Managing Intellectual Capital and Innovation for Sustainable and Inclusive Society
27–29 May 2015
Bari • Italy

make learn
TIIM

Management, Knowledge and Learning
Joint International Conference 2015
Technology, Innovation and Industrial Management

CRACKING THE CHINESE SME INNOVATION FRONTIER: CROSSING THE IMITATION CHASM

Kim Hua Tan
Nottingham University Business School, United Kingdom
kim.tan@nottingham.ac.uk

Leanne Chung
Cardiff Business School, United Kingdom
chungl1@cf.ac.uk

Abstract:
On product development capabilities, many researchers argue the development stages of early Japanese and Korean manufacturing industry could be summed up as 'from imitation to innovation'. But, will Chinese manufacturers follow the same product innovation development path? This paper aims to identify the Chinese SMEs' unique product innovation development stages. Specifically, this paper addresses one key research question i.e. what are the unique Chinese SMEs product innovation development stages? The results identified that Chinese SMEs' product innovation development can be catogoried into three unique stages that are distinguished from the Japanese and South Korean path. The results provided interesting insights into how SMEs in different industries cultivated their skills and knowledge under their unique innovation development stages. This study contributes to the SMEs literature especially on the product innovation development stages in China, and other developing countries.

Keywords: Chinese innovation, SME, product development, imitation, absorptive capacity

1. INTRODUCTION

China, as one of the oldest civilizations in the world, has made many contributions in term of new product inventions. For example, dating back to thousands of years ago, Chinese ancient scientists invented “The Four Great Invention”, i.e. gunpowder, compass, paper-making, and printing. However, most foreigners still see China as a 'duplicative imitation' country. The label “Made in China” - can be generally associated as products with the characteristics of cheap and poor quality. In order to change this common stereotype and enhance the sustainable competitiveness of Chinese products in the global market, the Chinese government is transforming itself from “Made in China” to “Design in China” by establishing many initiatives to boost innovation capabilities.

Nonetheless, based on the data from the Chinese statistics year book (2011), about 60% of Chinese SMEs would shut down within the first five years, and only 10% of SMEs can operate over ten years. Such phenomenon demonstrates the common problems face by most Chinese SMEs when come to product innovation i.e lack of sufficient technological capabilities and capital support (Radas and Bozic, 2009). Thus, how to boost innovation capabilities have become the primary goal for both Chinese government and SMEs owners.

In the case of SMEs’ product innovation, many studies have indicated that SMEs can make large contributions to national economic growth by carrying out effective product innovation activities. However, compared to large firms, lack of resources is the main constraint. (Radas and Bozic, 2009). So far, limited studies have investigated the SMEs’ product innovation development stages in developing countries such as China. In particularthe approaches that enhanceproduct innovation performance. Moreover, most studies just simply describe China’s product innovation development stages as from imitation to innovation or equal it to the early Japanese and Korean manufacturing development stages. As a result, the product innovation development stages for Chinese SMEs are underexplored.

Clearly, knowing how to improve product innovation performance is critical for Chinese SMEs in today’s’ intense competitive market. Kim (2001) stated that a good understanding of current product innovation development stages is critical for SMEs. Thus, Chinese SMEs face two key questions: what are the product innovation development stages they could emulate? And what are the determinants to help them to progress in various development stages? In order to answer these questions, this research strives to identify the product innovation development stages for Chinese SMEs.

2. BARRIERS TO PRODUCT INNOVATION FOR SMES

Several scholars indicated a number of factors which may adversely contribute to SMEs new product development capabilities. Firstly, Li and Atuahene-Gima (2001) argued that product innovation can be a high risk and resource consuming activity. In general, the resource constraints that SMEs are suffering can be divided into four categories: Financial resources, Marketing and Management, Human resources and Knowledge (Kim, 1997; Ragatz *et al*. 1997; Hadjimanolis, 1999; Freel, 2000; Henard and Dacin, 2010). Freel (2000) argues that the majority of SMEs are directly or indirectly affected by shortages of financial resources. Without the sufficient capital support, many SMEs may shrink back, afraid of attempting to carry out new product development again if they have a failed experience previously (Hadjimanolis, 1999). Also, Dacin (2010) stated that although many SMEs have a detailed product innovation plan, high setup cost, high monitoring cost and long payback period usually slow down their strides to new product R&D.

Secondly, apart from the influence of capital requirement, poor management competency and lack of market information can also negatively impact SMEs on their new product development capabilities (Ragatz *et al*. 1997). Management competency, in other words, refer to a manager’s background such as relevant career experience and educational background. Barker and Mueller (2002) pointed out both managers’ previous work experience and educational background has a significant impact on corporate new product R&D decisions. For example, a manager with rich work experience and higher education may be more likely to adopt innovative activities, and vice versa. With respect to Marketing, Moenaert and Souder (1990) stated firms can be constrained in new product R&D as they were unable to obtain sufficient information from marketplace.

Thirdly, nowadays lacking high technically qualified personnel seems to be a common problem for most SMEs (Freel, 2000). In contrast to large firms, SMEs with insufficient capital may not be able to afford high wages to attract experienced management team or high qualified workers. However, such human resources are critical for implementing successful innovation, especially at the beginning of new product development (Dacin, 2010). Finally, the poor technological capability also inhibits SMEs' new product development. Prior researches argue that technological capability can be affected by two major factors: Absorptive Capacity and Collaborative Network (Kim, 1997; Zahra and George 2002; Zeng *et al*. 2010).

In a survey of Belgian SMES, Lybaert (1998) found that firms with higher capability in searching and absorbing external knowledge were more optimistic to adopt product innovation. On the other hand, in the absence of sufficient high qualified labour, most SMEs cannot well assimilate external knowledge nor apply it into product innovation. Likewise, SMEs is more likely to rely on interfirm cooperation rather than on horizontal collaborations such as cooperation with government, research institutions and intermediary organisations (Zeng, *et al*. 2010). However, such horizontal collaboration is gradually becoming the key element to successful product innovation (Godin and Gingras, 2000).

Many existing studies indicated that government intervention was a driven force which direct SMEs' product performance in China (Li, 1998). Anderson (2001) stated the role of SMEs in China have been expanding in the changing socio-political environment. Some scholars indicated that the performance of product innovation activities of SMEs was determined by the government R&D expenditure. Due to the characteristics of SMEs, such as small firm size and the ability of fast response to market trends, SMEs are capable to carry out more efficient new product development than large firms (Tan, 2001). Recently, Chinese SMEs increasingly recognize that they need to enhance their ability to develop new products and differentiate their own brands from competitors (Siu, 2001). Further, some researchers point out that several Chinese SMEs have successfully grasped such opportunity and transformed into large enterprises that generate their particular brands (Wang and Yao, 2002).

Siu (1995) pointed out that due to capitalism practitioners like privately-owned business in a socialist nation, privately-owned SMEs in China were not socially acknowledged in the past. Under such environment, Chinese SMEs had to implement other ownership structures to achieve legitimacy such as joint venture, small individual enterprises and collective enterprise (Malik, 1997). As such unclear ownership structures have been continuing to the present, Chinese SMEs have to rely on informal channels to obtain loans (Wang and Yao, 2002). Simultaneously, they further indicate that Chinese SMEs depend on local governments to obtain land or buildings in order to save costs. Due to limited resource, Chinese SMEs have to establish links with other firms, such as collaborating with research organisations, building joint ventures with foreign firms, supplying basic components or services to large firms, and collaborating with other SMEs in order to broaden their technological knowledge base for product innovation (Liefner *et al*. 2006). Many scholars further noted that Chinese SMEs tend to imitate or copy others product design in order to overcome the resource limitation and reduce the cost of product development (references. Because you mentioned many scholars here).

3. PRODUCT INNOVATION DEVELOPMENT STAGES

Many researchers argue that "product innovation development stages" refers to the learning sequence from assimilation and accumulation of knowledge or skills to transforming the technological capability into new products. Many scholars conceptualise this term as the process from imitation to innovation (Choi, 1989; Segerstrom, 1991; Kim, 1997). With respect of the role of imitation in terms of product innovation, a vast number of researchers believe that imitation can bring a positive significant impact on many areas. For instance, imitation can be an evolutionary approach (for example, Abernathy and Utterback, 1978; Nelson and Winter, 1982; Dosi, 1982), imitation contributes to a firm's product development (for example, Teece, 1986) and imitation may enhance a firm's competition position on the perspective of inventors' return on profit (for example, Bessen and Maskin, 2009). However, Aghion *et al*. (2001) argue differently i.e. excessive imitations can result in adverse effects on corporate growth. They further noting that imitation has minimal beneficial to enhancing growth.

On product innovation capabilities, many researchers argue the development stages of early Japanese and Korean manufacturing industry could be summed up as 'from imitation to innovation'. But, will Chinese manufacturers follow the same product innovation development path taken by the

Japanese and South Korean? The following sections investigate and compare the product innovation development stages in Japan, Korea, and China.

3.1. Product innovation development stages in Japan

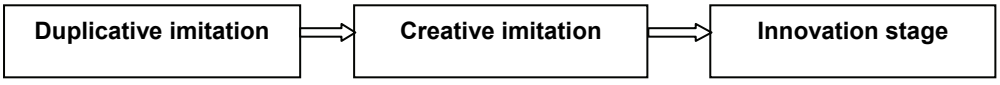
Interestingly, many researchers argue the Japanese learning flow can be dated back to 15th century in Japan, a sword master named Miyamoto Musashi stated that learning process can be divided into three stages and proposed a concept of Shu-Ha-Ri (守破離) in his book (See Figure 1). Till now, the concept of "obedience-breakdown-breakaway" has impacted many generations in Japan. First of all, the students should learn the old traditional forms and faithfully obey them. Secondly, once the students are able to master the skills proficiently, they should break down the old one gradually. Finally the students would break away from the tradition to create new forms (Proctor and Tan and Fuse, 2004). After the Second World War, Japanese manufacturing industry grew at an incredible speed. Many researchers paid attention on Japan's success from the perspective of the traditional learning process of Shu-Ha-Ri (Hirono, 1986; Cross, 1990; Bowonder and Miyake, 1992). Many earlier innovation literature pointed out that when a Japanese entrepreneur gained the knowledge from the front lines of technologies and develop a new product; the others would imitate his product and learn from it. However, it is more than just a simple imitation. During the process of imitation, Japanese firms will select and master the useful skills independently, while improving and transforming the basic technologies into new products. For example, Toyota as the largest automobile manufacturer in the world was not a product innovator when it was established in the early 1930s. They used to be a follower of Ford (e.g. imitate the expertise for the electrical systems). However, Toyota subsequently improved the technologies to innovate new products and outperformed Ford. (Nonaka and Takeuchi, 1995). The majority of Japanese firms believe that once they can completely utilize the new knowledge which absorbed from others, their desire would reach a higher level of innovating them (Imai *et al*., 1985).

Figure1: Shu-Ha-Ri (obedience-breakdown-breakaway) Japanese learning sequence

3.2. Product innovation development stages in South Korea

Coincidently, South Korea has successfully managed her progress of innovation stages from a subsistent agricultural economy to a newly industrialized country during the past forty years (Kim, 1997). Kim further stated that the South Korean economy grew at an average annual rate of 8 percent while increasing its GNP per capita from $87 to $10,550 during the period between 1962 and 1997. There is no doubt that South Korea had become an advanced industrial economy in Asia after the emergence of Japan. Kim (1997) highlighted that the major success factor to South Korea's fast industrialization can be attributed to the accumulation of technology capability. In the case of South Korea's transformation, technology capability can be defined as the ability to effectively absorb, utilize and change external knowledge in order to either improve existing product or create new technologies to meet the fast-changing business environment. Further, Kim (2001) revealed South Korea's industrialisation had undergone three stages, which are duplicative imitation stage, creative imitation stage and innovation stage. (See Figure 2)

Figure 2: South Korean product innovation development stages



Kim (2001) also underlined the most critical determinants for each stage in duplicative imitation i.e. South Korean firms build their knowledge-building mechanisms through the way of employees training, foreign technology transfer and the diffusion of new knowledge among all the technical workers across the companies. South Korean companies strived to obtain advanced technologies through either formal mechanisms such as technical licensing agreements or informal mechanisms such as literature and technical assistance under the premise of existing knowledge base. Then, in the stage of creative imitation, South Korean firms attempted to reach a higher level to slightly improve their product value

on the base of the preceding stage. They started to cooperate with local universities and research institutions, while fostering technical talents, carrying out internal technology research & development, building strategic alliance with foreign companies. Eventually, the South Korean entrepreneurs made major shift from imitating advanced technologies to emerging innovation technologies by themselves. After experiencing the preceding two stages, the entrepreneurs realized a series of activities may contribute to corporate innovation such as more intense investment in internal R&D, strengthen collaborations with universities and research institution and absorb high-quality experienced technicians from overseas. In short, the South Korean fimrs are more outgoing in terms of building capabilities, i.e. more collaboration with institutions and foreign collaborations, whilst Japanese tends to focus on building their own national internal capabilities.

3.3. Chinese SMEs' catch up: Different product innovation development stages

As stated above, it is apparent that both Japan and South Korea have achieved industrialisation step-by-step through their progress of innovation stages. Many Chinese entrepreneurs may ask: "should we follow Japanese and South Korean firms' track to carry out product innovation activities from imitation to innovation?" In essence, China's product innovation program started in 2006. Chinese government proposed the plan called the "11th Five-Year Program", striving to promote technological capability across the whole country in order to maintain a sustainable growth in the future. Further, the authorities also stated that they would transform their strategic importance to accelerate the development of science, technology and education for building an innovation-oriented nation (Government of People's Republic of China, 2006). Currently, Chinese SMEs are encouraged by the government to make transition from labour-intensive manufacturing to more mature technology-intensive industries (Xie and White, 2006). Subsequently, a large number of Chinese companies have improved their technology diffusion and knowledge transfer through recruiting foreign talented technologists, establishing strategic alliances with overseas firms, and purchasing technical patent licensing from abroad.

As Japanese and South Korean firms' product innovation emerged after the WWII, as such several innovative determinants such as education, financial resources, technology, collaborations with foreigners were at a very low level (Kim, 1997; Herbig and Jacobs, 1997). In contrast, the economy of China is growing at the rate of around 8-9 percent annually in the past three decades (WTO, 2011). Hence, based on such a strong economic and political environment, Chinese SMEs may have their own product innovation trajectory compared to their neighbours such as Japan and South Korea (Dobson and Safarian, 2008).

Comparing with the initial product innovation development stage of Japan and South Korea, Chinese SMEs have more resources that can be utilized in product innovation such as high qualified personnel, sufficient raw materials, and good collaborative relationships with foreign organisations (Xie and White, 2006). Kim (2001) stated that most of South Korean firms can only obtain the science from abroad during the stage of duplicative imitation. In contrast, Chinese SMEs are able to access the latest scientific technologies from thousands of universities and research organisations (Zeng *et al*., 2010). As a result, Chinese SMEs at the initial product innovation development stage are more likely to obtain new knowledge for the use of their product innovation. According to the survey conducted by Dobson and Safarian (2008), they indicated that the majority of Chinese privately-owned manufacturing SMEs were still at the stage of imitation. However, Chinese SMEs conduct "imitation" program more than just simple "Duplicative imitation" or "obedience". This idea was supported by Dobson and Safarian (2008), who argued that Chinese SMEs implementing imitation strategy that aim to reduce high product innovation risks, as well as accumulate enough knowledge and funds in order to carry out product innovation more efficiency in the future. Thus, the initial product innovation development stage for Chinese SMEs can be named as a Chinese word "**引(Yin)**". The term "Yin" in Chinese refers to the meaning of introducing and importing others' knowledge or experience to achieve a better result. Likewise, the next product innovation development stage can be described as another Chinese word "**调(Tiao)**", which means a way to adjust and improve the existing products. From the viewpoint of Chinese SMEs, this step is seen as a transition stage between imitation and innovation. According to Xie and White (2006), before launching new products, Chinese firms usually like to test the market reaction by adding a number of new features on the existing products. Hence, Chinese SMEs at the stage of Tiao is closer to innovating new products than the stages of "creative imitation" and "breakdown" in South Korea and Japan respectively. With respect to the innovation

stage, it is defined as "**创(Chuang)**" in Chinese word, which denotes the meaning of create new products for more profit. In short, Chinese SMEs can have the advantage of being the late comer, so they can have a shorter period of the first three stages and get into the creation stage much quicker than the Japanese and Korean paths. They tend to achieve Yin and Tiao together and make innovative features at a much quicker pace.However, many researchers pointed out only a small number of Chinese SMEs can develop new products.

Figure 3: Chinese SMEs' product innovation development stages: Adoption-Adjustment-Alteration

4. FINDINGS AND DISCUSSION

After examining and comparing the 3-stage product innovation stages in Japan, South Korea and China, a short semi-structured was conducted to further explore the validity and feasibility of the Chinese model in practice. Ten SMEs were selected from Zhejiang province of China. The interview reveals that Chinese SMEs from different industries and technology levels have different opinions on their new product development.

From the viewpoint of low-tech manufacturing SMEs, the owners interpreted the reasons for not carrying out the plan of product innovation because: (1) they do not have sufficient production capacity as it has been fully used by the OEM purchasers, (2) process innovation seems more appropriate for their development and (3) they would not like to waste resources on product innovation because there is no demand for new product in the particular marketplace. Three Chinese SMEs owners from Textile industry, Fabricated Metal Product Manufacturing industry and Furniture Manufacturing industry said:

"For example, over the past three years, with the recovery from the global financial crisis, more and more foreign OEM purchasers have placed orders to us so that our production capacity has been fully used by them and we do not have any spare resources to develop our new products."

"We believe new product development is essential for us in the future. However, based on the current environment, our primary objectives is to improve the product quality and save cost. In order to survive in the competitive market, exploring new customer may be more difficult than reduce production cost."

"We do not think new product can contribute to the sales growth and profit growth, so we just produce generic products."

On the other hand, SMEs owners from high-tech manufacturing industries have different perspectives on product innovation. They mainly indicate the problems which are not covered in the questionnaire measurement items. In contrast to low-tech industries, most of Chinese high-tech manufacturing SMEs have emerged new product innovation more or less. Further, high-tech manufacturing SMEs more favour to build collaborative relationships with research institutions. Nevertheless, they also revealed that usually the targets of research institutions are not consistent with the market trend. Likewise, they pointed out that the cooperation with government agencies had become less important than cooperate with their customers. Two SMEs entrepreneurs from Electronics industry and Medical Devices Manufacturing industry said:

"Since we signed the contract with universities, the features they designed cannot be applied into our products at all. In fact, our initial objective is to hope they can provide us with new technology support, but their target is to make contributions to academic circles, is not matching our needs. Research institutions spend too much time on new product development, as a result, we have missed a considerable commercial opportunities."

"The role of government tends to be less important than the beginning of Chinese Economic Reforms. At the beginning, relevant government agencies came over our plant and told us how to improve existing products and to design new product. However, China now is transforming to be a socialist market economy and all of the Chinese privately-owned enterprises can only rely on themselves to develop new product. Instead, we increased the frequencies to communicate with customers, because their valuable feedback about product innovation is significant.

The ten interviewees were also asked the questions about the way to carry out product innovation. In general, the formal sequences of new product development in most Chinese manufacturing SMEs were identified: 1. Existing product gap search, 2. Idea generation, 3. Market survey and analysis, 4. Sample development, 5. Sample test in small range, 6. Market reaction analysis, 7. Sample modification, and 8. Mass production.

"Before product innovation activities are conducted, we first analyze the future market trend and search the product gap. We attempt to tap into the gap among the existing product and analyze the commercial value in the future. Then, we will generate ideas how to design the new product, pre-determining the initial features about the new product. A market survey will be subsequently undertaken to realize the expectation from market place. During this process, we ask the questions about the number of manufacturers in this field and the source of the raw material. We will analyze the results from the survey and determine whether we should implement the product innovation plan or not. If this plan is feasible, we will make a small number of samples to test the market reaction. Meanwhile, we will change some features according to the feedback from consumers. Until everything is perfect, we will launch the new products in large scale."

5. CONCLUSION

Our study shows that most scholars simply define the product innovation development stages in China as the transition from imitation to innovation. However, Chinese SMEs are suffering from many constraints such as limited technological capabilities, insufficient fund and lack of high qualified workers, which may slow down their progress of product innovation development. Consequently, most innovative SMEs are staying at the transition stage between imitation and innovation by improving a number of features on the existing products. In order to have a better understanding of Chinese SMEs' product innovation development stages, this research compared the literature findings of Japan and South Korea product innovation stages. As a result, a unique three product innovation development stages (Yin-Tiao-Chuang) was proposed to explicitly demonstrate the Chinese SMEs' product innovation development. Further, the stage Yin refers to the initial product innovation development stages for privately-owned manufacturing Chinese SMEs i.e. mainly on applying existing knowledge and technology to produce product. It is similar to the imitation stage (of Japan and South Korea), except that the Chinese SMEs have to rely on local knowledge and technologies given the lack of resources or support (Japan and South Korea received a lot of support i.e. technology, access to market etc. under the American administration after the war). Tiao refers to the second product innovation development stage i.e. to adapt the new knowledge and skills gained to improvise new innovation. This is slightly different from creative imitation stage (as in South Korea) because Chinese SMEs have the advantage of vast local market. Thus, SMEs develop new products based on existing skills and technologies (learned in the Yin stage) to meet local demands. This is different from the Japan/South Korea where SMEs at this stage will make slight modification of existing products to offer cheaper alternatives to consumers. The final Chuang refers to the stage of innovating new products. Many Chinese SMEs have achieved this stage and most of them are now becoming multinational firms. For example, Huawei, Haier are examples of SMEs once in the Chuang stage and make use of the vast knowledge gained from making local products to introduce 'universal' products that could be sold in international markets. In addition, this research finds many SMEs are at the transition stages i.e. between "Yin" to "Tiao" or the stage between "Tiao" to "Chuang".

5.1 Contribution to knowledge and managerial implications

This research contributes to the existing body of literature in SMEs and innovation. For SMEs literature, this research identified an interesting unique three product innovation development stages for the Chinese SMEs. As the research focusing on the Chinese SMEs, the findings are not generalisable to SMEs all over the world. However, the three unique stages should be applicable for Far East SMEs manufacturing firms such as those in Taiwan. The findings also provide further evident showing the impact of absorptive capacity and network on innovation performance especially on different innovation development stages.

ACKNOWLEDGEMENT

The authors would like to thank Mr. Jun Hua for his inputs to this paper both in term of literature inputs and case studies.

REFERENCE LIST

1. Abernathy, W. J. & Utterback, J. M., (1978). Patterns of industrial innovation. *Technology review*, June/July: pp. 41-47.
2. Aghion, P, Harris C, Howitt P, Vickers J., (2001). Competition, imitation and growth with step-by-step innovation. *Review of Economic Studies*. 68(3): pp.467-492.
3. Anderson, R., (2001). *Security engineering: A guide to building dependable distributed systems*. New York: John Wiley & Sons Inc.
4. Barker, V. L., & Mueller, G. C., (2002). CEO characteristics and firm R&D spending. *Management Science*, 48 (6): pp. 782–801.
5. Bessen, J. & Maskin, E., (2009). Sequential innovation, patents, and imitation. *The RAND Journal of Economics*, 40: pp. 611–635.
6. Blundell, R., Dearden, L., Meghir, C. & Slannesi, B., (1999). Human capital investment: The returns from education and training to the individual, the firm and the economy, *Fiscal studies*, 20 (1): pp.1-23.
7. Bowonder, B. & Miyake, T., (1992). A model of corporate innovation management: some recent high tech innovations in Japan, *R&D Management*, Vol. 2 No. 4, pp. 319-336.
8. Boynton, A., Zmud, R., & Jacobs, G., (1994). The influence of IT management practice on IT use in large organizations. *MIS Quarterly*, 18: pp. 299-320.
9. Brioschi, F., Brioschi, M.S., Cainelli, G., (2002). From the industrial district to the district group: an insight into the evolution of local capitalism in Italy. Regional Studies 36 (9): pp. 1037–1052.
10. Chinese statistics year book, (2011). *National Bureau of Statistics of China*.
11. Choi, H.S., (1989). Transition from imitation tocreation, *Technological Forecasting and Social Change*, 36: pp. 209-215.
12. Cohen, W., & Levinthal, D., (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: pp. 128 -152.
13. Cross, M., (1990). Innovation or imitation: the state of Japanese research, *Japan Update*, Summer, pp. 19-21.
14. Danneels, E. (2002), The Dynamics of product innovation and firm competences, *Strategic Management Journal*, 23: pp.1095-1121.
15. Diez, J. D., (2002). Metropolitan innovation systems: a comparison between Barcelona, Stockholm, and Vienna. *International Regional Science Review* 25 (1): pp. 63–85.
16. Dobson, W. & Safarian, A. E., (2008). Making the transition from imitation to innovation: an enquiry into china's evolving institutions and firm capabilities, *Working Papers Series 11*, Rotman Institute for International Business
17. Doloreux, D., (2004). Regional networks of small and medium sized enterprises: evidence from the metropolitan area of Ottawa in Canada. *European Planning Studies* 12 (2): pp. 173–189.
18. Dosi, G., (1982). Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change. *Research Policy*, 11 (3): pp. 147-162.
19. Floyd, S. W. & Lane, P. J., (2000). Strategizing throughout the organization: managing role conflict in strategic renewal. *Academy of Management Review*, 25 (1): 154–177.
20. Freel, M. S., (2000). Barriers to product innovation in small manufacturing firms, *International Small Business Journal*, 18: pp. 60-80.
21. Godin, B., Gingras, Y., (2000). The place of universities in the knowledge production. *Research Policy* 29 (2), 273–275.
22. Hadjimanolis, A., (1999). Barriers to innovation for SMEs in a small less developed country (Cyprus), *Technovation*, 19: pp. 561-570.
23. Hagedoorn, J., (2002). Inter-firm R&D partnerships— An over view of patterns and trends since 1960. *ResearchPolicy,* 31(4): pp. 477–492.
24. Henard, D. H. and Dacin, P. A., (2010). Reputation for product innovation: its impact on consumers. *Journal of Product Innovation Management*, 27: pp.321–335.
25. Herbig, P. & Jacobs, L., (1997). A historical perspective of Japanese innovation. *Management Decision*, 35 (10): 760 – 778.
26. Hirono, R., (1986). Japanese experiences in technology transfer, *Management Japan*, 19 (1): Spring, pp. 9-19.

27. Hu, M. C., & Mathews, J. A. (2008). China's national innovative capacity. *Research Policy*, 37: 1465–1479.
28. Imai, K., Nonaka, I. and Takeuchi, H., (1985). Managing the new product development process: how Japanese companies learn and unlearn, in Clark, K.B., Hayes, R.H. and Lorenz, C. (Eds), *The Uneasy Alliance,* Harvard Business School, Boston, MA.
29. Kim, L., (1997). *From imitation to innovation: dynamics of korea's technological learning*, Cambridge, MA: Harvard Business School Press.
30. Kim, L., (2001). The dynamics of technological learning in industrialisation, *International Social Science Journal*, 53 (168): pp. 297-308.
31. Li, H. Y. & Atuagene-Gima, K., (2001). Product innovation strategy and the performance of new technology ventures in China, *Academy of Management Journal*, 44 (6): pp. 1123-1134.
32. Liefner, I., Hennemann, S., Xin, L., (2006). Cooperation in the innovation process in developing countries: empirical evidence from Zhongguancun, Beijing. *Environment and Planning* A 38 (1): pp. 111–130.
33. Lin, C., Lin. P., Song, F. M., Li, C. T., (2011), Managerial incentives, CEO characteristics and corporate innovation in China's private sector, *Journal of Comparative Economics*, 39: pp. 176-190.
34. Liu, X., & White, R. S., (1997). The relative contributions of foreign technology and domestic inputs to innovation in Chinese manufacturing industries. *Technovation*, 17: pp. 119-125.
35. Lybaert, N., (1998). The information use in a SME: Its importance and some elements of influence. *Small Business Economics,* 10 (2): 171-191.
36. Malik, R., (1997). *Chinese entrepreneurs in the economic development of china*. Westport, CT: Praegar
37. Matusik, S. F., & Heeley, M., (2001). Absorptive capacity and firm knowledge: Separating the multiple components of the absorptive capacity construct. *Paper presented at the annual meeting of the Academy of Management*, Washington, DC.
38. Moenaert, R. K. and Souder, W. E., (1990). An information transfer model for integrating marketing and R&D personnel in new product development projects, *Journal of Product Innovation Management*, 7: pp.91-107.
39. Mowery, D. C., Oxley, J. E., & Silverman, B. S., (1996). Strategic alliance and interfirm knowledge transfer. *Strategic Management Journal*, 17: pp 77-91.
40. Nelson, R. R. and Winter, S. G., (1982). An evolutionary theory of economic change. *Belknap Press Series*, Harvard University Press.
41. Nieto, M. J., Santamaria, L., (2007). The importance of diverse collaborative networks for the novelty of product innovation.*Technovation* 27(6–7): pp. 367–377.
42. Nonaka, I. & Takeuchi, H., (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovatio*n, Oxford University Press, ISBN 978-0195092691
43. Proctor, T. Tan, K. H., Fuse, K., (2004). Cracking the incremental paradigm of japanese creativity, *Creativity and Innovation Management,* 13 (4): pp. 207-215.
44. Radas, S. & Bozic, L., (2009). The antecedents of SME innovativeness in an emerging transition economy. *Technovation*, 29: 438–450.
45. Ragatz, G. L., Handfield, R. B. and Scannell, T. V., (1997). Success factors for integrating suppliers into new product development. *Journal of Product Innovation Management*, 14: pp. 190–202.
46. Segerstrom, P.S., (1991). Endogenous growth without scale effects. *The American Economic Review* 88: 1290-1310.
47. Siu, W. S., Lin, T. L., Fang, W. C., Liu, Z. C., (2006), An institutional analysis of the new product development process of small and medium enterprises (SMEs) in China, Hong Kong and Taiwan, *Industrial Marketing Management*, 35: pp. 323-335.
48. Tan, J., (2001). Innovation and risk-taking in a transitional economy: A comparative study of Chinese managers and entrepreneurs. *Journal of Business Venturing* 16 (4): 359-376.
49. Teece, D. J., (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*, 15(6), pp. 285-305.
50. Todorova, G. & Durisin, B., (2007). Absorptive capacity: Valuing a Reconceptualization, *Academy of Management Review*, 32: pp. 774-786.
51. Tsai, K, H. (2009), Collaborative networks and product innovation performance: Toward a contingency perspective, *Research Policy*, 38: pp. 765-778.
52. Wang, Y. and Yao, Y., (2002). Market reforms, technological capabilities and the performance of small enterprises in China. *Small Business Economics*, 18: 197-211.

53. World Trade Organization, (2011). *World Trade in 2011*. Accessed at www.wto.org.
54. Xie, W. & White, S., 2006. From imitation to creation: the critical yet uncertain transition for Chinese firms. *Journal of Technology Management in China*, 1 (3): pp. 229 – 242.
55. Zahra, S. & George, G., 2002. Absorptive capacity: a review, re-conceptualization and extension, *Academy of Management Review*, 27 (2), pp. 185-203.
56. Zaltman, G., Duncan, R. and Holbek, J., 1973. *Innovations and Organizations*, JohnWiley & Sons, London.
57. Zeng., S. X., Xie, X. M., Tam, C. M., 2010. Relationship between cooperation networks and innovation performance of SMEs, *Technovation*. 30: pp. 181-194.
58. Zhu, Y., Wittmann, X., Peng, M. W., 2011, Institution-based barriers to innovation in SMEs in China, *Asia Pacific Journal of Management*, DOI 10.1007/s 10490-011-9263-7.