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## INNOVATION CAPABILITY AND KNOWLEDGE FLOW OF INFORMATION COMMUNICATION TECHNOLOGIES: EMPIRICAL STUDY OF COMPARISON BETWEEN INDIA AND CHINA

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### ABSTRACT

*Although it can be expected that India and China will increasingly influence global economic dynamics and technological development, especially in information and communication technologies (ICT). However, studies related to ICT between India and China are scarce. Innovation capability is very important for emerging countries to promote economical growth. Owing to the fact that a country can advance innovational capability through absorbing external knowledge, it is necessary to explore knowledge flow. Thus, this study aims to compare innovation capability and knowledge flow of ICT between China and India. Based on patent and citation data from USPTO (U.S. Patents and Trademark Office) during 1976- 2011, empirical findings are as follows. First, both India and China have a growing tendency of innovation capability in ICT. China is stronger than India both in innovation quantity and quality. Invented patents of both India and China are more than their owned patents. Second, India holds relative innovation strengths in telecommunications technological field. Electrical engineering is the main technological field of relative innovation strength in China. Third, fully developed countries are the most abundant knowledge sources of innovation in ICT for India and China, but China is found to have a high level of knowledge spillovers with Asia newly industrialized countries (Taiwan, South Korea). Finally, India and China play a role as knowledge acceptor rather than knowledge creator in ICT.*

### KEYWORDS

innovation capability, knowledge flow, information and communication technology (ICT), patent and citation.

### INTRODUCTION

Innovation capability is very important for emerging countries to promote economical growth. Innovation capability is the ability to transform knowledge and ideas into new products and systems for the benefit of the firm (Lawson and Samson, 2001). The spillover of knowledge can be beneficial to innovation capability, because a country can take advantage of external knowledge to strengthen its innovational capability (Tseng, 2006; 2009). Understanding knowledge flow of technological innovation is helpful for a country to enhance innovation capability. High innovation capability and management of knowledge flow thus have become two keys to technology progress and economic development.

Information and communication technology (ICT) is the important infrastructure to build national competitive advantage (Porter, 1990). ICT is not only widely applied in different industries, but also boosts economy globalization. *Although it can be expected that India and China will increasingly influence global economic dynamics and technological development, especially in information and communication technologies (ICT). However, studies related to ICT between India and China are scarce.*

### REVIEW OF LITERATURE

R&D, patents, and new product are three common measurement categories for innovation capability. There are four advantages to use patents to measure innovation capability (Ernst, 2001; Tseng, 2009). First, they grant the inventor of a new product or process the exclusive rights to use, make and sell that product or process for a certain period. Second, since patents can be examined and eventually granted by the patent office, they are objective measures of technological innovation. Third, patent data are easily accessible from the free database. Finally, tracing citations between patents is very helpful to knowledge flow of an innovation.

Early studies about knowledge flow and spillover have used traded goods and R&D spillover (Coe and Helpman, 1995). Jaffe et al. (1993) employ patent citations data to trace knowledge spillover. These linkages among different patents demonstrate a trace of knowledge flows. Hu and Jaffe (2003) used patent citations as indicators of knowledge flow to investigate knowledge diffusion from the U.S. and Japan to Korea and Taiwan. Many studies also adopted patent citation method to investigate knowledge flow and spillover (Verbeek et al., 2003; Tseng, 2009; Park and Suh, 2013).

### OBJECTIVES OF THE STUDY

The objectives of the study is to analyze three topics related to innovation capability and knowledge flow of ICT in India and China.

1. This study uses different measurements of innovation capability to compare India with China in ICT.
2. This study investigates the relative innovation strengths in different sub-technological fields of ICT between India and China
3. This study demonstrates knowledge flows of technological innovation for ICT in India and China.

### RESEARCH METHODOLOGY

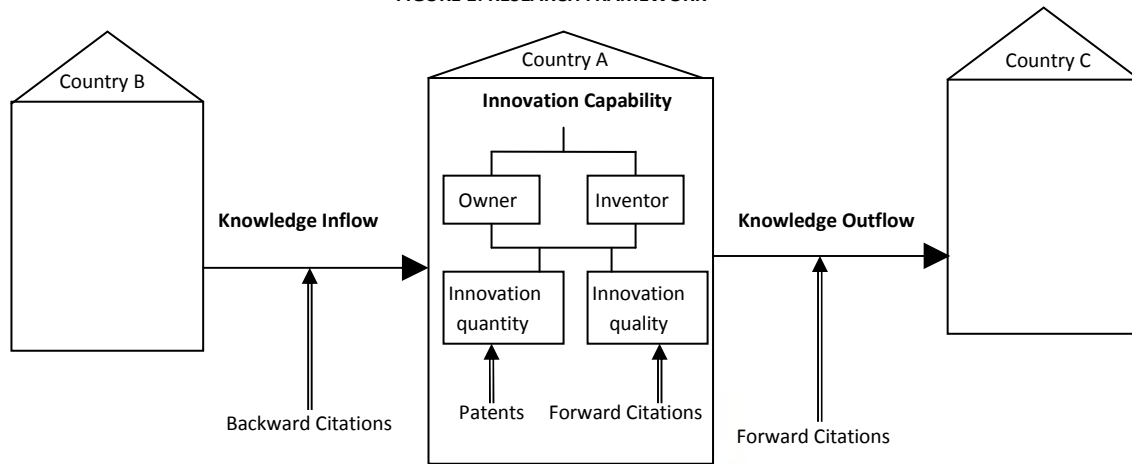
#### 1. RESEARCH FRAMEWORK

This study uses patent and citation data as major measure for innovation capability and knowledge flow. Many studies assert that patents with higher forward citations have greater economic value relative to other patents (Bloom and Reenen, 2002; Tseng, 2009). One measurement perspective for Innovation capability is based on owner level and inventor level. Another measurement perspective for Innovation capability is measured by innovation quantity (patent count) and innovation quality (forward citations). Citation data have been used to measure knowledge flow (Jaffe et al. 1993; Hu and Jaffe, 2003; Verbeek et al., 2003; Tseng, 2009; Park and Suh, 2013). This study uses backward citations and forward citations as two proxies for knowledge inflow and knowledge outflow. The research framework in this study is shown as figure 1.

#### 2. THE DATA AND VARIABLE

The patent and citation data are from all patents granted by U.S. Patents and Trademark Office (USPTO) during 1976-2011. Because inventorship and ownership are separate for a patent, this study respectively measures innovation capability based on patents of owner's country and inventor's country. To understand relative innovation strengths in different sub-technological fields of ICT between India and China, this study adopted a technology-oriented classification by Breschi et al. (2003), and aggregates IPC (International Patent Classification) codes into 5 sub-technology fields in ICT, including electrical engineering, audiovisual technology, telecommunications, computer technology and semiconductor.

FIGURE 1: RESEARCH FRAMEWORK



**ANALYSIS AND RESULTS**

**Figure 2** indicates the comparison of innovation capability in ICT between India and China from 1976 to 2011. India and China have a growth tendency of innovation capability in ICT after the 2000 year, and peaking in the 2011 year. In analysis of both owned patents and invented patents, Innovation capability of China is stronger than that of India. Invented patents of India and China are all more than their owned patents. **Table 1** shows that relatively innovation strengths in five sub-technological fields of ICT between India and China. In analysis of forward citations, innovation quality of China is stronger than that of India. In analysis of relatively innovation strengths based on patents by owner's country, *India holds relative innovation strength in telecommunications technological field*. Audiovisual technology and semiconductor are two relative innovation weaknesses in India. Electrical engineering is the main technological field of relative innovation strength and computer technology is relative innovation weakness in China. Results of relative innovation strengths based on patents by inventor's country are not different from preceding results. Knowledge flows of innovation in ICT between India and China are shown as **Table 2** and **Table 3**. Main knowledge sources of innovation in ICT between India and China are same from external knowledge inflow (99.65% and 97.65%). Both USA and Japan are main knowledge sources of innovation in India and China. France and Germany are third and fourth knowledge sources of innovation in India. In China, Taiwan and South Korea are found to be third and fourth knowledge sources of innovation in China. Top 10 countries of knowledge outflow for India and China are similar to results of knowledge inflow. India and China have high interrelationships with fully developed countries, but China has a higher level of knowledge spillover with Asia's newly industrialized countries (Taiwan, South Korea). On the other hand, knowledge inflows are more eight times than knowledge outflows in India and China. India and China are found to be knowledge accepters more than knowledge creators.

FIGURE 2: COMPARISON OF INNOVATION CAPABILITY IN ICT BETWEEN INDIA AND CHINA DURING 1976- 2011

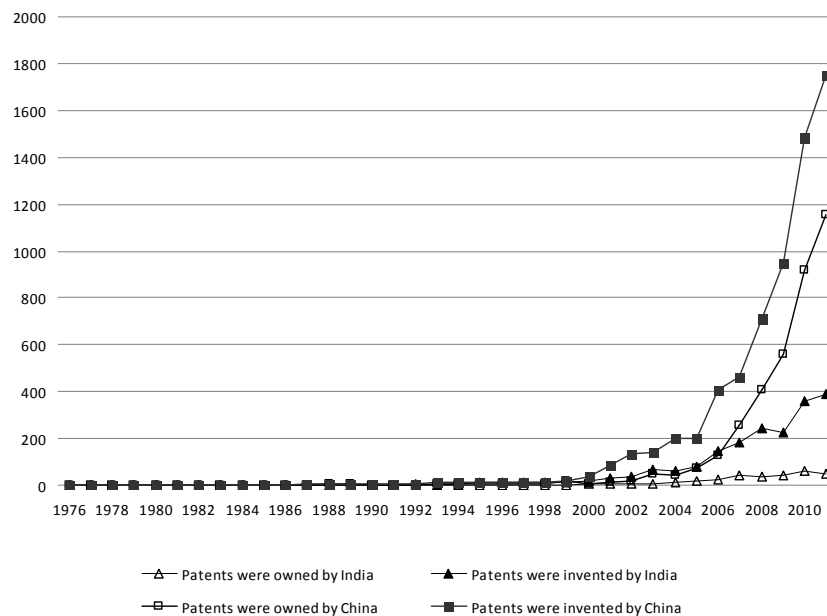




TABLE 1: RELATIVE INNOVATION STRENGTHS IN FIVE SUB-TECHNOLOGICAL FIELDS OF ICT BETWEEN INDIA AND CHINA

5 sub-technological fields of ICT	Innovation quantity-				Innovation quality			
	-Patent count-				-forward Citations-			
	India		China		India		China	
	Count	%	Count	%	Count	%	Count	%
<b>1. Patents by owner's country</b>								
Electrical engineering	41	13.02	1573	40.83	60	14.93	2783	42.20
Audiovisual technology	14	4.44	409	10.62	13	3.23	472	7.16
Telecommunications	194	61.59	1224	31.77	251	62.44	1361	20.64
Computer Technology	53	16.83	86	2.23	58	14.43	435	6.60
Semiconductor	13	4.13	561	14.56	20	4.98	1544	23.41
Total	315	100.00	3853	100.00	402	100.00	6595	100.00
<b>2. Patents by inventor's country</b>								
Electrical engineering	229	11.58	3196	46.37	789	10.55	9041	54.36
Audiovisual technology	131	6.63	658	9.55	550	7.36	1765	10.61
Telecommunications	1307	66.11	2024	29.36	4770	63.80	3035	18.25
Computer Technology	216	10.93	228	3.31	941	12.59	623	3.75
Semiconductor	94	4.75	787	11.42	426	5.70	2168	13.04
Total	1977	100.00	6893	100.00	7476	100.00	16632	100.00

TABLE 2: KNOWLEDGE INFLOW OF ICT IN INDIA AND CHINA DURING 1976-2011

Rank	India			China		
	Country	Backward Citations	Percent	Country	Backward Citations	Percent
1	US	3732	69.20%	USA	16393	52.28%
2	Japan	711	13.18%	Japan	5349	17.06%
3	France	156	2.89%	Taiwan	4417	14.09%
4	Germany	133	2.47%	South Korea	1035	3.30%
5	Canada	123	2.28%	China	737	2.35%
6	South Korea	121	2.24%	Germany	659	2.10%
7	Taiwan	99	1.84%	Canada	575	1.83%
8	Sweden	60	1.11%	France	371	1.18%
9	Holland	38	0.70%	Finland	340	1.08%
10	Finland	35	0.65%	Sweden	294	0.94%
Others	185	3.43%	Others	1184	3.78%	
Total	5393	100.00%	Total	31354	100.00%	

TABLE 3: KNOWLEDGE OUTFLOW OF ICT IN INDIA AND CHINA DURING 1976-2011

Rank	India			China		
	Country	Forward Citations	Percent	Country	Forward Citations	Percent
1	USA	275	68.07%	USA	1561	41.66%
2	Japan	26	6.44%	Taiwan	715	19.08%
3	South Korea	20	4.95%	Japan	447	11.93%
4	Taiwan	15	3.71%	China	386	10.30%
5	Germany	14	3.47%	South Korea	144	3.84%
6	India	14	3.47%	Germany	89	2.38%
7	Canada	9	2.23%	Italy	55	1.47%
8	France	8	1.98%	HongKong	51	1.36%
9	Finland	5	1.24%	Canada	38	1.01%
10	Holland	4	0.99%	Holland	38	1.01%
Others	14	3.47%	Others	223	5.95%	
Total	404	100.00%	Total	3747	100.00%	

## RECOMMENDATIONS

1. This study integrated two measurement perspectives to measure innovation capability, one is owner's patent and inventor's patent and another perspective is innovation quantity and innovation quality. This integrated method is helpful for future study to correctly measure innovation capability.
2. This study constructs knowledge flow by forward citations and backward citations. Trace knowledge flow is the important method for the latecomer countries to understand how to enhance innovation capability.

## CONCLUSIONS

1. India and China have a growth tendency of innovation capability in ICT. Innovation quantity and innovation quality of China are stronger than those of India. Invented patents of both India and China are more than their owned patents.
2. India holds relative innovation strength in telecommunications technological field. Electrical engineering is the main technological field of relative innovation strength in China.
3. Fully developed countries are the most external knowledge sources of innovation in ICT for India and China, but China is found to have higher knowledge spillovers with Asia newly industrialized countries (Taiwan, South Korea)
4. India and China are found be knowledge accepter more than knowledge creator in ICT.

## REFERENCES

1. Bloom, N. and Reenen J.V. (2002) 'Patents, real options and firm performance', *The Economic Journal*, 112, pp.97-116.
2. Breschi S., Lissoni F. and Malerba, F. (2003) *Knowledge networks from patent citations? methodological issues and preliminary results*, DRUID summer conference 2003 on creating, sharing and transferring knowledge, The role of geography, institutions and organizations, Copenhagen, June 12-14.
3. Coe, D.T. and Helpman, E. (1995) 'International R&D spillovers', *European Economic Review*, 39 (5), pp.859-887.

4. Ernst, H. (2001) 'Patent applications and subsequent changes of performance: evidence from time-series cross-section analyses on the firm level', *Research Policy*, 30, pp.143-157.
5. Hu, G. Z. And Jaffe, A. (2003) 'Patent citations and international knowledge flow: the cases of Korea and Taiwan', *International Journal of Industrial Organization*, 21, pp.849-880.
6. Jaffe, A., Trajtenberg, M. and Henderson, R. (1993) 'Geographic localization of knowledge spillovers as evidenced by patent citations', *Quarterly Journal of Economic*, 108, pp.577-598.
7. Lawson, B. and Samson, D. (2001) 'Developing innovation capability in organisations: a dynamic capabilities approach', *International Journal of Innovation Management*, 5(3), pp.377-400.
8. Park, H. and Suh, S. (2013) 'Scientific and technological knowledge flow and technological innovation: quantitative approach using patent citation', *Asian Journal of Technology Innovation*, 21(1), pp.153-169.
9. Porter, M.E. (1990) *The Competitive Advantage of Nations*. Free Press, New York.
10. Tseng, C. (2006) *Innovation Capability and Knowledge Spillover in Emerging Economy*, Third IEEE International Conference on Management of Innovation and Technology (ICMIT2006), Singapore, June 21-23.
11. Tseng, C. (2009) 'Technology development and knowledge spillover in Africa: evidence using patent and citation data', *International Journal of Technology Management*, 45(1/2), pp.50-61.
12. Verbeek, A., Debackere, K. and Luwel, M. (2003) 'Science cited in patents: A geographic "flow" analysis of bibliographic citation patterns in patents', *Scientometrics*, 58 (2), pp.241-263.

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