Studying the Innovation Ecosystem Transition of IT start-ups in China: based on government and venture capital perspectives

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Abstract

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New technology generations are currently reconstructing the conventional innovation logics (Basole 2009). Firms and business processes are becoming intertwined with innovation ecosystems around them (Basole 2009). Previous researches have paid lots of attention on firms’ innovation ecosystem theory. Theoretically, de Vasconcelos et al., (2018) have clarified six main research streams in innovation ecosystem theory: industry platform and innovation ecosystem; innovation management; strategic management, innovation ecosystem strategy, value creation and business model; the innovation ecosystem lifecycle; innovation ecosystem and new venture creation; managing partners (de Vasconcelos et al.,2018). All streams are believed to propose views for further study to consolidate the innovation ecosystem theory. Meanwhile, plenty of IT start-ups are also constantly trying to innovate, whether in technology innovation, business model innovation or in building their own innovation ecosystems in China. After interviewing many entrepreneurs, chief executive officers (CEOs) and chief technology officers (CTOs) of Chinese IT start-ups, government officials at the national and local levels, fund managers of the government funds and private equity funds, it is believed that the innovation ecosystems of IT enterprises in China and their innovative logics are reshaping. They are changing closely related to the policy environment and institutional logics behind government, venture capital as well as themselves. In previous studies, researchers pay little attention to the roles and the impact of both government and venture capital when trying to explore more about young IT firms’ innovation. The transition process for innovation ecosystem development of young IT firm also attracts little interest. Fortunately, Pahnke et al., (2015) illustrate that funding partners vary from one another in significant ways to influence young firms’ innovation and enhance research interest in this research area. This paper therefore aims to fill these gaps and consolidate the innovation ecosystem theory through the lens of analysing interrelationships among government, venture capital and IT start-ups’ innovation ecosystem transition process. To answer the research question ?How do the
interrelationships and their institutional logics among government, IT start-up and venture capital influence the innovation ecosystem transition process to stimulate young IT firms’ innovation? This research conduct a case study and empirical data is collected from semi-structured interviews complemented with documents and observations. Data analysis process follows grounded theory guidelines. The key finding of the research is that within the innovation ecosystem of the IT start-up in China, the roles and relationships of government, venture capital and young firms are nearly like a pyramidal structure. Government is on the top of the pyramid with the greatest influence and priorities to make an impact on the young firms’ innovation and system’s resource flows. Chinese government is currently focusing on creating a favourable business environment has a positive effect on IT start-ups’ innovation ecosystem transition. IT start-ups and types of venture capital take up the rest of the pyramid with their different institutional logics, which leads them to construct various ways of innovation and cooperation. Innovation ecosystem are formed by their activities as a stable pyramidal structure to stimulate continuous innovation, especially more effective in business model innovation than technical innovation.

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1. Introduction
Over the past four decades, China has experienced sustained and rapid development that has attracted worldwide attention. China has been able to achieve such extraordinary growth because it has invested substantial resources in infrastructure and talent development, focused on the role of the market, and vigorously developed foreign trade and attracted foreign investment. China’s reforms take a gradual, pragmatic approach, with new policies often pilot locally before being rolled out to other regions. Through these reforms, China has transformed itself from an agricultural, rural-led economy into a global manufacturing hub and the world’s second-largest economy. At present, China is at a crossroads of development. Four decades of reform and opening up have led to rapid industrialisation and urbanisation and a surge in efficiency in China, but that has not been enough to sustain China’s past economic growth. Declining returns on public investment, an aging population and a complicated external environment all make it more urgent to find new drivers of economic growth. It is crucial to accelerate the diffusion of existing advanced technologies and innovations in order to take full advantage of China’s huge catch-up growth potential and to promote the discovery of new technologies, new products and new processes in order to continuously expand the boundaries of China’s own production capacity. China is already seen as one of the world’s leaders in digital technologies such as e-commerce, fintech, as well as in emerging areas such as artificial intelligence. Chinese unicorns are companies that use digital technology to innovate in e-commerce, mobile transportation, the financial sector and education services. Digital technology is at the heart of China’s industrial upgrading plan, which aims to increase productivity and domestic value-added in the industrial supply chain. China has recognized the importance of deepening the application of internet-related technologies in manufacturing and developing intelligent manufacturing. Therefore, the purpose of this study is to keep abreast of current development trends and focus on innovation issues in new IT start-ups. IT start-up is considered as the main force of the current technological transformation. Based on the theoretical research of the current innovation ecosystem and the practical experience of China’s IT start-up industry, this research aims to examine the interrelationship among the government, venture capital and IT start-up companies.

2. Literature review
Recently, the word “innovation ecosystem” has received increasing research interest. It is regarded as a key factor for enhancing the innovation capabilities among individual companies, various industries, and different levels of regions and nations (Jackson 2011). In this study, we focus on the level of individual corporations’ innovation ecosystems.

2.1 Individual corporations’ innovation ecosystem: concepts and theory
Many researchers have paid attention to the concepts and the theory development of firm’s innovation ecosystem in order to explore the valuable networks of suppliers, distributors, and outsourcers, technology providers, product or service providers and other organization (Su et al., 2018). Previously, the ecosystem’s concept is neither well defined nor well shared. It may only have practical insights to give suggestions for the firms’ survival and growth. For example, in 1993, an American economist James F. Moore mentions “business ecosystem” as a new strategic concept in his review article which has been published in Harvard Business Review. It suggests
that companies’ networks should be considered from a higher and more uniform conceptual level which is similar to a biological ecosystem (Moore 1993). A business ecosystem allows a random factors, elements and competitive and cooperative activities within the individual firm network move to a more structured community in four distinct stages: birth, expansion, leadership and self-renewal. In 2004, Lansiti and Levien identify ecosystem by two dimensions of “level of turbulence and innovation” and “complexity of relationship” and four different players: Keystone players, Dominator, Commodity and Niche players (Lansiti and Levien 2004 b). They emphasize that each player has its own duty on creating a new platform in which new participants create and share value or on integrating a network’s resources and activities horizontally or vertically. In 2006, Adner defines innovation ecosystem as a series of collaborative arrangements through which companies can combine their individual offerings together into corresponding customer solutions.

More recently, de Vasconcelos Gomes et al., (2018) use systematic review and make a content analysis of 125 articles and find the turning point of conceptual change that business ecosystem relates to value capture and the innovation ecosystem relates to value creation. Dehehayir et al., (2018) pay attention to the genesis of innovation ecosystem and extract four key roles of actors: leadership, direct value creation, value creation support and entrepreneurial ecosystem. Tsujimoto et al., (2018) also illustrate four research perspectives after reviewing 90 published papers: industrial ecology, business ecosystem, platform management, and multi-actor framework. A series of researches continually extend the definition of “innovation ecosystem”, which enables further technological innovation and development (Jackson 2011 1). Firm’s technological innovations are currently created through a more dynamic and complicated ecosystem, involving not only enterprises but also government agencies, research institutes, universities, industrial players, and so on (Frankel and Maital 2014).

2.2 Government perspective

At present, in order to promote sustained productivity growth and foster new growth drivers, China can follow three clues to deepen structural and institutional reforms that promote three elements: Distortion, Diffusion, Dicovery (Ma and Victoria 2019).

The first element is to reduce distortions in the allocation of resources, which in the past has been a key driver of growth, and continued reforms have brought China to its biggest potential production frontier today. This element requires reforming the markets for factors such as finance market, labor market and land market to ensure that resources are allocated to the most efficient and productive sectors of the economy (Ma and Victoria 2019). The second element is to accelerate the diffusion of those more advanced existing technologies, products and management skills that will help China expand its current production frontier to the global frontier. This requires an emphasis on innovation and science and technology policies that promote technology diffusion; Upgrade education and training systems to make the economy more open, integrate with the rest of the world, and promote access to global technology and innovation (Ma and Victoria 2019). The third and final element is discovery, the discovery of new innovations and technologies that will help China advance the global technological frontier. As China gets richer and closer to the technological frontier, this element will become even more critical. It needs a bottom-up, collaborative national innovation system (Ma and Victoria 2019).

Governance and institutional reform are the basis for bringing all three elements into play. As the economy approaches the frontier of global production, countries need to play a greater role in
supporting the market, promoting market competition and improving the business environment, so that market participants can form stable expectations and thrive in fair competition. At present, China is pursuing these three growth drivers simultaneously. All three elements require the support of policies and institutional reforms to promote market competition. Greater market competition will allow those who are more competitive to gain access to resources and encourage companies to invest in innovation and research and development, thus becoming more competitive. When countries focus on promoting market competition on the basis of a good business environment and fair competition, businesses have the confidence to make long-term investments in real innovative research and development.

In conclusion, a single firm basically is not able to develop and deliver a complicated value proposition process from start to finish in an increasingly specialized world (Kapoor and Furr 2015). As a result, firms usually need to rely on other actors, resources, activity support in their innovation ecosystem, generating an ecosystem-wide value proposition (Adner 2012) and combining different actors contributions (Hannah and Eisenhardt 2017). In this way, innovation ecosystem enables firms to leverage ecosystem relationships for higher value creation through the network effects and synergies arising from complementarities among actors (Adner and Feiler 2017; Clarysse et al., 2014).

2.3 Institutional logics and young firms’ innovation

Institutional theory illustrates how individuals and organizations’ activities within them are shaped by what is considered as rational, necessary and proper (Tolbert et al., 2011). Based on the institutional theory, more and more researches enhance their research interest in examining the ways in which the institutional logics, including taken-for granted norms, practices and structures of different kinds of organization influence IT start-ups performance and their pursuit of innovations. Institutional logics underpin the objectives and value proposition of an organization and have an impact on organizations’ internal operations and external interactions (Marquis and Lounsbury 2007; Thornton and Ocasio 2008). Institutional logics involve a series of assumptions and identifications about what is considered as appropriate and rational for an organization to do (Pahnke et al., 2015). They are usually deeply embedded in individuals’ cognition and preferences in different organizations. Therefore, institutional logics can influence how organizations’ members behave and interpret with others and are also able to generate a complete understanding of firms’ behaviors in a more accurate way. Different kinds of actors and organizations often have distinct institutional logics, within an innovation ecosystem, leading to difference in ecosystem’s internal relationships. Empirical work has already made some achievements. For example, Thornton et al., (2012) states that organizations create underlying norms about authority, membership and legitimacy. Glynn (2008) also suggest that organization also develop some basic strategy based on members’ views on their identity and strengths. Sine and Lee (2009) show a significant result that new firm’s founding rate is higher when the whole organization has wider normative acceptance of new firms. Similarly, Benner and Ranganathan (2013) suggest that the technical start-ups may have better opportunities to succeed if their former institutional logics are similar to those logics in the new field.

In conclusion, in terms of many new technology-based start-ups, innovation is regarded as the heart of their performance (Pahnke et al., 2015). The capabilities of creating technical breakthroughs and commercialize them as new products are central to IT start-ups survival and success. New firms are often looking up to external organization and resources to help themselves
to create and commercialize their innovation. As a result, research is becoming more and more interested in the institutional logics behind different actors and organizations in young IT start-ups innovation ecosystem.

3. Research questions and methods

3.1 The case
To answer the research question and to reveal the interrelationships and their institutional logics among government, IT start-up and venture capital in firms’ innovation ecosystem, this study adopts a case study approach, which is considered to answer “how” type research questions better (Yin 2009). Specifically, this study also develop a conceptual framework from the literature and try to test this framework via data collected from China and “further exposed new theoretical findings by applying the framework to the phenomenon (Strauss and Corbin 1994).”
To select cases, this study considers in what extent the case selected will represent the phenomenon of IT start-ups’ innovation ecosystem transition in China. We selected Beijing in China as the setting of case study. Because this city is currently the center of entrepreneurship and innovation in China, with the largest number of IT start-ups and resource flows.

3.2 Data
This data collection process are processed based on the previous analytical framework. The data was collected from multiple sources. In 2019, from 19 July to 7 November, we interviewed chief executive officers (CEOs) and chief technology officers (CTOs) of 15 Chinese IT start-ups, 8 government officials at the national and local levels, 15 fund managers of the government funds and private equity funds in Beijing. We interviewed each person individually and each interview lasted from 40 minutes to maximum 2 hours. We audio-recorded and later transcribed the interviews after receiving all informants’ permissions.

4. Discussion and Conclusion
The key finding of the research is that within the innovation ecosystem of the IT start-up in China, the roles and relationships of government, venture capital and young firms are nearly like a pyramidal structure. On one hand, government is on the top of the pyramid with the greatest influence and priorities to make an impact on the young firms’ innovation and system’s resource flows. However, government is also the least actor directly involved in the various ecosystem’s behaviors. In this way, the development of IT start-up industry is more about commercial competition rather than traditional industrial development under government planning. Meanwhile, the government’s public service transformation provides many IT start-ups with a lot of opportunities and orders. Chinese government is currently focusing on creating a favorable business environment has a positive effect on IT start-ups’ innovation ecosystem transition. Chinese government is currently focusing on all the distortion process, the diffusion process and the discovery process. The promotion of these three processes has played a positive role in the healthy development of IT start-ups innovation ecosystem. Specifically, the distortion process of government enables resources within the ecosystem can be transferred in a more efficient way. As a result, in IT start-ups’ innovation ecosystems, the diffusion process and the discovery process and the former will form a virtuous circle, in which IT start-ups, government, and venture capital have the confidence to make long-term investments in truly innovative research and development. Otherwise, firms and venture capitals will demand far more business innovation and returns.
rather than long-term investment in technological innovation. On the other hand, IT start-ups and types of venture capital take up the rest of the pyramid with their different institutional logics, which leads them to construct various ways of innovation and cooperation. Generally, there is no doubt that the investment objectives of government funds and private equity funds are not the same. However, there is big difference between government and non-government funds is that the former makes investment decisions for goals and the latter choose different investment plan for value. This can be reflected in the use of people and a variety of behaviors. On the premise of achieving the basic objectives, the investment pattern of government funds is relatively similar to managers' personal style. This makes the choice of projects very different from one government fund to another. And due to different levels of government personnel composition, the same budget plays a different role in the innovation ecosystem. In all, IT-startups' innovation ecosystem and all actors' behaviors are significantly affected by basis of norms, strategy and attention of venture capitals’ institutional logics. If an innovation ecosystem can be divided into two parts: market and non-market. Government belongs to non-market part while venture capital and IT start-ups are in the market part. Innovation ecosystem are formed by their activities as a stable pyramidal structure to stimulate continuous innovation, especially more effective in business model innovation than technical innovation.

References


