Guest editorial

Innovation and the digital economy of China and the Silicon Valley

Introduction

This special issue focuses on an important, timely and exciting theme: "Innovation and the Digital Economy of China and the Silicon Valley". The special issue consists of five papers, and together they make a valuable contribution to the rapidly growing field. The authors of these papers are all seasoned researchers, and they all succeeded in substantially extending the existing literature. We will provide a critical summary of these interesting papers next.

The first paper "Silicon Valley, France and China: A Comparative Study of Innovation Systems and Policies" is by Nathalie Aminian and K.C. Fung. In this paper, the authors study various important features of the innovation system and policy in France and China. As a benchmark for comparison, the paper also highlights some innovation-related features of *Silicon Valley* and *California*. The paper first examines innovation in France. The French innovation system and policies are found to be under significant changes, transitioning from a centralized state involvement to a more decentralized framework. The authors argue that despite the efforts by the French Government to decentralize and to localize, the innovation system in France is still primarily driven by various government ministries. Nonetheless, there are interesting new policies and new actors, including the creation of competitiveness clusters. The French private sector is increasingly contributing to the innovation efforts, but a more pervasive start-up culture and a more thriving innovation ecosystem need to be nurtured. The system can be characterized by being *in transition*, but still *government ministries-driven*.

For the case of China, the paper highlights the important role of the early technology cluster Zhongguancun (ZGC) in Beijing, sometimes called the *Silicon Valley* of China. ZGC has some positive characteristics for economic growth. These include government support, spinoffs as well as agglomeration effects, much like the clustering effects in *Silicon Valley*. But the most exciting development in China is the growth of its internet-related sector. The paper argues that the internet-driven economy is a disruptive, systemic technological change, and it is rapidly expanding in China. China has the important advantage of scale and a very deep pool of talents. The Chinese internet firms are fast and nimble, and there is an intense domestic competition. The private internet sector is thriving in innovation activities, despite difficult government regulations and control. Digital China also is now focusing on global expansion, and it may well have the ability to *disrupt* the global innovation market in a significant way. The system in China can be viewed as a *hybrid model*, where domestic private firms are thriving, but with the government providing heavy regulations while at the same time giving favorable supporting policies.

The paper points out that the ultimate benchmark of comparison is still *Silicon Valley*, with its dynamism, robust innovation system and an entrenched start-up culture. *Silicon Valley* is also blessed with world-class research universities, including the *University of California* and *Stanford University*. This paper is one of the earliest papers in the literature that focuses on the comprehensive comparisons of innovation systems and policies in *Silicon Valley*, *France* and *China*.

The next paper "FinTechs in China—with a Special Focus on Peer to Peer Lending" is by Caroline Stern, Mikko Mäkinen and Zongxin Qian. The authors first describe the recent development of payment services and peer-to-peer (*P2P*) lending in China and then analyze empirically the determinants of such lending in different Chinese regions for the

years 2014-2017. Mobile payments and P2P lending in China are already very popular and are gaining market shares rapidly. This paper shows that mobile payments are already a real alternative to other electronic payments and cash in China. The widespread use of the internet and mobile phones supports this development. The paper highlights an interesting feature of the lending market in China. It is well-known that the financial market in China is dominated by large state-owned banks. As a result, a shadow banking system is developed to provide loans to enterprises and private households. In this context, P2P lending platforms also start to grow in China. The number of platforms operating in the country reached a peak toward the end of 2015.

The descriptive analysis in the paper shows that the increase in the number of the P2P platforms in China seems to follow an inverted U-shaped pattern. The outstanding balances of P2P lenders continue to grow. The average yields of P2P lenders have decreased sharply. The authors also conduct several empirical exercises. The statistical results show that P2P lending is more extensive in Chinese regions with more mobile phone subscriptions. In addition, in regions where the outstanding balance of P2P lenders is high, the size of the traditional banking sector tends to be low. Finally, the paper also finds that the number of the P2P platforms is negatively related to fixed assets investments in the region. This is one of the few papers in the literature that combines both insightful qualitative analysis as well as some formal empirical testing in the research area of FinTech in China.

The third paper "Big Data-Driven Business Model Innovation by Traditional Industries in the Chinese Economy" is by Sarah Cheah and Shenghui Wang. The paper aims to focus on how big data can transform various business model innovations in traditional industries. It highlights the construction of various mechanisms that lead to big data-driven business model changes. Market, strategic and economic perspectives are provided, linking the development of big data to the core logic of business model improvements.

The paper applies qualitative but logical method to the study of big data. Case study analysis focusing on manufacturing firms in China is provided in the paper. The authors develop an integrated framework to analyze the elements of big data-driven business model innovation. The highlighted framework consists of three elements: perspectives, business model processes and lastly big data-driven business model innovations. A strong infrastructure that smoothly integrates internet of things, customer systems and production systems for manufacturing is essential for firms. Management needs to make sure that its organization's structure, climate and human resources are integrated for the transformation. In general, users are more likely to share their customer experiences and feedback when they are given a convenient platform.

The paper applies the constructed integrated framework to three companies operating in China's traditional industries – Suning, Haier and Suofeiya. Even though the number of cases is relatively small, the studies demonstrate that the mechanisms of business model innovation based on big data are an evolutionary and dynamic process. During the process, big data has been used extensively by the companies to discover value, create value and realize value from market, strategic and economic perspectives.

From the market perspective, companies can determine market demand through big data collection to discover value. At a strategic level, new business models may be developed to create value in the form of product, process, organizational or market improvements. From the economic perspective, firms can realize value by reducing operational costs or finding new revenue sources. With big data, firms can continuously upgrade their existing business models to improve their advantage.

Given the high fixed cost in human, industrial and intellectual capital for many companies, the functions of big data processing, collection and analysis are likely to be

outsourced to consulting firms specializing in big data. However, over time, more human resources with practical expertise and prior experience in big data will become more available. It is expected that in the future, big data applications are likely to undergo standardization. One major contribution of this paper is the construction of an integrated framework to examine big data. In addition, the three case studies are highly useful and interesting.

The fourth paper "Innovation and Imitation: Competition between the USA and China in Third Party Payment Technology" is by Ya-Wen Cheng, Su-Ying Hsu and Chu-Ping Lo. It is pointed out in the paper that third-party payments were first introduced by the US company PayPal. At that time, American consumers mainly used credit and debit cards. Soon after the invention of PayPal, China developed a localized version called Alipay. Because of the lack of financial infrastructure, Alipay quickly became the main payment method for online transactions in China. At present, the number of global transactions conducted with Alipay is three times that of PayPal. In addition to online transactions, Alipay also integrates with mobile payment applications to facilitate offline services, making physical transactions more convenient for customers. In the case of the technologies of third-party payment, the imitator surpasses the inventor.

According to the paper, the USA has a more comprehensive internet network, higher internet penetration and a much more developed e-commerce industry compared to China. However, China's lack of financial infrastructure has actually caused the third-party payment market in China to leapfrog. PayPal enhances the efficiency and security of transactions, but the security of financial transactions is not a major issue in the US financial systems. Legal mechanisms in the USA are better established compared to China. Credit card usage is high in the USA. Most online transactions are conducted using credit and debit cards rather than checks, so few services were replaced by third-party payments in the USA.

In contrast, the credit card penetration rate in China is low, and other non-cash transactions tend to be difficult. The authors point out that banks are unwilling to support small online payments, even though small and mid-size enterprises have great need for these services. China's lack of credit mechanisms means that users lack confidence in the security of online transactions. This facilitates the rise of Alipay, a third-party, non-financial credit intermediary. The USA has already invested much in the smooth operations of credit cards and checks. China lacks the infrastructure for payments made with credit cards and checks, and therefore the opportunity cost of moving directly from cash transactions to third-party payments is much smaller than that of the USA.

As pointed out by the paper, the number of internet users in China is almost twice the entire population of the US population; the scale advantage is an important element behind the successful catch-up story of an imitating China. While the general technology contours of Alipay are mainly imitation-oriented, nevertheless, there are useful localized features that the service provides. To make Alipay more user-friendly, Alipay has conducted considerable local adaptions based on the Chinese market conditions. These are not radical changes. Nonetheless, these local adaptions could be viewed as forms of innovations.

The fifth paper "China's Digital Policy and Its Non-Negotiable Rationales" is by Martina Francesca Ferracane and Hosuk Lee-Makiyama. The paper studies China's digital policy with a focus on highlighting the reasons behind such policies. The authors provide a detailed catalogue of the measures China use in the policy area of digital trade. They find more than 70 such policy measures. The paper analyzes the objectives behind these measures. These reasons range from industrial policy, public order, national security and to provide support for China's fiscal structure and state-owned enterprises. For example, in

industrial policies, China has tariff peaks of 35 per cent applied to certain information and communication technology (ICT) products such as lithium batteries, electric parts and wirings. China's public procurement framework contains an active "Buy Chinese". However, the authors also point out that China is not alone in pursuing some degree of protectionist industrial policy. For example, the USA has its Buy American policy. The European Union has tariff protection against imports of consumer electronics. The paper makes a nice contribution by highlighting new perspectives in the digital policy in China.

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