

Assessing the Influence of Urban Innovation Hubs on Local Entrepreneurial Ecosystems and Startup Survival Rates

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Abstract

Innovation hubs in urban areas have become effective mechanisms of promoting entrepreneurship, innovation, and economic development in regions. Even though the role of innovation hubs in the creation of startups is well known, there is little information regarding the impact of the physical association of startups with innovation hubs on their survival and ecosystem development. The current study investigates the impact of physical proximity to innovation hubs on startup survival and ecosystem development. An empirical longitudinal research design and a matched-pair comparative approach are applied in this study. The data have been collected from 320 startups selected from particular metropolitan areas over a five-year period, including 160 startups associated with innovation hubs and 160 startups without innovation hub associations. Data have been collected from business registers in municipalities, portfolios of innovation hubs, venture capital databases, and regional economic reports. The survival of startups has been estimated using the survival analysis and Cox Proportional Hazards models, while the ecosystem development has been assessed by means of employment, financing, mentoring, and collaboration with universities. The results indicate that 74.4% of firms connected to hubs have survived for five years compared to 58.1% of non-hub firms. According to the Cox regression model, new firms located within innovation hubs had a 32% lower probability of failure (HR= 0.68, $p<0.05$). Firms associated with the innovation hubs exhibited higher levels of mentorship engagement (78.8%), greater access to additional capital (68.1%) and university-industry collaborations (61.9%). In addition, the firms located in the innovation hub created more jobs and registered high growth rates in revenues. However, the increase in the cost of doing business and difficulty of securing skilled workers is another issue in the innovation district. There are numerous benefits of innovation hubs in urban areas for entrepreneurs, other than the creation of start-ups, because of the firm sustainability and availability of resources.

Keywords

Urban Innovation Hubs, Entrepreneurial Ecosystems, Startup Survival, Knowledge Spillovers, Venture capital, Regional Innovation, Agglomeration Economies.

1. Introduction

Innovation clusters in the city are one of the most famous concepts for fostering entrepreneurship and investment, and for the development of the regional economy. Nowadays, more and more states, local administrations, universities, and private investors work on developing innovation districts where there is a combination of startups, research institutes, incubators, accelerators, venture capital, and technology companies in a unified territory (Bandera & Thomas, 2018; Stolz, 2022). These innovation clusters target stimulating innovations through interactions, collaboration, networking, and better resource accessibility. In this regard, since many cities compete to be considered innovation centers, large funds are invested into urban innovation clusters (Isenberg & Onyemah, 2016; Witte et al., 2018).

However, there is still doubt about the effectiveness of innovation hubs when it comes to fostering sustainable startups. In most of the existing literature on the matter, the importance of innovation hubs in facilitating the development of businesses and innovation activities is mentioned (Audretsch & Belitski, 2017). However, simply creating businesses will not ensure entrepreneurial success since the enterprises will still have many problems connected with uncertainties in the market, financial limitations, recruitment difficulties, and scalability issues. Moreover, the clustering of enterprises in innovation districts can lead to certain negative effects, such as increased competition for resources, rising costs of real estate, talent poaching leading to employee turnover, and uneven distribution of benefits provided by the ecosystem.

In this case, the research would be concentrated on the effect of urban innovation hubs on entrepreneurial ecosystem and survival rates of start-ups. In particular, the main goal of the research is to investigate the effect of startup participation in urban innovation hubs on survival rates over a five-year period. The relevant spillovers, which include networking, financing, mentoring, and cooperation would be analyzed.

The significance of the research would be defined by the contribution of evidence-based data to policymakers, urban developers, economic development agencies and venture capitalists. Through the analysis of sustainability of the survival advantage from the urban innovation hubs in comparison with the temporary help of the urban innovation hubs, the research would contribute to successful creation of the entrepreneurial ecosystems.

The rest of the paper consists of six sections. First, in Section II, the review of entrepreneur ecosystem and innovation cluster related literature will be described. Second, in Section III, the theoretical construction and hypotheses will be demonstrated. In Section IV, the study will describe the methods, sampling, operational definitions, and measurements as well as analysis strategy. The empirical analysis results will be discussed in Section V. The study will discuss theoretical and managerial implications, then, make recommendations for managers in Section VI. At the end of the paper, Section VII concludes the entire research and proposes the future research opportunities.

2. Literature Survey

The relevance of the urban innovation hubs as integral components of entrepreneurship ecosystems, which facilitate knowledge transfer, access to resources, and entrepreneurship outcomes has received acknowledgment recently. In particular, recently conducted research has stressed the fact that ecosystem-related policies and infrastructure may influence the outcomes of entrepreneurship irrespective of the process of venture formation (Harmaakorpi & Rinkinen, 2020; Mitra et al., 2023). The framework for the evaluation of city-level entrepreneurship policies has been offered, along with the role of local institutions in relation to high growth ventures (Egan, 2022). At the same time, the paper has shown that technology incubators provide mentoring, business development, and networking services for startups, which positively influences entrepreneurship outcomes (Kaggwa et al., 2024). Finally, the study performed within the scope of digital innovation hubs has proved that ecosystem architecture facilitates startup development due to enhanced cooperation between entrepreneurs, investors, and institutions (Gumbo & Moos, 2024; Yuan et al., 2022).

The importance of institutions' and actors' role in the ecosystem has been analyzed in several research studies (Khurana & Dutta, 2024; Bărbulescu et al., 2021). According to one research study, a good institutional environment is associated with successful entrepreneurship as it creates a resourceful environment and decreases uncertainties (Audretsch et al., 2021). The study also emphasized the importance of leadership in the entrepreneur community for dealing with ecosystem stakeholders and encouraging regional entrepreneurship (Roundy, 2021; Madaleno et al., 2022). In addition, it has also been stated that universities, municipalities, incubators, and business associations collaborate to develop entrepreneurial ecosystems (Leal et al., 2023; Helman, 2020). Furthermore, in studies conducted in developing nations, it has been observed that innovation centers play a key role in facilitating technological diffusion and development of the ecosystem (Mwantimwa et al., 2021; Haukipuro et al., 2024).

Ecosystems have been identified as one of the factors for the growth of entrepreneurship in smart cities in the existing literature on the subject. Previous studies have revealed that the networking capability, innovation-related support services, and financial resources are among the factors that play a role in the effectiveness of the ecosystems. In general, the existing literature suggests that innovation hubs can provide a lot of benefits for the ecosystem in regard to knowledge spillovers, institutional benefits, and networks. However, there is no empirical evidence available about the effect of such hubs on the sustainability of startups. This research aims to fill this gap.

3. Theoretical Framework and Conceptual Model

This study is based on the theory of Agglomeration Economies and the concept of social capital which are two different theories that are consistent in their attempt to explain the impact of innovation districts on entrepreneurship performance and survival. According to the Agglomeration Economies Theory, geographically close firms have an advantage through the sharing of resources, pooling of the labor market, supplier specialization and the spillover of knowledge. In this case, the presence of entrepreneurs within innovation districts makes it possible for these firms to reduce costs and collaborate, making it easier for innovation and growth of businesses. Start-ups in particular may find it helpful in acquiring necessary resources and surviving.

The Social Capital Theory further elaborates on the above concept by highlighting the importance of networking, building relationships, and trust. The enterprises that operate within the entrepreneur ecosystems and have high social networks can easily get access to information, mentorship, financing options, and partnership. The innovation hubs in the cities facilitate face-to-face interaction of different people and creation of social capital, which can help ventures become flexible and resilient.

One of the common elements between the two theories is that of spillovers. Being located geographically close to each other facilitates interactions, learning, and institutions. Entrepreneurs often get ideas from various networking events, co-working spaces, acceleration programs, and other encounters, which are unlikely to happen in cases of geographically distributed locations.

However, measuring the real effects of innovation hubs is fraught with difficulties of survival. Successful firms could self-select into innovation districts since they have better capabilities or more ambitious growth targets. As a result, the survival gains observed may stem from selection bias, not the effect that stems from being part of an innovation hub. In this research, distinctions are drawn between firm attributes that affect their location and the treatment effect that arises from the structural characteristics of the innovation hub.

Based on these theoretical assumptions, the following propositions are stated:

Proposition 1: Startups physically located within or adjacent to urban innovation hubs demonstrate higher survival rates during their first three years than geographically isolated startups.

Proposition 2: The positive influence of urban innovation hubs on local entrepreneurial ecosystem health is mediated by the density of networking assets and the accessibility of regional venture capital resources.

4. Methodology

Research Design

The present study makes use of the empirical longitudinal research approach when considering the impact of innovation clusters in the city on the survivability of startups as well as the emergence of entrepreneurial ecosystems. The matched pair comparative approach is utilized in the comparison of startups located within urban innovation clusters and those adjacent to them and other startups. The longitudinal methodology will allow the measurement of the performance of the startups over a five-year period of time so as to be able to measure short-term as well as long-term impacts. Through the use of this combination, the impact of

innovation cluster membership can be isolated from other sources of influence on the success of startups. In addition, the matched pair method eliminates selection bias since startups have similar characteristics.

Urban Innovation Hubs and Entrepreneurial Ecosystem Outcomes

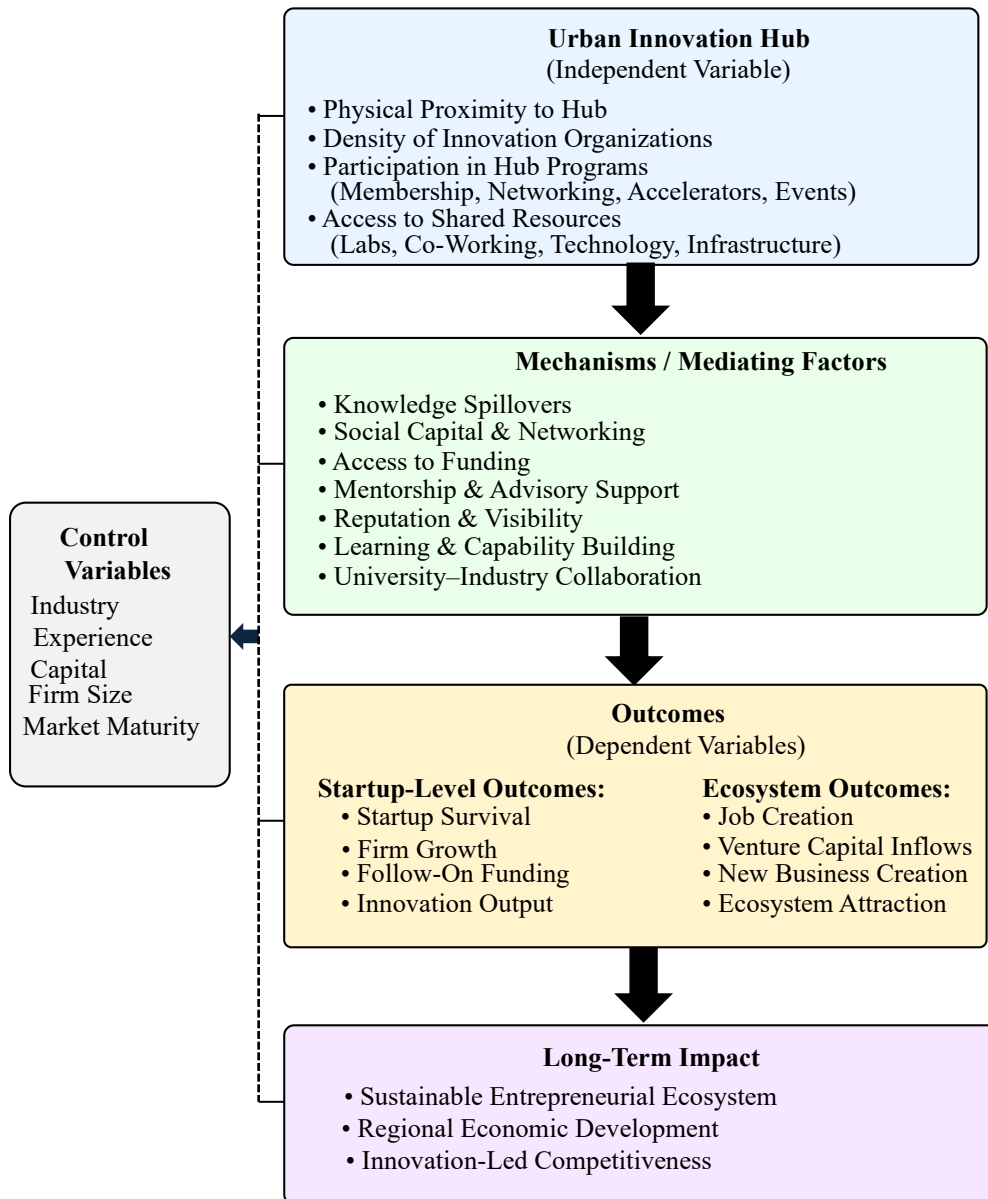


Fig. 1: Conceptual framework for urban innovation hubs and entrepreneurial ecosystem outcomes

Fig. 1 shows the urban Innovation Hub's Influence on Entrepreneurial Ecosystems. This depicts a conceptual framework showing the progression of the independent variables-operationalized in terms of proximity, organization density and availability of resources-via intermediary mechanisms such as knowledge spillovers, mentoring and social capital -to both dependent variables, defined as measures of startup's success and ecosystem wellness -and future long-term impacts (e.g., regional growth) while controlling for the other factors.

Sampling and Data Sources

The sample includes startups founded in metropolitan areas that have innovation hubs, technology districts, or entrepreneurial ecosystems. The sampling method employed in the study is purposive. This means that the startups belong to industries like information technology, biotechnology, fintech, advanced manufacturing, and digital services. In order to minimize selection bias, the startups founded within innovation hubs were

matched with those founded outside innovation hubs on variables such as founding year, industry, firm size, and initial level of financing.

The final sample includes 320 firms, 160 of which belong to startups within or in close proximity to urban innovation hubs and 160 of which are startups operating outside innovation hubs. The sample size is adequate for conducting survival analysis and running statistical models. It exceeds the minimum requirements for Cox Proportional Hazards regression.

Multiple sources are used to collect data for the purpose of ensuring that triangulation is done. They include municipal business directories, incubators, accelerators, and venture capital firms in the region, as well as reports from various governments and information on firms publicly available. Other indicators of the ecosystem are derived from local economic development organizations and innovation observatories. The analysis will be conducted using five years of data.

Variables and Metrics

The independent variable consists of the extent of the startup's integration in the urban innovation cluster based on proximity to the innovation cluster, organization density within a certain radius of the innovation cluster, and engagement in innovation cluster-based activities like networking, mentoring, acceleration programs, and innovation collaboration.

Dependent variables include the survival period of the startups and ecosystem health. The survival of the startups will be estimated using the Kaplan-Meier survival estimates and Cox Proportional Hazard models, and will be the probability of business survival at any point in time. On the other hand, ecosystem health will be assessed based on employment creation, follow-up investments, venture capital investments, partnerships, university-industry cooperation, and firm creation.

Some of the control variables are taken into account to increase the validity of the proposed model, which includes the startup industry sector, founder experience, capitalization at the beginning, firm size, market maturity, startup age, and the macroeconomic environment. Taking into account these variables will allow to eliminate the influence of extraneous factors and better understand whether startup success and ecosystem outcomes may be associated with involvement in innovation hubs.

5. Empirical Results and Analysis

For the empirical part of this study, the data were collected from 320 startups: 160 startups from innovation hubs and 160 geographically isolated startups were analyzed for five years. It was found out that startups located in urban innovation hubs had higher survival and ecosystem performance in comparison with geographically isolated startups.

Table 1: Comparative results of hub-affiliated and non-hub startups

Indicator	Hub-Affiliated Startups (n=160)	Non-Hub Startups (n=160)	Difference (%)
Five-Year Survival Rate	74.4%	58.1%	+16.3
Average Jobs Created per Startup	18.7	12.4	+50.8
Follow-on Funding Received (%)	68.1%	47.5%	+20.6
University-Industry Collaborations (%)	61.9%	39.4%	+22.5
Participation in Mentorship Programs (%)	78.8%	42.5%	+36.3
Average Annual Revenue Growth	21.6%	15.2%	+6.4
Startup Failure Rate	25.6%	41.9%	-16.3

From table 1 and fig. 2, the results indicate that there is a high level of survival advantage for those startups located within urban innovation clusters. In relation to the Kaplan-Meier analysis on survival rates, the rate of survival of 74.4% after five years was recorded for the startups within the innovation clusters versus 58.1% for

non-cluster firms. The curves show the largest disparity in the period of the first three years, implying that innovation clusters offer much-needed support in the early stages of ventures.

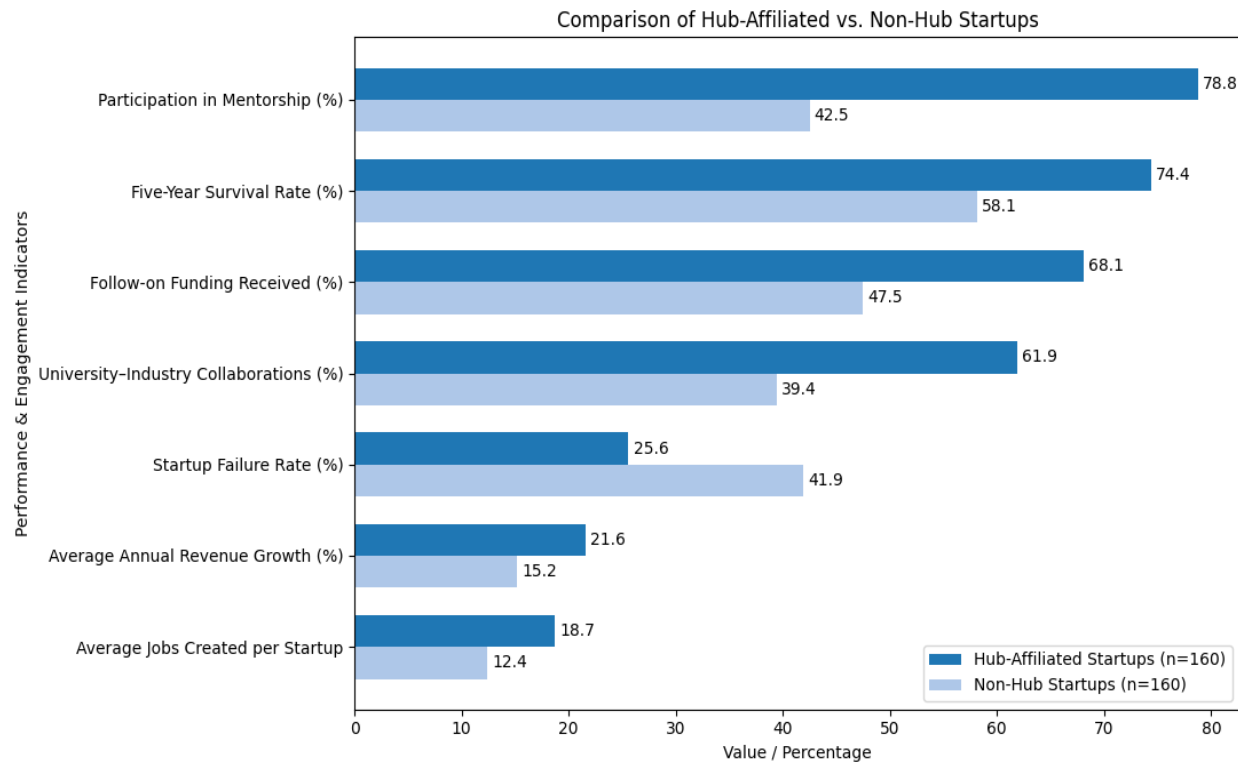


Fig. 2: Comparison of key performance and engagement indicators for hub-affiliated vs. non-hub startups
Cox proportional hazards model also supports the relationship found. On controlling for industrial sectors, experience of the founding team, level of capitalization, and macroeconomic conditions, the inclusion in an innovation cluster reduces the probability of business failure by 32%.

In addition, the findings revealed that the presence of innovation hubs generated positive spillover effects such as better access to follow-up funding, mentorship, and collaborations between universities and firms. However, some problems associated with the hub-based startups such as high rent of offices, high-salary expectations and tough competition for competent workers were pointed out in the responses. This research proves that although urban innovation hubs help develop startup resistance and entrepreneurial ecosystem existence, the crowding effects should be solved.

6. Discussion

In general, the results of the current research prove that urban innovation hubs have a vital role in developing sustainability of startups and entrepreneurship ecosystems. Following the principles of the Agglomeration Economies Theory, the startups based on the innovation hubs benefited from proximity advantages, such as financing, mentoring, skilled labor and collaboration. High survival rate of hub-based startups (74.4% in contrast to 58.1% for non-hub startups), indicates that besides being a mechanism of developing startups' survival, these ecosystems can provide a sustainable system of their support.

In terms of theory, this paper contributes to the body of knowledge concerning entrepreneurship ecosystems since this research is focused more on the startup survival rather than just their creation and proliferation. Since previous papers considered innovation centers as an element influencing startups' decision on coming to a particular location, mostly due to their ability to create startups in the area, this paper provides evidence that assessment of the ecosystem quality should be done using long-term indicators of entrepreneurs' activities. In

addition, this paper shows how knowledge spillover, mentorship, and connectivity affect the influence of hubs on startup success.

Practical implications of these results are important for city officials, innovators themselves, and managers of the ecosystems. Infrastructure development of the innovation centers should be supplemented by programs increasing networking opportunities, strengthening university-industry collaboration, increasing accessibility of venture capital financing, and entrepreneurship support services. In addition, officials should consider problems related to the high level of clustering of these centers – high prices and a lack of talent.

Innovation hub involvement is even more essential for entrepreneurs in the initial phases of venture formation because it is during such times that the need for knowledge, money, and mentoring is vital. As companies grow, however, entrepreneurs must constantly reassess the costs involved in operation and resource dependency. Moving towards hybrid or decentralized modes of operation may help continue growing despite increased costs in very concentrated urban environments.

From the results above, the study recommends that policymakers put up innovation hub strategies that focus on performance and which measure performance in terms of survival of ventures, job generation, and subsequent funding of ventures, but not just the creation of the ventures. There is a need for a mentors' program implementation by the administrators of innovation hubs, investor platforms, and collaborative research within the ecosystem to enhance positive spillover effects. In future ecosystem strategy, there should also be inclusion of less visible startups in the resource access process.

7. Conclusion

In this study, the effects of innovation hubs on entrepreneurial ecosystems and startup survival rates were examined based on a longitudinal analysis involving 320 startups over a five-year time period. The results of this research provide convincing evidence that startups in innovation hubs have better ecosystem resources and demonstrate higher levels of resilience compared to those which do not have such resources. In particular, the analysis shows that there is a five-year survival rate of 74.4% for startups in innovation hubs, whereas the survival rate for other startups is 58.1%. Additionally, the survival analysis proved that startups located within innovation hubs had 32% lower risks of failure taking into account such variables as the industry sector, founding team experience, startup's capitalization and macroeconomic environment. Apart from survival rates, this research discovered that innovation hubs also have a positive impact on ecosystem development through increasing mentorship, university-industry cooperation, venture capital investments, and employment creation. The participants in innovation hubs showed high involvement in mentorship programs (78.8%), higher opportunities for follow-up financing (68.1%) and higher research collaborations (61.9%). However, there are some problems which the innovation environment is supposed to solve that may negatively affect the efficacy of the innovation hubs unless proper measures are taken to address them. It is essential for the authorities to strike a balance between the density of the ecosystem and its affordability in order to promote the growth of entrepreneurs in the long term. This research adds value to the existing entrepreneurship ecosystem studies in that it shifts attention from the rate of startup generation to startup survival and resilience. Future research should consider the differences in terms of sectors, analyze innovation hubs in different countries, and consider how hybrid and digital innovation ecosystems affect startups.

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