

Analysis of the Migration of Knowledge Base and the Evolution of Research Hotspots in Domestic and International Think Tank Research--- Based on CiteSpace Visual Analytics

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Abstract: In recent years, the issue of think tank influence has received widespread attention from theoretical and practical circles at home and abroad, and a comparative analysis of the research process at home and abroad can provide useful references for the development of think tank research in China. This study uses CiteSpace 5.5.R2 to analyze 1645 foreign and 480 domestic mature research results in terms of author cooperation network, keyword hotspots, time distribution and other visual measures. In terms of research hotspots, the research hotspots of international think tanks include think tank, policy, politics, impact, and science. The research hotspots of domestic think tanks include think tank construction, local think tanks, local social science academies, think tanks, and new think tanks. In terms of keyword time distribution, international keywords are mainly concentrated in 2007-2015, and domestic keywords are concentrated after 2014. Looking into the future, think tank research should be more abundant and systematic, and give full play to its role in national economic and social development, international influence enhancement, and enterprise decision-making.

Keywords: Domestic and International; Think Tanks; Visualization; Scientometrics; CiteSpace

1. Introduction

Think tanks are also known as "think factory" and "think bank". According to Andrew Rich, think tanks are independent, not-for-profit organizations that rely on experts and their ideas to gain support and influence the public decision-making process^[1]. In our national context and context, a think tank is mainly a professional research institution with public policy as its research object, influencing government decisions as its research goal, public interest as its research orientation, and social responsibility as its research guideline^[2]. In January 2015, the Opinions on Strengthening the Construction of a New Type of Think Tank with Chinese Characteristics issued by the General Office of the CPC Central Committee and the General Office of the State Council stated "think tanks are an important carrier of national soft power, increasingly becoming an important factor of international competitiveness and playing an irreplaceable role in foreign exchanges", and proposed to focus on building a number of high-end think tanks with greater influence and international visibility^[3]. Currently, many researches related to think tanks have been conducted by industries and scholars at home and abroad, and the research results are abundant. However, there are currently fewer comparative studies on think tanks from a scientometrics perspective. Which domestic and foreign scholars have contributed to think tank research, what are the collaborative relationships between them, what are the research hotspots in this field at home and abroad, what are the issues around which research is being conducted, and how the evolutionary history needs to be studied in depth. Therefore, based on citation analysis theory, this paper uses CiteSpace information visualization software to sort out the development of think tank research through the knowledge map of author cooperation network, keyword research hotspots, keyword time zone distribution, etc. to provide academic support for the development of domestic think tanks with higher quality.

2. Author cooperation network analysis

Through the statistics of authors' publications, we can better identify the influential authors in the field of think tanks at home and abroad in recent years. At the same time, the Knowledge Graph of Author Cooperation Network can visually reflect the cooperation among authors by mining the network relationship of authors in the research field, which can provide reference for

evaluating the influence of authors in the academic scope. Therefore, this paper uses the knowledge mapping software of Citespace5.5.R2, sets the mapping type as Author, sets the Top value as 5 for English data, sets the Top value as 50 for Chinese data, and defaults the rest of the values, generates the source author mapping and author publication statistics of domestic and foreign think tank research literature, so as to check the importance index of authors in the cooperation network and the related The network attributes are shown in Figure 1 and Figure 2, and Tables 1 and 2.

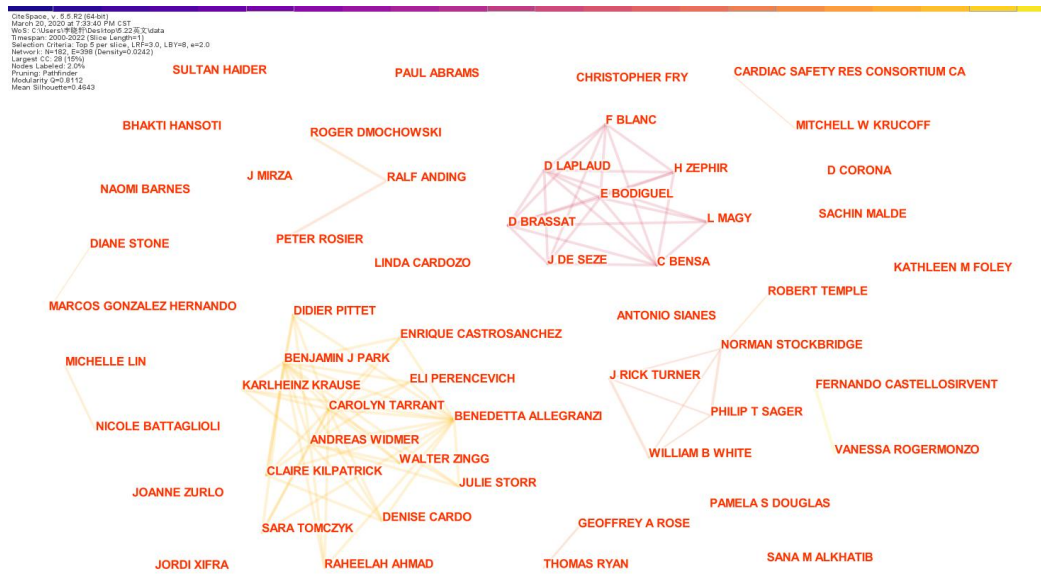


Figure 1 Knowledge map of foreign author collaboration networks

According to figure 1, there are 182 authors in the research of international think tanks, with a large number of authors. There are 398 connections between the authors, and the cooperation between the authors is very close. Among them, there were 10 research cooperation teams. The research team centered on author ANDREAS and WALTERZINGG has the largest scope, including 14 research authors, followed by the cooperative group centered on author E BODIGUEL, including 8 research authors. The research group centered on the author NORMAN STOCKBRIDGE ranks the third, with a total of 5 research authors. The other cooperative groups are small in scope, and are composed of two to three research scholars, forming cooperative relations with each other.



Figure 2 knowledge map of domestic author cooperation network

Serial number	Author	Number of documents issued	Serial number	Author	Number of documents issued
1	NORMAN STOCKBRIDGE	6	11	DIANE STONE	4

2	PAMELA S DOUGLAS	6	12	H ZEPHIR	3
3	PAUL ABRAMS	6	13	NICOLE BATTAGLIOLI	3
4	RALF ANDING	5	14	WILLIAM B WHITE	3
5	LINDA CARDOZO	5	15	C BENZA	3
6	SANA M ALKHATIB	5	16	SACHIN MALDE	3
7	VANESSA ROGERMONZO	4	17	JULIE STORR	3
8	MITCHELL W KRUCOFF	4	18	L MAGY	3
9	FERNANDO CASTELLOSIRVENT	4	19	SULTAN HAIDER	3
10	ROGER DMOCHOWSKI	4	20	WALTER ZINGG	3

Table 1 Statistics on the number of papers published by foreign research authors

It can be seen from Fig. 2 that in the author cooperation network of local think tanks in China, 93 research authors participated in the research, and there are 39 lines among authors, indicating that the cooperation among authors is relatively close. There are 18 research cooperation teams in the figure, of which the largest research team is the research group centered on Li Beiwei and Song Zhifei, including 5 research scholars. The research group with scholar Li Beiwei as the center mainly studied the construction mode of new local characteristic think tanks. They proposed that the construction mode of regional think tanks be divided into five types: scientific research center, enterprise center, industrial alliance, research enterprise cooperation and network type, and the construction strategy of new local characteristic think tanks serving regional innovation and development, so as to provide support for local construction of local think tanks promoting regional innovation and development. The main research direction of the research group with song Zhifei as the center is to establish new think tanks of local universities. In order to better promote the development of local social economy, the think tanks of local universities can only make full use of their own advantages, rely on basic research, insist on application research, and establish a diversified evaluation mechanism based on the evaluation of governments, enterprises and other users, Only in this way can we become a characteristic think tank that truly serves the local social and economic development. Among other cooperation teams, the cooperation scale is small, and each research team includes 2 to 3 research authors.

Table 2 Statistics of the number of articles published by domestic research authors

Serial number	Author	Number of documents issued	Serial number	Author	Number of documents issued
1	Wang Mian	46	11	Xu XI	4
2	Guo Bensheng	46	12	Dang Jun	4
3	Ma Xianzhong	45	13	Li Xue	4
4	Zeng Jiang	45	14	Huang Jinhong	4
5	Zeng Fengxaing	31	15	Cui Shuyi	3
6	Hao Xin	30	16	Li Jun	3
7	Zhang Qingli	30	17	Huang Dunyi	3
8	Li Beiwei	7	18	Jia Chengxian	3
9	Li Rui	6	19	Li Wenzeng	3
10	Zhang Xianglin	4	20	Chen Kaimin	3

3. Keyword hotspot analysis

It is well known that the key words are the core summary of a paper. Analyzing the key words of the paper can understand the theme of the target article. However, several keywords given in a paper must have some relevance, which can be expressed by the frequency of co-occurrence. It is generally believed that the more lexical pairs appear in the same document, the closer the relationship between the two topics. As one of the content analysis methods, CO word analysis mainly analyzes a group of words relationship between the two topics. As one of the content analysis methods, CO word analysis mainly analyzes a group of words by counting the number of times they appear in the same document, so as to form an intuitive knowledge map. At the same time, the co word analysis method uses the common occurrence of word pairs or noun phrases in the literature set to determine the relationship between the subjects represented by the literature set. In the CiteSpace knowledge visualization software, the keyword co-occurrence network method is mainly used to generate the knowledge map of domestic and foreign think tank research hotspots (see Fig. 3 and Fig. 4) and the keyword frequency table (see Table 3), which can intuitively display the hot topic content of domestic and foreign think tank research.

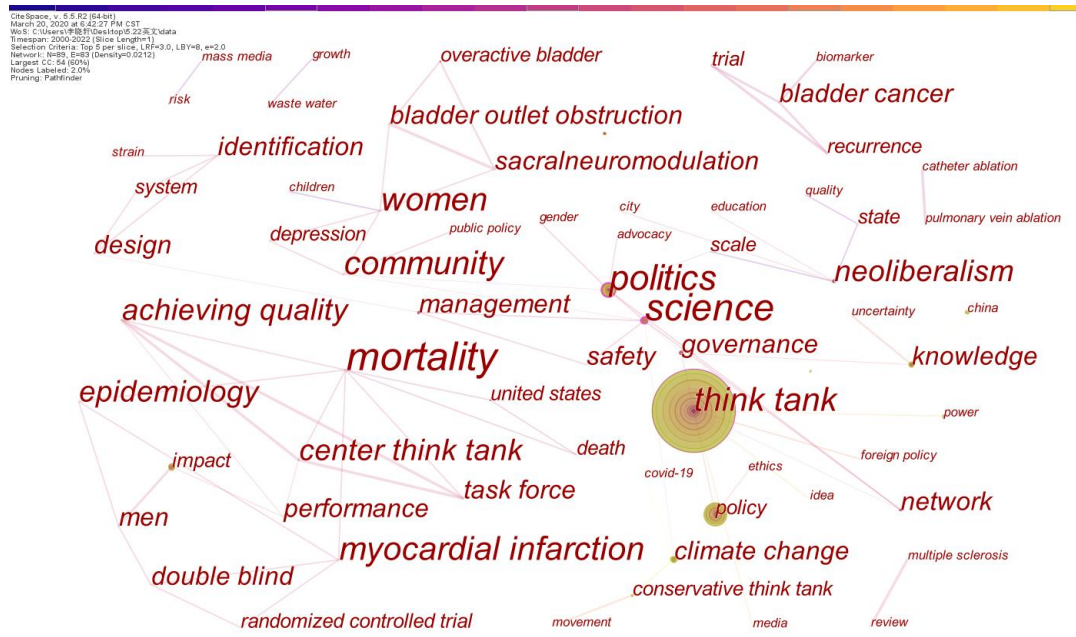


Figure 3 Knowledge map of foreign think tank research keyword hotspots

It can be seen from Fig. 3 that among the research hotspots of foreign think tanks, the nodes of the main keyword think tank are very prominent, with a maximum frequency of 268 times and a centrality of 0.11. The year when it first appeared was 2001.

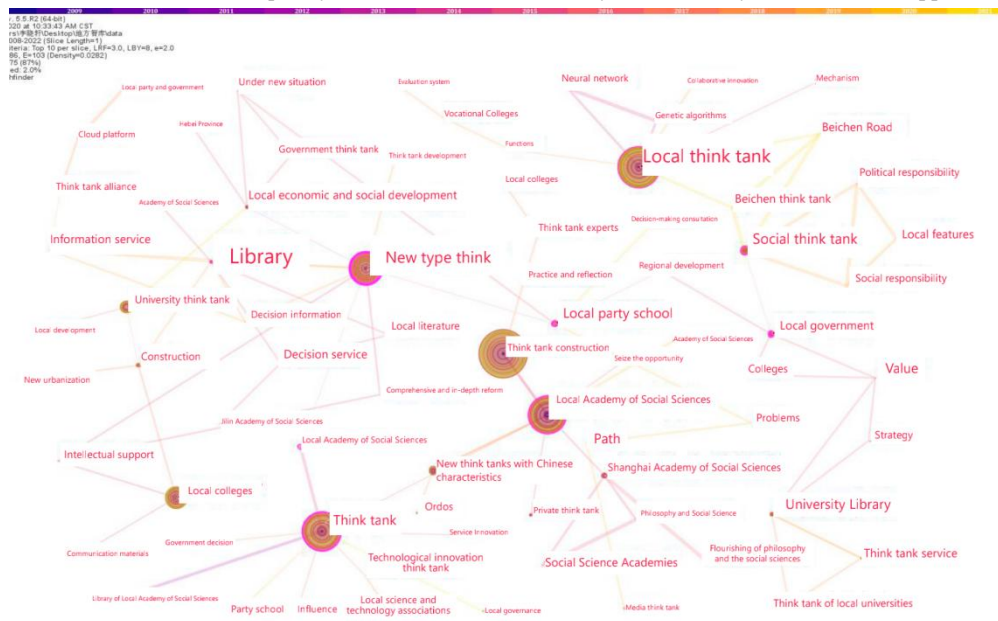


Figure 4 local think tank research keyword hot knowledge map

According to figure 4, the nodes of local think tanks are prominent in the research of domestic think tanks. The frequency of occurrence is 73 times, the centrality is 0.27, and the year of first occurrence is 2010.

Table 3 co occurrence frequency of key words at home and abroad

Foreign key words	frequency	Centrality	Domestic key words	frequency	Centrality
think tank	268	0.11	Think tank construction	82	0.12
policy	80	0.03	Local think tanks	73	0.27
politics	59	0.21	Local Academy of Social Sciences	68	0.48
impact	26	0	think tank	67	0.72
science	25	0.49	New type think tank	53	1.02
climate change	25	0.08	Local Universities	41	0.04
knowledge	25	0.05	University think tanks	26	0.05
governance	20	0.13	New think tanks with Chinese characteristics	17	0.04
china	19	0	Social think tank	14	0.46
model	17	0	Shanghai Academy of Social Sciences	11	0.12
neoliberalism	15	0.11	University Library	10	0.08
power	14	0	build	8	0.06
management	14	0.1	Local economic and social development	7	0.14
network	10	0.13	Private think tanks	7	0
conservative think tank	10	0.03	local government	7	0.65
strategy	9	0	Think tank Alliance	7	0.08
risk	9	0	Local Party School	6	0.76
women	9	0.1	library	5	0.23
behavior	8	0	Academy of Social Sciences	4	0
overactive bladder	7	0	erdos	4	0

4. Time distribution of key words

The number of documents appearing in different years represents the results published at that time, and also indicates the period or stage of the field. In the CiteSpace visualization software, click timeline to generate a timeline map of domestic and foreign keywords under clustering (see Fig. 5 and Fig. 6), which can more intuitively understand the evolution process of research topic hotspots in the field of think tanks at home and abroad.

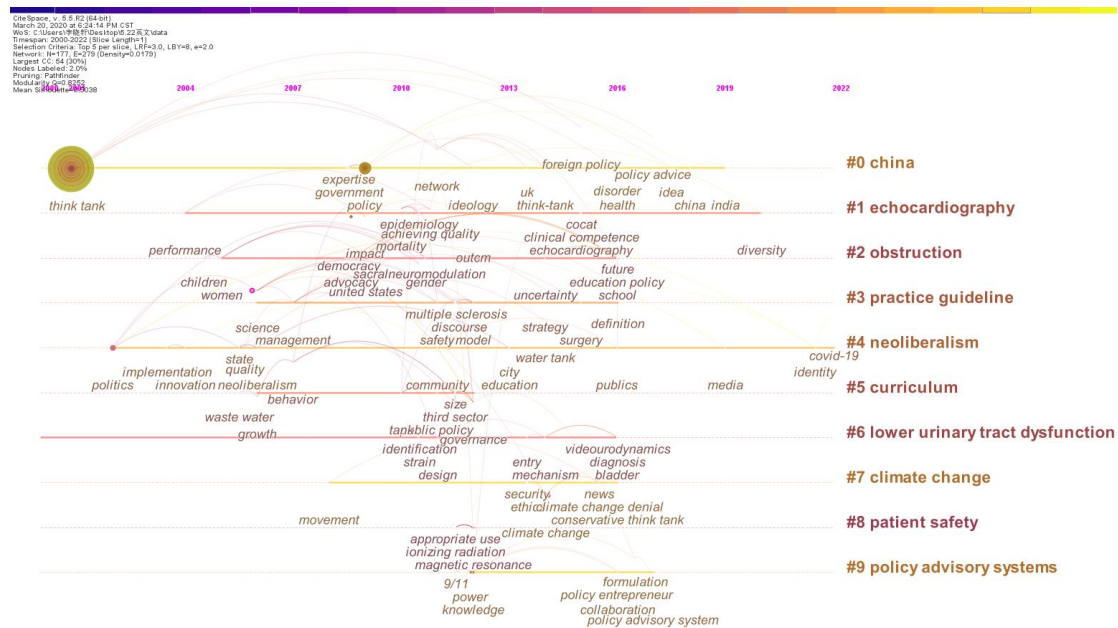


Figure 5 time distribution of keywords in foreign think tanks

It can be seen from Fig. 5 that there are 10 clusters in the time line map abroad, representing 10 main research directions. These 10 clusters are respectively # 0 China, # 1 echocardiography, # 2 observation, # 3 practice guideline, # 4 neolithism, # 5 curriculum, # 6 lower urinary tract dysfunction, # 7 climate change, ## 8 patient safety, # 9 policy advisory systems. The value of clustering module q is related to the density of nodes. Since $Q = 0.8252$, it indicates that the clustering effect of the network structure is good and can be used for scientific clustering analysis. The average contour value s can be used to measure the homogeneity of clusters, $S = 0.5038$, indicating that the homogeneity is high and different clusters are well divided.

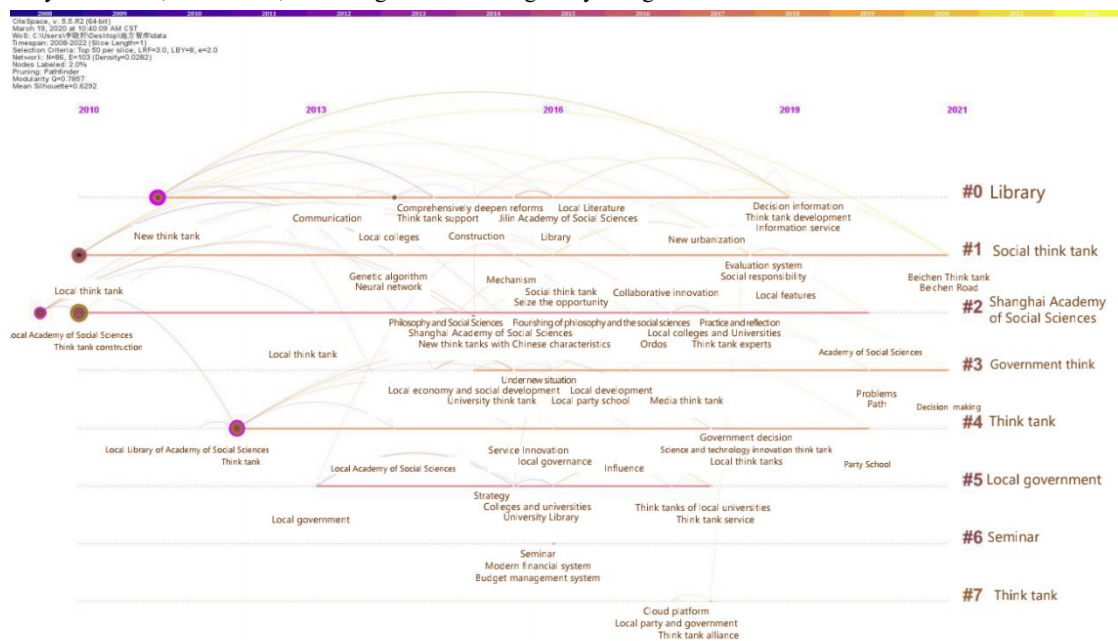


Figure 6 time distribution of keywords in domestic think tanks

According to figure 6, it can be seen that there are 8 clusters in the domestic timeline knowledge map, representing 8 main research directions. These 8 clusters are respectively # 0 library, # 1 social think tank, # 2 Shanghai Academy of Social Sciences, # 3 government think tank, # 4 think tank, # 5 local government, # 6 seminar and # 7 think tank alliance. The value of clustering module q is related to the density of nodes. Since $Q = 0.7857$, it indicates that the clustering effect of the network structure is good and can be used for scientific clustering analysis. The average contour value s can be used to measure the homogeneity of clusters, $S = 0.6292$, indicating that the homogeneity is high and different clusters are well divided.

5. Research conclusion

This paper uses the CiteSpace information visualization software to collate and visually analyze the research literature of think tanks from both domestic and foreign perspectives, and sorts out the frontier hot spots and evolution of research in this field since 2000 and 2008, including the author cooperation network, research hot spots and evolution analysis, so as to provide reference and reference for the research of think tanks in China.

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