

# Study on the Empowering Effect of Entrepreneurial Ecosystem Elements Grouping Effect on Startups

Meiqing Sun<sup>1,\*</sup>, Ying Wu<sup>2</sup>, Yan Zhang<sup>3</sup>

<sup>1</sup>School of business administration, Anhui University of Finance and Economics, Bengbu Anhui, 233000, China

<sup>2</sup>School of Finance and Public Administration, Anhui University of Finance and Economics, Bengbu Anhui, 233000, China

<sup>3</sup>School of Statistics and Applied Mathematics, Anhui University of Finance and Economics, Bengbu Anhui, 233000, China

## Abstract

**In order to explore the role of entrepreneurial ecosystem elements on the empowerment of entrepreneurial enterprises, this paper uses secondary data analysis to study the impact of the group effect of entrepreneurial ecosystem elements on the empowerment of entrepreneurial enterprises based on the group perspective, so as to better understand the mechanism of the role of many elements on entrepreneurial activities and help entrepreneurial enterprises. In this way, we can better understand the mechanism of the role of many factors on entrepreneurial activities, and help entrepreneurial enterprises to better utilize entrepreneurial factors to improve entrepreneurial capabilities and quality.**

## Keywords

**Startup Ecosystem; Startups; Empowerment.**

## 1. Introduction

In 2014, Premier Li Keqiang first proposed the slogan of "mass entrepreneurship and innovation" at the Davos Forum, and in 2015, Premier Li Keqiang stated the concept of "dual innovation" in the Government Work Report and the first Internet Conference. Subsequently, innovation and entrepreneurial activities have gradually become an important part of China's economic development. The number of start-ups in China is growing rapidly, but the failure rate of start-ups is also rising. Since small and medium-sized enterprises play an important role in increasing employment, promoting economic growth, scientific and technological innovation and social harmony and stable development, supporting the survival and development of start-ups has become one of the most important tasks of government departments. As a result, business incubation carriers such as science and technology parks, industrial parks and technology gas pedals, and startup business incubators play an important role in the survival and development of startups by providing basic entrepreneurial services and matching entrepreneurial resources. Because there are many elements in the entrepreneurial ecosystem and the current empirical research data of related studies are single, based on the China Knowledge Network 2009-2019 search, there are few core journals related literature with startup incubators as keywords. The existing studies on entrepreneurial ecosystem empowering startups still need attention. For many elements affecting startups break through the simple superposition and interact organically in all dimensions, forming an ecological network system that promotes the continuous emergence of new business models and new technologies. Thus, when examining the relationship between the elements of the entrepreneurial ecosystem on the study of business empowerment, a holistic perspective

focusing on the group effect analysis rather than the traditional regression analysis is needed. Therefore, this paper attempts to study and explore the linkage, matching and coordination relationships of the elements in the entrepreneurial ecosystem through a grouping perspective from the overall perspective of each element in the entrepreneurial ecosystem on the entrepreneurial enterprise empowerment to provide some insights.

## 2. Literature Review

### 2.1. The Conceptual Content and Research Perspective of Entrepreneurial Ecosystem

First of all, the concept of "ecosystem" was first introduced by Tansley, which refers to a unified whole formed by the complex interactions between different organisms and between organisms and their environment in a certain area. In later studies, Hannan and Freeman introduced the population ecology perspective to the organization-environment relationship, and then proposed the concept of organization ecology and corporate population. Later, scholars further researched organizational ecosystems and formed the subfield of organizational management - "organizational ecology". Carroll and Khessina combined the study of entrepreneurship and organizational ecosystems, and Spilling used a systems perspective to study regional entrepreneurial performance and proposed the concept of "entrepreneurial systems." Dunn first introduced the concept of "entrepreneurial ecosystem" by combining the ecological and systemic perspectives, but did not define it clearly. Subsequently, entrepreneurial ecosystems have been studied by other scholars, including Cohen and Isenberg, who argue that an entrepreneurial ecosystem is the external environment outside of the entrepreneurial entity, generally the start-up. Isenberg argues that entrepreneurship is most likely to succeed when entrepreneurs or startups are in an environment with easy access to capital and talent, government policy support, a local culture that encourages innovation and tolerance of failure, and certain infrastructure and other supporting elements. Scholars such as Lin Song, Vogel, Mason and Brown point out that the entrepreneurial ecosystem should include both entrepreneurial subjects and the external environment of entrepreneurship, and develop together as a unified whole under the influence and interaction of the two. In this perspective, entrepreneurial subjects interact with each other and form clusters associated with each other, while these clusters and the external environment form a unified whole together to form the entrepreneurial ecosystem. Vogel proposes that entrepreneurial ecosystems are interactive communities in a certain region, consisting of multiple interdependent business subjects and environmental elements such as markets and regulatory systems that evolve over time, with subjects and environments coexisting and interacting to promote business creation. Mason and Brown define entrepreneurial ecosystem as a set of interconnected entrepreneurial agents such as entrepreneurial firms, investment institutions, universities, etc. and entrepreneurial environments such as policy and culture that enhance performance through formal and informal linkages. There are 2 main types of research perspectives within the concept of entrepreneurial ecosystem. The first category is the ecological perspective, where the complex interactions between entrepreneurial subjects and the environment and the relationships between entrepreneurial subjects and the environment jointly influence regional entrepreneurial performance and activity. The second category is the network perspective, in which the relationships are constructed by each participating subject and environmental element through the network. Especially in the information age, the connection between entrepreneurial subjects, participating subjects and the environment needs to construct a close network relationship so as to ensure that information can flow quickly and accurately between different elements.

In summary, in both perspectives, the entrepreneurial ecosystem contains individuals, populations and communities composed of entrepreneurial subjects, participating subjects, and formed through certain network relationships and linkages. Therefore, this paper argues that the entrepreneurial ecosystem is an organic whole that consists of various elements such as entrepreneurial subjects, participating subjects and external environment, which are interconnected and interact with each other in order to promote the normal operation of the system and the overall entrepreneurial performance in a certain region, and is dedicated to improving the overall entrepreneurial activity.

## **2.2. Structural Model and Components of the Entrepreneurial Ecosystem**

Isenberg proposes a "six domain model" of policy and regulation, tangible markets, financial capital, human capital, social culture and supporting environment, which is further subdivided into 12 domains. Kolta R proposes the "6+6 model" of the entrepreneurial ecosystem and states that the entrepreneurial ecosystem is organized as a network and revolves around a centrally located entrepreneur. The six key elements are motivation, identification, training, block granting and empowerment, and the six main subjects involved are non-profit organizations, foundations, government agencies, academic institutions, government agencies and investment institutions. The six key elements and entrepreneurial subjects interact with each other and the six main participating subjects to form an advanced form of network organization. Vogel divides the components of the entrepreneurial ecosystem into entrepreneurship-specific and general environmental elements. Entrepreneurship-specific environmental elements include entrepreneurship education, investment, culture, networks, and support systems. Stam distinguishes the six key elements into two categories: basic elements and structural elements based on the characteristics and functional differences of the entrepreneurial ecosystem components, and points out that basic elements are the environmental foundation of the entrepreneurial ecosystem; while structural elements are important factors that facilitate the operation and development of the entrepreneurial ecosystem. Spiegel classifies them into Spiegel classifies the elements into cultural, social and physical categories based on their attributes. Culture includes cultural attitudes and entrepreneurial history; society includes investment capital and deal aggregators as well as talent; and entities include universities, infrastructure, policies and markets. Based on these scholars, Jinyun Sun and Tao Li developed a classification of the components of the entrepreneurial ecosystem and proposed that the basic elements include three types of environments, such as cultural, institutional, and market environments, while the structural elements include human and financial capital and technological research and development.

## **2.3. Entrepreneurship and Entrepreneurial Ecosystem from a Histogram Perspective**

The histatic perspective was first used in the field of strategic management, and Miller called for the adoption of a histatic perspective to study management-related issues because the traditionally used thinking about the relationships between binary or multivariate variables could not explain well the phenomena and realities related to strategy research. He uses the group state perspective to classify the types of strategies, in which the production of a particular outcome depends on the combination of antecedent conditions, and multiple elements interact with each other to produce the corresponding outcome, helping to answer questions of causal complexity such as multiple concurrent causal relationships, causal asymmetry, and multiple scenario equivalence. Therefore, in view of the complex interactions and synergistic coupling between the elements of entrepreneurial ecosystem, a histological perspective is adopted to study entrepreneurial activities, which, on the one hand, is consistent with the reality of multiple factors acting together and interdependent in entrepreneurial practice, and on the other hand, gives us a more accurate and complete understanding of entrepreneurial activities

as a whole. So far, most of the existing literature on entrepreneurial ecosystems is based on the statistical techniques of independent antecedent variables and causal symmetry, focusing on the static assumption of control variables and the marginal "net effect" of a single factor on entrepreneurial performance, with limited explanatory power in studying the complex causal relationships among multiple factors. Due to the existence of both systemic symbiotic and competitive interactions among the elements of the entrepreneurial ecosystem, interactions among the elements are common. The elements of the entrepreneurial ecosystem are interdependent and interact with each other, and the elements of the entrepreneurial ecosystem have obvious group effects rather than linear characteristics on firm empowerment[1]. Therefore, an in-depth analysis of the synergistic effects of multifactorial concurrency on entrepreneurial quality is necessary from a holistic perspective. For example, McKenny, et al. used a cluster perspective and QCA approach to classify five dimensions of strategic entrepreneurial orientation: autonomy, innovativeness, competitive aggressiveness, initiative, and risk-taking into different combinations to explore how different clusters affect firm performance.

### 3. Theoretical Analysis and Research Model

In this paper, based on relevant studies by scholars such as Isenberg, Feld, Vogel, Stam, and Spigel and their results, the elements of the entrepreneurial ecosystem are divided into four dimensions.

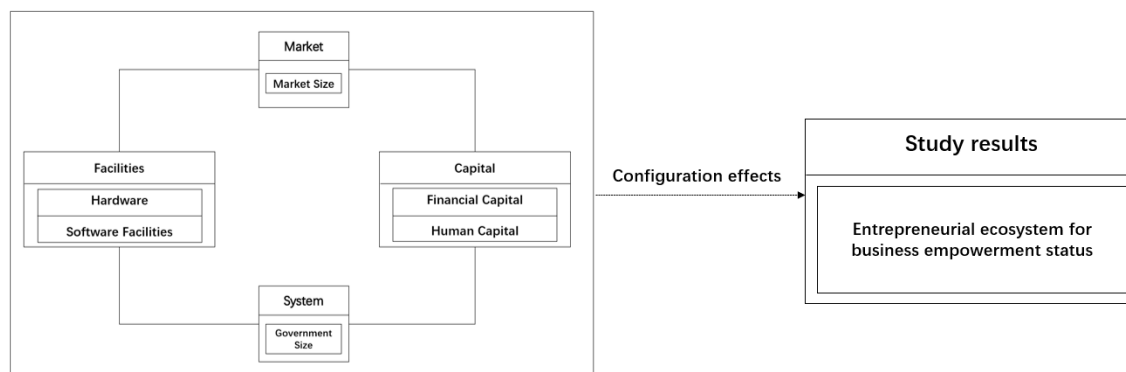
(1) Market level. According to Yuan Yuyang, market size can, to a certain extent, illustrate the level of regional economic development from the side. Economically developed regions can attract more entrepreneurial subjects, as well as more investors and investment institutions, and entrepreneurs can find and identify entrepreneurial opportunities faster, thus providing convenience for entrepreneurs, who can operate a convenient market environment to obtain resources to develop the opportunities. In addition, a larger market allows the entrepreneurial ecosystem to integrate more quality resources and thus achieve higher entrepreneurial performance.

(2) Facility level. First is hardware facilities, hardware facilities under the entrepreneurial ecosystem perspective are the material basis for focusing innovation resources and promoting the flow and combination of production factors such as knowledge, technology, talent and capital, etc. Good infrastructure can attract more entrepreneurs to participate in the entrepreneurial ecosystem. Secondly, software facilities, i.e. virtual facilities different from physical facilities, generally refer to the level of Internet-based digital facilities. In the background of double creation, the country vigorously develops "Internet+", and more and more entrepreneurial activities are closely connected with the Internet, and digital innovation and entrepreneurship such as e-commerce, self-media, and data services gradually become mainstream.

(3) Capital level. First is financial capital, which, according to Gompers, plays an important role for all stages of the life cycle of entrepreneurial subjects, especially for the start-up phase of new ventures. Adequate financial capital is conducive to the survival and development of the entrepreneurial ecosystem, and is also the basis for the services provided by the entrepreneurial ecosystem. Next is human capital, and Wei Houkai points out that talent and capital tend to have consistent mobility in the entrepreneurial ecosystem. It is generally believed that in the entrepreneurial ecosystem, the higher the level of knowledge, the richer the entrepreneurial knowledge and the more entrepreneurial experience, the more likely people are to participate in entrepreneurial activities, and the more entrepreneurial subjects are able to discover more opportunities in mutual exchanges with the participants.

(4) Institutional level. Audretsch et al. argue that the analysis of the role of government size on entrepreneurial performance is mainly derived from institutional economics theory and has both facilitating and inhibiting effects. The positive effect is mainly reflected in larger government expenditures and fully functional government functions, and good public services can reduce the start-up costs of entrepreneurial enterprises; the inhibitory effect is mainly reflected in larger government expenditures need to rely on higher taxes, resulting in entrepreneurial ecosystems and entrepreneurs face higher costs and affect entrepreneurial performance.

Through the above theoretical analysis, the elements in the entrepreneurial ecosystem are used as research variables in this paper, which constitute the theoretical model of this paper, as shown in Figure 1.



**Figure 1.** Model of the driving mechanism of entrepreneurial ecosystem for business empowerment

## 4. Research Methodology and Analysis of Results

### 4.1. Research Methodology

The qualitative comparative analysis approach is an ensemble analysis method that aims to deconstruct the phenomenon of causal complexity. The approach assumes that the factors influencing a given outcome are not independent, but interdependent. The entrepreneurial ecosystem factors have obvious group effects rather than linear characteristics on business empowerment, and one cannot rely on simple linear analysis to derive the results of entrepreneurial ecosystem factors on business empowerment. Therefore, this paper mainly uses secondary data to analyze the results of the study on the impact of entrepreneurial ecosystem elements on entrepreneurial enterprise empowerment by using the keywords of entrepreneurial ecosystem elements and group effect based on China Knowledge Network.

Ma Hongjia et al. conducted a study on multi-subject interaction in digital entrepreneurial ecosystem on digital entrepreneurial performance by fsQCA method and came to 3 conclusions[2].

(1) In the digital entrepreneurship ecosystem, digital startups maintaining a strong interaction with a single subject does not constitute a necessary condition for high digital entrepreneurial performance.

(2) There are four multi-subject interaction patterns that generate high digital entrepreneurial performance in the digital entrepreneurship ecosystem: the first path is driven by cooperative enterprises, the second path is driven by universities and research institutions with the help of intermediaries, the third path is driven by cooperative enterprises with the help of digital users, and the fourth path is driven by both cooperative enterprises and universities and research institutions.

(3) There are two multi-actor interaction groupings that generate non-high digital entrepreneurial performance in the digital entrepreneurship ecosystem. The first path is to maintain a strong interaction with the government and cooperative enterprises and a weak interaction with digital users and intermediaries, and the second path is to maintain a strong interaction with digital users and a weak interaction with cooperative enterprises and universities and research institutions, which is consistent with the groupings that generate high digital. There is an asymmetric relationship with the grouping that produces high entrepreneurial performance.

Hu Yijian applied the histological perspective and QCA method to study the entrepreneurial ecosystem based on the incubation performance of crowdsourcing spaces and concluded that[3].

(1) Individual elements at each level of the entrepreneurial ecosystem cannot constitute the necessary conditions that lead to high crowdsourcing space business incubation performance.

(2) There are three driving models that can lead to high incubation performance of crowdsource start-ups: market-driven logic driven by complementary infrastructure and talent, talent-assisted market and finance driven by hardware and software facilities, and talent-assisted market and finance driven.

(3) There are 2 driving models that can lead to non-high crowdsourcing space business incubation performance: market-network inhibition under strong government logic and market-finance inhibition under strong government logic.

(4) All 3 driving models that lead to high crowdsource business incubation performance include the presence of market size, while all 2 models that lead to non-high crowdsource business incubation performance include the absence of market size.

Based on entrepreneurial ecosystem theory, Chen Hongxi et al. used fuzzy set qualitative comparative analysis to investigate which entrepreneurial ecosystem enhances innovation output of crowdsource innovation spaces and concluded 3 points[4].

(1) The enhancement of innovation output of crowdsource innovation spaces relies on the synergy of various elements within the entrepreneurial ecosystem, including the influence of the aggregation of entrepreneurial subjects, government support, investment and financing environment, human resource allocation, innovation and entrepreneurial activities and training, and technology supply, and the role of individual elements is not sufficient to achieve this goal.

(2) There are three types of entrepreneurial ecosystem configurations to achieve the goal, which can be summarized as "subject aggregation + government support + finance-driven", "all-factor-driven" and "government support + technology-empowered". With government support, the first grouping mainly relies on the gathering of entrepreneurial subjects and high-quality financial environment; in the second grouping, the gathering of creators, investment and financing advantages and technological support play a central role; the third grouping focuses on platform technology supply services.

(3) There are differences in resource endowments and development strategies in different regions. From the perspective of the configuration of the group, the "all-factor" driven model is the most common, and the economically developed regions basically adopt this model, which indicates that the developed economic level is more conducive to the generation of all-factor entrepreneurial ecosystem. However, other regions can still build crowdsourcing ecosystems with their own characteristics.

## 4.2. Analysis of Results

Through the analysis of the above-mentioned studies, this paper draws the following research conclusions.

(1) No single element at any level of the entrepreneurial ecosystem is a decisive factor in the entrepreneurial ecosystem's empowerment of entrepreneurial ventures, so an in-depth analysis of the multiple elements at different levels and their coordinated role is also needed. On the one hand, this reflects the limited explanatory power of individual elements on the outcome and the fact that each element does not play a decisive role in the emergence of the outcome; on the other hand, it shows that for each element of the entrepreneurial ecosystem to play a role in the emergence of the final outcome, it must be combined with other elements to form a group, which needs to function as a whole.

(2) The existence of market scale is the core condition of the entrepreneurial ecosystem elements grouping, and the market logic dominates with greater influence, therefore, the market-driven logic of infrastructure and talent complementary drive type, talent-assisted market and financial drive type relying on hardware and software facilities, talent-assisted market and financial drive type three drive mode can improve the entrepreneurial ecosystem elements to entrepreneurial enterprises empowering role . Under the condition that entrepreneurial subjects are fully gathered and supported by government resources and large amount of financial capital, regardless of whether innovation and entrepreneurship education and technical support services within the entrepreneurial ecosystem are sufficient, it can also be a higher empowerment of entrepreneurial enterprises. Or the entrepreneurial ecosystem can attract more social entrepreneurial subjects to join with a lower entry threshold, and with access to sufficient government support, the agglomeration of entrepreneurial subjects strengthens the competing relationship between entrepreneurial subjects, helps the resident teams and enterprises to grow together, and provides the possibility to further sort out a complete industrial chain and form a perfect system. Alternatively, the entrepreneurial ecosystem is built around the core technology enterprises, the local government gives support and effective supervision through long-term project R&D and policy guidance, and the core enterprises are able to provide resource support for new enterprises through projects and other means.

## 5. Limitations and Insights

### 5.1. Limitations

(1) This paper constructs a model of the driving mechanism of the studied entrepreneurial ecosystem for business empowerment by including the 4 dimensions<sup>6</sup> elements in the entrepreneurial ecosystem, but it cannot guarantee that all elements are included. For example, entrepreneurial willingness, entrepreneurial effectiveness, or social culture, values, etc. Future research can consider including the above elements as conditional variables in the analysis framework to enrich the relevant research.

(2) This paper mainly uses secondary data for analysis, and there may be errors in data and case selection. The analysis of the data is still static, and the dynamic analysis process that changes over time is not readily studied. Based on the limitations of data analysis in this paper, it fails to include different time periods in the analysis of histories, and cannot reflect the changes of histories in different stages.

### 5.2. Inspiration

(1) All places should vigorously develop their economies, enhance the scale of the market, and improve the construction of infrastructure and network services. From the analysis results of this paper, it can be seen that the existence of market scale is the core condition of the factor grouping of entrepreneurial ecosystem, and the market logic dominates with greater influence. Adequate market scale and economic development level are the support and guarantee for entrepreneurial subjects to participate in entrepreneurial activities, and if the market scale is

insufficient it cannot provide sufficient resources for entrepreneurial subjects and crowdsourcing spaces to have an impact on entrepreneurial activities.

(2) For enterprises in the system, they should recognize their own position and resource capacity in the system, increase the empowering effect of the elements of the entrepreneurial ecosystem on the entrepreneurial enterprises through the organic combination of the elements, find the right position in the fierce market competition, and improve their risk-taking level by combining their own actual situation.

## Acknowledgments

**[Fund Project]** This project is supported by the Undergraduate Scientific Research Innovation Fund Project of Anhui University of Finance and Economics (Project No.: XSKY22140).

## References

- [1] Hu Yijian. A study on the entrepreneurial ecosystem on the performance of business incubation in crowdsourcing spaces [D]. Supervisor: Zhou Jinbo. Guangxi Normal University, 2022.
- [2] Hao Zheng, He Gang, Wang Xinyuan, Zhang Yong. The influence path of entrepreneurial ecosystem grouping effect on the quality of rural industrial revitalization--a qualitative comparative analysis based on fuzzy sets[J]. Science and Technology Management, 2022, 43 (01):57-75.
- [3] Ma Hongjia, Lin Yuet, Xiao Bin. The impact of multi-subject interaction on digital entrepreneurship performance in digital entrepreneurship ecosystem - a study based on fsQCA approach[J]. Research and Development Management,2022,34(03):41-53.
- [4] Chen Hongxi, Zhang Jiabin, He Yewei. What kind of entrepreneurial ecosystem enhances innovation output of crowdsourcing spaces-a qualitative comparative analysis based on a sample of 30 provinces and cities (2019-2020) [J]. China University Technology, 2022, (06):31-36.