

# The New Development Trend of Chinese-funded Banks and Internet Financial Enterprises from Patent Perspective

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## Abstract

Relying on the perfect integration of Internet technology, new business format and financial services, the Internet finance is developing at an unexpected speed, bringing impacts to Chinese-funded banks in the traditional business and emerging areas such as customization. Based on the preliminary study of the close contact between Chinese-funded banks and Internet financial enterprises as well as the necessity of patent protection, the paper proposes a comprehensive analytical framework and makes statistical comparison between 5 well-known Chinese-funded banks and Alibaba Group's patents from the perspective of annual trend, collaboration, application organizations, citation and other characteristics with data up to 2014 collected from Derwent Innovations Index(DII). It builds a Derwent Manual Code co-occurrence network with time coordinate by combining with visual tools and quantized the respective patent focuses of banks and Internet financial enterprises from the perspective of frequency and burst. After analysing the patents' contents, the paper discusses the mode of patent assignment. Finally, according to the status of patents, the paper concludes the strategic layout of domestic banks and Internet financial enterprise's intellectual property protection to predict the trend of further competition and alliance.

## Conference Topic

Patent Analysis

## Introduction

The data of British magazine "Banker" showed that in 2014, 13 Chinese banks ranked among the world's top 100 banks. Among them, Industrial and Commercial Bank of China ranked No.1 with the fund scale of 2,076.14 billion U.S. dollars, followed by China Construction Bank, Bank of China and other Chinese-funded banks, highlighting the fast growth and significant expansion of Chinese-funded banks. Nevertheless, the rates of return on assets of these banks were less than 3%, indicating that although the overall profit scale of China's banking ranked No.1 in the world, its profitability was not the case. With the slowdown of economic growth, substantial promotion of interest rate liberalization and further standardization of banking regulation, it is difficult for banks to maintain rising profit by relying on traditional channels. Like a huge dam, commercial banks store the saving deposits and collaborative deposits, but now there is a gap in the dam and the initiator is Internet finance. In the extensive penetration of Internet technology, traditional financial industry is undergoing dramatic changes: financial services have become the area competed by major institutions. Investors' "financial outlook" is corrected and the process of interest marketization has been promoted virtually (SOHO, 2014). The release of small and micro enterprises and individual consumer market's demand for loan is accelerated and the financing market presents a thriving prospect. With huge dividends of reform as well as the progress of big data and cloud computing technology, the Internet financial innovation is increasingly deepening. The rapid rise of Internet financial enterprises obliges Chinese – funded banks to face the continuous overlapping business, increasing demand for product service, competition and challenges brought by the application of innovative technologies.

In the new era, the competition between Chinese-funded banks and Internet financial giants does not only stay in the extent of business coverage, and more importantly, it is a rigid form

of innovation, which has been highly concerned by famous financial institutions, especially international banks, and produced historical and substantial effect on financial markets, services, products and management (Chen, 2006). Meanwhile, as an important link of financial products and intellectual properties, patents reflect the high degree of innovation of bank and Internet financial enterprises in service and product development. Meanwhile, in the period of patent protection, the banks exclusively enjoy the market of the innovative product, increase extra profits and safeguard fundamental interests. Events including the determination of the United States on the patentability criteria of bank business methods in 1998 or the patent bulk purchase of Alibaba Group before the listing in the United States in 2014 indicated that the field of financial patent protection has always been a focus of people. With the constant innovation of e-commerce and in-depth integration of Internet and mobile communication network, transaction platforms and payment means represented by e-banking, online banking and mobile banking will be bound to become the main form of future financial services. This control of the patents closely related to high-tech may become constitutor of financial market rules.

### **Theoretical basis and analytical framework**

The slight decline of net interest margin posed no threat to large banks like ICBC, and the real blow came from the endogenous market force, the counterattack of Internet financial enterprises. For example, Ali Group's financial system has fundamentally broken the ice of the domestic credit loan by the "one-stop" service of customer absorption, credit assessment, loan review and issuance via e-business platform, providing more possibilities to the SME's problem of "difficult financing and expensive financing". In addition, Ali Group does not only involve in traditional fields of commercial banks including deposits and loans, financing, payment and settlement, but resulting in profound impact on commercial banking services and business philosophy. The formal establishment of Zhejiang E-business Bank ("Ali Bank") in 2014 intensified the potential threat to traditional banks. The strengthening of intellectual property protection strategy fired the first shoot of the competition between domestic banking industry and Internet financing; meanwhile, to defend the intellectual property disputes with foreign companies, especially under the circumstances of Ali's listing in the United States, Chinese companies will be exposed to a wider range of patent competition, so the enhancement of information sharing, innovative alliance building (Feng, 2013), and especially the optimization of patent protection become particularly important.

Overseas research on the relationship between Internet finance and banks was significantly earlier than China. Chou, et al, believed the in-depth integration of Internet and bank caused a revolutionary upheaval to the banking sector (Chou & Chou, 2000); Tsai, et al held the customers of Internet financial enterprises and traditional commercial banks varied in age, which was related to the degree of acceptance of innovative technologies and uncertain risk factors (Tsai, Huang & Lin, 2005). Meyer pointed out compared with commercial banks, P2P platform has lower operating costs and higher utilization of funds (Meyer, 2007); Ocean believed Internet financial enterprises provided more convenient credit business than bank process (Tess, 2013).

Chen believed the pressure of commercial banks caused by Internet finance should not be overlooked, forcing commercial banks to accelerate the pace of reform and strengthen customer customization (Chen, 2014); according to the status quo of competition between Internet financial enterprises and traditional commercial banks, Wang proposed four competitive strategies such as growth-orient strategy and aggressive strategy (Wang & Wang, 2014) by using the SWOT analysis; Gong thought the Internet financial model would not shake the traditional business model and earning way of commercial banks in a short term, and commercial banks should seek new development opportunities by using the Internet

(Gong, 2013). The above literature study involved the impact of Internet finance on traditional commercial banks as well as the business model based discussion on how commercial banks deal with Internet finance. However, its analysis of the relationship between commercial banks and Internet finance from the perspective of patent and technological innovation is still a blank area. This paper makes econometric analysis of the patents of Chinese banking industry and Internet financial giants, providing important reference basis for the development and improvement of the related patent protection system and patent strategy, the comprehensive analytical framework is proposed as shown in Figure 1.

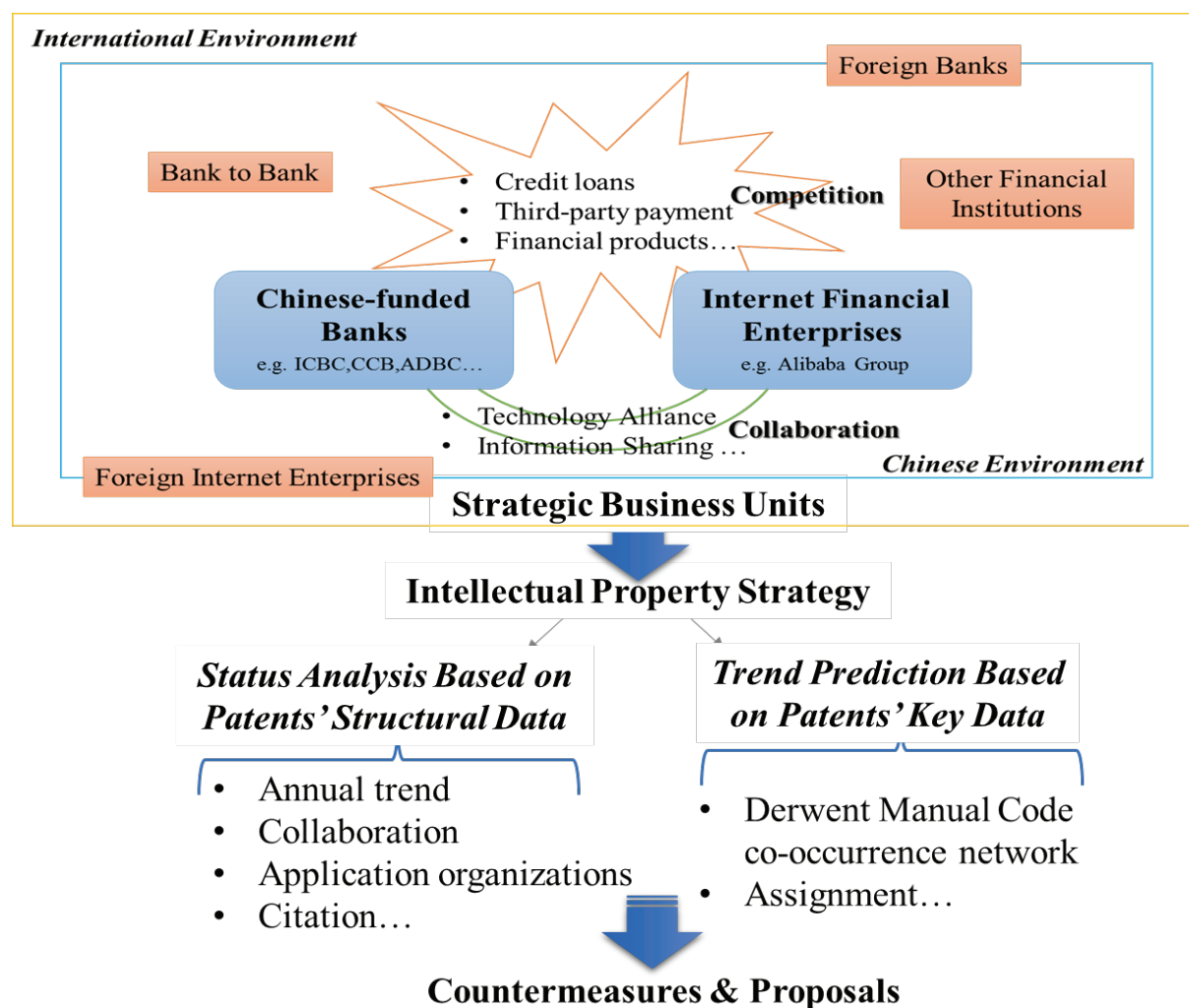


Figure 1. Patent analytical framework of Chinese-funded banks & Internet financial enterprises.

### Data collection and analysis approach

The paper acquires the patents of the five representative Chinese-funded banks (ICBC, CCB, ADBC, BOC and BOCOM) and Alibaba Group Holding Limited on Jan.7, 2015 in DII by the way of Assignee Name and Assignee Code complex retrieval mode (Assignee Name and Assignee Code is connected by “OR” internally and by “AND” between two), the time span is from 1963 to 2014. After manual screening and exclusion, 917 Chinese bank patents and 1088 Ali patents are finally obtained.

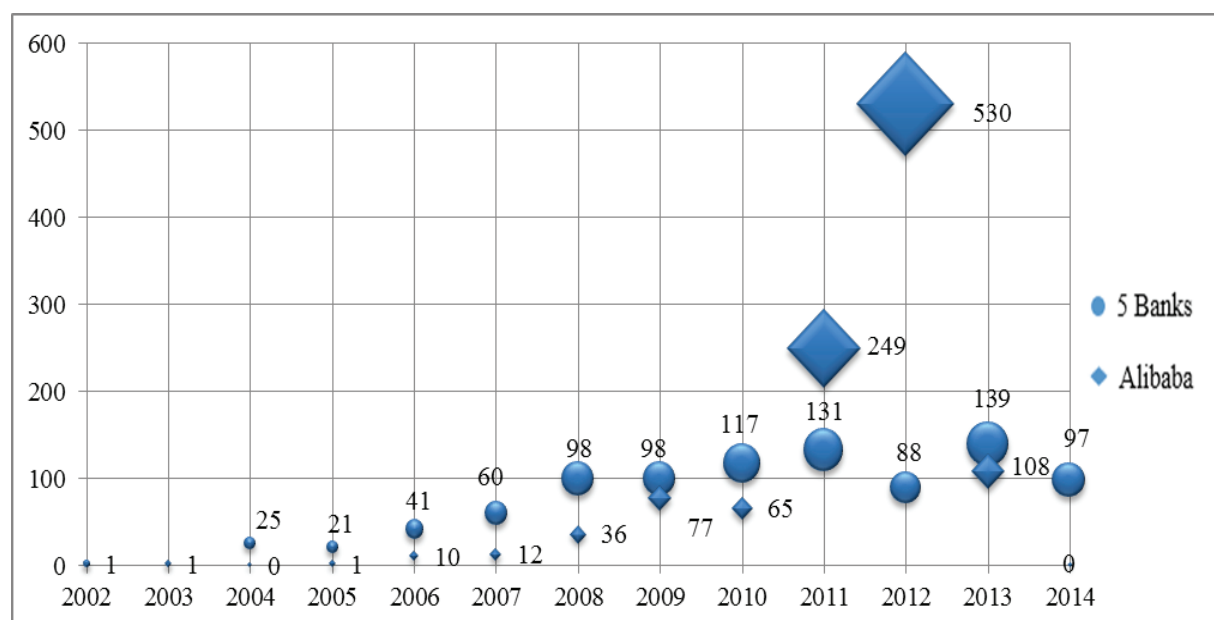
The paper generalizes the patent development status and trend prediction of Chinese-funded banks and Internet financial enterprises by approaches of patent quantity statistical analysis

and patent content measurement in combination of visual tools, and proposes strategies and measures for the two sectors to improve patent protection, enhance technological innovation capacity, share information and build technology-business alliance if necessary, providing reference for the new development layout.

## Results

### *Results of status analysis based on patents' structural data*

Although the five Chinese-funded banks were built significantly earlier than Alibaba Group, they didn't occupy a striking advantage in the patent protection starting year, and lagged behind Ali in the total number of patents. In 2002, ICBC's patent of bank-card with dual account's processing device and method (PN: CN1397916-A) started the bank patent applications. Three years later, Alibaba carried out comprehensive patent protection and gradually exceeded the banks at an amazing growth. The annual patent application amount is shown in Figure 2.



**Figure 2. Annual trend of five Chinese-funded banks and Alibaba Group's patent quantity.**

Figure 2 shows that the patent application amount of the selected banks has entered into fast growth since 2004. Though with slight fluctuation, but the overall situation is stable and the annual application number is relatively balanced. ICBC (549 patents) and CCB (253 patents) occupied a dominant position and led domestic banks to quickly engage in the patent development gradually integrating high-tech into the enterprise strategic level. In contrast, Ali Group's patent application was almost in exponential growth trend. The number of patent in 2012 was as high as 530, and the growth declined since 2013. The rapid deployment of domestic banks and financial enterprises was inseparable from the guidance of a series of policy documents including "National Intellectual Property Strategy" and also inseparable from the continuous expansion of Chinese enterprises and high-tech application.

By making statistics according to the patentee, we found all the 2005 patents were independently applied by banks and Ali Group. Few patents were produced via internal cooperation, and the branches concentrated in Zhejiang and Jiangsu. This phenomenon indicated that Chinese-funded banks and Internet financial enterprises didn't have close external relation in the patent activities, with a low degree of cooperation. To some extent, it

indicated that in the scope of finance, domestic enterprises have the relatively independent R&D team and were not positive enough in the flow and share of knowledge and information. If the external cooperation characterizes the degree of openness of proprietary technology, the geographical distribution of patent pending organizations is the indicator of measuring the corporate strategic deployment breadth. By the patent geological layout, we can learn and predict the key development areas of banks and Internet financial enterprises as well as the market distribution status of financial products and services (Luan, 2012). This paper makes analysis based on the connotation of the patent pending areas and organizations represented by the first two bits of code, we find only three patents of the Chinese-funded banks are applied in the non-Chinese mainland pending organizations, which are held by ICBC and distribute in WIPO, Taiwan and Russia. Although ICBC ranked No.1 in the world by a higher core capital and positively promoted international business strategy by means of organization application, mergers and acquisitions (till 2014, ICBC set up more than 330 overseas establishments in 41 countries and regions), its patent strategy failed to achieve the corresponding expansion (People, 2014). In contrast, Aliaba's patent has a wider geographical distribution; up to 71.7% (780pcs) of the patents were applied in organizations out of China. The average number of non-Chinese mainland patent application is 2.4 times (non-Chinese mainland application number/ non-Chinese mainland patent application number 1879/780), and the application of a number of patents has covered the range of over 6 organizations, and the pending mechanisms mainly distribute in Hong Kong, the United States and Europe (Table 1). Since the expansion of overseas business (since the establishment in 1998, Ali Group has set international headquarters in Hong Kong, offices in the United States, European and Japan), maintaining a highly consistent direction.

**Table 1. Distribution of Ali's patent applications (outside of mainland China).**

<i>Region</i>	<i>QTY</i>	<i>PCT(%)</i>	<i>Region</i>	<i>QTY</i>	<i>PCT(%)</i>
HK	631	33.58%	JP	186	9.90%
US	337	17.94%	KR	2	0.11%
WO	321	17.08%	SG	1	0.05%
EP	201	10.70%	AU	1	0.05%
TW	196	10.43%	DE	1	0.05%

Furthermore, the paper analyses status of two sections with patent citation data. These citations open up the possibility of tracing multiple linkages between inventions, inventors, scientists, firms, locations, etc. (Hall, Jaffe & Trajtenberg, 2001). 171 and 101 patents of Chinese banks and Ali Group were cited by other patents, respectively; patents with high citing frequency (top 5) were selected for analysis by combining with the cited patent information, and Table 2 is derived. Data showed that all the highly cited patents of Chinese banks were from ICBC, highlighting its outstanding R&D level among the peers.

**Table 2. Highly cited patents of Ali and ICBC (Top 5).**

<i>ICBC</i>		<i>Ali Group</i>	
<i>PN/Freq.</i> <i>(cited patents)</i>	<i>AE/Freq.</i> <i>(citing patents)</i>	<i>PN/Freq.</i> <i>(cited patents)</i>	<i>AE/Freq.</i> <i>(citing patents)</i>
CN1556449-A/19	BEIJ-Non-standard/10	CN101562543-A/7	GOOG-C/5
CN101183456-A/7	INCO-Non-standard/3	CN101662460-A	SALE-Non-standard/4
CN1588846-A/7	TNCT-C/3	CN101662460-A/6	IPCU-Non-standard/3
CN101119202-A/6	JIED-Non-standard/2	CN1835438-A/6	HUAW-C/2
CN101393671-A/5	SONG-Individual/2	CN101685516-A/5	TNCT-C/1

The patents of ICBC and Ali Group were mainly cited by enterprises, and a small number distributed in the patents held in the name of individuals and universities. Enterprises cited the patents of ICBC including categories of marketing, communications, telecommunications, network equipment, data security, authentication and other related categories, of which the citing frequency of BEIJING FEITIAN CHENGXIN SCI & TECHN CO (a world leading professional software protection and authentication of high-tech intelligence company), indicating the important of the authentication-related technology included in ICBC patents and also reflecting the close relation between the company products and ICBC business. Enterprises' citations of Ali Group involved customer consulting, Internet, software, communications (communications equipment), electronics, telecommunications, investing and financing, and the patent citers distributed in the United States and Japan. It is noteworthy that enterprises with similar business as Alibaba like Google, Tencent, are also among the citing group, showing Ali's patent technology is playing a guiding role in the Internet industry. In addition, Beijing Institute of Technology and Taiyuan University of Technology cited the patent of Ali and ICBC once, respectively.

#### *Results of trend prediction based on patents' key data*

Compared to other classification system, Derwent manual code (MC) outlines more detailed indexing information in retrieval of patent's theme and core content based on the uses and applications of an invention, rather than just a straight forward description of what the invention is (Stembridge, 1999).

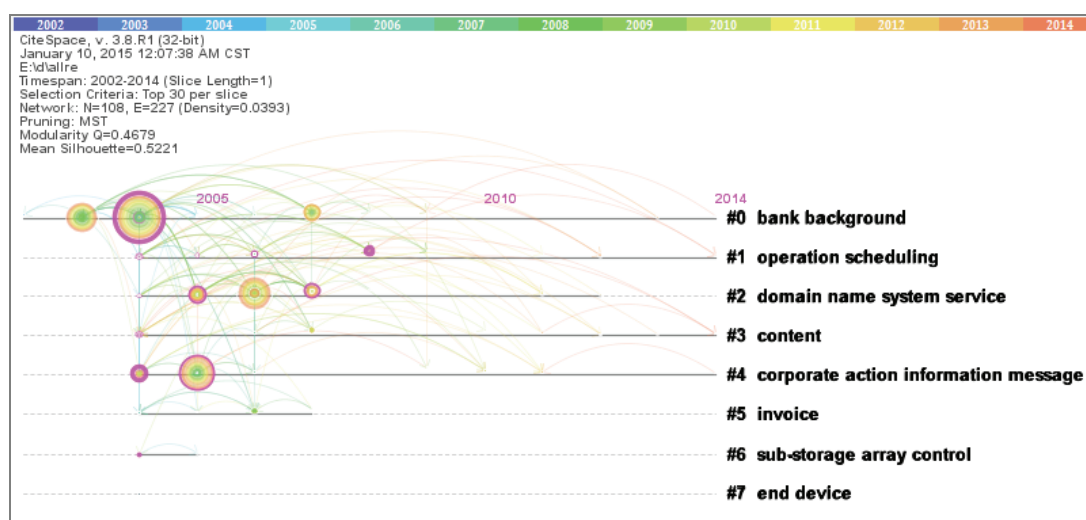
**Table 3. High frequency Derwent Manual Codes (Top 10).**

<i>Alibaba freq</i>			<i>Five Chinese-funded banks</i>		
Freq	MC	Content	Freq	MC	Content
310	T01-J05B4P	Database applications	175	T01-J05A1	Financial
230	T01-N01D3	From remote site or server	140	T01-N01A1	Eft/banking
184	T01-S03	Claimed software products	139	T01-N01D3	From remote site or server
172	T01-N02A3C	Servers	134	T01-J05B4P	Database applications
154	T01-N03A2	Search engines and searching	81	T05-L03C1	General control system
126	T01-J05B3	Search and retrieval	75	T01-N02A3C	Servers
123	T01-N01D2	Document transfer	69	T01-D01	Data encryption and decryption
77	W01-A07G1	Transmission control procedure	67	T01-N01A	Financial/business
74	T01-N01A	Financial/business	59	T01-N01D2	Document transfer
65	T01-N02A2C	Client/server system	57	T01-N02B2B	System and fault monitoring

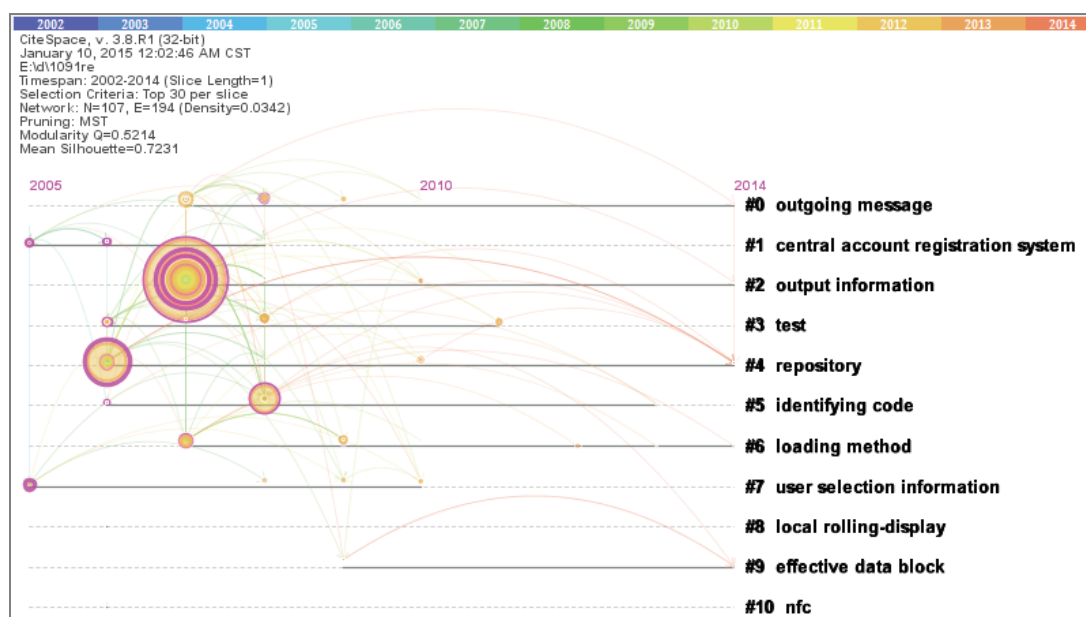
Further, we transforms the bibliographic data of all the 2005 patents into WoS logging data and introduced into the CiteSpace, and set the analysis interval as 1 year, then drawing the maps (Figure 3 and Figure 4). By depicting the association and combination between the MCs, it can analyse the correlation between patents and even technologies, and can also facsimile the internal technology composition and structure (Shen, Gao & Teng, 2012). Timeline visualization provides a directly temporal overview of technologies, columns are time periods of co-occurrence of technologies and rows are clusters (Gong, Jiang, Yang& Wei, 2011). The dynamically changing course of banks and Internet finance patent technologies can be revealed by combining with the attribute changes in timeline axis. Moreover, the development trend can be predicted through their restive business characteristics. The top 10 high-frequency manual codes of Chinese-funded banks and Ali Group (Table 3) were intercepted respectively to explore the hot fields.

It can be seen from the analysis that the technical research of both subjects was carried out by centring the category of “T01”, showing the Chinese banks and Internet financial enterprises are very concerned about the application of digital computer in financial services. A series of patent activities were conducted by combining with the research of “database applications” and “application originating from remote sites or remote servers”. It is noteworthy that in the distribution of the top 10 high-frequency bank patents, Internet financial patents showed a high degree of overlap in some technical contents. In addition to “database applications” and “remote service”, “document transfer” and “Financial/business” were also included in the key content of their patent developments. In contrast, the patents of banks are more inclined to the study of financial, banking, system monitoring and related technology; Ali Group makes innovation and protection based on the contents of search engine and software.

As the largest cluster in the bank MC network, “bank background” demonstrated the general picture of banking business featuring electronic funds transfer point of sale equipment, currency handling systems, smart media and the Internet and information transfer, which occupied the central position in the entire time chain.



**Figure 3. Five banks' Derwent Manual Code co-occurrence network (Timeline view).**



**Figure 4. Alibaba Group's Derwent Manual Code co-occurrence network (Timeline view).**

In Ali's network, the cluster "outgoing message" constituted by the close connection of digital information transmission, Internet and messaging, data processing systems and process control comprehensively summarized the business flow carried out by Ali Group based on Internet data. Second, the cluster "central account registration system" composed by audio / video record and Internet-based information processing and transfer, and nine clusters including data and communications. The overall technology relevance and research contents are similar to these shown in the MC of Chinese bank patents, but more emphasis was made on the application of Internet in business.

On this basis, codes with high frequency change rate with the time sequence (burst term, Table 4&5) further determined the technology frontier and development trend of Chinese banks and Ali (Huang, Wang & Wang, 2014).

**Table 4. Bursts of Banks' Derwent Manual Codes**

<i>Burst</i>	<i>MC</i>	<i>year</i>	<i>Content</i>
5.77	T05-L03	2002	Cash dispensing and depositing machines
6.18	T05-L02	2003	Electronic funds transfer
5.21	T01-N01A1	2003	Eft/banking
3.06	T01-N01A2A	2004	E-shop, e-auction, e-mail, and e-services
2.94	T01-J05A1	2004	Financial
2.93	T05-L01D	2004	Data transfer and network aspects
2.76	T01-J12C	2004	Security
2.76	T01-J05B4P	2005	Database applications
5.7	T01-F05	2006	Arrangements for executing specific programs and system management software
4.93	T01-N01D	2006	Data transfer
3.53	T01-J05A2	2006	Administration and management tools
4.08	W01-A07G1	2011	Transmission control procedure
2.99	W01-A06C4	2011	Radio link
2.68	T01-N03A2	2011	Search engines and searching
3.04	T04-K03B	2012	Rfid/transponder

**Table 5. Bursts of Ali' Derwent Manual Codes**

<i>Burst</i>	<i>MC</i>	<i>year</i>	<i>Content</i>
5.12	T01-N01A1	2005	Eft/banking
3.14	T01-N02A3C	2006	Servers
5.02	T01-E01A	2007	Sorting
4.48	T01-S03	2007	Claimed software products
2.86	T01-J16C3	2007	Natural and pictorial language processing
4.58	T01-M02	2008	Multiprocessor systems
6.29	T01-E01	2009	Sorting, selecting, merging or comparing data
4.63	T01-J20C	2011	Software test, verification, debug, optimization
2.73	W01-A06E	2013	Network control and software

The patented technology burst of Chinese banks are more evenly dispersed in 2002~2012, following the development course of bank reserves appliances → electronic funds / bank → online business and data processing → database applications → specific project management and data transfer → search engine, control → wireless communications, showing the trend of gradual evolution from traditional banking to Internet financial sector. Since 2005, Ali's patent started from e-funds/e-bank technologies, and then underwent a series of technology evolution of data processing from server, data sorting, and software to graphic language processing, which is currently in the data processing optimization and study of Internet control technology. Although the related technologies of e-transaction technology appeared earlier in the patent of Chinese banks, but Ali Group is more sustainable in the ongoing online transactions, which continues to carry out the research based on big data and gradually establish technology chain in the field of Internet finance.

Technological evolution is the exploration on the development route and trend of bank and Internet financial enterprises based on patent, and the conclusion of patent assignment information can provide references to the patent development mode of the two. In 2014, Alibaba Group made IPO financing amounted to 25 billion U.S. dollars, which was the largest IPO. The United States is a country with frequent patent disputes, to avoid the patent infringement issues encountered by Facebook or Twitter in IPO, Ali Group has made significant patent deployment in the U.S. since 2013, where a lot of patents have been reserved. Till the retrieval date of this paper, 399 U.S. patent family cases were found and more than 50 have been authorized (Chinaip, 2014). In addition to independent application, Alibaba purchased 21 patents from IBM in 2013, and one of which was for Amazon, the largest U.S. e-commerce platform, and also prepared for coping with the patent competition and litigation. We made inquiry of the operating data of Ali Group and five Chinese banks in Chinese patent database and found that Ali Group started to purchase the patents of other organizations since 2012 onwards, but only limited to the category of invention patents. Patent seller expanded from domestic organizations to international institutions, such as Shanghai Yiren Information Technology Co., Ltd. and IBM; in addition to enterprises, Ali also purchased patents from Chinese Academy of Science Institute of Computing Technology; the change of some patent was caused by the changes of the corporate nature, such as Alibaba to Alibaba Group Holding Limited. The aforementioned technical fields of patent change included electric digital data processing, transmission of digital information, arrangements of circuit components or wiring on supporting structure and coin-freed or like apparatus. However, the patent purchased by Chinese banks included patent, utility models and appearance design, and the patents with internal change were almost 1/2 of the total patent transfer amount. These patents mainly came from the bank branches and individuals, and only CCB had one patent purchase from enterprise (Shandong Confucian Culture Communication Co., Ltd.), and the technical fields of patent change mainly involved the bank cards, security cards, teller settings and other contents, no transactions concerning goods and services of bank financial commodities and services were made.

## **Discussion and conclusions**

### *General comments*

In a long term in the past, Chinese banks made huge profits by relying on monopoly advantages and policy bonus, and occupied the position on the top of financial ecology. However, the single channel and curing product business model can no longer work. In China, the rapid development trend of Internet finance represented by Alibaba does not only occupy a significant share in domestic financial sector, but also causes widespread concern in the overseas business expansion. Traditional profit making channels of banks have been

hindered in a variety of aspects, including the competition of domestic and overseas banking industries and the pressure caused by the enhancement of overlap ratio with Internet finance business. With the development of commodities and services based on big data, Internet financial enterprises are inseparable from the application of technology. In the new situation, it faces the transfer from purely financial products to technical competition; whether banks or Internet financial enterprises, technology innovation and application have been upgraded to a new strategic plan.

By the comparison of patents of 5 Chinese banks and Alibaba Group Holdings Limited, we found that the patent activities of Chinese banks started late, with limited number, especially in key business areas like e-commerce. Most of the bank patents were independently applied in China, and their overseas IPR protection does not match their development of business, which may become a potential hazard for patent disputes arising from overseas promotion of financial products and services. Although the banks have higher patent citing frequency, the citing parties are mostly in China and the all the highly cited patents are held by ICBC. In contrast, Ali Group has achieved rapid progress of patent activities, with advantages in the total number, patent geographical distribution and the composition of citing groups. However, like banks, Ali Group also has low degree of external cooperation, indicating their closure and limitations in patent research and development. We can learn from MC co-occurrence network that banks and Internet financial enterprises have relatively concentrated technology, which were the patent R&D centred by computer and showed a high degree of overlapping in database use, financial/commercial and remote control, etc. The patent contents of Chinese patents tend to the research of digital communication, hardware equipment and banking business operation, whereas Alibaba pays more attention to search engine and software-related innovation and protection. From 2002 to 2014, bank patent technology showed the shift from bank reserves appliance to e-funds/banking, online services and data processing. Currently, it is in the stage of network and wireless communications, whereas the research of Alibaba has undergone a series of technology evolutions from e-funds/e-banking, data processing from server, data processing, software to graphic language processing. Patent assignment data showed that independently developed ones are still the main source of banks and Internet financial enterprises' patents, while the patent purchase of Internet financial enterprises are quietly rising, and may form a new patent development mode of "independent R&D and purchase".

### *Countermeasures & Proposals*

Based on the abovementioned patent status and future development direction of banks and Internet financial enterprises, China's banking industry shall attach important to the development, protection, management and utilization of bank patents at all levels. Moreover, it is essential to set up product and service technology early warning, make technical prediction and selection in fields with priority. At the same time, cooperation with high-tech industries represented by information technology shall be emphasized to improve the patent technical quality. At the same time, on the basis of full study of international regulations and overseas local laws and regulations, Chinese banks shall learn from Alibaba's international patent strategies to increase the overseas patent application quantity, expand market share and gain competitive advantages. After the listing in the United States, as the leader of Internet financial industry, Alibaba shall not only strengthen the risk control effort, promote the innovation of financial products and services and customer participation as well, but shall accelerate the deployment of intellectual property, take the mode of simultaneous patent purchase and independent R&D, to avoid patent disputes with overseas companies and win market opportunities by appropriate use of patents. In addition to strengthening their competitive advantages, banks and Internet financial enterprises shall strengthen cooperation

to make best use of the advantages and bypass the disadvantages, so as to form a new finance-technology alliance. Banks can use the network resources, information data and cloud computing of Internet financial enterprises to play their professional administration, thus introducing customers to the professional advantages via network channel. Likewise, by relying on the financial background of banks, Internet financial enterprises shall set up long-term, stable relationship with mutual trust to expand the scope of commercial exchanges, strengthen financial risk management and control, thereby providing a cooperation and win-win opportunity to both parties.

### *Further research*

In the process of researching the status quo and future trend of Chinese-funded banks and Internet financial enterprises, this paper only took into account of their competition and cooperation. In fact, we can learn from the framework of this paper that factors affecting the development of them are multifaceted and complex. Hence, in the following study, the author will put overseas companies into the comparison to explain the development situation of banks and Internet financial enterprises in detail.

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