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The Rise of China: Innovation or Cost Leader

Introduction

Years ago, when Lee Kuan Yew, the founding father of modern Singapore, was asked in a conference in Barcelona about the innovation of China; he told this story: Lee was then meeting the president of Siemens and he launched the question of which country was more innovative: India or China? Most people, including the Chinese present, were expecting the answer to be India. However, to Lee Kuan Yew's surprise, the reply was China. Why? The explanation was simple: Siemens had Research and Development (R&D) Centers in both India and China. When a problem was sent to two centers for solution, both came back with results before established deadline. However, the R&D center in China provided several alternatives in addition to the result requested.

Over recent decades, China has become well known as world workshop or manufacture center. At the same time, its innovation capability is often questioned in the Western, with a special counter-emphasis on its low-cost model. On the one hand, academics and practitioners are constantly surprised with its average two-digit GDP annual growth rate. Even though a recently announced annual growth rate is only around 7 or 8 percent, it is still impressive given the globalized economic crisis effects: most Western countries were still in recession or struggling to aspire to a growth rate of 2 or 3 percent. On the other hand, China continues to receive criticism on its economic development model. Basically it refers to low-labor-cost based competitive model, in addition to huge consumption of nature resources and raw materials. Both environmental and human rights issues have been a big concern for the sustainable development of the Chinese economy.
While both environmental and human right issues have a profound impact and deserve their own merits for discussion, in this present book we focus on the innovation as the source of China’s sustainable economic development, and the source of China’s innovation per se. That is, there is a less studied and observed innovation issue in Chinese enterprises beyond its low cost. Few have observed that what lies behind the huge and impressive numbers are strategic innovation based on both hard-working and creative business model combined with modern technology.

The competitive cost of Chinese products and services has for a long time been an important part of the strategic advantages of Chinese enterprises. This is unquestionably a factor in its ongoing advantage in global business, since no house can be built on sand. Similarly, innovative enterprises need to focus on their pricing structure in order to be profitable.

Our principal argument for the innovativeness of Chinese enterprises is that in reality if the advantages of low cost were to have been the sole source of Chinese firms’ development, then the Chinese economy as a whole, reflecting their business dynamics, could have not sustained its development for so many decades – with a high probability of continuing to grow in the coming decades. The data shows that emerging economies such as India, Vietnam, Mexico and Turkey have already replaced China as favored lower-cost production locations. Some Chinese multi-nationals are even relocating some of their production centers in these emerging economies to reduce production cost.

Thus, the decisions to make continuous foreign direct investment to build up production centers in China are based on more than just low cost. So it could be argued that the principal motivation for foreign investment is the pursuit of the huge Chinese market potential. Without denying that fact, some Western investors also illustrate that even though they are not entering into Chinese market in the short term, their factory in China provides rapid innovation outcomes for their global market, in terms of both quality and volume.

On the other hand, the increasing phenomenon of Chinese enterprises moving abroad raises an additional question about the aforesaid advantage to Chinese companies being based on low cost. If the latter is true, then Chinese enterprises would immediately lose their advantage once they had left their Chinese production centers. Similarly, China is open to foreign investors building manufacturing centers, so in theory all firms, whether Chinese or foreign, have the same chance of accessing cheap labor in China.
Purpose of the book

The purpose of this book is to clarify these doubts as to whether Chinese enterprises are innovative, and having done so, to define these sources of Chinese innovation. For instance, institutional factors have always been regarded as playing a relevant role in Chinese transitional economic development and its innovation capability. Fuller (2009: 61) acknowledges the effort of institutional factors when evaluating and understanding the institutions and practices of National Innovation System (NIS) in China. As China is transitioning from a socialist planned economy and a developing economy, the role of its institutions is more relevant than any other economic context.

Nevertheless, the focus of our argument on the sources of innovation in China is not so much on governmental support as on the entrepreneurial activities of indigenous Chinese firms. With the recent surge of interest in the innovation phenomenon in China, with literature dedicated to that issue (e.g. Xie and Wu, 2003; Liu and White, 2001; Gu, 1999), studies have been done on the different underlying factors, referring both to developments in technology and to the other underlying elements that promote innovation. For instance, previous works have pointed out the importance of institutions to encourage learning (e.g. Bell and Pavitt, 1992), as well as the importance of learning in learning to enhance positions of capability in the global production network (e.g. Liu and Zhang, 2014). In order to understand the innovation phenomenon in China, a wide range of factors, from the national/regional innovation system to networking and social capital, have been explored. We also attempt to expose the hidden factors such as human culture: for instance, how do learning and knowledge transfer occur? How do human resources play their role in innovation and creativity? What does multinationalization mean for Chinese innovation?

Innovation is often regarded as technological development (e.g. Sun, 2002) rather than anything else, so the term is often confused with “invention.” However, in business and management, innovation is much more broadly defined, with a range of classifications. For instance, the product, process and strategy type of innovation is defined by Grant (2013). But because the focus is usually on technology, innovation is often narrowly defined in literature, research and the policymaking process. While technology is unquestionably relevant in the innovation process, other factors such as culture and knowledge also determine its success, but have attracted much less study as a source of innovation.
With this purpose in mind, we go beyond the technological type of source of innovation in Chinese firms. Fuller (2009: 59) defines “contributions to technological development” in China as “using local Chinese human resources to create products that are closer to the international technological frontier than those products commonly created in China in the recent past.” The study specifically includes a condition that local human resources must be included, to avoid counting only foreign technological personnel as contributing to technological development in China.

The assumption on which Fuller (2009) implicitly builds the foundation of his hypothesis is that human resources, especially local ones, are essential to the development of technological innovation in China. His logic is based on the point that “without any knowledge-transfer to the local workforce, such operations should not be deemed as contributing technical knowledge to the host economy because the knowledge leaves the host economy as soon as the foreign technical personnel depart” (p. 59). Though the principal determinant for innovation is still technology, the study recognizes other variables such as human resources, as knowledge workers influence the performance of innovation. In previous decades, overseas Chinese returnees were deemed as playing an important role in many new technology operations (Saxenian, 2002). Nonetheless, in the industries studied by Fuller (2009), especially in the integrated circuit design industry in China, returnees or foreign technical personnel were a minority among the technical staff of the new technology firms.

Though the definition of Fuller (2009) regarding innovation and technological development is arguable, his finding may be limited by the specific industry context (the IC industry is principally dominated by Taiwanese firms; Liu and Zhang, 2014). The fact that local human resources sustain the industrial innovational system illustrates to certain extent the reality of innovation in China. Rather than innovation arising from imported technology, as is usually believed, it is in fact the domestically generated broadly defined innovation which has been the principal source of the success of Chinese enterprises.

Furthermore, technological innovation is usually measured by patent registration. But even though China has gained a reputation for the impressive number of patents it has registered in recent years, in this book we refer more the concept of innovation in a broad sense. That is, we define innovation as not only technological innovation, but also to include process innovation and strategy innovation. It is the last in particular that we would like to emphasize, since it is the springboard
for Chinese enterprises to become highly competitive in the global market. A combination of different types of innovation is what leading Chinese firms plan to use in order to position themselves to advantage in the current hyper-aggressive, borderless market, and to be prepared for future strategic moves.

Our hypothesis on the rapid economic development in China is based on its innovation system, which is a consequence of an exemplary combination of the paradoxical factors of high technology and low cost. In the 1970s and 1980s, as Japanese firms emerged into the global market, the management of the best enterprises (such as Toyota) were able to handle these contradictory issues. They managed to keep their overall operational costs low in order to provide tempting offers to clients; yet they also supplied high quality goods and services, satisfying their customers’ needs. Do Chinese enterprises simply copy the Japanese strategy, managing to transfer knowledge from the outside and then internally creating its own? Are there any features of Chinese enterprises that are distinct from Japanese ones, despite the fact that both are from Eastern Asia, which from a Western viewpoint pertains to the same cultural bloc? (Kase et al., 2011)

Theoretical foundations

One of the principal theses of this book is that the underpinning element sustaining Chinese economic development is business entrepreneurship and the highly innovative systems surrounding it. Based on our extensive research work over recent years, we propose that the innovation of Chinese enterprises has been based not only on technology but also, essentially, on strategy and the business model. In addition, we challenge the common understanding of the way in which Chinese culture impedes innovation, we argue the contrasting cultural effects on innovation, and we propose that there is innovativeness in the embedded cultural roots of Chinese society. Examining the network characteristics along with Chinese economic evolution, we also distinguish three types of network-based innovation: a government-initiated innovation network, a twin-driven institution–market innovation network, and digital-era network-centric innovation. Thus, we come to the point that the innovative capability of Chinese enterprises centralizes on its people by proposing a people-centric innovation model through strategic human resource management. Finally, we discuss the challenges that Chinese enterprises face when they multinationalize overseas, and how they can continue innovating while overcoming these challenges.
Since human resources such as knowledge workers are part of the underlying sources of Chinese innovation, we must discuss various aspects of social science such as cultural influences. At Professor Richard Freeman’s Science and Engineering Workforce Project (SEWP) at the National Bureau of Economics Research (NBER), talented workers are intermingled with science and technology. China has made huge efforts and investment to transform its transitional economy from that of low-cost and large-scale manufacturing to an innovative one. However, can China turn itself into a true innovator? What are the drivers for Chinese innovation, and what is the operational mechanism? These are the basic questions that the book attempts to answer.

We recognize the innovation steps that China has taken along this exploratory and practical path. At the different levels – national, industrial, firm, and individual – everything has been integrated into a new transitional economy of innovation. Throughout the book, we draw attention to highly innovative systems which describe different mechanisms of Chinese innovation practices (see Figure 1.1).

First, as an economy in a profound transition process and undergoing rapid development, the Chinese economic and social system possesses strong tolerance with multiple characteristics. What underlies the so-called “socialism with Chinese characteristics,” “socialistic market economy,” or “state capitalism” as known in the West, is its core institutional force.

**Figure 1.1** Integrative framework of highly innovative systems in China
mechanism of a strong government and a big market. These two principal drivers interact with and complement each other, together playing an important role in several aspects of the social economy, including innovation in industrial economy. Thus, the two drivers of system and market are equally important factors that jointly enhance the innovation capability of the enterprises.

As far as the system drivers are concerned, it is the explicit policy combined with the implicit cultural root that together influence innovation in China. In terms of policy, in 2006 the Chinese government issued its National Long Term Science and Technology Development Plan (2006–2020). Since then, the government has prioritized a national strategy for China to become an innovative country within 20 years.

Innovation has been the driving force at the national, regional, industrial and firm levels. The regional innovation system means that industrial clusters have been developed rapidly, represented by economic and technological development zones and science parks. This not only provides healthy promotion for firms’ innovation in the policy environment, but also gives opportunities for firms to network and jointly innovate. This innovation-oriented policy platform offers excellent support to the building of the Chinese innovation network.

Regarding social culture, Neo-Confucianism has long been one of the basic tenets of Chinese traditional culture. Many of its frequently cited elements, such as power distance (i.e. no independent judgment) and middle-way (i.e. seeking neither extremes nor to overpower) are often considered as impediments to innovation. However, combining Chinese traditional culture with today’s evolution and changing society, we argue that there are many aspects of Chinese culture that positively facilitate innovation. For instance, “power distance” may centralize energy and power toward a single objective of innovation under high bureaucratic structure, thus resulting in a positive effect (Hirst et al., 2011).

As shown in Figure 1.1, we list some of cultural elements to provide examples of contrasting effects on innovation. For instance, Chinese society lays emphasis on the interpersonal “guanxi” in social interactions. This cultural element not only provides active social relationships, but also offers a deep micro-foundation for collaborative innovation networking among organizations. Collectivism, also a typical character of Chinese culture, facilitates the formation of intra-organizational highly participative, and high commitment cultural environment and management practices, which in turn positively affect innovation (Zhou et al., 2013).

From the market-driven logic, the huge domestic market provides space for survival and opportunities for rapid growth as well as room
for innovation. At the same time, with the economic opening up of China and its integration into the world economy, the strategic exploration of a multinationalization process gives more chances for Chinese enterprises to improve their innovation capability. Nonetheless, the enhancement of the innovation capability of Chinese enterprises is an evolutionary process, shifting from the importation of external knowledge to the internal generation of innovative ability.

At the beginning of China’s economic opening up, Chinese workers learned knowledge and innovation through their self-absorptive ability, to learn by doing when working for international leading firms as Original Equipment Manufacturer (OEM) or market agent. This is also called the “ShanZhai Model” of imitative innovation. Then, learning by imitation, Chinese enterprises approached their huge domestic market with a highly efficient low-cost manufacturing capability, to rapidly implement the commercialization of the application type of innovation. Once their domestic market reached maturity, and the accumulation of their financial and innovation capability in the domestic market reached a highly competitive level, Chinese enterprises looked for overseas opportunities. Through the strategic leverage of alliances, mergers and acquisitions, many competitive Chinese enterprises carried out consolidative innovation with leading technological resources in the industry. The capability to produce high technology at relatively low cost is becoming the salient feature of the integrative and configurational innovation of multinationals from emerging markets (Ramamurti, 2012). It is the turning point at which a multinational from an emerging market can take the opportunity to grow and become a global leader. In this process, Chinese enterprises are taking an important role, managing to make the leap from indigenous manufacturer to global innovator.

This new phenomenon of the multinationalization process of enterprises from emerging economies, including China, creates a challenge to a new world economic order. For the challenge to be successful, internal-generating independent innovation is crucial in order to build up sustainable innovative capability in Chinese enterprises – much more so than in the transformation process from external innovation capability in the early stages of development. In this internal building of capability for innovation, human resources (HR) become the key source to gain and sustain a competitive advantage. Indeed, the Chinese HRM structure has been constantly optimized through a continuous upgrading of economic industry. Based on the vast Chinese labor market, the accumulation of high technology and talented technicians are of great
importance to government and enterprises. Through the highly participative human system that invests heavily in human capital, improving employees' participation and motivating their intrinsic passion, it is the intelligent and hard-working Chinese skilled workers that are the principal source of the independent innovation of Chinese enterprises to face the global challenges when they multinationalize.

**Structure of the book**

The book is arranged in chapters such that it will:

- support the argument that it is innovation rather than the low cost of labor that boosts Chinese economic development,
- further explore the source of innovation,
- underline the strategic focus of innovation,
- emphasize the relevance of cultural factors,
- highlight the function of social network in Chinese context,
- theorize a humanistic approach to strategically managing people in Chinese enterprises, and
- conclude with final challenges in multinationalization.

The basic structure of the book is as shown in Table 1.1, excluding Chapters 1 and 6 since they are the introduction and conclusion. Each of the other chapters debates a principal point and is relatively freestanding. Mainstream Western theory is first reviewed and narrated, followed by a description of what actually takes place in China. The novel phenomena in China’s business world will contribute to a new understanding of management theory. Case studies of Chinese enterprises are given in the appendices of each chapter to illustrate or explore these theoretical propositions.

Chapter 1 briefly introduces the principal purpose of the book, its basic foundation, as well as the structure of the book. Chapter 2 explores three types of innovation in China: product innovation, process innovation and strategy innovation, in connection with the previous discussion as to whether sustainable economic development in China could be based on low labor costs, or needs to respond the challenge of innovation. Since the evolution of strategic management has reached the point of strategy innovation (Grant, 2013) to create and sustain competitive advantages, Chapter 2 concentrates on exploring different types of innovation, specifically referring to the strategy innovations that Chinese firms have been carrying out.
After providing facts on patent registration and other innovation performance targets achieved by China and Chinese enterprises, we investigate the dual forces demonstrated in Figure 1.1: institutional and market factors creating the foundation for a firm’s strategic innovation development. The transition of Chinese economy from that of a world
factory to that of innovative organizations is debated by exploring the triple interaction between government, university and research institutes, and industry. As prioritized by Chinese governmental policy, Chinese firms are encouraged to shift their business from an imitation model to an innovation approach. Like Japanese firms in the 1950s and 1960s, Chinese firms are obliged to follow this period of imitation in order to learn and to obtain up-to-date technology and management knowledge. If Chinese firms, following that path, wish to achieve the worldwide success that Japanese firms are now enjoying, then innovation is the key. In strategic management, business models have been studied in depth recently, with innovation considered as critical to the organization of firms, beyond technological innovation (Chesbrough, 2007). By illustrating the national innovation policy of China with a concrete case example of the policy’s implementation in some Beijing areas in the appendix, the chapter further discusses the different strategy innovations in both technology-intensive and labor-intensive industry, with examples of firms listed.

Chapter 3 concerns the effects of cultural values on the innovative capability of knowledge workers, referring in this case to highly skilled Chinese workers. Beyond the exposition of innovation models, we intend to explore the underlying cultural values that create the innovative capability and behavior of such highly skilled Chinese workers. Most literature has considered that Chinese traditional culture is a hindrance to innovation. Some of the mostly heavily criticized factors include the hierarchy and obedience inherent within the firm’s structure, and the leader–subordinate relationship. However, the dynamic and contrasting effects of Chinese culture have not been deeply explored in understanding the potential of Chinese innovation. From this viewpoint, traditional Chinese culture also facilitates innovation. And it is not traditional Chinese culture alone, but it is the diversity of Chinese culture in today’s society after importing Western systems and values, combined with naturally rooted Neo-Confucianism thought, that boosts creativity in Chinese enterprises. We analyze the cases of different enterprises listed in the appendix to illustrate the dynamic evolution of culture, the diverse effects of culture on innovation, and the currently successful Chinese firms’ innovative behaviors.

The loosely-coupled social networking culture in China also encourages smooth progress in a network-based innovation system. Chapter 4 takes China’s economic evolutionary path into account, then explores and summarizes different types of network-based innovation in China: government-initiated innovation networks, twin-driven
institution–market innovation networks, and a digital era network-centric innovation. The traditional commercial clan-style business network evolves alongside institutional and economic development, as the network culture dynamically changes in Chinese innovation, further strengthened through digitalized economy. Hi-tech development and R&D development in Chinese scientific projects, as well as emerging Chinese e-business giants, are analyzed, exposing their innovation networks.

Chapter 5 proposes a people-centric concept involving an innovative human system in order to enhance the innovative capability of the firm, taking into account both internal human resources (employees) and external human capital (stakeholders). On the one hand, internal human resource management practices (recruitment, training, development, assessment, promotion and so on) could be engaged coherently with the criteria of innovative performance (Zeng and Zhou, 2006). On the other hand, differentiating from an innovative work system which only addresses employee issues in consideration of human factors, we incorporate a broader approach to personnel management in the firm, by incorporating the social network of the different stakeholders and their contribution to the firm’s innovation. The proposed innovative human system thus integrates various types of human capital with embedded knowledge to holistically promote innovation by the firms, strategically managing people such as their stakeholders from different angles, levels and dimensions. Different strategic human resource management practices of successful Chinese enterprises have been illustrated in this chapter for their high innovative human system proposal.

As knowledge probably is “the only meaningful resource” (Drucker, 1993), innovation as knowledge creation has become a principal strategic issue for a firm’s prosperity. Becoming more familiar with the way successful Chinese firms compete in the local and global market is knowledge that is useful in order for a firm to gain abilities to achieve and sustain competitive advantages. Nonaka and his colleagues have consistently insisted on the concept of firm as a knowledge-creating entity (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998; Nonaka et al., 2000; Nonaka and Toyama, 2003; Nonaka and von Krogh, 2009) for the dynamics of innovation in Japanese firms, along with others arguing that the economic role of the firm is to integrate knowledge to create societal value (Grant, 2002, 2013; Spender, 2002). Among others, Zhang et al. (2013) follow Nonaka’s thought, and pursue a humanistic perspective of knowledge creation as the center for innovation, applying explicit-tacit knowledge conversion at organizational level.
Chapter 6 concentrates principally on the challenges that Chinese innovation faces regarding business development. Special emphasis is given to the multinationalization process of Chinese enterprises developing from a domestic firm, with or without existing international trading. These innovation challenges have been experienced by some vanguard Chinese multinationals, while many others are on their way up following the call of the institutions and market demand. Besides proposing a multinationalization model along with innovation capability development, we also tackle other sources of innovation challenges such as future skilled workers with creativity and the creativity education of young Chinese children. Some future research projects are also suggested, to further understand the sources of innovation.

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