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Since its establishment in 2002, this program has helped to launch world-class scholars into the exciting and emerging field of entrepreneurship research, thus laying a foundation for future scientific advancement. The findings generated by this effort will be translated into knowledge with immediate application for policymakers, educators, service providers, and entrepreneurs as well as high-quality academic research.
The Implications of Geographic Cluster Locations for New Venture Performance

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Executive Summary

If ever you have wondered why there is so much interest in geographic clusters,¹ which are places such as Silicon Valley, Route 128 or the Research Triangle -- you are not alone -- these regions have intrigued many scholars for many years. A review of the literature on clusters suggests their popularity may be attributable to three observations of these regions: the higher levels of specialized resources, the higher levels of startup activity, and the reported superior performance of firms operating within cluster regions. Although firms operating from cluster locations have been reported to outperform firms operating from other locations, the impact of cluster regions on the new firms operating within them is less clear. Specifically, while some studies reported that clusters positively affect new firm performance, others have found that clusters negatively affect performance. However, because few studies measured the attributes of the firms likely being affected by the firms’ presence within a cluster, the factors contributing to the differential results is unclear.

The purpose of this research was to accomplish two objectives. First, to determine whether new firms operating from cluster locations have higher or lower levels of performance than new firms operating from other locations; second, to understand what factors are influencing the performance of cluster new ventures. Utilizing the literature on industry clusters, agglomerations and industrial districts, this research began on the premise that cluster regions are entrepreneur-friendly environments yielding entrepreneurial expertise, access to resources,

¹ Porter (1998: 199) defined geographic clusters as geographic regions where “firms in downstream industries (that is, channels or customers); producers of complementary products; specialized infrastructure providers; government and other institutions providing specialized training, education, information, research and technical support (such as universities, think tanks, vocational training providers); and standards-setting agencies” are collocated (Porter, 1998:199).
capital and other support systems to the firms operating within them. These characteristics of clusters were expected to contribute positively to the innovation and growth performance of new ventures. In addition to the aforementioned representations of geographic clusters, the literature suggested that two attributes of the firms would be particularly affected by a location with a geographic cluster region. One is the knowledge that firms assimilate into their operations. The other is the alliances into which the firms enter.

Clusters are argued to develop because firms are attracted to the resources available within the region. One of the foremost resources argued to benefit firms operating from cluster regions is the knowledge that spreads throughout the region. With knowledge spillovers, firms are equipped with industry specific knowledge that empowers them to know what other firms have done, what they are currently doing, and the levels of success they have achieved in their activities. Such knowledge enables recipient firms to appropriately align their innovation activities to those occurring within the region, thereby enhancing their legitimacy. Because research has found that knowledge spillovers occur within a limited geographic region, and research also suggests that firms assimilate knowledge better when it is related to their technological capabilities, it was hypothesized that firms operating near other firms would be in a greater position to assimilate innovation knowledge into their operations than firms operating from other locations.

Innovation knowledge is important because it enables firms to identify innovation opportunities worth pursuing. Knowledge of other firms’ innovation knowledge activities has been recognized as instrumental in stimulating the innovation activities of a focal firm. For these reasons, innovation knowledge assimilation was expected to positively affect the product innovation performance of the firms. Additionally, because knowledge spillovers enable a firm
to develop product or services aligned to stakeholder expectations, which enhances the ability of
the firms to sell the products to the marketplace, the growth of the firms was also expected to be
positively affected by the innovation knowledge assimilation of the firms.

Clusters are also widely regarded for creating a social structure that influences the
behavior of firms within the cluster. This culture would make cluster firms more adept at
exhibiting behaviors that indicate their ability to work toward mutual gain in alliance
relationships, rather than self gain. Moreover, the increased popularity of cluster regions means
firms operating from clusters have greater visibility to other firms within the industry. It was
expected, therefore, that new ventures operating from locations with high industry clustering
would be viewed as more attractive alliance partners to other firms than ventures operating from
locations with less industry clustering, and consequently, the size of the alliance partner network
would be larger for ventures operating from locations with higher levels of clustering.

Alliances afford firms the opportunity to strengthen internal competencies and seize new
product opportunities that arise, thus, enabling firms to improve their innovation performance.
Alliance partners have been found to help reduce the lead-time needed to develop new products
and generate new technological and process innovations. Therefore, it was expected that with a
larger network of alliance partners in their networks, new ventures would have higher product
innovation activities. As alliances provide opportunity for the firms not only to assess the
potential of an opportunity but also to provide strategic and operational know-how needed to
exploit the opportunity, alliances have also been argued to be growth strategies for firms
engaging in them. Larger alliance partner networks increase the exposure of the firms to
opportunities and capabilities that could lead to higher levels of growth. Therefore, it was
expected that alliance partner size would also positively affect new venture growth.
The cluster environment was hypothesized to enable cluster firms to enter into more alliances with other firms, but it was also expected to cause them to enter into more relationships with firms located within their respective geographic regions, minimizing the geographic diversity of their alliance partner network. Firms operating from locations with lower industry clustering on the other hand, given the smaller number of potential partners within their geographic region, were expected to enter into alliances with firms from a larger number of geographic regions, thereby increasing the diversity of knowledge coming through their alliance partner network. Alliance partner geographic diversity, therefore, was expected to be higher for ventures operating from locations with lower levels of industry clustering than for ventures operating from locations with higher levels of industry clustering.

Geographic diversity of a venture’s alliance partners is important because regions develop technological competencies that are specific and unique to that region. By working with partners from different geographic regions, a venture would minimize the potential for receiving redundant knowledge from their partners. Network diversity is beneficial, therefore, because it may require a firm to engage in further research activities to understand the implications of new knowledge it has received, thereby increasing the innovation activities of the firm. It was expected, therefore, that alliance partner geographic diversity would positively influence the product innovation of the firms.

Research has also shown that relationships with partners from diverse clusters ensure that firms remain apprised of opportunities and disasters emerging on the horizon. Essentially, research suggests that diverse networks serve as important screening devices for firms. With network diversity, firms are exposed to more information which enables them to compare the information received from all sources, evaluate the implications of the information and utilize the
information received to effectively delineate attractive opportunities from unattractive ones. Ventures with greater access to diverse networks have been found to have higher growth than other ventures, therefore, it was expected that alliance partner geographic diversity would positively impact the growth of the firm.

A pictorial representation of the model this research tested is shown below:

Sample, Analytical Techniques and Results

The relationships were tested using a sample of technology firms that undertook an initial public offering (IPO) before reaching the age of eight. This age range was selected because research has shown that a new firm requires eight years to reach the operational levels of established firms. All 144 firms undertook their IPO between the years of 1995 – 2000, and operated in the computer programming, software or systems integration industry sectors. Many of the firms were pioneers of new markets, processes and services, making them a unique and accomplished group of firms upon which to assess whether location matters to their innovation and growth performance.
The innovation performance measure taken was the number of new and enhanced products released during the two year time period after IPO. These values were summed together to determine their total product development activities during that time. The venture’s growth was determined by measuring the sales growth for the two year time period after the venture went public. To determine whether a venture operated from a location where a cluster existed, data from the Cluster Mapping Project were utilized. This system identifies the degree to which industry clustering exists in geographic regions across the U.S. and world. The percentage of industry clustering in the venture’s location during the year in which the venture undertook its IPO was utilized to represent the extent to which a venture operated from a cluster location.

The venture’s innovation knowledge assimilation was measured by determining the extent to which the citations in a venture’s awarded patents went to other firms in the venture’s economic area (which encompasses the venture’s MSA and any adjacent MSA’s or counties with strong economic ties to that respective MSA). Alliance partner network size was captured using press releases and the firm’s IPO prospectus to count the number of partners with which the firm had entered into joint product development, joint ventures, technology exchanges, joint marketing or distribution alliance relationships before it went public (pre-IPO alliances), and the ones added to the network in the two years after the firm went public (post-IPO alliances). Alliance partner geographic diversity was measured by determining whether the alliance partners were located in the venture’s economic area, in an economic area with high levels of industry clustering, in an economic area with low levels of industry clustering, or in a foreign location. The diversity measure accounts for the number of partners in each category relative to the total number of partners. Because innovation and growth could be influenced by factors in addition to the ones of interest in this research, variables consistently found to explain new venture
performance were utilized. These variables included the age, size, industry membership, and year of IPO.

The analytical procedure utilized to assess the relationships was path analysis. With this procedure, the relationship between industry clustering and growth and innovation was assessed as the first step; then the relationship between industry clustering and innovation knowledge assimilation, alliance partner network size and alliance partner geographic diversity was determined. In the last step, the relationship between innovation knowledge assimilation, alliance partner network size, alliance partner geographic diversity and the product innovation and growth performance of the firms was analyzed. As a final analysis, I determined the total impact, direct and indirect, of a cluster location on the innovation and growth performance of new ventures.

The results confirmed the expectation that the industry clustering present in a venture’s geographic area indeed enhances the growth and innovation performance of the ventures. Similarly, ventures operating from locations with higher clustering had higher innovation knowledge assimilation, and larger alliance partner networks, but contrary to expectations more diverse geographic regions represented in their networks than ventures operating from locations with lower industry clustering. The geographic diversity of alliance partners was particularly pronounced for partners added after the venture went public, meaning that after IPO, firms operating from locations with higher levels of industry clustering were more likely to be working with firms from diverse geographic regions.

The innovation knowledge the firms assimilated strongly influenced the innovation of the firms, but only weakly influenced their growth. Alliance partner network size for alliances established before and after IPO each had strong relationships with the innovation of the firms,
but weaker relationships with the growth of the firm. More specifically, while the number of alliance partners from the two year period after IPO moderately improved the growth of the firms, the number of alliance partners held pre-IPO depressed the growth of the firms. Alliance partner geographic diversity also exhibited positive relationships with innovation for diversity measured before and after IPO, but positive and non-significant relationships with growth.

Additional analyses were also undertaken to assess the individual effects of industry clustering in a geographic location on new product and product enhancement activities of the firms. Similar results were found as those reported for growth and total product development activities. Industry clustering strongly affected the product enhancement activities of the firms, but had no influence on the new product development activities of the firms. Innovation knowledge assimilation, alliance partner network size and alliance partner geographic diversity were each significantly related to product enhancement activities, but not at all related to new product innovation. Overall, the results indicated that industry clustering has a very strong total effect on innovation, particularly product enhancement activities, with the direct and indirect effect of industry clustering strongly affecting the product enhancement activities of the firm. When growth and new product innovation were analyzed, industry clustering had only small direct effects and even smaller indirect effects on those variables, meaning that the growth and new product innovation activities of the firm were not strongly affected by the industry clustering in the venture's location.

Implications

For entrepreneurs operating within regions where industry clustering exists in high levels, the results suggest that cluster firms are likely to realize higher levels of innovation and growth
than ventures founded in other geographic regions. However, while industry clustering within a geographic region indeed creates opportunities for entrepreneurs to recognize new opportunities to exploit, most of the recognized opportunities were to enhance the offerings on existing products rather than to create new products. Thus, industry clustering within a geographic region may be more effective for exploiting existing innovations rather than for creating new innovations.

While it was true that the product innovation activities were higher for firms operating from locations with higher levels of industry clustering, the growth of these firms was only moderately higher than that of ventures operating from other locations. These results suggest that it is still possible for ventures operating from locations with less industry clustering to grow at levels comparable to those of firms operating from locations with more industry clustering. As new product development activity did not differ greatly for firms operating from a cluster when compared to those operating from locations where less industry clustering exists, these results may suggest that for some strategies, particularly those encompassing radical innovation activities, operating from a location with lower levels of industry clustering would be preferred.

For policy officials desiring to create clusters within their geographic regions, these results point to the importance of supporting innovation centers that focus on the creation and dissemination of new knowledge that would prevent the firms from adopting an insular view of the industry. Moreover, to ensure that firms operating from locations where industry clustering exists have the resources needed to incorporate the new knowledge generated, it will also be important for policy officials to ensure the resources from the cluster region are suitable for current as well as future needs of the firms. As the geographic diversity of alliance partners had strong relationships with the innovation activities of the firms, promoting the capabilities of the
region and firm within the region to other locations should become a key activity for policy
officials. Such activities are not only expected to enhance the performance of the firms, but also
the performance of the region.

Conclusion

This research revealed that there is much truth to the presumption that geographic
clusters exert strong influence on the performance of firms operating within them. The effect,
while consistently positive, differed in strength depending upon the measure of performance
utilized, with the strength of geographic cluster regions appearing to be in the product
enhancement activities they foster. Still, these activities are not strongly transferring to the
growth of the ventures. There is much for us to learn regarding the impact of cluster locations on
the performance of new ventures.