

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Telecommunications Policy

URL: www.elsevier.com/locate/telpol

A new regional clustering approach for mobile telecommunications policy in China



Jinyang Lim^a, Changi Nam^b, Seongcheol Kim^{c,*}, Euehun Lee^b, Hongkyu Lee^b

^a Institute for Information & Communications Technology Promotion, 1548 Yuseong-daero, Yuseong-gu, Daejeon 305-348, Republic of Korea

^b Department of Business and Technology Management, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 305-701, Republic of Korea

^c School of Media and Communication, Korea University, 145 Anam-dong, Seongbuk-gu, Seoul 136-701, Republic of Korea

ARTICLE INFO

Available online 26 September 2014

Keywords:

Regional clustering
Innovation coefficient
Imitation coefficient
Cluster analysis
Mobile telecommunications
China

ABSTRACT

In the Chinese telecommunications industry, the penetration rates of mobile telecommunications currently vary by province from less than 40% to over 100%. The purpose of this paper is to suggest a new regional clustering approach of China from the perspective of mobile telecommunications based on the diffusion characteristics of estimated innovation and imitation coefficients in the mobile telecommunications market. While China has traditionally identified three groups of regions, a cluster analysis based on those diffusion characteristics shows that the 31 provinces in China can be classified into six groups. This empirical result implies that the traditional regional classification seems too simple and that the market should be segmented further in order to develop policies more relevant to Chinese mobile telecommunications.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

China is now the world's largest mobile telecommunications market (ITU, 2014). Although the 3G service only started in January 2009, by 2012, the number of 3G subscribers had reached 232.8 million, and the proportion of 3G subscribers out of the total mobile telecommunications subscribers increased more than 13 times from 2009 (1.6%) to 2012 (20.9%) (see Appendix A). In addition, the number of active smart phones in China exceeded 700 million by the end of 2013.¹ Thus, the Chinese mobile market has been developing brilliantly year after year.

However, mobile telecommunications subscriptions in China show significant provincial disparities. The number of Chinese mobile subscribers at the end of 2010 differs greatly by region: 393.2 million in the Eastern region, 261.6 million in the Central region, and 203.8 million in the Western region. Mobile telecommunication penetration rates also differ, with 84.7% for the Eastern region, 54.1% for the Central region, and 59.8% for the Western region. The province with the highest penetration rate is Beijing (109%), which is located in the Eastern region.

This regional disparity of mobile telecommunications penetration rates is argued to be based directly on differing diffusion characteristics of each province, which in turn are affected by various socioeconomic factors such as income, occupation structure and education (Nam, Kim, Lee, Duan, & Meng, 2008). In other words, the different levels of penetration

* Corresponding author. Tel.: +82 2 32902267; fax: +82 2 9254797.

E-mail address: hiddentrees@korea.ac.kr (S. Kim).

¹ Source: A report from analytics firm Umeng. Retrieved from http://tip.umeng.com/uploads/data_report/2013_umeng_insight_report.pdf.

rate might be regarded as a consequence of different levels of socioeconomic factors. For example, the Chinese reform and open door policy that began in the 1980s led to the development of eastern coastal regions, which in turn has contributed to the income gap between coastal and inland areas. Therefore, the Central and Western regions may have lower penetration rates because they are less economically developed.

As for other socioeconomic factors, there exists provincial variation of mobile telecommunications diffusion in China. Policy makers therefore need to consider the mobile telecommunications diffusion characteristics of each province to establish the best policy for each. To propose such a policy, a new regional clustering approach is needed. However, the classification used in previous studies—Eastern, Central and Western—is too simple to reflect the diffusion characteristics of each province.

The purpose of this paper is to suggest a new regional clustering approach of China into several groups based on the diffusion characteristics of both innovation and imitation coefficients for the 31 provinces. First, this paper presents the innovation and imitation coefficients of 31 provinces in China. Second, a cluster analysis is conducted to suggest a new regional clustering approach using the diffusion characteristics of innovation and imitation coefficients as independent variables. Finally, this paper offers meaningful implications for policy makers and mobile network operators in China.

2. Literature review

China has typically been divided into three administrative regions: the Eastern, Central and Western regions.² According to the official definition of the National Bureau of Statistics of China, these regions are based on geographical location and level of economic development. Many researchers have used this official regional division. Zhang, Liu, and Yao (2001) used this simple classification and found that the Eastern and Western regions have converged to their own specific steady states over the period 1952–1997. Other researchers have also used this classification for their work (Chi, 2008; Nam et al., 2008; Nam, Kim, Lee, & Duan, 2009; Narayan, Nielsen, & Smyth, 2008).

At the same time, other regional classifications were made for different purposes using different criteria. Liu and Li (2006) examined disparities in factor contributions between coastal and noncoastal (inner) provinces.³ Fujita and Hu (2001), using this regional division, found that the income disparity between coastal provinces and the interior had been increasing during the period 1985–1994. For agricultural issues, four regional groupings, Northeastern, Eastern, Central and Western, differing from each other in geography, natural endowment, and most importantly, the level of economic development, were used by Chen and Song (2008) and Chen, Huffman, and Rozelle (2009). Demurger et al. (2002), analyzing geographical and economic characteristics of China in the post-1978 period, suggested six regional groupings: Metropolis, Northeastern, Coastal, Central, Northwestern and Southwestern.⁴ Cui and Liu (2000) proposed seven regional groups based on economic development and consumer purchasing power: Southern, Eastern, Northern, Central, Southwestern, Northwestern, and Northeastern.⁵

However, no research on the appropriate regional clustering approach for analyzing the pattern of mobile penetration has been conducted, although it might be necessary for more effective and efficient mobile telecommunication policies or strategies. For this reason, this paper suggests a new clustering approach based on regional innovation and imitation diffusion characteristics.

3. A new regional clustering approach

3.1. Innovation and imitation coefficients

The diffusion of an innovation is the process by which an innovation spreads among members of a social system (Rogers & Shoemaker, 1971). Regardless of the type of phenomena being diffused, a major aspect of the diffusion process as revealed in previous research is the time pattern of the spread of the innovation (Mahajan & Peterson, 1978). While a number of models have been proposed to represent the time pattern of the diffusion process over years, the Bass diffusion model can be counted as representative, where adopters are defined as innovators and imitators, and their behaviors are explained by

² The Eastern region includes Beijing, Tianjin, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan. The Central region includes Hebei, Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan. The Western region includes Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang. The locations of each province can be found in Appendix B.

³ The Coastal provinces are Beijing, Tianjin, Hebei, Liaoning, Jiangsu, Zhejiang, Shandong, Guangdong, Hainan, Shanghai and Fujian. The Noncoastal provinces are Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi, Sichuan and Tibet.

⁴ Metropolis includes Shanghai, Beijing and Tianjin. The Northeastern region includes Jilin, Liaoning and Heilongjiang. The Coastal region includes Guangdong, Fujian, Zhejiang, Jiangsu, Hainan, Shandong and Hebei. The Central region includes Henan, Hubei, Anhui, Jiangxi, Hunan and Shanxi. The Northwestern region includes Xinjiang, Inner Mongolia, Shaanxi, Gansu, Ningxia and Qinghai. The Southwestern region includes Yunnan, Sichuan, Guangxi and Guizhou.

⁵ The Northwestern region includes Inner Mongolia, Shanxi, Shaanxi, Gansu, Ningxia, Xinjiang, Qinghai and Tibet. The Southwestern region includes Sichuan, Guangxi, Guizhou and Yunnan. The Central region includes Henan, Anhui, Hubei, Hunan and Jiangxi. The Northeastern region includes Heilongjiang, Jilin and Liaoning. The Northern region includes Beijing, Tianjin, Hebei and Shandong. The Eastern region includes Shanghai, Zhejiang and Jiangsu. The Southern region includes Guangzhou, Fujian, Hainan and Hong Kong.

Download English Version:

<https://daneshyari.com/en/article/556449>

Download Persian Version:

<https://daneshyari.com/article/556449>

[Daneshyari.com](https://daneshyari.com)