

Researching the transfer of management knowledge to China during the inter-war years: Bibliometric and social network approaches

Stephen L Morgan

Department of Management
University of Melbourne
tel: +61 (0) 3 8344 5282;
fax: +61 (0) 3 9347 3770
s.morgan@unimelb.edu.au

Paper prepared for the Asia/Pacific Economic and Business History
Conference, QUT, Brisbane, 16-18 February 2006

Comment: My original intention was to present a paper titled “Sources of managerial knowledge in Republican China, 1910-30s: A preliminary bibliometric analysis”, but I have not completed the analysis of the collected data. Instead, I propose to discuss the use of techniques such as bibliometric and social network analyses to explore historically how managerial knowledge is transferred abroad, received, adapted and implemented, specifically focused on China. Below I present a set of notes, points and pictures that I hope will interest colleagues and promote discussion of methodologies.

Key words: China, Management history, Business History, Scientific management

Introduction

Where do management ideas come from? The simple answer is any and everywhere. Managers draw on formal knowledge from their schooling, their reading of the business and popular press, and from observation of the behavior in their firm and their competitors. Most studies of cross-country transfer of managerial knowledge are about the transfer of largely American knowledge to Europe and to a lesser extent Japan. These studies often emphasize the role of business schools, management consultants and individual management guru or approaches associated with a particular guru promoted by an industry organization. Professional and business associations play a crucial role in the transfer of knowledge, setting standards and promoting education, and that is a particular focus of my research. Social network analysis (SNA) would seem a fruitful approach to explore how links between people and organizations contribute to the diffusion of new managerial knowledge, though there are difficult issues measuring what was actually transferred via the ties that any particular association created among its participants and members. In addition, we need to ask what formal knowledge was available to managers, and when might they have become across that knowledge. In this context it seems useful to quantify what was published on management-related topics, and when – this is the bibliometric approach that is being developed.

The research seeks to understand how Chinese appropriate management knowledge from outside China. It also seeks to address the peculiar myopia that surrounds the discussion of contemporary Chinese management. Many practitioners and academics involved in Chinese business are unaware that Chinese industrialists, officials and academics embraced western management ideas during the 1920s and 1930s, such as scientific management. They sought in these ideas ways to make their factories, business and administration more competitive. Imported ideas influenced innovations in personnel systems, work organization, accounting practices, office administration, and the approach to business education. The interest in “new” (Western) management extended beyond industrialists and industry officials to the popular press. Yet scant attention has been given to the history of absorption, adaptation and implementation of managerial practices in China in the past. In contemporary management literature on China the view is that “modern” management is a product of the economic reforms since 1979. A little reflection or knowledge of such prominent industrialists as Zhang Jian, Rong Zongjing, Liu Hongsheng and many others ought to give rise to an interest in discovering how they managed their multi-firm, multi-industry business groups.

The focus of the research is the source and transfer of managerial knowledge in China during the inter-war years. It asks what was transferred, how was this knowledge received, what were the vehicles for its diffusion, and what effects did new knowledge have on the organization and management of business. Knowledge about management is conceived as a soft technology, an ideology of work and administrative organization that is institutionally and cultural structured in a particular national context. We can think of this context in China as firstly constituted endogenously in the sense of pre-existing nativist ideas and practices, such as the Chinese partnership form of firm organization and the reliance on social networks. Secondly, the context of management is modified through exogenous influences, the transfer from outside the nativist tradition of new ideas and new practices, conveyed through translations or as observed practice of other firms, whether foreign or domestic.

In the following pages I will say something about the bibliometric approach first. Next, I will briefly discuss social network analysis and show some pictures of the ties among the Shanghai business elite around c.1930.

Bibliometric approaches

The bibliometric approach is based on the tedious task of counting and weighting the publications on management-related topics, identifying key words, and calculating in the first instance frequencies for different periods. The focus is on the international flow of ideas as reported in publications rather than their transmission through academic channels, such as the business schools of the period (that is another paper). The initial data are drawn from selected business and popular journals, and classified catalogues of books published before 1949. The main journals are the *Gongshang ban yue kan* (Industry and Commerce Semi-Monthly, the official news bulletin of the Ministry of Industry and Commerce), *Gongshang guanli yuekan* (The Scientific Management Monthly, the vehicle of the Chinese Institute of Scientific Management in the 1930s), *Renshi guanli* (Personnel Management, the short-lived journal of the Chinese Personnel Management Association in the mid-1930s), and the *Dongfang*

Zazhi (Eastern Miscellany, a bit like a Chinese version of *The Bulletin Magazine* from a century ago, containing literature, politics, economics and whatever was the fashion of the chattering and upper-middle classes of the time). Other journals that will be combed for articles over the next year will be *Yinhang zhoukan* (Bankers' Weekly, the authoritative journal of the Shanghai Bankers' Association), *Shen Bao* (Morning Daily, the leading Chinese daily newspaper of Shanghai), the North China Herald (the leading English-language newspaper of the period).

What am I doing? First, I or various RAs have combed through the table of contents or pages of the journals identify articles that might be relevant to management and business organization. Basic bibliographic details of the title, author, date and pages are recorded. Based on the title – and sometimes the first paragraph of an article if the title is obscure – a list of keywords is compiled for the content of the article or book. The work is also classified into a particular discipline area, such as accounting (various subfields), management (various subfields), etc. These keywords and classifications are then coded for statistical analysis (and this is where I am currently bogged down, hence the failure to deliver the intended paper).

What do I expect to find? We calculate frequencies for the keywords and discipline areas by time period, which can give us an indication of the types of management and business topics that managers, officials and academics were being exposed to or thought were important for the Chinese to know. Largely the approach draws on the method used by Üsdiken and Çetin (2001) to examine the transfer of management ideas to Turkey before and after the Second World War.

Social network approaches

Social networks and social capital concepts have become popular research topics in contemporary social science literature, and increasingly in management. The basic idea is that relationships matter. The unit of analysis is shifted from a focus on the attributes of actors (individuals or firms) to the dyadic relationship between actors (Scott 2000). In the case of social capital, a concept that is widely and contradictorily used without clear definition, the value arises from the network of ties and is not possessed by any single person as an attribute in the way in which education is a possessed attribute of an individual. An attribute persists irrespective of the relationship. Social capital only persists as long as the actor is part of a particular web of relationships that in some way or another convey power, status, influence, knowledge or whatever the trait that is supposed bundled in the network of associative relations under study (Lin 2000, 2001).

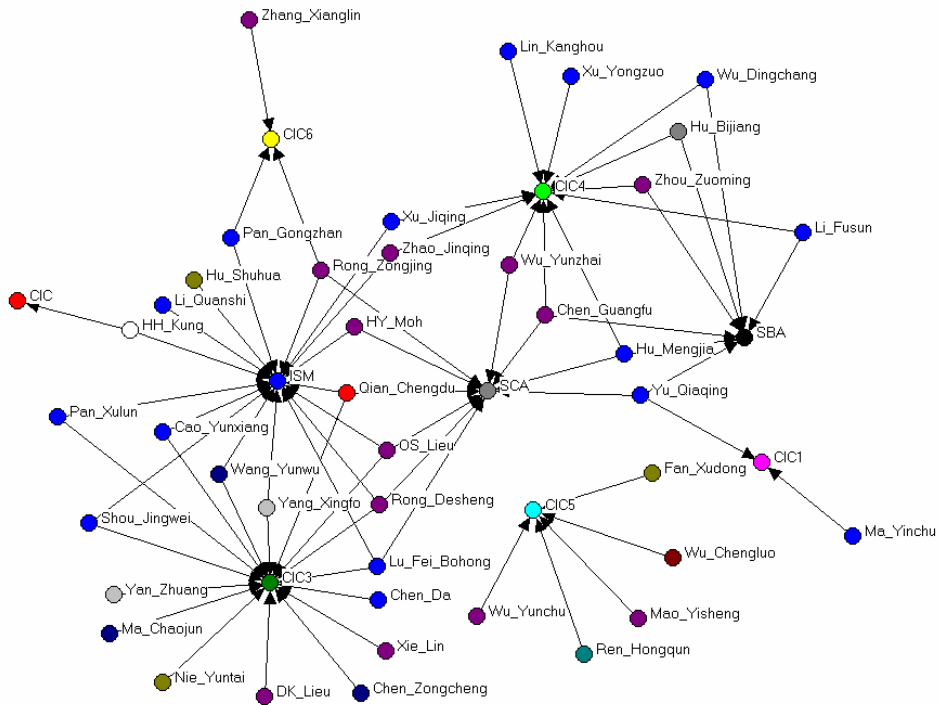
Everyone knows networks are important for the Chinese, both now and in the past, and there is a huge amount of literature on Chinese networks and the role of *guanxi* (connections) in business (eg, Chan 2000, Hamilton 1991). Some writers have recently turned to SNA to look at Chinese networks (eg, Keister 2001, Luo 2003, Peng 2004). These build on the established SNA literature in management (see Brass et.al 2004 for a summary; also Bogartti and Foster 2003) and strategy (Gulati 1999, 2000; Kogut 1992, 2000). Historical data are important for allowing us to examine the role of networks among Chinese business when many Chinese are reluctant to explain

or disclose the character of their networks to contemporary researchers using standard SNA ego-nets and other survey/questionnaire methodologies.

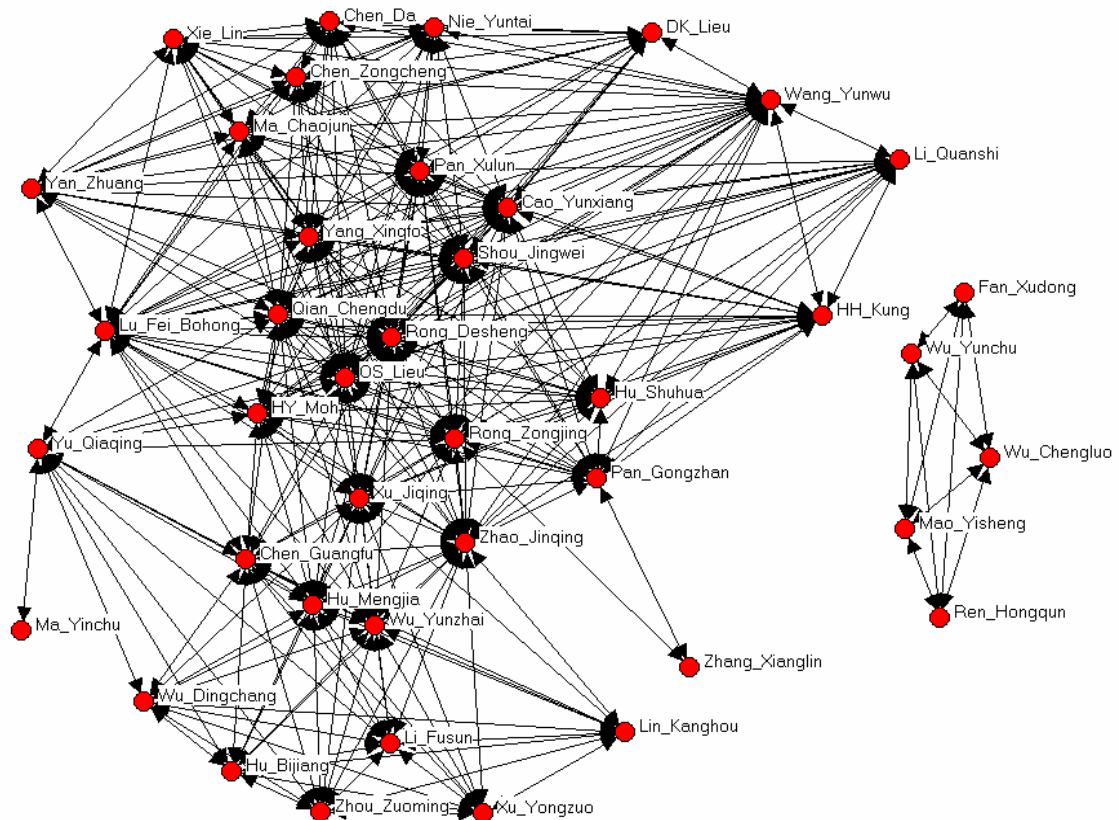
For me one of the problems was how to visualize and analyse the networks. Software tools associated with packages such as UCINET and Pajek allow us to do so. They overcome some of the problems of tables, that soon become big and unwieldy, and the drawing of simple diagrams where the links are rarely complete and do not lend themselves to quantitative analysis. An example of a large table of persons connected with a major business conference in China is shown below. While we can attempt to make connections using marks in specified columns, the ties are difficult to hold in our head even with only 40 or so people. The table can be easily converted to a form that lends itself to analysis using UCINET and NetDraw. Before doing so, let me mention two other major problems.

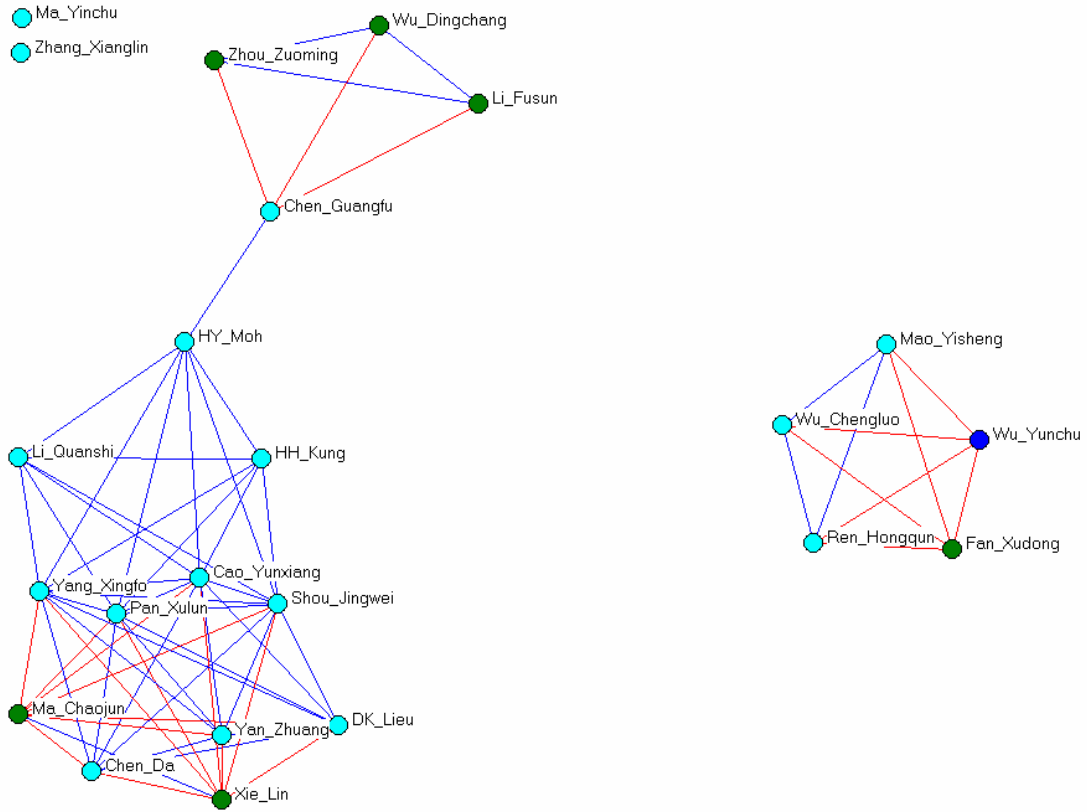
Firstly, much network analysis is static. It captures a network of ties at some discrete moment in time. My interest is in how these ties unfold, that is, the longitudinal and dynamic aspect of the relationships. This entails collection of multiple panels or frames of data that can enable us to construct sets of networks. The second major problem is what might be called the dependent variable problem. The existence of a network does not tell us anything about what flows through ties, whether information, power or influence. Can we measure the influence of the strength/weakness of ties on a particular decision or the adoption of a particular managerial practice? What might be a suitable dependent variable? Moreover, which network variable – centrality, between-ness, closeness, degree of clique formation, etc – would be best used for testing the relationship with a particular dependent variable? And keep in mind that because network relationships by definition are not independent, conventional regression techniques need to be adapted.

Below I present a preliminary analysis of members of the Shanghai business elite and others who participated in the National Industrial and Commercial Conference of November 1930, or were members of the executive of the Chinese Institute of Scientific Management, the Shanghai Bankers Association or the Shanghai Commercial Association. The data in the table are by no means complete. For anyone familiar with inter-war Chinese business, the table is almost a who's who of the business elite, and includes such figures as H.H. Kung, who was the brother-in-law of Chiang Kai-Shek, and who was the Minister of Industry and Commerce, and later Finance Minister. Others include the Rong brothers (the flour and textile kings), Liu Hongsheng (the match and cement king), Mu Xiangyue (head of the Chinese Cotton Exchange who translated Taylor's Principles of Scientific Management).



Connections between the various business men based on where they meet and their native place (geographic origin) is indicated by the different colors of each node. This two mode representation is converted to a one-mode incidence matrix that shows the ties between the business men rather than via an organization.





Above illustrate ties by education in the USA or Japan, and below show between and within group ties of those educated in USA, Japan and China.

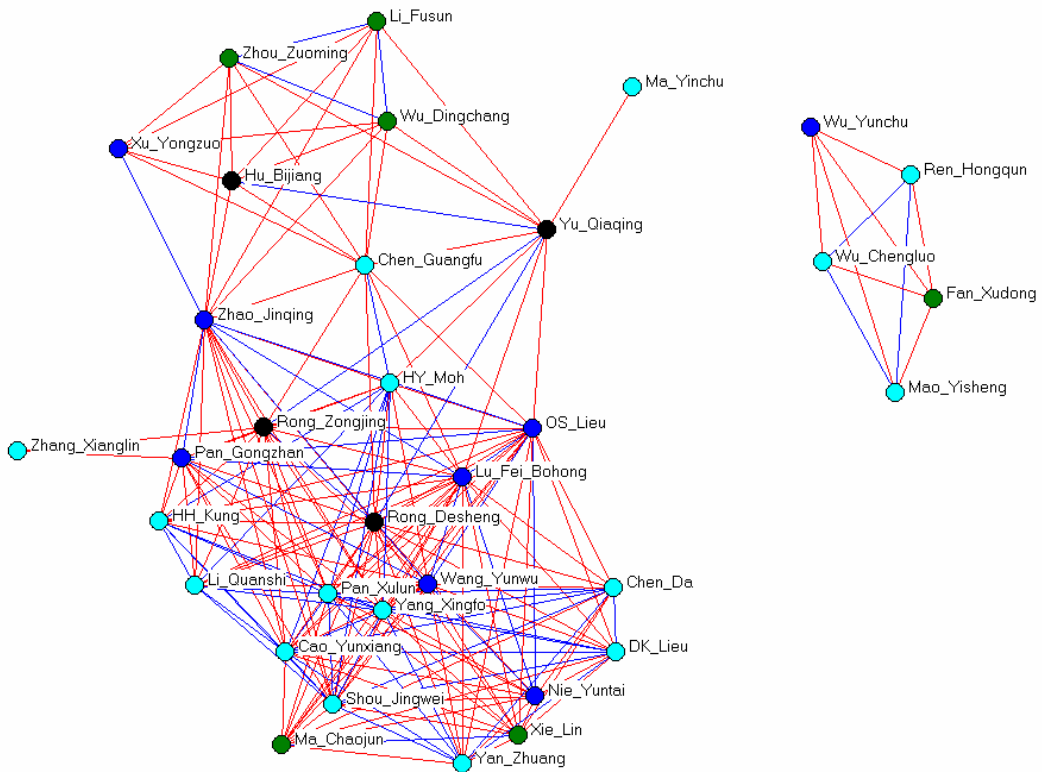


Table: Restricted cross-tabulation of business sector affiliations of selected persons

Name	Province	Education	Position	ISM 1930	CIC 1930	SCA 1927
Kong Xiangxi (H.H. Kung)	Shandong	USA	Minister of Industry and Commerce; brother in law of Chiang Kai-shek	x		
Mu Ouchu (Xiangyue; H.Y. Moh)	Jiangsu	USA	Textile industrialist (three mills), Chairman of the Cotton Exchange, Vice-minister of Industry, former director of Shanghai Chamber of Commerce (mentored by Zhang Jian)	x		*
Liu Hongsheng (O.S. Lieu)	Jiangsu	Shanghai St John's University	Industrialist (diversified), promoter of cost accounting, CEO China Merchant Steam Navigation Co., Shanghai Cement Co., Hongsheng Match Co., etc; formerly agent for British-run Kailan Coal Co.	x	3	*
Rong Zongjing	Jiangsu	traditional	Entrepreneur and industrialist (textile, flour), CEO of the Rong Family Enterprise Group, China's largest industry group.	x	6	*
Rong Desheng (Zongquan)	Jiangsu	traditional	Industrialist and educator, younger brother of Zongjing, and general manager of group factories		3	*
Shou Jingwei	Zhejiang	USA (Phd)	Hangzhou Manager Bank of China; formerly secretary SBA, business editor of Shen Bao newspaper, chief editor at the Bureau of Foreign Trade, Ministry of Industry	x	3	
Pan Xulun	Jiangsu	Shanghai St. John's University and USA (Phd)	Accountant, founder of the Lixin School of Accounting, executive member of the economics society and the accountants society; formerly Dean of Commerce at Jinan University (Guangdong)	x	3	
Pan Gongzhan	Zhejiang	Shanghai St John's University	Commissioner of Social Affairs for Greater Shanghai; formerly editor of the Shen Bao newspaper, the largest circulation daily in China.	x	6	
Yang Xingfo (Quan)	Jiangxi (raised in Zhejiang)	USA (M.Ec, MBA)	Secretary-General of Academia Sinica and editor at large for Commercial Press; formerly secretary to President Sun Yatsen, founder of the Science Society, chief accountant for Hanyang Iron & Steel Co., Dean of Business Nanjing Normal University, etc	x	3	
Li Quanshi	Zhejiang	USA (Phd)	Professor and dean of commerce Fudan University	x		
Hu Shuhua	Hunan	Germany	President Tongji University; former CEO Shanghai Iron and Steel and the Hanyang Iron Co.; terms as presidents of the Chinese Institute of Engineers and the Chinese Economics Society	x		

Name	Province	Education	Position	ISM 1930	CIC 1930	SCA 1927
Lu Fei Bohong (Joseph Lo Pa Hong)	Zhejiang	China modern schools	CEO China Books (Zhonghua shuju) in which Kong Xiangxi had an interest; formerly teacher, magazine editor and director Commercial Press before China Books.	x	3	*
Wang Yunwu	Guangdong	China modern schools	CEO Commercial Press, China's largest publisher and director for legal matters at Academia Sinica; formerly a teacher (taught Hu Shi), 1911-14 assistant to education minister Cai Yuanpei, opium- suppression commissioner	x	3	
Zhao Jinqing (Xi'en)	Jiangsu	Shanghai Nanyang School	Vice-minister of industry; managing director Tung Yieh Land & Estate Co., and China Industrial Corp.; former councillor Shanghai Municipal Council 1928-30.	x	4	
Xu Jiqing	Zhejiang	??	senior executive posts with the Bank of Communications, Zhejiang Industrial Bank, the Central Bank, the National Commercial Bank	x	4	
Qian Chengdu	??	??	??	x	3	*
Cao Yunxiang	Zhejiang	USA (MBA)	Director of the Institute of Scientific Management; formerly counsellor, Ministry of Foreign Affairs, Chinese director of British America Tobacco, president of Qinghua University	y	3	
Chen Zongcheng (C.S. Chan)	Guangdong	France (docteur en droit)	Director, China Branch, International Labour Organization; former section member ILO Geneva and member of M. Albert Thomas staff Far East Mission.		3	
Chen Da	Zhejiang	USA (Phd)	Professor of sociology Qinghua [Tsinghua] University, well known author on labor and migration		3	
Ma Chaojun	Guangdong	Japan	Career labor and political activist; Mayor of Nanjing, Head of the Guomindang Central Peasant and Workers Department		3	
Yan Zhuang	Shaanxi	USA	Section chief Ministry of Industry; former engineer Taiyuan Mines Bureau, Director Shaanxi Construction Bureau, China delegate to ILO 1925		3	
Liu Dajun (D.K. Lieu)	Jiangsu	USA	Director Bureau of Statistics, Ministry of Industry; formerly professor of economics Beijing University; founder and executive member of the Chinese Economics Society, Chinese Statistics Society, Institute of Chartered Public Accountants, etc		3	

Name	Province	Education	Position	ISM 1930	CIC 1930	SCA 1927
Nie Yuntai	Hunan	Modern education by private tutor	CEO of Dazhong Textiles; with Kung Xiangxi, Zhang Jian, Rong Zongjing and Chen Guangfu set up various textile, metals and trading companies; former head Shanghai Chamber of Commerce		3	
Xie Lin	Jiangsu	Japan	Professor Shanghai Commercial College; former company secretary Bank of Communications		3	
Li Fusun (Li Ming)	Zhejiang	Japan	CEO Zhejiang Industrial Bank; member of the Shanghai Bankers Association		4	
Wu Yunzhai	Jiangsu	??	Manager Jincheng Bank; member of the Shanghai Bankers Association		4	*
Lin Kanghou	Zhejiang	??	Gen Man Sin Wah (Xinhua) Bank, administrative vice-minister of Finance, secretary-general Shanghai Bankers Association		4	
Hu Bijiang	Anhui	traditional	CEO China & South Seas Bank; member of the Shanghai Bankers Association		4	
Hu Mengjia	Zhejiang	Britain	CEO Bank of Communications; member of the Shanghai Bankers Association		4	*
Chen Guangfu	Jiangsu	USA	CEO Shanghai Commercial and Savings Bank; member of the Shanghai Bankers Association; major financier of industrial projects		4	*
Zhou Zuoming	Jiangsu	Japan	CEO Jincheng Bank; member of the Shanghai Bankers Association; major financier of industrial projects		4	
Xu Yongzuo	Zhejiang	Shanghai St John's University	Accountant and editor of Accountancy Magazine; former accounts head for Shanghai Stock Exchange, editor of Shanghai Bankers Weekly		4	
Wu Dingchang	Zhejiang	Japan	CEO Yien Yieh Commercial Bank		4	
Fan Xudong	Hunan	Japan	CEO Jiuda and Yongli Group of companies; director of Jincheng Bank, China Books, China Ship Building, Nankai University Council and advisor to Academia Sinica		5	
Wu Yunchu	Jiangsu	Modern technical school	CEO Shanghai Soda and Chemical Group; former technician at Shanghai Arsenal and Hanyang Iron and Steel companies; executive member of China Chemical Engineering Institute		5	
Wu Chengluo	Fujian	USA	Director of the standards and testing services of the Ministry of Industry; former professor of chemistry, terms as president Chinese Institute of Engineers and the Chinese Chemical Society		5	

Name	Province	Education	Position	ISM 1930	CIC 1930	SCA 1927
Ren Hongqun	Sichuan	USA	Vice-president Southwestern University Nanjing; former founder of the Science Society (with Yang Xiangfo)		5	
Mao Yisheng	Jiangsu	USA (Phd)	President Beiyang University; former president Tangshan Engineering College		5	
Zhang Xianglin	Jiangsu	Shanghai St John's University and USA	Divisional head foreign trade bureau, Ministry of Industry		6	
Ma Yinchu	Zhejiang	USA (Phd)	Economist, Department chief Bank of China; active in Chinese Economics Society		1	
Yu Qiaqing	Zhejiang	traditional	One of Shanghai's most prominent merchants; chairman of Shanghai Chamber of Commerce 1926, chairman of Chinese Ratepayers Association, Managing Dir SanBei Steam Navigation Co., Shanghai Municipal Councillor		1	*

Notes:

ISM 1930: Executive planning committee to establish the Institute of Scientific Management, June 1930;

CIC 1930: the first National Industrial and Commercial Conference Nov 1930;

SCA: Members of the Shanghai Commercial Association, March 1927

Sources: *Chinese Year Book*, various issues 1920-34; Xu and Lao, *Zhongguo guanli*; Xu, *Chinese Professionals and the Republican State*; Wu and Ma, *Shanghai jinrong*; H. L. Boorman, ed., *Dictionary of Republican Biography*, 4 Vols. (New York and London, 1970); Xu Youchun, ed., *Minguo renwu dizidian* [Biographical dictionary of Republican China], (Shijiazhuang, 1991).

Table from Morgan 2004 BHC paper.

Reference:

- Borgatti, S.P. and Foster, P. C. 2003, "The Network Paradigm in Organizational Research: A Review and Typology", *Journal of Management*, 29(6), 991-1013
- Brass, D. J., Galaskiewicz, J., Greve, H. R. and Tsai, W. P., 2004, "Taking Stock of Networks and Organizations: A Multilevel Perspective", *Academy of Management Journal*, 47(6), 795-817
- Chan, K. B., ed., 2000, *Chinese Business Networks: State, Economy and Culture* (Singapore).
- Cochran, S. 2000, *Encountering Chinese Networks: Western, Japanese, and Chinese Corporations in China, 1880-1937* (Berkeley).
- Grannovetter, M., 1973, "The Strength of Weak Ties", *American Journal of Sociology* 78(6): 1360-80.
- Granovetter, M., 1985, "Economic Action and Social Structure: The Problem of Embeddedness", *American Journal of Sociology* 91 (November): 481-510.
- Gulati, R., 1999, "Network Location and Learning: The Influence of Network Resources and Firm Capabilities on Alliance Formation", *Strategic Management Journal* 20: 397-420.
- Gulati, R., Nohria, N., Zaheer, A., 2000, "Strategic Networks", *Strategic Management Journal* 21, 203-15
- Hamilton, G., ed., 1991, *Business Networks and Economic Development in East and Southeast Asia* (Hongkong), re-issued 1996 as *Asian Business Networks* (Berlin)
- Keister, L. A., 2001, "Exchange Structures in Transition: Lending and Trade Relations in Chinese Business Groups", *American Sociological Review*, 66(3), June, 336-60.
- Kogut, B., 2000, "The Network as Knowledge: Generative Rules and the Emergence of Structure", *Strategic Management Journal* 21, 405-25.
- Lin, N. 2000, *Social Capital: A Theory of Structure and Action* (New York).
- Lin, N., Cook, K., Burt, R., eds., 2001, *Social Capital: Theory and Research* (New York).
- Luo, Y. 2003, "Industrial Dynamics and Managerial Networking in an Emerging Market: The Case of China", *Strategic Management Journal* 24, 1315-27
- Morgan, S. L., 2003b, "Scientific Management in China, 1910-1930s", Department of Management, University of Melbourne, Working Paper 2003/10012 (www.management.unimelb.edu.au/research/re_deptPublicationSeries.cfm)
- Morgan, S. L., 2004, "Professional associations and the diffusion of new management ideas in Shanghai, 1920-30s – A Research Agenda", The Business History Conference, *Business and Economic History Online*, Vol 2, (www.thebhc.org/)
- Peng, M. W., and Luo Y. 2000, "Managerial Ties and Firm Performance in a Transition Economy: The Nature of a Micro-Macro Link", *Academy of Management Journal*, 43(3), 486-501
- Peng, Y. 2004, "Kinship Networks and Entrepreneurs in China's Transitional Economy", *American Journal of Sociology*, 109(5), 1045-74.
- Scott, J. 2000, *Social Network Analysis: A Handbook* (London)
- Üsdiken, B., and Çetin, D. 2001, "From *Betriebswirtschaftslehre* to Human Relations: Turkish Management Literature before and after the Second World War", *Business History* 43(2), April, 99-124