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International Entrepreneuship and Geographic Location: An Empirical Examination of New Venture Internationalization

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

Brett Anitra Gilbert

Paticia P. McDougall

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International entrepreneurship and geographic location: an empirical examination of new venture internationalization

Stephanie A Fernhaber, Brett Anitra Gilbert and Patricia P McDougall

In this paper, we argue that geographic location may be one reason why some ventures are able to acquire the resources needed to internationalize while others cannot. We use ecological arguments to predict an inverted U-shaped relationship between the concentration of industry clustering within a geographic location and the venture's internationalization. We also explore whether venture characteristics influence the nature of this relationship. Our hypotheses are regressed on international intensity and scope, and analyzed through a sample of 156 publicly held new ventures. Results confirm that location influences new venture internationalization, and firm characteristics impact the nature of the relationship.

International new ventures overcome constraints associated with limited history and smaller size (Hannan & Freeman, 1984; Stinchcombe, 1965) to commit substantial resources to the internationalization process. Pursuing internationalization early in their existence enables new ventures to realize improved performance (Bloodgood, Sapienza, & Almeida, 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra, Ireland, & Hitt, 2000), to achieve greater breadth, depth and speed of technological learning (Zahra et al., 2000), and to exploit a competitive advantage (Oviatt & McDougall, 2005b). The importance of resources for new venture internationalization has focused the attention of many scholars on the resources the ventures own (e.g., Bloodgood et al., 1996; Westhead, Wright, & Ucbasaran, 2001). Yet limited attention has been devoted to understanding how some new ventures gain access to the resources that enable them to internationalize their operations while other new ventures remain constrained in their ability to do so.

Ecological theory focuses attention on the role of the local environment in providing access to key resources. For new ventures, owing to their limited history and smaller size (Hannan & Freeman, 1984; Stinchcombe, 1965), the local environment is noted to be the primary source of resources needed for operations (Romanelli & Schoonhoven, 2001). Within the local environment, resources develop according to the needs of industries operating therein (Maskell & Malmberg, 1999; Niosi & Bas, 2001; Porter, 1998) and consequently increase with the concentration of industry clustering within a given location (Bresnahan, Gambardella, & Saxenian, 2001). Locations with higher concentrations of industry clustering are commonly referred to as *geographic cluster locations.* Geographic cluster locations include well-known regions such as Silicon Valley in the US, the leather and fashion industrial districts in Italy, and the Multimedia Super-corridor in Malaysia. These locations are suggested to provide many resource benefits to firms operating therein (Audretsch & Feldman, 1996; Deeds, Decarolis, & Coombs, 1997; Karagozoglu & Lindell, 1998; Saxenian, 1990). The resource benefits of geographic cluster locations combined with the importance of resources to the internationalization process suggests that the greater availability of resources in

locations with higher concentrations of industry clustering would enable new ventures operating therein to acquire the resources needed to internationalize their operations.

However, while the concentration of industry clustering in a region may signify resource availability, it also signifies the extent to which the ventures face competition locally for resources needed for operations. Higher competition over resources in a firm's location may limit the resources it is able to acquire (Boeker, 1991; Budros, 1994; Hannan & Freeman, 1977; Lomi, 1995) and the strategic initiatives it is able to pursue. As the concentration of industry clustering increases both the availability of and competition for resources within a given location, it may both enable and constrain a venture's ability to internationalize operations. In this paper, we explore these contrasting arguments further, and predict a curvilinear relationship between the concentration of industry clustering in a new venture's location and the internationalization of the new venture.

We ground our arguments in ecological theory, which fosters understanding of how the availability of and competition for resources shape the ultimate outcomes of affected firms (Hannan & Freeman, 1977). Competitive dynamics have been found to influence firm growth (Boeker, 1991), choice of product market entry (Baum & Korn, 1996) and overall organizational viability (Barnett & McKendrick, 2004). This investigation therefore contributes to this stream of research by providing evidence of how another strategic outcome, new venture internationalization, is linked to the ecologies of the local environment. Furthermore, by considering how the resource availability and competition dynamics in a venture's location influence its level of internationalization, we also address a recently noted important gap in the international entrepreneurship literature (Zahra & George, 2002).

Theoretical Framework

International entrepreneurship involves the "discovery, enactment, evaluation, and exploitation of opportunities – across national borders – to create future goods and services" (Oviatt & McDougall, 2005a: 5). International entrepreneurship is sometimes stimulated by demand for firm products that spans international boundaries (Oviatt & McDougall, 1995). At other times it is motivated by a need to recover costs invested in new technologies (Qian & Li, 2003). Early internationalization enables a new venture to take advantage of narrow windows of opportunity (McNaughton, 2003) to exploit products in international markets before competitors are able to attain a foothold (McDougall, Shane, & Oviatt, 1994; Oviatt & McDougall, 1994). International activities have also been shown to help new ventures realize performance advantages through increased profitability (Bloodgood et al., 1996; Lu & Beamish, 2001; McDougall & Oviatt, 1996; Zahra et al., 2000), owing to the new venture taking advantage of an increased customer base. Additionally, Zahra et al. (2000) found internationalization to impact favorably on the new ventures' breadth, depth and speed of technological learning. In essence, international activities are argued to influence new venture survival and growth positively (D'Souza & McDougall, 1989).

For a venture to realize these benefits from internationalization, however, it must have access to the resources that enable it to do so. Dunning (1998) and Porter (1990)

identify the resources within a firm's geographic location as a key determinant of the subsequent level of internationalization activities pursued. A firm's geographic location influences firm outcomes because it is a physical space within which resources become available to firms (Hannan & Freeman, 1977), and may therefore provide the resources firms need to build and sustain operations (Romanelli & Schoonhoven, 2001). For example, geographic locations develop resources according to the needs of the industries present in the region (Maskell & Malmberg, 1999; Niosi & Bas, 2001; Porter, 1998). The industry-specific resources that become available to firms as the industry concentration in a location increases include workers with important skill sets, specialized inputs needed for operations, access to buyer or supplier industries, and knowledge about opportunities and competitor activities (Marshall, 1920). The creation and availability of these resources in a specific geographic location initially lowers the cost of entry for subsequent firms, making the area relatively more attractive for investment by similar firms than is true of other areas (Stuart & Sorenson, 2003). However, as subsequent investments in the area are made by other industry firms, the competition that exists for resources available in the location increases. With greater competition, the costs for doing business increase as the demand for resources depletes the available supply and pushes upward the costs for acquiring them (Arthur, 1990). The industry clustering in a geographic region therefore influences the demand for and supply of resources in a given location, both of which are instrumental in determining whether firms will exploit opportunities in international markets (Dunning, 1998; Porter, 1990).

Porter (1990: 86) suggests that exploiting opportunities in international markets becomes an option when "firms are better able to perceive, understand, and act on buyer needs in their home market." The confidence gained through domestic activities can then be extended into international markets. Operating from an industry cluster where there is high demand for products and services can also enable a venture to understand its competitive market better (Baum & Haveman, 1997; Chung & Kalnins, 2001). Moreover, the perceived value of combining resources developed locally with those in a foreign country is known to motivate foreign direct investment (Dunning, 1998), especially when the cost for moving operations to the foreign market may reduce the costs that the firm incurs from operating in the domestic market. As reducing costs enables a firm to improve its profitability, internationalizing operations to exploit lower costs becomes an attractive motivator for internationalizing a firm. If industry clustering is the condition that influences not only the supply of but also competition over resources needed for operations, then for new ventures, which are particularly dependent upon their local environment for the resources needed to sustain operations (Glasmeier, 1988; Romanelli & Schoonhoven, 2001), the industry clustering in their geographic location is an important influencer of their internationalization behavior.

Industry Clustering and New Venture Internationalization
In cluster locations, there are many resources produced that new ventures could leverage to internationalize their operations. For example, foreign multinational firms are commonly attracted to regions with industry clustering (e.g., Birkinshaw & Hood, 2000; Shaver & Flyer, 2000). Being co-located with foreign firms increases "the entrepreneur's consciousness of and responsiveness to opportunity" in international markets (Vernon,

1966: 192), and provides new ventures with an understanding of the standards required for competing at an international level (O'Farrell, & Wood, 1996). A high presence of foreign firms in a location can make it easier for entrepreneurs to conceive of operating in foreign markets. Firms operating within clusters also commonly receive inquiries from foreign firms (Karagozoglu & Lindell, 1998), which increases their exposure to foreign markets. Since the pull of an international opportunity is a common catalyst for new venture internationalization (O'Farrell et al., 1996), a venture's presence in a recognized industry cluster location should make internationalizing operations seem like a more feasible option.

Cluster locations may also serve as a catalyst for internationalization because these locations are connoted as a form of network for cluster firms (Saxenian, 1990). Networks are known to be a critical source of knowledge about international opportunities for new ventures (Coviello & Munro, 1995). New ventures operating from regions with industry clustering may have better connections to firms that provide knowledge about opportunities in foreign markets that firms operating from locations with less industry clustering may not similarly have. The concentration of industry clustering in a location can also provide a strong presence of venture capitalists in the region, which may provide greater access to capital needed for financing international objectives (Porter, 1998; Saxenian, 1990). Cluster firms also gain access to knowledge spillovers, which strengthen their technological sophistication. Strong technological capabilities are important for new venture internationalization, as they equip firms to develop routines that enable them to reconfigure new knowledge into their operations (Knight & Cavusgil, 2004).

Clearly, there are many benefits of a cluster location that could aid a venture's ability to internationalize its operations; however, increased competition over resources in cluster locations could eventually produce consequences that offset the benefits new ventures receive from operating from cluster regions. As Pouder and St John (1996: 1206) summarized, as a cluster grows, "size, congestion, and saturation within the hot spot may begin to 'choke off' the agglomeration economies." Thus the ability of new ventures to make use of cluster resources to internationalize their operations could be hampered by the increased levels of competition for the resources in the venture's location (Arthur, 1990). For example, with more firms operating from the region, a venture's access to, and consequently ability to work with, foreign partners may become limited. The competition in the region may also limit the access a venture has to venture capitalists in the region as new competition continually appears (Shaver & Flyer, 2000; Sorenson & Audia, 2000). A disconnect from key players within the cluster may make it difficult for a venture to attract new employees, who have been argued to be essential for fostering new venture success (Stuart & Sorenson, 2003). Employees are known conduits of knowledge spillovers (Almeida & Kogut, 1999), and with limited ability to attract key employees, new ventures from such regions may find it difficult to remain connected to the pulse of the region. With limited access to resources within the cluster, cluster new ventures might choose to focus on servicing other industry firms within the cluster, or simply on serving a domestic market niche that would require fewer resources than including international activities in the efforts (Castrogiovanni, 1991).

Taken together, these arguments suggest that a higher concentration of industry clustering within the venture's headquarters location provides benefit by generating resources that can be valuable for internationalizing operations. However, once the concentration of industry clustering reaches a certain threshold, the ability and urgency of new ventures to internationalize may be weakened by the scarcer resources resulting from the competitive conditions that exist. Scholars (e.g., Folta, Cooper, & Baik, 2006) have confirmed that, to a point, industry clustering positively influences firm performance, but once it reaches the limit there is indeed a negative effect on performance. As ecological theory likewise suggests, some industry clustering in a geographic region can provide important benefits to the firm, because it helps to produce essential resources the firm needs, but in regions with too much industry concentration competition effects dominate, and make it difficult for firms to acquire the resources needed and subsequently to sustain the levels of performance they once enjoyed. Consequently, the ability of those ventures to internationalize might decline, and their observed entry and penetration into international markets may be affected. Plainly stated, we expect the relationship between concentration of industry clustering and new venture internationalization to be positive initially, but later to reach a point after which it becomes negative. Accordingly, we hypothesize that:

Hypothesis 1:

The concentration of industry clustering is positively related to the level of new venture internationalization to a point, after which it becomes negative.

Although we posit a curvilinear relationship between industry clustering and new venture internationalization, we do not expect this curvilinear relationship to hold uniformly across all ventures. Firm characteristics determine whether a firm will internationalize. They also determine whether a firm is likely to be dependent upon the local environment (Delacroix, Swaminathan, & Solt, 1989; Romanelli & Schoonhoven, 2001; Shaver & Flyer, 2000) and, therefore, how it will be influenced by the ecological dynamics in the local environment. In the sections that follow, we expand our argument to consider whether the relationship between industry clustering and new venture internationalization differs for ventures that contrast on three firm-level predictors of entrepreneurial behavior in foreign markets: firm size, R&D intensity, and the international experience of the top management team.

Modifiers of the Industry Clustering–New Venture Internationalization Relationship
The size of a new venture is often linked to higher levels of internationalization (Bloodgood et al., 1996; Preece, Miles, & Baetz, 1998; Zahra et al., 2000), because an international strategy requires a higher volume of resources to execute. Larger firms realize extensive advantages in the internationalization process because they typically have greater diversity of product offering (Carroll, 1985) and more expansive industry connections (Porac, Thomas, Wilson, Paton, & Kanfer, 1995), which increase the options they have for pursuing internationalization. Larger firms also have a greater

ability to manage dependence relations (Pfeffer & Salancik, 1978) and obtain economies of scale (Wholey & Brittain, 1986), which can aid entry into international markets. Smaller firms, on the other hand, often follow specialist approaches to their product offerings (Mezias & Mezias, 2000), and consequently may have a limited range of products and typically smaller distribution systems, which can restrict their access to large markets (Porac et al., 1995). These firms may also find the resources available to them in the domestic market sufficient for sustaining operations.

A venture's size may also impact on its ability to take advantage of resources from a cluster location that could further enable it to internationalize operations. Larger firms are typically more powerful and have an easier time garnering key resources from the environment (Hannan & Freeman, 1977). Higher volumes of resources available from a location where industry clustering exists would make it easier for larger new ventures to employ high-quality resources in the internationalization process from their local environment, regardless of the local conditions that exist. However, it is likely that their greater need for resources would make them less likely to be dependent solely upon the local environment for the resources needed to sustain operations. Smaller firms, on the other hand, often have lower demands for resources in their operations than larger firms (Carroll, 1985), but a greater dependence on the local environment for the resources that are utilized (Glasmeier, 1988). Although we expect smaller ventures to benefit to a great extent from some of the "free resources" available within cluster environments, we also expect their limited size either to negate their ability to attain and mobilize the resources needed to internationalize their operations or to limit their focus to the domestic market. Because of the lower dependence of larger ventures on the local market, we expect them to be more capable of garnering or providing the resources needed to internationalize operations, independent of the competitive conditions created by the industry clustering in the location, than would be true of smaller ventures (Preece et al., 1998). Accordingly, we hypothesize that:

Hypothesis 2:

Larger ventures receive a more positive effect of industry clustering on internationalization up to the optimal point and a less negative effect afterwards than smaller ventures.

The development of unique products has also been advanced as an important component of new venture internationalization (Autio, Sapienza, & Almeida, 2000; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994). A unique product can motivate a venture to internationalize in order to take advantage of higher global demand (Dimitratos, Johnson, Slow, & Young, 2003; Oviatt & McDougall, 1995) or to exploit the innovation before its competitors are able to replicate it (Oviatt & McDougall, 1995). Innovative new ventures may also internationalize to leverage the research and development costs associated with creating innovative products across a greater market volume or to generate extra profits to sustain their large-scale R&D operations (Qian & Li, 2003).

In geographic cluster locations where knowledge spillovers are known to exist, new ventures that expend more on research and development would be more apt to exploit the knowledge spillovers from clusters, and develop products that contribute to a firm's competitiveness in foreign markets (Dunning, 1988). These new ventures may also have a greater need to internationalize operations in order to sustain their competitive advantage. New ventures that are less involved in R&D activities may have difficulties valuing the knowledge being received (Cohen & Levinthal, 1990), making it harder for these ventures to assimilate the spillovers to the same extent as their innovating counterparts. Presumably, these firms would have fewer innovative new products, which would make it difficult for these firms to excel in increasingly competitive environments. We expect R&D=intensive ventures to realize greater benefit from the resources that accrue as industry clustering increases, and concomitantly to be less negatively affected by the competitive dynamics that exist at higher levels of industry concentration.

Hypothesis 3:

Ventures with high R&D intensity receive a more positive effect of industry clustering on internationalization up to the optimal point and a less negative effect afterwards than ventures with low R&D intensity.

The international experience of a new venture's top management team has been shown to increase the new venture's awareness of and ability to exploit opportunities in international markets and, subsequently, to increase venture internationalization (Bloodgood et al., 1996; Cavusgil & Zou, 1994; Reuber & Fischer, 1997). With experience in an international setting, top managers know what opportunities might exist, and what forms of organizing will be appropriate in the national environment they wish to enter.

As foreign subsidiaries are often placed within cluster regions (Birkinshaw & Hood, 2000), knowledge of opportunities in foreign markets also increases with the concentration of industry clustering in a region (Karagozoglu & Lindell, 1998; Westhead et al., 2001). New ventures with greater top management team international experience should be more apt to take advantage of external knowledge of international opportunities because they may already have access to contacts and the requisite knowledge for conducting operations internationally. Therefore internationally experienced top management teams in cluster locations may be in a better position to recognize the potential for and mobilize the resources needed to exploit international opportunities. Top management teams with less international experience, who are limited in their own knowledge of international markets, may also learn of international opportunities by being located in a cluster region. However, their limited knowledge of the internationalization process may hinder their ability to capitalize on and effectively exploit international opportunities. As the level of industry clustering increases and competition becomes more severe, limited international experience of the top

management team may be a liability that keeps new ventures from fully realizing the benefits of a cluster location.

Hypothesis 4:

Ventures with high internationally experienced top management teams receive a more positive effect of industry clustering on internationalization up to the optimal point and a less negative effect afterwards than ventures with low internationally experienced top management teams.

Method and Analysis

Sample
Our database contains 156 US-based publicly held information technology new ventures. The data were sourced from the Compustat database, individual IPO prospectuses, and the Cluster Mapping Project, which was developed and is maintained by the Institute for Strategy and Competitiveness at the Harvard Business School. All firms that completed an IPO between 1995 and 2000 that also met the following criteria were included in our sample.

First, the firm had to be a new venture at the time it undertook its IPO. The operational definition of a new venture within the entrepreneurship literature is up to 6 or 8 years of age. Biggadike's (1976) pioneering new venture research established an 8-year time period for new firms to reach the operational levels of established firms; however, more recently, many scholars are utilizing 6 years of age or less (e.g., Brush, 1995; Kunkel, 1991; Robinson, 1999; Shrader, Oviatt, & McDougall, 2000). The first 6 years are regarded as a crucial period in which survival is determined for the majority of companies (US Small Business Administration, 1992). In this study, we adopted the more conservative 6-year age limit for the firms.

Second, we chose SIC codes that matched both the industry descriptions of information technology provided by the Cluster Mapping Project and had substantial new venture IPO activity during the 1995–2000 time period of our study. We sourced data from the 7370, 7371, 7372 and 7373 SIC codes. These SIC codes encompass firms engaged in computer programming and service, software development and systems design, all of which have been identified as belonging to the information technology cluster (Porter, 2003). Third, retained firms also had to be independently founded and operated – that is, without current or prior ownership affiliation to another company. Specifically, ventures that were corporate subsidiaries or corporate spin-offs were eliminated from the sample.

Using a sample of publicly held new ventures can be very beneficial owing to the public access to key financial information and, in this case, internationalization data that would be very hard to obtain otherwise. Since ventures of the same age can vary considerably in their development, the only way to achieve this goal would be to measure key

variables of interest at a time when the ventures faced a similar point in their development. Only a few new ventures truly are born operating across international markets, so the year of founding would not have been an option. As the concentration of industry clustering can change throughout the years, what happens during the year of founding may not have been representative of what happened during later years of the venture's operations. As the ventures in this sample could have internationalized at any point prior to their IPO, we chose to follow prior research and measure internationalization at a point in time after the founding year. Shrader (2001) chose to include data in his sample on publicly held new ventures *as of six years of age*, but the new ventures varied with regard to when they undertook their IPO. In contrast, Carpenter, Pollock, and Leary (2003) gathered data on new ventures *as of their IPO year*, and controlled for variance in the firm age of the new venture. An IPO represents a significant transition point in the lifecycle for any firm, including new ventures, as this undertaking shifts the firm from the private arena to the public arena (Certo, Daily, & Dalton, 2001). We decided to use the year of IPO to measure our key variables. This time period is important, because prior to this time the performance of the firms had to be such as to ensure they would be able to undertake an IPO successfully. This snapshot in time therefore allows us to best assess what factors correlated the most with new venture internationalization when the ventures most likely faced similar developmental conditions. Unless otherwise stated, all variables were gathered at the end of the fiscal year in which the new venture undertook the IPO.

A summary of the SIC codes and geographic locations within our sample can be found in Table 1. Approximately 55% of the ventures operate within the prepackaged software segment (SIC #7372). Geographically, the highest percentages of ventures are located in the San Jose (19%) and San Francisco (21%) metropolitan areas. As these metropolitan areas constitute the "Silicon Valley" region – perhaps the most commonly acknowledged hotbed for high-technology activity – a large proportion of firms from these regions could be expected. The geographic distribution of all ventures in our sample correlates with the geographic distribution of firms within the information technology cluster at a level of 0.73 (compared with 2000 data sourced from the Cluster Mapping Project), which suggests that our sample is similarly distributed across the US to the information technology cluster as a whole.

See publishers version for Table 1

Independent Variable

Concentration of industry clustering

Traditional measures of industry clustering have captured either the national share of firms (Shaver & Flyer, 2000) or national share of employment (Enright, 1993) represented by an industry sector in a given location. Research on industry clusters, however, has long acknowledged the existence and key role of both mainstream

industries and their supporting industries (Marshall, 1920; Porter, 1998). Furthermore, recent research by Ellison and Glaeser (1997) has confirmed that industries seldom exist in isolation from other industries in upstream or downstream relationship to them. For example, information technology clusters not only include software development firms, but might also include software distribution, disk manufacturers and advertising firms specializing in the marketing of software-related products. The primary limitation of traditional measures of industry clustering, therefore, is the narrow definition that accounts only for firms or employment within a specific industry sector (typically a single SIC code).

To fully capture the essence of the cluster phenomenon as theorized in this study, we utilize as our measure of clustering a measure that captures the national share of employment for mainstream and supporting information technology industries in the headquarter location of the new venture. Sourced from the Cluster Mapping Project (2002) (an initiative of the Institute for Strategy and Competitiveness at Harvard Business School), the Cluster Mapping Project combines (1) quantitative analyses that correlate the national employment levels of industry firms with their supplier and buyer industries; and (2) qualitative procedures that verify the validity of the resulting industry cluster (see Porter, 2003, for a more detailed description). Because the Project identifies linkages between industries across the US, rather than simply looking at the levels of concentration for a given industry sector, we believe it is a more appropriate measure for capturing the cluster phenomenon as theorized in this paper.

To illustrate the value added by using this measure of industry clustering, we compare the classification of locations in our sample using the traditional measures of share of industry firms or employment and the Cluster Mapping Project measure described above. Data were gathered from the US Census Bureau (2000) to determine the national share of industry firms and the national share of industry employment for SIC codes 7370–7373 for each metropolitan area represented in the database. We present the results of the comparison in Table 2. The ranking of cluster locations and the respective cluster measure in columns 2 and 3 are calculated based on the national share of industry (SIC) firms. Columns 4 and 5, in contrast, consider the national share of industry (SIC) employment. Columns 6 and 7 offer the cluster location rankings and measures based on the Cluster Mapping Project's national share of cluster employment.

See publisher's version for Table 2

As Table 2 indicates, the Cluster Mapping Project's national share of cluster employment (columns 6 and 7) identifies the San Jose–Sunnyvale–Santa Clara, CA, MSA (metropolitan statistical area) as the largest information technology cluster location and Boston–Cambridge–Quincy, MA–NH, as the second largest. These determinations are consistent with other research that has identified these two regions as important for information technology firms (Herbig & Golden, 1993; Hill & Naroff, 1984; Saxenian, 1990). Moreover, the rankings of the top locations based on this system are consistent with other research that has looked at the geographic concentration of technology-based firms (Audretsch & Feldman, 1996).

The national share of industry (SIC) firms (columns 2 and 3) and national share of industry (SIC) employment (columns 4 and 5), on the other hand, identified the New York–Northern New Jersey–Long Island, NY–NJ–PA, MSA as the location possessing the largest concentration of industry clustering, while Chicago–Naperville–Joliet, IL–IN–WI, and Washington–Arlington–Alexandria, DC–VA–MD–WV, were the second largest areas. While these areas are indeed important, their status as the highest-ranking cluster locations for information technology firms is questionable, and their utility in describing the clustering phenomenon as theorized in this paper is limited. The moderate correlations (0.64 and 0.40 respectively for national share of industry firms and national share of industry employment to national share of cluster employment) confirm that the national share of cluster employment incorporates the SIC 7370–7373 industries, but it also incorporates data from other industries as well. We view these observations as evidence that the Cluster Mapping Project depicts a more representative measure of clustering for information technology industries than the measures traditionally utilized.

Although we believe the national share of IT industry clustering measure to be superior to other measures of industry clustering, it is not without its limitations. Just as the New York and Washington DC MSAs probably ranked high under the alternative operationalizations of clusters because of their size, the national share of cluster employment does not account for the size of the metropolitan area. The size of the metropolitan area, however, may enhance or dilute the effects expected to result when a high concentration of industry activity exists. Therefore we deemed it necessary to adjust for the size of the metropolitan area. For this purpose, we utilize the cluster location quotient shown below, also provided by the Cluster Mapping Project (2002), to determine the concentration of industry clustering given the size of the metropolitan area:

$$\text{Cluster location quotient} = \frac{\left(\dfrac{\text{MSA employment in cluster}}{\text{MSA total employment}}\right)}{\left(\dfrac{\text{US employment in cluster}}{\text{US total employment}}\right)}$$

The cluster location quotient is an index that indicates the degree to which a given metropolitan area has a higher, lower, or equivalent representation of cluster employment compared with what exists in the US at large. For example, a given metropolitan location whose proportion of cluster employment is equivalent to that of the United States as a whole would have a cluster location quotient of 1. Metropolitan areas with a cluster location quotient greater than 1 have a higher concentration of cluster employment than that which exists in the US, whereas those with a cluster location quotient less than 1 would be less concentrated than the US as a whole. As the final column of Table 2 indicates, this operationalization ranks Silicon Valley as the most concentrated location, but emerging IT locations Boulder, CO, and Austin, TX, are rated as the next concentrated locations. As Boulder was recognized to possess the potential

to become the next "Silicon Valley of the Communications Age" ([Maney, 1993](#)), and Austin, TX, similarly has been recognized as a "hot spot" for the computer manufacturing and computer chip industries ([Pouder & St John, 1996](#)), such high concentration rankings during the years utilized for our study period are not surprising. While the Boston area is still more concentrated than other locations in the US, the diversity of industry activity in the region results in a lower cluster concentration value when the cluster location quotient is utilized.

Conceptually, the location quotient measure is akin to the population density measures utilized in other studies (e.g., [Budros, 1994](#); [Delacroix et al., 1989](#); [Mezias & Mezias, 2000](#)). In contrast to the measure used in these studies, which operationalize density according to the number of firms existing at the end or beginning of a given year, this measure operationalizes the industry clustering that exists within the region as of March of the IPO year ([US Census Bureau, 2000](#)). Our measure of clustering adjusted by the size of the metropolitan area is therefore theoretically significant, because it indicates the importance of a given industry cluster relative to other industry clusters in the firm's metropolitan area. This measure helps us understand the extent to which firms operating within a given region are likely to have the resources needed to support that given cluster, but also the extent to which they are more likely to feel competitive effects from the higher concentration of industry clustering in their local area than would be true of firms in regions with a lower concentration of industry clustering.

Thus each venture in our sample was assigned to its metropolitan area and the cluster location quotient determined for the year the IPO was undertaken. We used the year of IPO for this measure because, as [Table 3](#) illustrates, the level of clustering, and the resultant cluster location quotient, have changed over time. Interestingly, the San Jose metropolitan area has steadily decreased in cluster concentration while Seattle and many other locations have increased. Although the cluster location quotient has fluctuated over time, the 1995 and 2000 cluster location quotients across metropolitan areas remain highly correlated at 0.98.

See publisher's version for Table 3

Dependent Variables
The degree to which a firm sells products to customers outside its domestic market can vary tremendously. Some firms derive a high percentage of their total sales from international markets, while other firms derive little to none of their sales from international markets. Firms that have a greater dependence on sales from international markets have a higher *international intensity* than other firms. Similarly, the number of countries or regions in which a firm's products are being sold can also vary tremendously. While some firms service customers from a limited number of countries, other firms service customers from numerous countries. Firms that sell to customers from numerous countries are said to have greater *international scope* than firms that sell to fewer countries. Following [Sullivan (1994)](#), who recommended that scholars adopt multiple measures when operationalizing internationalization, we offer two tests of our

hypotheses by focusing on these two dimensions of internationalization to assess the impact of industry clustering on the internationalization of new ventures.

International intensity

Consistent with previous research, international intensity was operationalized as the percentage of total sales derived from international markets (Autio et al., 2000; McDougall & Oviatt, 1996; Preece et al., 1998; Reuber & Fischer, 1997). To calculate the venture's international intensity, we divided the revenues sourced from outside the domestic market by the total revenues for the firm, both taken from the year of IPO. Sales data were sourced from Compustat.

International scope

While our international intensity dependent variable accounts for the total percentage of foreign sales, our international scope variable examines the extent to which a new venture enters foreign markets outside its home region. As Rugman (2000) argues, the level of effort and comfort level required to internationalize differs when entering countries within versus those outside a firm's home region. For this reason, we defined international scope as the number of continents from which a venture generated revenue. Our measure of international scope therefore represents a more global measure of internationalization than the international intensity measure, and is similar to that utilized by Preece et al. (1998). As firms are argued to internationalize to nearby countries (intra-region) more so than to distant countries (extra-region) (Rugman, 2000; Rugman & Verbeke, 2004), we deemed this operationalization an appropriate indicator of the extent to which the venture sold beyond adjacent international markets. While a limitation of our variable is that it does not take into account the actual number of countries in which a new venture generated revenue, the benefit of operationalizing the variable at the continent level is that it provides a more conservative measure of internationalization that enables us to understand how global the operations of the ventures are.

For each firm, we utilized Compustat data to determine the number of continents from which sales were generated. To ensure consistency with the practice utilized in operationalizing scope for other continents, Mexico, Canada and the US were all considered part of North America. Data were sourced from both Compustat and the prospectus.

Moderator Variables

Size

The size of a firm is typically operationalized as either the amount of sales or assets. As the two are very highly correlated, and have been determined to be proxies for one another, we chose sales as our measure of size. The measure represents sales during the year of IPO.

R&D intensity

R&D intensity for each new venture was also measured during the year of IPO and sourced from Compustat. To calculate the R&D intensity for each venture, we divided R&D expenditures by the total number of employees.

International work experience

To operationalize international work experience, we examined the IPO prospectus for each venture (e.g., Bloodgood et al., 1996; Carpenter et al., 2003; Sambharya, 1996; Shrader et al., 2000). The prospectus includes a list and brief biography of all members of the top management team. From these biographies, we determined whether international experience was mentioned for any of the top management team members. Members were considered to have had foreign work experience if their biography indicated they had held a position overseeing the international component for a previous employer. We also counted those individuals whose biography indicated they had worked in a foreign company or for the foreign subsidiary of a US-based company as having international experience. Consistent with previous scholars (e.g., Bloodgood et al., 1996; Carpenter et al., 2003), we determined the total number of persons with foreign experience. Resulting values ranged from 0 to 4 team members with prior international experience.

Control Variables

Industry

Although SIC codes 7370, 7371, 7372 and 7373 are all considered part of the information technology cluster, dummy variables were included to control for potential differences related to industry sector. SIC codes 7370 and 7371 were treated as one industry, since both involve computer programming, and only four ventures were classified as belonging to the 7371 SIC code.

IPO year

Dummy variables were created in order to control for differences related to the year the new venture undertook the IPO.

Age

New ventures with a few years of experience, but not old enough to be considered established firms, are likely to have accumulated more resources and received greater exposure to opportunities than ventures within or just beyond the startup stage. Therefore, following prior research, age was incorporated as a control variable (Burgel & Murray, 2000; Kotha, Rindova, & Rothaermel, 2001; Reuber & Fischer, 2002; Zahra et al., 2000). To determine the age of the new venture as of the year of IPO, founding dates were sourced from the IPO prospectus, the venture's website or Hoovers.com.

Venture capital

As financial resources are needed to pursue internationalization, a venture receiving venture capital may have more financial resources to internationalize than a venture not receiving venture capital. Following Carpenter et al. (2003) we created a dummy variable coded 1 if the new venture had received venture capital backing prior to IPO and 0 otherwise. These data were sourced from VentureXpert Web.

Firm accounting performance

Prior research has suggested that firm accounting performance is related to firm internationalization (Hitt, Hoskisson, & Kim, 1997), and is thus a necessary control variable when examining new venture internationalization (Carpenter et al., 2003). Firm accounting performance was operationalized by taking the new venture's net income before interest and taxes as of the IPO year.

Analysis and Results

Correlations, means and standard deviations of the variables are presented in Table 4. The average age of the new ventures was 3.59 years, and ages ranged from 1 to 6 years. The average size of the new ventures in terms of sales was approximately $32 million. Of the 156 ventures, 62 reported international sales. The international intensity of the sample ranged from 0 to 99% with an average of 18.2%. The international scope variable ranged from 1 to 4 with an average of 1.59 continents entered. The ventures in our sample generated sales on all continents around the world except Antarctica.

See publisher's version for Table 4

As other research has reported (e.g., Preece et al., 1998), we found a significant correlation between the international intensity and scope dependent variables (r=0.64, p<0.01), lending credence to these measures as dimensions of internationalization behavior. The cluster location quotient has a weak correlation with both international intensity and international scope.

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

To test the inverted U-shaped relationship proposed in Hypothesis 1, we squared the cluster location quotient variable. The hypothesis is supported when both the cluster location quotient variable and the squared cluster location quotient variable are entered into the regression equation, and the squared term is negative and significant. For testing the interaction effects in Hypotheses 2–4, we multiplied both the cluster location quotient and squared cluster location quotient variables by the sales, R&D intensity and international experience variables, respectively. We mean-centered each variable prior to creating the interaction term to reduce multicollinearity when testing both the curvilinear and moderating relationships.

The results of the multiple regression analysis are displayed in Tables 5 and 6. Separate models were used to test the hypotheses for international intensity (Table 5) and international scope (Table 6). In the first step for each model, control variables were entered along with the cluster location quotient, testing for the presence of a linear relationship. Next, the cluster location quotient variable and the squared cluster location quotient variable were entered to test for the hypothesized inverted U-shaped relationship. Then each of the proposed moderating relationships was entered individually. Lastly, all relationships are represented in the final model. This procedure was followed as the inclusion of all 21 variables in the final model slightly exceeds the recommended ratio of 1 variable per 10 sample firms (Neter, Kutner, Nachtsheim, & Wasseerman, 1996), and we wanted to ensure significance of variables prior to proceeding to the next step. Additionally, we wanted to ensure that collinearity among the interaction terms did not negatively influence the interpretability of the joint results. We checked the results by splitting the data by the median of each of the moderating variables and graphing the results.

See publisher's version for Tables 5 and 6

Hypothesis 1 proposed an inverted U-shaped relationship between the level of clustering and the level of new venture internationalization. Model 2a in both Tables 5 and 6 confirms the absence of a linear relationship for the international intensity and international scope dependent variables, respectively. Yet, in Model 2b for both dependent variables, the cluster location quotient variable becomes positive and significant ($p<0.05$) while the squared cluster location quotient variable is negative and significant ($p<0.05$). Thus Hypothesis 1 receives full support for both the international intensity and scope models. The nature of these relationships is illustrated in Figure 1 for international intensity and in Figure 2 for international scope.

See publisher's version for Figures 1 and 2

Hypothesis 2 argued that larger new ventures would receive a more positive benefit from the cluster location up to the optimum point of industry clustering, and a less negative effect afterwards than would smaller new ventures. Model 3b in Table 5 indicates a lack of significance for the sales × cluster location quotient moderating variable and squared moderating variable when regressed against international intensity. However, Model 3b in Table 6 reveals a positive, significant moderating variable ($p<0.01$) with a negative, significant squared moderating variable ($p<0.05$) when regressed against international scope. As Figure 3 demonstrates, the relationship between the concentration of industry clustering and international scope is initially positive for both small and large new ventures, but the point at which too much clustering negatively impacts on international scope comes at lower concentrations of industry clustering for small new ventures. Moreover, at all levels of industry clustering, larger firms were more likely to be operating on more continents, and thus to have higher international scope than were smaller ventures at the same levels of industry concentration. Hypothesis 2 receives partial support.

See publisher's version for Figure 3

In Hypothesis 3 we postulated that ventures with higher R&D intensity would be in a better position to capitalize on the resources from the cluster location and internationalize operations up to the optimal point, and that they would be less likely to be negatively affected by the industry clustering after the optimal point. Model 4b in Table 5 does not offer support for the international intensity dependent variable, as neither the R&D intensity × cluster location quotient moderating variable nor the squared moderating variable are significant. Yet support is found in Model 4b in Table 6 for international scope, as the moderating variable is positive and significant ($p<0.05$) while the squared moderating variable is negative and significant ($p<0.01$). As Figure 4 indicates, the internationalization of ventures with higher levels of R&D intensity was less negatively affected by higher concentrations of industry clustering. Hypothesis 3 receives partial support.

See publisher's version for Figure 4

Our fourth and final hypothesis suggested that higher levels of international work experience among the top management team would enable the venture to benefit more from the cluster location up to the optimal point, and be less negatively affected afterwards. As illustrated in Model 5b of Table 5, the coefficient for the international work experience × cluster location quotient moderating variable is positive and significant (p<0.01) and the squared moderating variable is negative and significant (p<0.01) for international intensity. As Figure 5 illustrates, ventures guided by top management teams with higher levels of international experience had higher levels of international intensity across nearly all concentrations of industry clustering than ventures guided by top management teams with lower levels of international experience. We found no significance in Model 5b in Table 6 for the moderating effect of international work experience in the cluster location quotient and international scope relationship.

See publisher's version for Figure 5

Model 6 in Tables 5 and 6 presents the results when all variables are considered jointly with the international intensity and scope dependent variables, respectively. The cluster location quotient and squared cluster location quotient variables remained significant and in the appropriate direction for both international intensity and international scope, thereby providing strong support for our first hypothesis. For the moderating hypotheses, the international work experience × cluster location quotient moderating and squared moderating variables remained significant within the international intensity analysis illustrated in Table 5. For the international scope dependent variable in Table 6, only the sales × cluster location quotient moderating and squared moderating variables remained significant.

Discussion

The objective of this research was to examine how the concentration of industry clustering in a new venture's headquarters location affects its level of internationalization. Focusing on the availability of and competition for resources within the location, we used ecological theory to guide our predictions on the impact that the concentration of industry clustering would have on new venture internationalization. Consistent with expectations, our results suggest that the concentration of industry clustering within a location can foster new venture internationalization by making available resources needed to support the internationalization process. However, too much industry clustering stimulates competition effects, which may constrain the venture's ability to garner the resources needed to internationalize its efforts. The finding of a curvilinear relationship between the concentration of industry clustering and new venture internationalization was strongly supported in both the international intensity and scope models.

It is interesting to observe that the inflection point (i.e., the point at which the relationship between industry clustering and new venture internationalization turns from

positive to negative) occurs when the cluster location quotient is 8.6 for international intensity and 8.2 for international scope (see Figures 1 and 2). In our sample, there are two geographic locations where new ventures are headquartered that have location quotients above 8.6 (based on 2000 data): the Boulder, CO, and San Jose–Sunnyvale–Santa Clara, CA, metropolitan statistical areas. While only one new venture in our sample is located in Boulder, 30 new ventures are located in the San Jose–Sunnyvale–Santa Clara region, more commonly known as Silicon Valley, but only half of those ventures are international. Although ventures in these areas perhaps had the resources available locally that would help them internationalize, as highly saturated geographic regions (Arthur, 1990) the Boulder and Silicon Valley areas appear to induce constraints on ventures' abilities to garner the resources needed for internationalization activities.

Another interesting conclusion deriving from the data relates to the proximity of a firm's location to regions containing high concentrations of industry clustering. Our use of MSAs as our level of geographic analysis separated firms in the San Francisco–Oakland–Fremont, CA, MSA from the nearby San Jose–Sunnyvale–Santa Clara MSA. Whereas the San Jose–Sunnyvale–Santa Clara MSA had the highest concentrations of industry clustering, and half of those ventures were internationalized, the San Francisco–Oakland–Fremont, CA, MSA had a lower level of concentration of industry clustering (~2.57), yet half of the ventures in that region were also international. Our results may show the value of being located *near* metropolitan areas with high industry clustering, but not actually being *within* such locations. Additional research is needed to investigate the validity of this proposition.

Our results also confirm that the way a venture is affected by its location depends upon the characteristics of the venture. Smaller new ventures were found to be negatively affected by the concentration of industry clustering sooner than were larger new ventures. Two explanations exist for this finding. First, smaller size increases the difficulties that these firms encounter in garnering the resources needed to exploit opportunities in international markets. Second, their smaller size may mean that they have less need to exploit opportunities in international markets, as the resources they acquire from the local environment may be sufficient to sustain their small scale of operations. Since larger new ventures in cluster locations were no more likely to derive higher percentages of sales from foreign markets (i.e., to have higher international intensity) than were smaller ventures, these results suggest that large and small ventures were penetrating international markets at the same rate. However, larger new ventures were found to be more capable of withstanding the negative impacts of increasing competition and pursuing internationalization activities across multiple continents (i.e., to have higher international scope). Larger size may maximize the location options ventures have for internationalizing operations to reduce dependence on the local environment, and may be most beneficial for ensuring firms possess the resources they need to operate on a global level.

Whereas R&D intensity had no impact on the relationship between industry clustering and international intensity, its impact on the relationship between industry clustering and international scope was positive. Firms with higher R&D intensity in locations of increasing industry cluster concentration are able to internationalize to more continents

than less R&D-intensive firms, perhaps in part because of their increased ability to reconfigure their technologies, which makes it easier to customize then for diverse local markets (Knight & Cavusgil, 2004). The ability to customize products for new geographic markets may open up opportunities for the firms to also improve upon products sold to the domestic market, which could increase the total sales a firm acquires and neutralize the effect that R&D intensity has on the international intensity of the sales.

The results for international experience similarly indicated that ventures whose top managers have more international experience benefit from a cluster location to a greater extent than teams with less international experience. Interestingly, this result was supported only for international intensity. This finding may suggest that international experience may open the door for new ventures located in cluster locations to pursue sales in international markets sooner, owing to their increased ability to recognize and exploit the available international opportunities that arise, which would increase the percentage of sales they derive from international markets relative to ventures that pursue internationalization at a later time. Future research may wish to investigate the extent to which a cluster location influences the speed of venture internationalization. The absence of a finding between international experience and international scope may suggest that entrepreneurs limit their international activities to those regions with which they are most familiar. Future research may wish to determine the extent to which international experience promotes or hinders new venture internationalization behavior.

Overall, we draw two important conclusions from our results. First, our results suggest that, at lower concentrations of industry clustering, new ventures without substantial size, a significant level of resources invested in R&D activities or higher levels of international experience utilize resources from the cluster area to internationalize their operations in a similar manner to firms high on those characteristics. At higher concentrations of industry clustering, however, size, R&D intensity, and international experience are important for helping ventures mitigate the effects of increasing competition and strengthen their competitiveness and ability to recognize and exploit international opportunities. These results strongly validate our central proposition that industry clustering positively impacts on the resources firms can access, by making them more plentiful in the region, but concomitantly negatively impacts on the resources a firm can access by increasing the competition that exists for them. These findings create an intriguing contrast of clusters as regions that are both helpful and harmful to the firms operating within them.

Second, our results suggest that larger size and R&D intensity are important for helping ventures expand *across* multiple geographic regions to minimize the effects of competition in the local region, with size being the most important characteristic of the two. In contrast, international experience of the top management team is valuable for helping ventures penetrate *within* foreign markets. Clearly, growing revenues is contingent upon more than simply knowing that the opportunities are there and having knowledge of or contacts in the region that could aid exploitation. Likewise, exploiting products across numerous continents is contingent upon more than just having R&D

capability. In other words, as the small effect sizes suggest, these factors are beneficial in helping firms mitigate the impact of industry clustering, but clearly take a secondary role to other factors that help the ventures penetrate and exploit the opportunities in international markets. Size, on the other hand, is a substantive factor helping minimize the negative effects of industry clustering, while at the same time providing great influence in helping new ventures internationalize across continents.

It is also interesting to note that our results in the international intensity models were not as strongly supported as extant theory reflects. This finding is probably linked to the fact that new ventures grow at a rapid pace, and their growth in the domestic market may outpace their growth in the international market. Future research may wish to decompose domestic and international growth to determine what factors are influencing each, and to determine the extent to which growth in one negates a venture's ability to grow via the other.

Contributions
Our study contributes to the emerging literature on new venture internationalization in several ways. First, we respond to a recently noted gap in the literature regarding the role of the external environment on new venture internationalization (Zahra & George, 2002). In doing so, we highlight the importance of geographic location as an external source for acquiring internationalization resources. This research is important, because although existing research, drawing upon the resource-based view, frequently examines and confirms the criticality of resources to new venture internationalization (Preece et al., 1998; Westhead et al., 2001), this study helps the field understand several factors that contribute to a firm's ability to gain access to resources that enable them to internationalize. By taking an ecological perspective, our study sheds light on the potential origins of critical resources for internationalizing operations, and demonstrates how one characteristic – the industry clustering in a venture's geographic location – can influence the availability of resources that aid internationalization.

A second and related contribution lies in the new-found complexity in the resource and new venture internationalization relationship. Prior research has already empirically examined the direct relationship between firm resources such as size (Bloodgood et al., 1996; Preece et al., 1998; Zahra et al., 2000), innovativeness (Autio et al., 2000; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994) and TMT international experience (Bloodgood et al., 1996; Cavusgil & Zou, 1994; Reuber & Fischer, 1997) and new venture internationalization. However, the existence of a significant moderating relationship found in this study suggests caution must be applied when researchers examine the main effects as the sole relationship between firm resources and new venture internationalization. To more accurately understand new venture internationalization, the geographic location of the new venture and the firm's resources should be jointly rather than separately considered.

Third, we offer insight to the new venture internationalization literature through our empirical test of two varying degrees of new venture internationalization: intensity and scope. While we assumed the theory developed in this study would apply to both international intensity and scope in the same manner, the results proved otherwise. The

main effect of the curvilinear relationship between the concentration of industry clustering and new venture internationalization was supported with both dependent variables. However, the moderating hypotheses did not follow the same pattern of support, with one hypothesis being supported in the international intensity model and the remaining two hypotheses being supported in the international scope model. Consistent with Preece et al. (1998), our findings confirm that international intensity and international scope are distinctly different measures of internationalization. To better understand the implications for new venture internationalization, future studies should strive, both theoretically and empirically, to integrate these and other measures of internationalization.

We also build upon previous studies examining the impact of cluster locations, and offer evidence of yet another outcome that is affected by geographic clustering: new venture internationalization. Several studies exist that have examined international issues such as the role of multinationals (Rugman & Verbeke, 2004) or their foreign subsidiaries (Birkinshaw & Hood, 2000) in cluster locations, but the impact of cluster locations on new venture internationalization had not yet been considered. Furthermore, we add to the growing list of studies exploring the role of industry clustering on new ventures by examining a phenomenon other than foundation rates (Stuart & Sorenson, 2003) or performance (Deeds et al., 1997). Through this study we address a need to examine differences in strategic behaviors exhibited by new ventures operating from locations with high and low concentrations of industry clustering (Cooper & Folta, 2000). Furthermore, by arguing that the availability of and competition over resources in the venture's headquarters environment influences the strategic options pursued by the ventures, we demonstrate the applicability of ecological theory in the context of new venture internationalization. Thus, in addition to competitive dynamics influencing firm growth (Boeker, 1991), choice of product market entry (Baum & Korn, 1996) and overall organizational viability (Barnett & McKendrick, 2004), the ecologies of the local environment also matter for new venture internationalization. We encourage other international entrepreneurship researchers to use this theoretical perspective in future studies as a lens for understanding differences in firm internationalization.

Last, drawing on the Cluster Mapping Project, which encompasses the key role of supporting industries, we offer an alternative measure to the field that is a better theoretical representation of the industry clustering phenomenon and helps us understand the extent to which the availability of resources and competition over those resources might influence new venture internationalization.

Implications for Practitioners
The results also have several important implications for entrepreneurs. First and foremost, location matters for new venture internationalization as it does for other firm outcomes (see Baum & Haveman, 1997; Boeker, 1991; Canina, Enz, & Harrison, 2005; Lomi, 1995). Industry clustering within a geographic region provides the resources that are useful for internationalization to a point, but once the point of saturation is reached, the competition in the region will limit a venture's ability to benefit from resources in the local area. These results suggest the importance of being mindful of the extent to which industry clustering is occurring in the region. As industry clustering increases,

entrepreneurs starting a venture may well be advised to locate in less concentrated regions if they hope to access the resources that will enable them to succeed in strategic endeavors such as internationalization.

Second, size, R&D intensity and international experience can help a firm weather conditions in the local environment to continue pursing international endeavors. These characteristics empower new ventures to exploit local resources more effectively, and also remove the constraints created by increasing levels of competition that prohibit new ventures from taking advantage of resources available to them in their local areas.

Limitations and Future Research
Although we believe this study significantly enhances our understanding not only of new venture internationalization but also of the impact of industry clustering on new venture outcomes, there are several limitations to our study that it is important to acknowledge.

First, the nature of our sample limits the generalizability of our findings to ventures operating in industries distinctly different from the information technology industry, and to ventures headquartered outside the US. Moreover, the use of publicly held firms results in an elite survivor sample, as our sample includes neither new ventures that failed nor new ventures that did not do an IPO within their first six years. Additional testing will be required to assess the effect of geographic location on privately held new ventures, and on other industry sectors, as well as to determine whether these results hold for ventures from other countries.

Second, although we believe our measure of industry clustering is a more adequate representation of the clustering phenomenon than, and an improvement on, extant measures, it is still a broad measure for assessing this phenomenon. Further research that utilizes measures of cluster characteristics may provide deeper insights into this area. For example, by examining the extent to which the composition of firms in the region was composed of firms of comparable size to the focal venture, we would be able to determine whether the internationalization resulted from symbiotic relationships between large and small firms (Boeker, 1991; Stuart & Sorenson, 2003), or potentially from competitive effects between firms of similar size (Budros, 1994). It would also be interesting for the field to determine what mechanisms transferred the influence. This determination may require more studies that examine the networks of firms within clusters to see how internationalization is fostered. We also suggest that it may be interesting to examine how knowledge spillovers received from other companies or universities in the geographic locations were incorporated into a venture's product or international strategies, and how long it takes before the spillovers are assimilated.

While our results support the proposition that geographic location influences new venture internationalization, future research should further examine how this influence occurs. For example, how do networks within the cluster location influence the formation of alliances that facilitate internationalization? In addition, future research should explore how the presence within a cluster location might influence why a venture internationalizes, and the choice of countries entered. As we found no support for international experience as a moderator of the relationship between industry clustering

and the international scope of the ventures, it may be useful to know whether the familiarity of top managers with a given country limits the countries to which they will consider entering, at the expense of attractive opportunities elsewhere.

Finally, we chose to examine the venture's internationalization behavior as of a specific point in time: the conclusion of the venture's IPO year. For this sample, the average age of the ventures at the conclusion of this year was 3.6 years old. Impressively, approximately 40% of the ventures had internationalized their operations by their IPO undertaking. However, our analyses do not enable us to conclude what helps ventures *accelerate* their international behavior. A fruitful area for future research would be to investigate the impact of geographic location on new venture internationalization over time.

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