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How Chinese Financial Centers Integrate into Global Financial Center Networks: An Empirical Study Based on Overseas Expansion of Chinese Financial Service Firms

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Abstract: The increasing globalization of the Chinese economy has been enabled by both Chinese financial institutions operating globally as well as international firms operating within China. In geographical terms, this has been organized through a number of strategic cities serving as gateways for the exchange of financial functions, products and practices between China and the global economy. Drawing on location data of financial service firms in China listed on stock exchanges in Shenzhen, Shanghai and Hong Kong, this paper shows that Chinese financial firms are expanding globally and how Chinese financial centers are positioned and connected in the urban networks shaped by these financial service firms. It is found that Hong Kong, China, holds strategic positions in the integration of Chinese cities into global financial center networks, and that establishing a foothold in global financial centers such as New York and London has been a priority for Chinese financial institutions. The increasing capital flows directed by Chinese financial institutions suggests a shifting global financial geography, with numerous Chinese cities playing increasingly important roles within global financial center networks.

Keywords: urban networks; corporate networks; financial service firms; global financial centers; China

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1 Introduction

The last two decades have been characterized by a significant 'going-global' of Chinese firms (Yeung and Liu, 2008; Pan and Brooker, 2014; He et al., 2015). Despite the growing research attention on outward foreign direct investment (OFDI) from China in the manufacturing sectors (Si et al., 2013; Si, 2014; He et al., 2015), little attention has been paid to the internationalization of advanced producer services (APS) firms from China in general, and financial services firms in particular. However, in parallel with the rapid economic growth of the country, the internationalization of Chinese financial services firms does play an increasingly important role in connecting global and national circuits of capital. Against this backdrop, this paper analyzes the urban networks associated with financial services from a 'world city network' perspective.

The world city network literature frames an approach to understanding contemporary globalization by means of economic flows and the rising importance of cities as strategic nodes. The corporate networks of APS are

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deemed indicative of broader interurban connectivity (Taylor, 2001; 2004; Derudder et al., 2010; Taylor et al., 2012; Derudder et al., 2013; Taylor et al., 2014b), and analyzing these networks has shaped our understanding of how cities are tied up in economic globalization (Sassen, 2001; Taylor, 2001). For example, the Globalization and World Cities (GaWC, http://www.lboro.ac.uk/gawc/) research network has constructed a large dataset of the location strategies of 'leading' APS firms, which has been used to construct urban networks at various geographical scales. However, it has been claimed that datasets that focus on the largest or 'most globalized' firms may produce a biased picture of global urban centrality (Godfrey and Zhou, 1999), especially for cities located in 1) countries that are sub-central because of smaller national markets (Schmitt and Smas, 2012); 2) countries that are skewed towards markets in different sectors (Krätke, 2014; Martinus et al., 2015); or, 3) countries where APS markets are less globally integrated and/or competitive (Zhao et al., 2015; Pan et al., 2017). Therefore, in the spirit of Zhang and Kloosterman (2016), in this paper we explore how Chinese financial service firms use cities as basing points in their putative global strategies.

The locational strategies driving the internationalization of APS firms from emerging market economies such as China are assumed to be different to those from the more developed nations. While the latter often seek access to new markets (Beaverstock, 2004; Faulconbridge et al., 2008), the former might require access to capital, and/or look to be arm's length to other key APS firms. At the same time, a broad range of idiosyncratic processes may influence the geographical patterning of this internationalization. According to the mainstream Foreign Direct Investment (FDI) theories, APS firms from developed economies usually have ownership, locational and internalization (OLI) advantages when they enter new markets abroad (Dunning, 1989; 2001). In contrast, as APS firms from emerging economies face competitive disadvantages, their locational strategies are more likely to follow clients, which may differ from their developed world counterparts.

Indeed, previous studies have found that financial service firms from developed economies prefer to set up subsidiaries in countries that are geographical and culturally close to them (Hellman, 1996) as well as tend to situate within well-established global financial centers (Hellman, 1996; Moshirian, 2001). Little is known about the locational choice of financial service firms from emerging economies. The study of 'globalization of Chinese banks' by Calkins (2013) points out that the overarching logic underlying of China's globalization has been of banks servicing expanding Chinese business abroad in the first stage. In the second stage of globalization, Chinese banks would subsequently tap into local markets. The first strategy appears to have dominated, being exemplified by the expansion of the Industrial and Commercial Bank of China (ICBC). Calkins (2013) quotes Tian Zhiping, Chief Executive of ICBC Middle East, who states that ICBC bank targets 'regions that have a significant number of Chinese businesses in operation already, which allows us to play the critical role of financial intermediary'. In addition, the overseas expansion of Chinese financial service firms has also been driven by national agendas, such as the internationalization of the Renminbi (RMB), and the 'Belt and Road' Initiaive.

The net result has been that although China's 'big four' banks[①] depend on domestic financial operations for a majority of their annual revenue (current overseas operations by major Chinese banks account for less than 10% of their total assets), they do adopt aggressive geographical expansion strategies. ICBC, for example, has set up more than 200 subsidiaries and branch offices in 31 different countries and regions worldwide, according to the company's website (http://www.icbc-ltd.com/ICBCLtd/About%20Us/Global%20Websites/default.htm) (Taylor and Derudder, 2016). Meanwhile, the ABC has opened branch offices in New York, Hong Kong, China, Seoul and Singapore.

In this paper, we more systematically unpack the geographic patterns and networks which have emerged as a result of the internationalization of Chinese financial service firms. Drawing on a dataset of APS firms from three Chinese stock exchanges and framed by the world city network approach, we investigate how the strategic network ties are built from the perspective of Chinese producer service firms, with attention to how

① They are BOC, Bank of China; CCB, China Construction Bank; ICBC, Industrial and Commercial Bank of China; and ABC, Agricultural Bank of China.

and why these networks exist.

2 Internationalization of Financial Service Firms and Financial Center Networks

Due to the instrumental role of APS under conditions of financialized globalization and their concentration in a select group of cities (Sassen, 2001), the location strategies of APS firms are widely used to construct urban networks at various levels (Taylor, 2001; Derudder et al., 2013). Most existing studies incorporating different types of APS firms to describe urban linkages have found that key 'global' or 'world cities' within urban networks are strategic places for firms (Taylor et al., 2014b). Financial service firms are seen as both typical and key examples of APS firms. In Taylor and Derudder (2016), for example, 75 out of 175 firms (or 43 per cent) are from the financial services sector, with financial centers characterized by the agglomeration of different types of financial products including banks, securities, insurance, assets management firms and so on (Mollan and Michie, 2012).

The rapid increases in global FDI and trade flows have further catalyzed the internationalization and agglomeration of financial service firms. Whereas initial observations found those firms from more developed economies followed clients as they went abroad (Nigh et al., 1986; Hellman, 1996; Yamori, 1998; Moshirian, 2001), more recent research highlights a preference to locate in established national financial centers (He and Fu, 2008; He and Yeung, 2011; Sigler and Martinus, 2016). Top global financial centers usually house the head quarters of large financial service firms and a large number of subsidiaries of foreign financial service firms (Poon, 2003). As such, large financial service firms have affiliations in financial center cities across the world, creating intensive flows of capital, information between their different subsidiaries in various cities shaping networks of global financial centers.

Nonetheless, despite the increasingly footloose characteristics of financial capital through global markets, the agglomeration tendencies of financial service firms are widely researched, revealing continued strong tendencies to locate in existing financial centers when setting up overseas branches (Sagaram and Wickramanayake, 2005; Jarvis, 2011). The agglomeration of financial services is often motivated by path dependence, driven in part by cultural similarities (Hellman, 1996). Foreign banks tend to locate in banking centers and are attracted by capital markets (Brealey and Kaplanis, 1996). Once banks have established a foothold in a financial center, others generally follow (Engwall and Wallenstål, 1988).

The result of the rapid growth of Chinese economy has been the increasing internationalization of financial service firms from China. The Chinese Outward Foreign Direct Investment (OFDI) in manufacturing and growing trade volume has resulted in greater demand for financial services. Financial service firms have therefore started to 'follow' their clients from the manufacturing sector, pursuing their own strategies to expand their global presence for purposes, such as entering new markets, obtaining global reputation and so on, with the aim to become larger, more influential, and more globally connected.

Two major hypotheses underlie this study, and provide a framework to understand the globalization of the Chinese financial services network. Firstly, following the findings of other national studies, financial service firms from China might choose to locate in established overseas financial centers to either follow clients or seek new markets. In addition, Chinese financial service firms may follow each other as they devise their locational strategies. Geographic proximity, cultural distance, government regulations, servicing home country clients, and following competitors' locational choice are found to be major determinants of international market selection of business service firms (O'Farrell and Wood, 1994). Some financial centers may hold central positions for Chinese financial service firms within the urban networks, as they meet the demands of financial service firms from China to achieve their strategic purposes.

Secondly, China's national strategies such as Belt and Road Initiatives and RMB internationalization would play an important role in the locational choices of financial service firms, as many of the financial service firms are state-owned. After the Belt and Road Initiatives was officially announced in 2013, many Chinese financial service firms, in particular banks, started to set up more affiliations along the cities related to the Belt and Road Initiatives (Li and Chen, 2015). In addition, RMB internationalization has been a key national agenda of China. Those cities that can help the process of RMB internationalization are preferred by Chinese financial service

firms. Many top financial center cities, including Hong Kong, China (Huaxia, 2015), Singapore (CFO Innovation Asia Staff, 2014) and London (Detrixhe, 2015), are competing to become a key offshore RMB center. Given the friendlier environment for doing RMB related business, Chinese financial service firms will prefer these cites to expand their business globally.

The remainder of this paper analyzes the geographical extent of Chinese financial services firms and how firms' locational choice might reshape the global financial geography landscape. Finally, it explores how Chinese lead financial centers are connected with the global financial center networks.

3 Data and Methods

The data used in this study are primarily derived from the annual report of 2015 of publicly-listed financial service firms on the SSE (Shanghai Stock Exchange), SZSE (Shenzhen Stock Exchange) and HKEx (Hong Kong Stock Exchange, China). Only those firms that have overseas subsidiaries are included in the analysis. The annual reports of non-banking financial service firms contain a table listing all subsidiaries and their locations, which is used for further analysis. In addition, we also draw data from the official websites of those financial service firms to make sure the data are consistent. For the overseas subsidiaries of banks, the information is mainly drawn from the official website of the banks by the end of October of 2016. In addition, we also checked the information with the *Overseas Establishments of Chinese Banks* (China Banking Regulatory Commission, 2014). Finally, we searched the information of newly established overseas subsidiaries from news reports by using internet search engines under the same time frame.

There are 50 publicly listed financial service firms in total. Overall, banks are in the lead in overseas expansion, followed by securities firms (Table 1). Banks from China have 813 subsidiaries in 126 overseas cities. The multi-function financial service firms are the least globalized. Table 2 lists the top 10 financial service firms with the largest number of overseas affiliations. Bank of China, Industrial and Commercial Bank of China and China Construction Bank are the top three financial service firms, far ahead of other financial service firms. Another two banks, four securities firms and one diversified financial service firm are listed in the top 10.

Chinese global financial networks were constructed using the intra-firm networks of Chinese financial service firms through an adaptation of the 'interlocking network model' (for a recent overview, see Taylor and

Table 1 Summarizing information of publicly listed financial service firms

Sub-sector	Number of firms	Number of overseas subsidiaries	Number of cities distributed
Bank	13	813	126
Securities	26	304	21
Insurance	6	39	8
Multi-function financial service	5	36	6

Table 2 Financial service firms in China with largest number of overseas affiliations

	Financial service firm	Headquarter	Listing bourse	number of overseas affiliations
1	Bank of China	Beijing	SSE/HKEx	448
2	Industrial and Commercial Bank of China	Beijing	SSE/HKEx	140
3	China Construction Bank	Beijing	SSE/HKEx	82
4	Everbright Securities Co., Ltd.	Shanghai	SSE/HKEx	65
5	China Merchants Bank	Shenzhen	SSE/HKEx	56
6	China CITIC Bank	Beijing	SSE/HKEx	45
7	Haitong International	Hong Kong, China	HKEx	41
8	CITIC Securities Company Limited	Shenzhen	SSE/HKEx	30
9	Kunwu Jiuding Investment Holdings Co.,Ltd.	Beijing	SSE/HKEx	21
10	Huatai Securities Co.,Ltd.	Nanjing	SSE/HKEx	21

Notes: CITIC, China International Trust and Investment Company; SSE, Shanghai Stock Exchange; HKEx, Hong Kong Stock Exchange

Derudder, 2016). Each corporate office within a firm's network (j) was assigned a service value (V_{ij}) as a proxy for its strategic importance in a particular city (i), and is calculated as:

$$V_{ij} = \sum_h W_h \times n_{ij,h} \quad (1)$$

where W_h refers to the weight of the affiliation with level h of firm j; $n_{ij,h}$ refers to the number of subsidiaries with the level h of firm j in city i.

In this study, we adopted a slightly different strategy to interpret the bank and non-bank sectors. For banks, the headquarters, second-level branch, third-level branch and representative offices[①], are assigned weights of 4, 3, 2 and 1, respectively. For non-bank financial service firms, as very limited information of the subsidiaries can be found, we simply divide the subsidiaries into two levels: headquarters and others. We assign 4 to headquarters, while other subsidiaries are weighted as 3.

The connection $R_{ab,j}$ between cities a and b through firm j is then defined by:

$$R_{ab,j} = V_{aj} \times V_{bj} \quad (2)$$

$R_{ab,j}$ measures potential information flows between any two cities within a firm's office network, and assumes that a higher level office will have more potential for information exchange. Therefore, flows between two cities with higher level offices will be larger than between two cities with lower level offices. The total connectivity between cities a and b is then defined by:

$$R_{ab} = \sum_j R_{ab,j} \quad (3)$$

The end result is a connectivity matrix that can be used as the input to standard network analysis. In this paper, we use degree centrality, betweenness centrality and closeness centrality to assess the role of the cities within the networks of financial services firms. The reason for calculating different centrality measures is that a city can assume an 'important' position in a network for different reasons (Sigler and Martinus, 2016). First and perhaps most straight forwardly, a city has an influential position in the network if it has a large number of connections (degree centrality). Second, a city acts as a network mediator or assumes a bridging function in the network if it 'stands' on the shortest route between other pairs of cities that are not directly connected (betweenness centrality). Third, a city has a strong position in the network if it is, on average, a limited number of steps removed from other nodes (closeness centrality). Gelphi and Ucinet software were used to do the social network analysis and draw figures.

4 Geographies and Financial Center Networks Shaped by Chinese Financial Service Firms

4.1 Geographies of financial service firms in overseas markets

Chinese financial service firms have globalized considerably in the last two decades. Many Chinese financial service firms, such as the banks (Wang and Ge, 2015) and securities firms (BOCI Securities, 2015), have 'gone global' as part of their growth objectives. As shown in Fig. 1, financial service firms from China have become widely distributed across the globe, with presence across six continents.

As indicated by Table 3, overseas subsidiaries are mainly found among large Asian cities, established global cities, and offshore financial centers (i.e. 'tax havens'). Hong Kong, China is the most important destination for Chinese financial service firms to seek a global presence. Of 1238 overseas affiliations of Chinese financial service firms, 626 are located in Hong Kong, accounting for over 50% of the total. Macau, China, just across the Pearl River Delta from Hong Kong, China, is the second among all Asian cities with 50 overseas affiliations, followed by Singapore with 30. Several Southeast Asian cities including Jakarta, Bangkok, and Surabaya have also attracted a sizable number of Chinese financial service firms. And while Dubai houses a large number of financial firms, there are few in Seoul or Tokyo despite the proximity to and close economic linkages to China. The British Virgin Islands and Cayman Islands, the two leading offshore financial centers, rank second and fourth as hosting cities for overseas Chinese financial service firms, indicative of the Chinese corporate structures around the world through a number of jurisdictions offering tax advantages and/or secrecy intrans actions (Buckley et al., 2015).

① For Bank of China, Chinese Business Table, which is set up within foreign banks, is treated as the level of the representative office.

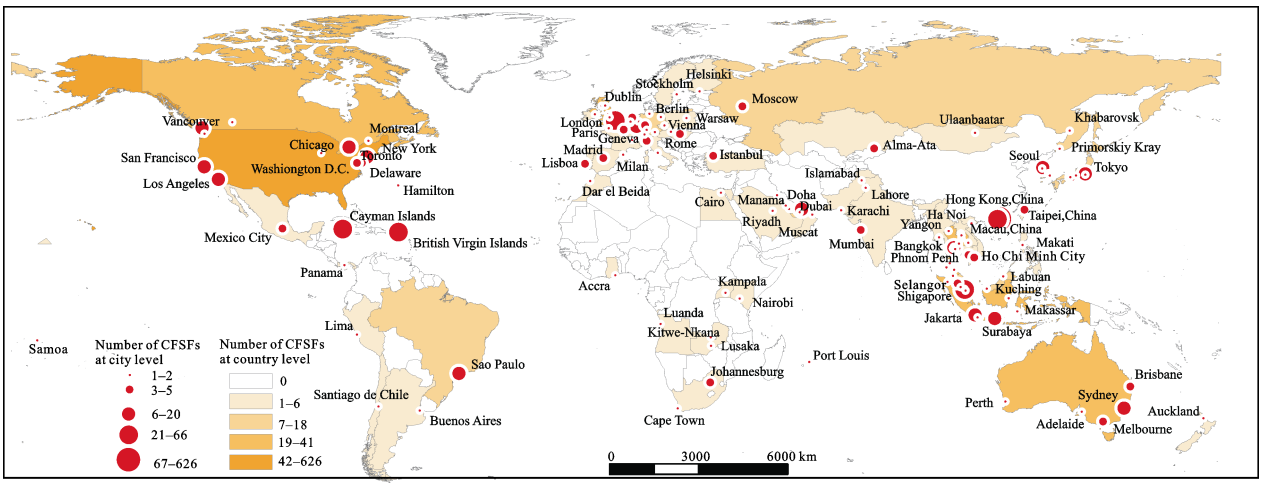


Fig. 1 Distribution of Chinese financial service firms (CFSFs) in overseas markets

Table 3 21 cities with largest number of overseas Chinese financial service firms

No.	City	Number of subsidiaries
1	Hong Kong, China	626
2	The British Virgin Islands	66
3	Macau, China	50
4	Cayman Islands	47
5	Singapore	30
6	London	23
7	New York	17
8	Jakarta	16
9	Bangkok	13
10	Toronto	13
11	Sydney	11
12	Surabaya	10
13	Luxembourg	9
14	Los Angeles	9
15	Vancouver	8
16	Seoul	8
17	Sao Paulo	8
18	Dubai	7
19	San Francisco	6
20	Tokyo	6
21	Selangor Darul Ehsan	6

Chinese financial service firms also have a strong presence in European and North American cities. In Europe, London is the most significant node, as both a 'global' city and an established financial center (Wójcik, 2013). Luxembourg, which is known for being an 'on-shore/offshore' hub (Dörry, 2015) for investment within the European Union is the most significant city in the European continent. Frankfurt and Paris are also important destinations for Chinese financial service firms. In North America, New York, Toronto and Washington are all important to the overseas Chinese financial network, just as Sydney is within Australia, and São Paulo within Latin America.

When broken down by sub-sector, more complex patterns emerge. As Table 4 indicates, banks are more likely to locate within 'mainstream' financial centers while securities and insurance firms are first and foremost networked through offshore financial centers. Hong Kong, China is a leading office location across all sectors, reflective of its unique position vis-à-vis China (Zhao, 2013). An analysis of sub-sectors also reflects the fact that they are at different stages of 'going global'. Overall, the banking sector is most broadly distributed in geographical terms, both in terms of scope and in terms of the sheer number of overseas firm locations. There are 826 overseas banking affiliations distributed across the world, accounting for over 66.7% of all Chinese overseas financial service firms.

The heterogeneity of banks appears to have a strong impact on the internationalization decisions, as previous studies have found with German banks (Buch and Lipponer, 2007). More profitable and larger banks are more likely to expand internationally than smaller banks, and they have more extensive foreign activities. In China's case, national state-owned banks are also more active in global expansion, with the BOC and ICBC being the most internationalized banks from China.

The relatively embryonic state of Chinese financial service firms in non-banking sectors renders them less widely distributed but with stronger presence in existing financial center cities such as Hong Kong, China, London and New York. The lion's share of overseas activity is situated within offshore financial centers such as the Cayman Islands and British Virgin Islands, which house 43 and 67 non-banking firms, respectively (Table 4).

4.2 Urban networks shaped by Chinese financial service firms

4.2.1 Connectivity

Within world city network research, connectivity is deemed a key indicator of a city's position with one network or another. Degree centrality specifically indicates direct linkages to other nodes, and singles out cities with the most connections in terms of financial and other flows. Betweenness centrality indicates a brokering or intermediary position, whereas closeness centrality refers to cities that are few degrees of transactional separation from all other nodes within a network. To better capture the characteristics of the networks, the top 20 cities measured by degree centrality within the networks are shown in the networks graph (Fig. 2). Meanwhile, Table 5 shows the connectivities of various cities around the world. These cities hold key positions within the urban networks shaped by Chinese financial services firms.

Unsurprisingly, Hong Kong, China is the most connected city using any indicator (Table 5). As an influential global financial center, it has strategic advantage in attracting financial service firms from all over the world. Moreover, Hong Kong, China acts as a springboard for Chinese financial service firms in learning how to deal with foreign business with many setting up their first 'overseas' office there. All Chinese financial service firms in this study have affiliations as well as higher level corporate branches in Hong Kong, China, highlighting the city's role in brokering transactions to and from the Mainland economy.

Singapore also holds a key position as both an offshore financial center and a leading global city. As measured by betweenness and closeness centrality, it follows Hong Kong's advantageous position. Macau, China appears slightly more important in terms of degree centrality indicating that it has more direction connections, but that Macau's connections are not as influential as those of Singapore.

Established financial centers such as London and New York are quite influential within the network, as are financial centers such as Frankfurt and Paris. Offshore hubs are also strongly connected, particularly in terms of betweenness centrality indicating a strong brokering role. In particular, Singapore, the Cayman Islands, British Virgin Islands, and Luxembourg are well connected within the urban networks as measured by betweenness centrality. Many of the other cities feature a strong diasporic Chinese presence, which creates *guanxi* (connections) driven ties to Mainland business activities. Aside from Hong Kong and Macau, China, which are both 'Special Administrative Regions' (SARs), Singapore, Jakarta, Bangkok, Surabaya, Toronto and Vancouver all have strong ethnic Chinese populations, suggesting that ethnic linkages still plays an important role in the cultural elements of locational advantage.

Table 4 Top cities hosting most Chinese financial service firms in different sub-sectors

	Bank	Number of subsidiaries	Securities	Number of subsidiaries	Insurance	Number of subsidiaries	Multi-function financial service firms	Number of subsidiaries
1	Hong Kong, China	416	Hong Kong	176	Hong Kong, China	24	Cayman Islands	15
2	Macau, China	47	British Virgin Islands	58	British Virgin Islands	6	Hong Kong, China	10
3	Singapore	19	Cayman Islands	27	Singapore	3	Washington	5
4	New York	16	London	7	London	2	British Virgin Islands	3
5	Jakarta	16	Singapore	7	Delaware	1	Delaware	2
6	London	14	Sao Paulo	6	Macau, China	1	Singapore	1
7	Toronto	13	Lisboa	4	Cayman Islands	1		
8	Bangkok	13	Mumbai	3	Bailiwick of Jersey	1		
9	Surabaya	10	Macau, China	2				
10	Sydney	10	Hamilton	1				

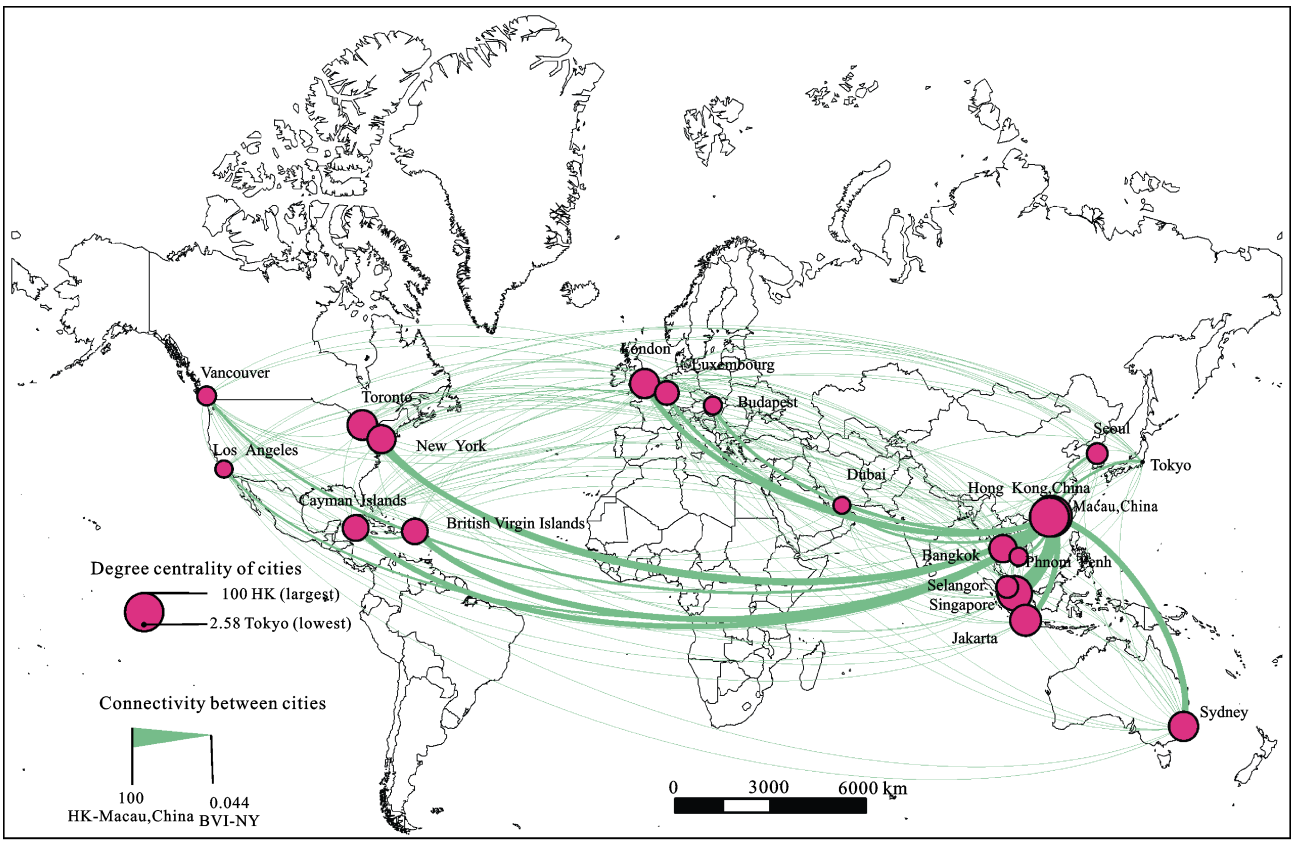


Fig. 2 Urban networks shaped by Chinese overseas financial service firms (top 20 cities by degree centrality. HK is Hong Kong, China; BVI is British Virgin Islands; NY is New York)

Table 5 Standardized centralities of top 20 cities within networks of Chinese financial service firms

	Degree centrality	Top city	Closeness centrality	Top city	Betweenness centrality	Top city
1	100.00	Hong Kong, China	100.00	Hong Kong, China	100.00	Hong Kong, China
2	28.70	Macau, China	99.25	Singapore	61.55	Singapore
3	11.62	Singapore	97.78	London	31.02	London
4	7.36	Jakarta	96.35	Macau, China	25.21	Macau, China
5	6.46	Toronto	96.35	Sao Paulo	21.35	Sao Paulo
6	6.11	Sydney	96.35	Mexico City	21.35	Mexico City
7	6.04	London	95.65	Sydney	13.08	Sydney
8	5.47	New York	95.65	New York	13.08	New York
9	5.15	Bangkok	95.65	Luxembourg	13.08	Luxembourg
10	4.54	Cayman Islands	94.96	Seoul	10.65	Seoul
11	4.43	The British Virgin Islands	94.96	Dubai	10.65	Dubai
12	3.88	Luxembourg	94.96	Tokyo	10.65	Tokyo
13	3.50	Selangor	94.96	Milan	10.65	Milan
14	3.32	Seoul	94.96	Paris	10.65	Paris
15	3.09	Vancouver	94.96	Melbourne	10.65	Melbourne
16	3.00	Phnom Penh	94.96	Frankfurt	10.65	Frankfurt
17	2.99	Budapest	94.96	Moscow	10.65	Moscow
18	2.92	Los Angeles	94.96	Johannesburg	10.65	Johannesburg
19	2.90	Dubai	94.96	Osaka	10.65	Osaka
20	2.58	Tokyo	94.29	Vancouver	10.59	Vancouver

Notes: Degree centrality, betweenness centrality and closeness centrality are all standardized. Centrality indices are presented as percentages of the largest network connectivity (Hong Kong, China) and multiplied by 100

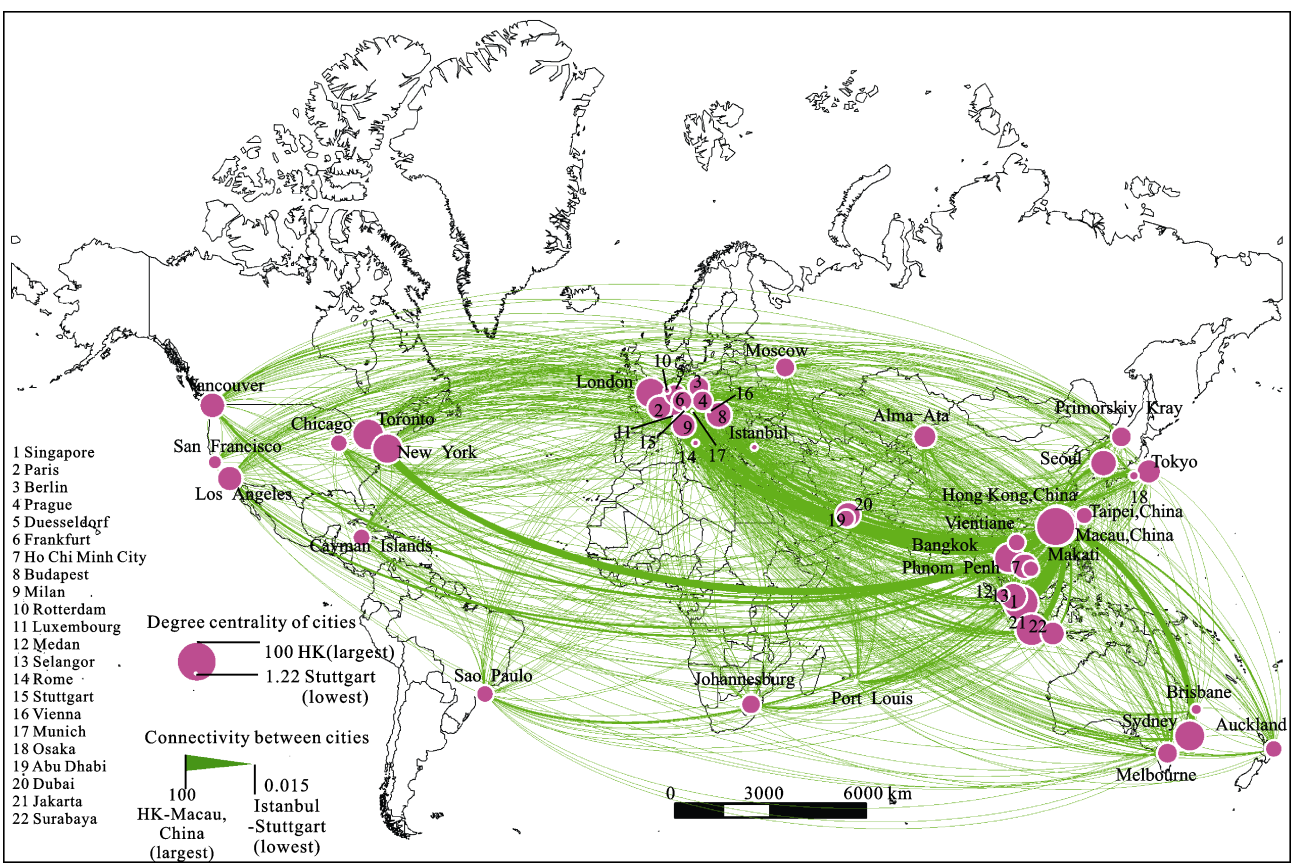
4.2.2 Sub-sector networks

There are notable differences in the global connectivities of the various financial services sub-sectors with each at a different stage in internationalization (Fig. 3). As shown in Fig. 3a, urban networks shaped by overseas banks are more intense and existing financial center cities, such as Hong Kong, China and London and hold key positions within these networks. Urban networks driven by other sub-sectors, in contrast, are less complex and extensive. Several offshore financial centers are influential in these networks, which indicates that financial service firms in these sub-sectors have different locational strategies compared to banks. For example, the insurance and securities networks have strong connectivities in established 'offshore' tax havens as well as known 'onshore' ones such as Wilmington in the US State of Delaware.

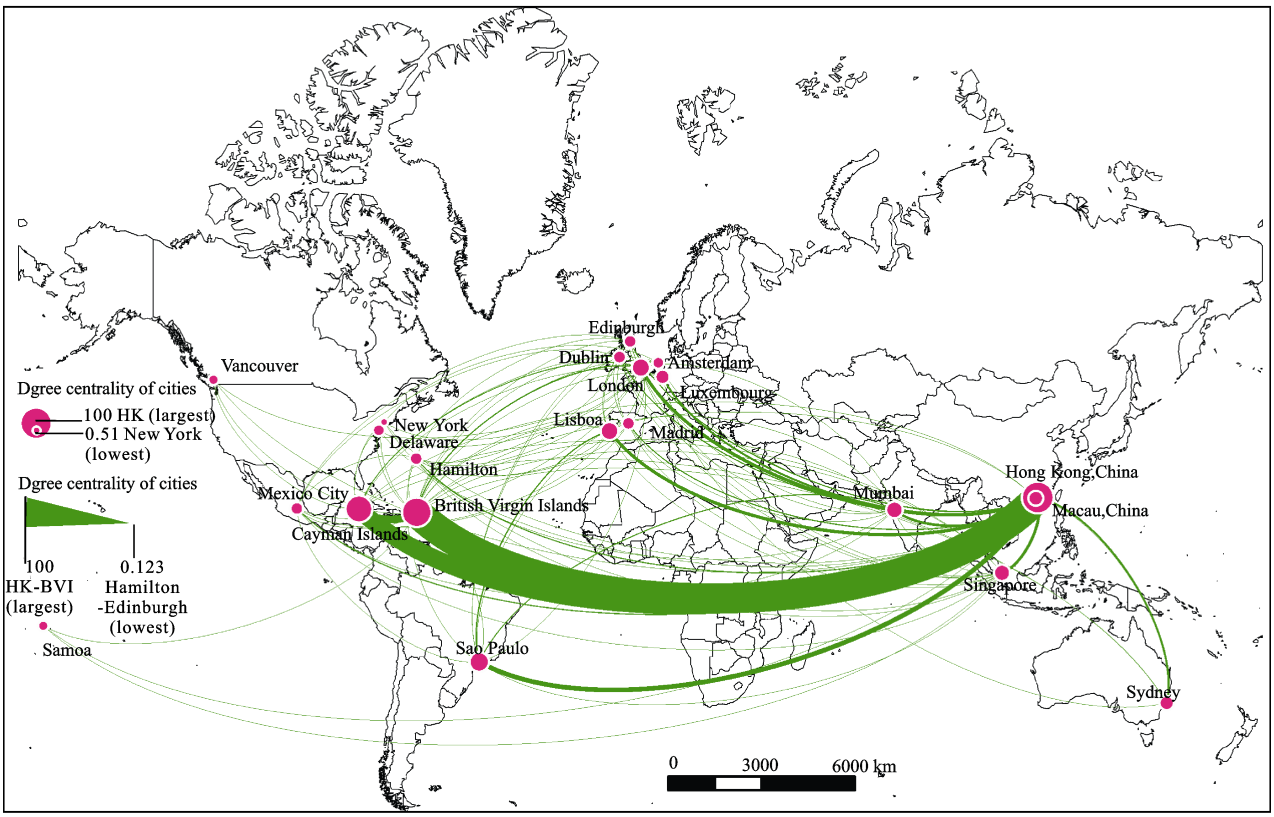
4.3 Impacts of Chinese financial service firms on the global financial geographies

The geopolitical and geo-economic strategies of both the Chinese State as well as the decisions of key state-owned enterprises have led more 'local' firms to pursue global strategies as well. Other factors may also influence the geographies and networks of Chinese financial service firms, and the growing trend of 'going global' will thus reshape the global financial landscape. First, one key driver is to provide services for those OFDI in non-finance sectors, just as their Western counterparts did many years ago. In particular, banks are following their clients when they seek global expansion, as emphasized by the CEO of Industrial and Commercial Bank of China (CNTI, 2012). Therefore, those countries with more OFDI from China will have strong trade connections with China and by definition more financial service firms. The location choice of Chinese financial service firms will increase the efficiency of financial centers in countries with frequent economic linkages with China.

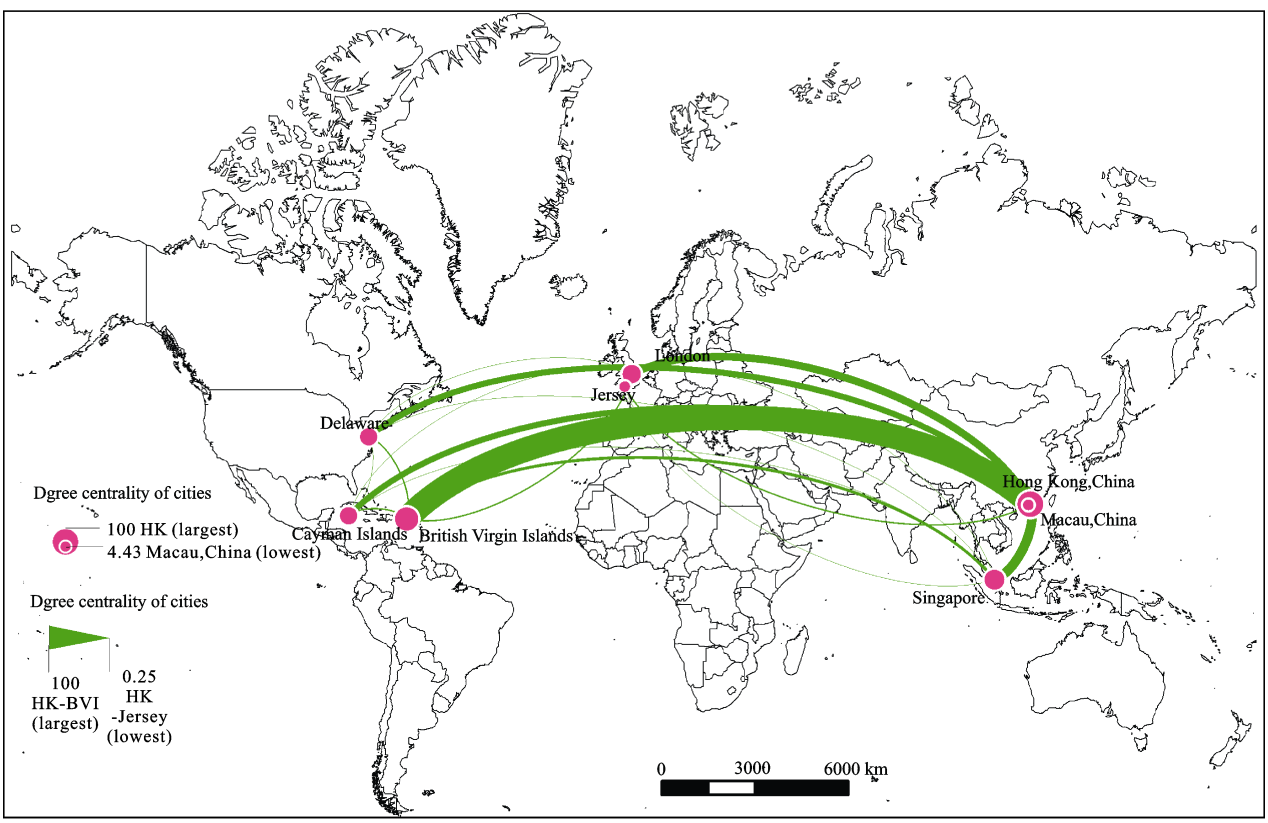
Second, there exist strong proximity preferences to the locational choice of overseas Chinese financial service firms. Hong Kong, China, Singapore, Macau, China benefit from being geographically and culturally close to China mainland. Hong Kong in particular has



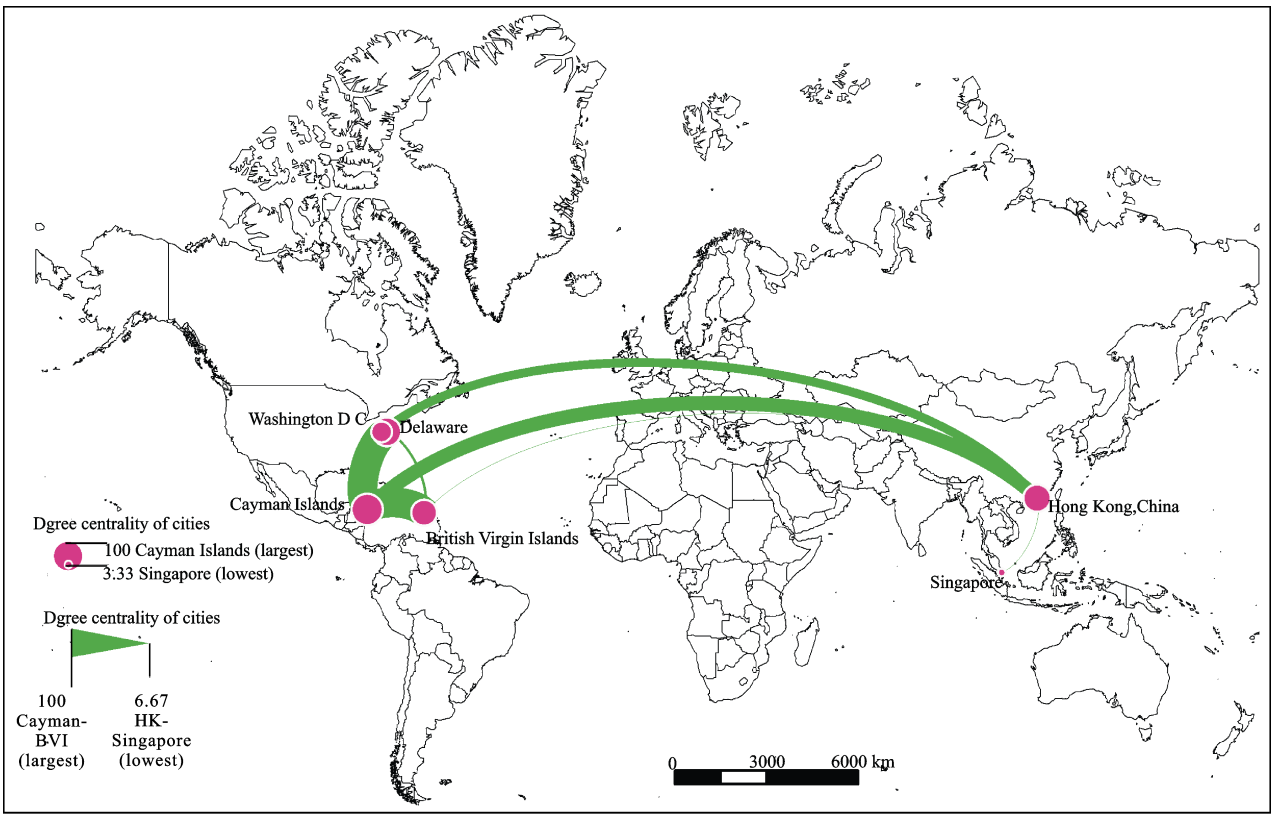
a, Urban networks shaped by banks (top 50 cities)



b, Urban networks shaped by securities firms



c, Urban networks shaped by insurance firms



d, Urban Networks shaped by multi-function financial service firms

Fig. 3 Urban networks shaped by Chinese financial service firms from different sectors. HK is Hong Kong, China; BVI is British Virgin Islands

played a key internationalization role. Not only are many financial service firms from China listed at the Hong Kong Stock Exchange (Pan and Brooker, 2014), but firms also chose Hong Kong, China as their first step to start their internationalization (Lai, 2012). These firms set up subsidiaries in Hong Kong, China, or acquired financial service firms in Hong Kong, China, and after a few years practice, these financial service firms went to farther regions. The city's position as a leading financial center has thus been significantly strengthened by Chinese financial service firms. In fact, most financial service firms are being listed on the Hong Kong stock exchange, bringing unique advantages for Hong Kong, China (Pan and Brooker, 2014). Political consideration are obviously also important for Hong Kong's position in attracting Chinese financial service firms.

Third, Chinese national strategies may influence the geographies of Chinese financial service firms in overseas markets given that the state-owned financial service firms are ahead in 'going global'. To speed up the internationalization of the RMB, some existing financial centers including Hong Kong, China, London, Singapore are the major destinations of financial service firms from China. Due to the great influence of these cities in the global financial landscape, Chinese financial service firms can utilize the financial infrastructure and networks to expand the use of RMB in financial transactions. To better achieve the Belt and Road Initiatives, the state-owned Chinese banks purposely set up branches in cities in less developed economies, in particular in Asian countries that are related to the program.

Finally, the results also show that certain Chinese cities including Beijing, Shanghai, and Shenzhen are much more significant than other cities in China mainland as financial centers (Table 6). Beijing leads in banking, insurance and multi-function financial service firms, partly due to firms' arm's length connectivity to the capital city's political institutions and *guanxi* (Zhao et al., 2004; Lai, 2012). Beijing particularly ranks high in betweenness and closeness centrality, indicating a strong presence of firms and a brokering role in transactions. As home to the country's most significant stock

Table 6 Positions of Chinese cities in urban networks

Major city	Number of headquarters	Degree centrality	Closeness centrality	Betweenness centrality
Beijing	22	100.00	100.00	100.00
Shanghai	9	22.96	58.64	7.68
Shenzhen	3	13.06	57.23	0.58
Guangzhou	1	3.06	55.88	0.00

Notes: Degree centrality, betweenness centrality and closeness centrality are all standardized. Centrality indices are presented as percentages of the largest network connectivity (Beijing) and multiplied by 100

exchange, however, Shanghai leads within the securities sector. With continuous growth in the Chinese economy, it is likely the importance of these cities on a global scale will continue to grow.

5 Conclusions and Discussion

Financial services are an integral component of the global economy, as they support a broader range of economic activities. While financial markets are highly integrated and globalized, there has been a strong tendency toward agglomeration in a handful of cities able to provide the labour force, knowledge, and expertise required to carry out a range of specialized financial activities. Financial services firms in China have been slower to globalize than other economies of similar magnitude, but have moved toward deliberate internationalization strategies in the past two decades.

Drawing on location information of all Chinese overseas financial service firms, this study constructed the urban networks through intra-firm networks of these firms and explores how Chinese financial service firms have started shaping global financial center networks in their own right. The results show that Chinese financial service firms from different sub-sectors are in different stages of internationalization and have different locational preferences, thus exhibiting different geographies and network patterns. Chinese financial service firms have set up their overseas affiliations extremely concentrated in existing financial center cities. Hong Kong, China plays a key central role in the global expansion of Chinese financial service firms. Offshore financial centers such as the Cayman Islands and British Virgin Islands also play a key role. One perspective on this would be to dismiss these data points as 'noise', as it is does not reflect a *bona fide* presence of employees and/or branch office activity that shapes these geographic locations. Much of this is attributable to 'round-tripping', or the practice of 'firms sending capital abroad only in order to bring it back under the semblance of 'foreign' investment to enjoy special government benefits and lower taxes' (Sutherland et al., 2009). Another perspective would be to contextualize these within a broader financial network in which a number of regulatory advantages underlie corporate structures incorporating offshore centers. As Vlcek (2010) indicates, these may include 'mutual (hedge) funds, captive insurance and re-insurance firms, trust companies, and shipping registries, as well as an international business company (IBC) registry'. There is also a clear tendency for firms to locate in established financial centers and global cities, with Hong Kong, China, Singapore, London, New York and Luxembourg as key centers in the global financial center networks shaped by Chinese financial service firms. There are also regional financial centers, such as São Paulo in Latin America, Dubai in the Middle East, and Sydney in Australia, that host many subsidiaries of Chinese financial service firms.

This study is one of the first to explore the geographies and networks of Chinese financial service firms, which is in its early stages but will have a much larger impact on current global financial geographies. Some cities are reinforced in their role through the locational strategies of Chinese financial service firms. Some might become less influential as a financial center if they cannot attract Chinese financial service firms. In the meantime, our results show several Chinese cities are very well connected with several top financial center cities, which provides more evidence on the rising of Chinese cities with world city networks (Ma and Timberlake, 2013; Taylor et al., 2014a).

In addition, sub-industry analysis also provides insights that extend beyond broader world city network studies. For instance, the energy sector is an ideal example to investigate how the cities are connected through energy supply and consumption relations (Martinus et al., 2015). At the same time, this study reconfirms the relevance of the observation that world city

networks are shaped by the initial "national context" of firms (Sigler and Martinus, 2016). With the continued global expansion of Chinese financial service firms, more research is needed to better understand the determinants of the locational choice of Chinese financial service firms and how they will change the global financial landscape. This research has explored how various industry- and location-specific considerations affect the globalization of Chinese firms and vice versa, and further knowledge about how firm activity follows established contours and leads global flows is needed.

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