.P. (1998). Firm and industry effects within strategic management: An empirical examination. *Strategic Management Journal*, 19, 211-219.
- McAuley, A. (1999). Entrepreneurial instant exporters in the Scottish arts and craft sector. *Journal of International Marketing*, 7, 67-82.
- McDougall, P.P. (1989). International versus domestic entrepreneurship: New venture strategic behavior and industry structure. *Journal of Business Venturing*, 4, 387-400.
- McDougall, P.P. & Oviatt, B.M. (1996). New venture internationalization, strategic change, and performance: A follow-up study. *Journal of Business Venturing*, 11, 23-40.
- McDougall, P.P., Covin, J.G., Robinson, R.B., Jr. & Herron, L. (1994). The effects of industry growth and strategic breadth on new venture performance and strategy content. *Strategic Management Journal*, 15, 537-554.
- McDougall, P.P., Oviatt, B.M., & Shrader, R.C. (2003). A comparison of international and domestic new ventures. *Journal of International Entrepreneurship*, 1, 59-82.
- McDougall, P.P., Robinson, Jr., R.B., & DiNisi, A.A. (1992). Modeling new venture performance: An analysis of new venture strategy, industry structure, and venture origin. *Journal of Business Venturing*, 7, 267-289.
- McDougall, P.P., Shane, S., & Oviatt, B.M. (1994). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of Business Venturing*, 9, 469-487.
- McGahan, A.M. & Porter, M.E. (1997). How much does industry matter, really? *Strategic Management Journal*, 18, 15-30.

- McGrath, R.G. & MacMillan, I.C. (1995). Discovery-driven planning. *Harvard Business Review*, 73(4), 4-12.
- McKendrick, David G. (2001). Global strategy and population-level learning: The case of hard disk drives. *Strategic Management Journal*, 22, 307-334.
- Meyer, J.M. & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83, 340-363.
- Mitchell, W., Shaver, J.M., & Yeung, B. (1993). Performance following changes of international presence in domestic and transition industries. *Journal of International Business Studies*, 24, 647-669.
- Mitchell, W., Shaver, J.M., & Yeung, B. (1994). Foreign entrant survival and foreign market share: Canadian companies' experience in United States medical sector markets. *Strategic Management Journal*, 15, 555-567.
- Moen, O. (2002). The born globals: A new generation of small European exporters. *International Marketing Review*, 19, 156-175.
- Morrison, A.J. & Roth, K. (1992). A taxonomy of business-level strategies in global industries. *Strategic Management Journal*, 13, 399-418.
- Murtha, T.P., Lenway, S.A., & Hart, J.A. (2001). Managing new industry creation: Global knowledge formation and entrepreneurship in high technology. Stanford, CA: Stanford University Press.
- Oster, Sharon M. (1999). *Modern competitive analysis*. New York: Oxford University Press.
- Oviatt, B.M. & McDougall, P.O. (1994). Toward a theory of international new ventures. *Journal of International Business Studies*, 25, 45-65.
- Oviatt, B.M. & McDougall, P.P. (1995). Global start-ups: Entrepreneurs on a worldwide stage. *Academy of Management Executive*, 9, 30-45.
- Porter, M.E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: The Free Press.
- Porter, M.E. (1986). *Competition in global industries*. Boston: Harvard Business School Press.
- Preece, S.B., Miles, G., & Baetz, M.C. (1998). Explaining the international intensity and global diversity of early-stage technology-based firms. *Journal of Business Venturing*, 14, 259-281.
- Qian, G. & Li, L. (2003). Profitability of small- and medium-sized enterprises in high-tech industries: The case of the biotechnology industry. *Strategic Management Journal*, 24, 881-887.
- Reuber, A.R. & Fischer, E. (1997). The influence of the management team's international experience on the internationalization behaviors of SMEs. *Journal of International Business Studies*, 28, 807-825.
- Reuber, A.R. & Fischer, E. (2002). Foreign sales and small firm growth: The moderating role of the management team. *Entrepreneurship Theory and Practice*, 27, 29-45.
- Robinson, K.C. (1999). An examination of the influence of industry structure on eight alternate measures of new venture performance for high potential independent new ventures. *Journal of Business Venturing*, 14, 165-187.

- Robinson, K.C. & McDougall, P.P. (1998). The impact of alternative operationalizations of industry structural elements on measures of performance for entrepreneurial manufacturing ventures. *Strategic Management Journal*, 19, 1079-1100.
- Robinson, K.C. & McDougall, P.P. (2001). An examination of the influence of industry structure on eight alternate measures of new venture performance for high potential independent new ventures. *Journal of Business Venturing*, 14, 165-187.
- Sandberg, W.R. & Hofer, C.W. (1987). Improving new venture performance: The role of strategy, industry structure, and the entrepreneur. *Journal of Business Venturing*, 2, 5-28.
- Shepherd, D.A. (1999). Venture capitalists' assessment of new venture survival. *Management Science*, 45, 621-632.
- Shrader, R.C., Oviatt, B.M., & McDougall, P.P. (2000). How new ventures exploit trade-offs among international risk factors: Lessons of the accelerated internationalization of the 21st century. *Academy of Management Journal*, 43, 1227-1247.
- Stinchcombe, A.L. (1965). Social structure and organizations. In J.G. March (Ed.), *Handbook of organizations*. Chicago: McNally.
- Teece, D.J. (1987). Profiting from technological innovation: implications for integration, collaboration, licensing and public policy. In D.J. Teece (Ed.), *The competitive challenge* (pp. 185-219). Cambridge, MA: Ballinger.
- Teece, D.J. (1996). Firm organization, industrial structure, and technological innovation. *Journal of Economic Behavior & Organization*, 31, 193-224.
- Toulan, O.N. (1996). Nonlinearities in the impact of industry structure: The case of concentration and intra-industry variability in rates of return. *Industrial & Corporate Change*, 5, 175-103.
- Tushman, M.L. & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31, 439-465.
- U.S. Small Business Administration. (1992). *The state of small business*. Washington, DC: U.S. Government Printing Office.
- Vernon, R. (1966). International investment and international trade in the product cycle. *Quarterly Journal of Economics*, 80, 190-207.
- Williamson, O.E. (1975). *Markets and hierarchies: Analysis and antitrust implications*. New York: Free Press.
- Yip, G.S. (1989). Global strategy ... in a world of nations? *Sloan Management Review*, 31(1), 13-42.
- Yiu, D. & Makino, S. (2002). The choice between joint venture and wholly owned subsidiary: An institutional perspective. *Organization Science*, 13, 667-683.
- Zahra, S.A. (2005). A theory of international new ventures: A decade of research. *Journal of International Business Studies*, 36, 20-28.
- Zahra, S.A. & George, G. (2002). International entrepreneurship: The current status of the field and future research agenda. In M. Hitt, R. Ireland, & D. Sexton (Eds.), *Strategic leadership: Creating a new mindset* (pp. 255-288). London, UK: Blackwell.

Zahra, S.A., Ireland, R.D., & Hitt, M.A. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal*, 43, 925-951.

Zook, M.A. (2002). Grounded capital: Venture financing and the geography of the Internet industry, 1994-2000. *Journal of Economic Geography*, 2, 151-177.

Stephanie A. Fernhaber is an Assistant Professor at Iowa State University.

Patricia P. McDougall is the Associate Dean of Faculty & Research and holds the William L. Haeberle Professor of Entrepreneurship at Indiana University's Kelley School of Business.

Benjamin M. Oviatt is a Professor of Managerial Sciences at Georgia State University's J. Mack Robinson College of Business.

A prior version of this paper was presented at the 2004 Academy of Management Conference.

Please send correspondence to: Stephanie A. Fernhaber, tel.: (515) 294-8463; e-mail: sfernhab@iastate.edu, to Patricia P. McDougall, tel.: (812) 855-7873; e-mail: mcdougall@indiana.edu, and to Benjamin M. Oviatt, tel.: (404) 651-3021; e-mail: benoviatt@gsu.edu.

Table 1
Frequently Examined Industry Structure Variables

Variable	Representative studies
Industry advertising intensity	Kobrin, 1991; McDougall et al., 1992
Industry asset intensity	Luo & Tan, 1997
Industry buyer concentration	Keeley & Roure, 1990
Industry competition	Chung, 2001; Karagozoglu & Lindell, 1998; Keeley & Route. 1990
Industry concentration	Chatterjee, 1990; Dean & Meyer, 1996; Mascarenhas, 1996; McDougall et al., 1992; Robinson & McDougall, 1998
Industry density	Mascarenhas, 1995; Aldrich, 1990
Industry economies of scale	Dean & Meyer, 1996; Kobrin, 1991; McDougall et al.. 1992; Robinson & McDougall, 2001
Industry evolution	Aldrich & Fiol, 1994; Eisenhardt & Schoonhoven, 1990; Robinson. 1999; Robinson & McDougall, 1998; 2001; Sandberg & Hofer, 1987; Vernon, 1966Z
Industry globalization	Kobrin. 1991; McDougall, Oviatt & Shrader, 2003; Mitchell et al., 1993; Morrison & Roth. 1992; Porter, 1986
Industry growth	Chatterjee, 1990; Dean & Meyer,

	1996; Luo & Tan, 1997: McDougall et al., 1994; McDougall, Robinson & DiNisi, 1992
Industry legitimacy	Deeds, Mang & Frandsen, 2004
Industry practice mutation	Honig & Karlsson. 2004: Guillen. 2002; Lu, 2002: Yiu & Makino, 2002
Industry product differentiation	Dean & Meyer, 1996; Robinson & McDougall, 1998: 2001
Industry profitability	Bloodeood et al., 1996; Luo & Tan, 1997
Industry uncertainty	Luo & Tan, 1997
Knowledge intensity of industry	Covin, Slevin, & Covin, 1990; Kobrin, 1991
Sales dynamics of industry niches	Dean & Meyer, 1996
Technological development in industry	Dean & Meyer. 1996
Transition industries	Mitchell et al.. 1994

Table 2
Industry Structure Characteristics and Elements
of International New Ventures

(1) Internalization of transactions	(2) Alternative governance mechanisms
* Industry concentration	* Level of venture capital in industry
* Industry evolution	
* Local industry Internationalization	* Regime of appropriability in industry
(3) Foreign location advantage	(4) Control over unique resources
* Industry concentration	* Knowledge-intensity of industry
* Industry evolution	
* Global integration of industry	* Regime of appropriability in industry
* Knowledge-intensity of industry	

Table 3
Definitions and Typical Operationalization of Industry
Structure Variables Used in Model

Variable	Definition
Industry evolution	Refers to whether an industry is just emerging, experiencing rapid growth or in a state of maturity
Industry concentration	Indicates the number and relative power of firms in an industry
Knowledge-intensity of industry	The extent to which organizational knowledge and learning is relied upon by industry firms
Local industry internationalization	The extent to which home country firms in an industry have internationalized or partake in certain internationalization practices
Global integration of industry	The degree to which an industry competes on a global rather than multidomestic basis
Industry venture capital	The extent to which venture capital is invested in firms within an industry
Regime of appropriability in industry	Ability of industry firms to capture the profits generated by an innovation
Variable	Typical operationalization
Industry evolution	Assessment of gross entry rates into an industry (Agarwal et al., 2002)
Industry concentration	The percentage of sales or employment accounted for by top four firms within an industry (Dean & Meyer, 1996)
Knowledge-intensity of industry	Average R&D expenditures as a percentage of sales for all industry firms (Kobrin, 1991)
Local industry internationalization	The number of home country firms in an industry that use a specific entry mode to enter a foreign country (Lu, 2002; Yin & Makino, 2002)
Global integration of industry	Intra-firm trade as a percentage of all international sales within an industry (Kobrin, 1991)
Industry venture capital	The percentage of all venture capital funds that is invested into a given industry (Green, 2004)
Regime of appropriability in industry	Survey of industry firms to assess perceived means of appropriability for innovations (Levin et al., 1987)