

IDENTIFYING NETWORKS OF CHINESE STATE INFLUENCE ON CHINESE FIRMS

The Chinese Communist Party (CCP) has long exerted influence over Chinese firms. In some cases, this influence takes the form of direct ownership, but in others, the influence is more opaque, hidden by layers of intermediary shell companies or company executives. Identifying specific connections between the CCP and private companies — particularly when these companies are attempting to invest in or acquire U.S. firms — is important in order to safeguard various Department of Defense and U.S. Navy equities:

- Preventing **theft** of sensitive military or civilian technology and intellectual property
- Preventing U.S. companies, particularly in industries related to national security, from coming under CCP **influence**
- Preventing Chinese companies from **spying** on U.S. targets on behalf of the CCP

Since 2016, CNA has been developing the capabilities and tools needed to identify such connections. In a recent pilot project, CNA's China experts teamed with its data scientists to explore how social network analysis, a set of analytical techniques for characterizing and visualizing complex relationships, could identify potential sources of influence on Chinese firms.

Using publicly available Chinese-language materials, the team **compiled a database of more than 65,000 Chinese companies** and the corporate relationships between them. Social network analysis quickly identified the shortest paths between private companies and elements of China's state-owned enterprise network — even when these paths were obscured by multiple layers of intermediaries and personal connections.

The database provides detailed information about each business, such as its industry and operating capital, as well as the identities of its subsidiaries, shareholders and key executives. Such information is critical in identifying potential sources of influence on Chinese firms. The table below summarizes the industries in which the analyzed companies operate and highlights the scope of the data collected by CNA.

COMPANIES PROFILED, BY INDUSTRY

Industry	Total
Business services	34%
Consumer	7%
Manufacturing and Construction	27%
Natural Resources	8%
Transportation	3%
Other	22%
Total	100%

Source CNA

BENEFITS OF SOCIAL NETWORK ANALYSIS

Social network analysis has the potential to provide rapid results and unique insights into the structure of China's state-owned economy and potential sources of risk for Department of Defense and U.S. Navy interests including:

- **Ties** between private entities and CCP or state institutions
- Key points of **influence**
- **Patterns** of state-owned enterprise behavior
- Obscured, nth-degree **connections** between individuals and organizations

IDENTIFYING INFLUENCE POINTS

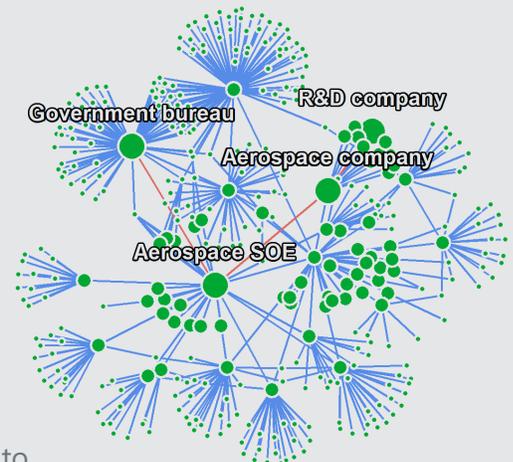
Social network analysis can also identify critical points of influence — knowledge that can be used for both defensive and offensive applications. For example, the social network metric known as betweenness centrality can identify which companies and personnel act as intermediaries. Betweenness centrality measures how often an entity sits along the shortest paths between all other pairs of entities in the network. Using the network of more than 65,000 Chinese companies, CNA has identified the corporations and business executives with the largest betweenness centrality

scores indicating how critical they are to the entire network of state own enterprises.

Government, military and business leaders concerned about the risk of technology transfer can benefit from knowing which companies serve as intermediaries in China's state-owned enterprise network. Technologies held or acquired by companies with a high degree of betweenness centrality could more easily be transferred to companies in other sectors, an important factor in **determining the level of risk**. Similarly, this metric could be used to identify key business personnel within the larger network.

CASE STUDY

CNA conducted an investigation into the corporate ties of a research and development company specializing in metal products for aviation, space flight and electronics. The company is well established, with more than 1,000 employees and over \$60 million in registered capital. While the company initially appears to be a private entity, social network analysis quickly uncovers direct corporate ties to China's state-owned enterprise network. A regional aerospace company owns a minority share in the R & D company. This aerospace company, in turn, is wholly owned by a state-owned enterprise (SOE) subordinate to a government agency. These ties indicate that doing business with this "private" company could entail some risk of technology transfer to state entities or the disclosure of sensitive information.



ABOUT CNA

CNA is a nonprofit research and analysis organization dedicated to the safety and security of the nation. It operates the Center for Naval Analyses — the only federally funded research and development center (FFRDC) serving the Department of the Navy — as well as the Institute for Public Research. CNA is dedicated to developing actionable solutions to complex problems of national importance. With nearly 700 scientists, analysts and professional staff, CNA takes a real-world approach to gathering data. Its one-of-a-kind Field Program places analysts on carriers and military bases, in squad rooms and crisis centers, working side-by-side with operators and decision-makers around the world. CNA supports naval operations, fleet readiness and great power competition. Its non-defense research portfolio includes criminal justice, homeland security and data management.

For additional information please contact:

Maryanne Kivlehan-Wise | Director, China Studies Program | Kivleham@cna.org | (703) 824-2386

Tim Kao | Director, Data Science Predictive Analytics | Kaot@cna.org | (703) 824-2232

For additional CNA work on this issue, see: <https://www.cna.org/centers/cna/cip/economic-statecraft>