# Business network strategies and performance of specialized, advanced, differentiated, and innovative (SADI) Chinese companies


## Abstract

Hidden champions are highly successful companies operating in niche markets, playing a key role in global supply chains. Recently, the Chinese government has launched a national strategy for selecting and supporting their own hidden champions, also called specialized, advanced, differentiated, and innovative (SADI) companies. Nonetheless, it is still unclear if these companies are different from non-Chinese hidden champions and whether their business strategies lead to different performance results. In this study, we investigate how SADI's business networking strategy relates to their performance, using data from Orbis M&A and the list of hidden champions published by the Chinese Ministry of Industry and Information Technology. By mapping the business network, our results show that SADI companies that establish joint ventures with companies from the same industry experience a positive increase in their performance metrics, however unique to the Chinese context Chinese SADI companies do not benefit fully from formal international collaborations.



## Keywords

China; Hidden champions; Business network; Joint ventures; Social Network Analysis.

# Introduction

Hidden champions are small and medium enterprises (SMEs) which are considered market leaders in specific industries. They usually show a high level of self-reliance, high growth potential and unrivalled competitiveness, and these qualities facilitate them to survive in global markets (Kim, 2016). They are globally in the top positions in their niche, thanks to their hyper-specialisation, focus on innovation, and strong emphasis on internationalisation (Audretsch et al., 2018; Schenkenhofer, 2022; Simon, 1990). Traditionally, many hidden champions are family-owned (e.g. Johann et al., 2022) and according to Simon (2022, p. 13), who first introduced this concept, they should have the following characteristics:

- they must be among the top three in the world in their market, or number one on their continent;
- their revenue must be less than €5 billion;
- they must have a low level of awareness among the general public.

Despite their small size, hidden champions usually achieve global market leadership by pursuing a focused niche market strategy, increasing their presence in new markets, and boosting competitiveness (Simon, 1990). This requires high knowledge intensity and a level of specialisation and differentiation which results in high barriers to entry, meaning there are no more than two to three competing companies within the same market. This is why world market leadership is often attained in the hidden champions (Schenkenhofer, 2022): it is the pursuit of the niche strategy which is the key characteristic that distinguishes hidden champions from other SMEs.

Hidden champions are fundamental for large manufacturing economies, and in the last decades the business literature has explored in depth what is driving their success (Schenkenhofer, 2022; Simon, 1990). However, while most of the studies has concentrated on European countries, only in recent years we have seen an increase in research on Asian hidden champions (Lalić & Purg, 2021: Lee & Chung, 2018), driven by the rapid increase in the number of champions observed since the beginning of the century, especially in China (Greeven et al., 2019). Interestingly, the Chinese government has recently launched (in 2016) a national strategy for supporting specialized, advanced, differentiated, and innovative (SADI) companies (专精特新), which are 'niche leaders with the characteristics of hidden champions' (Lei et al., 2025, p. 2). This strategy identifies and provides special support to these companies, aimed at creating a favourable business environment by offering financial support and tax incentives, investing in research and development (R&D) to enhance their competitiveness, and contribute to economic growth. Overall, SADI companies share the following aspects with their non-Chinese counterparts: a narrow focus on their niche market, a high technical specialisation, and the objective of having a high market share (Lei et al., 2025). On the other hand, they also differ in their cost leadership strategy and adaptation to rapidly changing institutional environments (Lei & Wu, 2022). Moreover, SADI companies are encouraged to develop synergies with domestic and international partners, to strengthen their financial performance and the supply chain security of the country (Hänle et al., 2022; Zhu et al., 2023). The creation of business networks enables companies to address market challenges and satisfying customers' needs (Wu & Lei, 2021). Nevertheless, these business networks are not randomly created, but they follow a precise company strategy. Previous studies have investigated the importance of collaboration within value chains and international collaborations for non-Chinese hidden champions (Lee & Chung, 2018; Petraite & Dlugoborskyte, 2017; Simon, 2022), finding that these companies do not search for collaborations aimed towards the diversification of their products (Voudouris et al., 2000) nor they want to concentrate on formal partnerships only (Din et al., 2013). However, it is unclear if this applies to SADI companies as well and if the search for specific domestic and international collaborations is impacting their performance.

Although SADI companies share several characteristics with hidden champions in developed economies, their strategic behaviour is shaped by a very different institutional and capability context. As relatively latecomer firms operating within a policy-driven industrial environment (Hänle et al., 2022; Lei & Wu, 2022), they often lack the long-term, path-dependent accumulation of technological capabilities that characterises German hidden champions (Audretsch et al., 2018; Simon, 1990). As a result, business networks play a broader and more strategic role for SADI companies: they function not only as relational assets, but also as mechanisms for accessing complementary knowledge, upgrading internal capabilities, and expanding market reach (Wu & Lei, 2021; Zhu et al., 2023). This suggests that the network strategies adopted by SADI companies are qualitatively different from those of hidden champions in advanced economies and therefore require more focused theoretical examination.

Therefore, this paper aims to address the following research question: how SADI networking strategies support their performance? Our empirical analysis is based on the use of secondary data collected from Orbis M&A and the Chinese Ministry of Industry and Information Technology, and it focuses on the business networks of SADI companies involved in domestic and international joint ventures. Our data covers the 2017-2023 period, which accounts for a two-years pre-policy period (2017-2018) and the entire policy period (2019-2022) plus a one year after-policy period (2023, for assessing the performance of those companies identified as SADI in the last period); the analysis draws upon the application of network statistics and panel econometric models to assess the impact of business network strategies on SADI performance. From a theoretical point of view, we contribute to the social network and business network literature by investigating how networking strategies of a relatively new type of companies (SADI), conceptually developed around the idea of hidden champions, can influence their performance.

The remainder of this paper is organised as follows. The next section discusses our main theoretical framework and the literature on hidden champions in general and SADI in particular. The Methodology section describes our data collection process and the modelling. Results are presented in the fourth section, while their discussion is included in the fifth section. Finally, the last section concludes, highlighting strengths and limitations of our work.

# Literature review

## Unique characteristics of hidden champions and SADI companies

Research on hidden champions have been pioneered by Hermann Simon on German manufacturing companies, they can be seen as top-performing anomalies in a business ecosystem, and are characterised by: ambitious leadership, focused strategy, innovation, close customer relations, and internationalization (Simon, 2009). Critical to maintaining their competitiveness and market leadership, innovation is at the forefront of these companies: it was found that vertical integration is critical for hidden champions to protect their quality standard, retain their knowledge, and to maintain their contracts (Audretsch et al., 2018). They frequently operate in B2B markets and are usually seen in various forms of engineering for which technology is key to their success. They keep the core aspects of their business relatively unchanged; instead, technology improvements are viewed to satisfy customer needs, to forge stronger customer relationships and increase loyalty - and therefore greater interdependency to their customers (Kožo & Braček Lalić, 2021). Simultaneously, continuous interactions with the customers allow intensively contribution to the innovation process, which is beneficial as it allows hidden champions to offer tailored products for specific uses (Baloh, 2013). On average, around 6% of hidden champions' revenues are spent on R&D, which is approximately twice as much as standard companies; additionally, hidden champions submit patents significantly more than other companies (Simon, 2009).

Most of these characteristics can be found in SADI companies as well; however, there are also several aspects which mark a difference between Chinese companies and their non-Chinese counterparts. As highlighted in the Introduction, in 2016 the Chinese Ministry of Industry and Information Technology introduced a policy initiative called "Implementation Plan of Special Action for Cultivating and Promoting Manufacturing Champion Enterprises", as a follow-up of the "Made in China 2025" master plan (Lei et al., 2022). This initiative was specifically designed to promote high-tech Chinese manufacturing companies, with the objective to financially support them. Moreover, in 2021 Beijing issued a guideline[1] announcing that by 2025 the country will develop 10,000 SADI companies specialized in niche sectors and will aim to have 1,000 companies considered champions in a single industry, focusing on core industrial components, materials, processes and cutting-edge technology. The Chinese government invested CNY 10 billion to support SADI companies, providing preferential support in terms of subsides, tax breaks and grants to help boost China's global technological position, with Xi Jinping expressing hopes that these champions will 'play a more importance role in stablishing supply chains and promoting economic and social development'[2]. This is a rather important difference between non-Chinese hidden champions and SADI companies: while the former have never been labelled as 'champions' by their governments, SADI companies are included in an official list and their presence in such list is not permanent - they must be able to retain their accreditation every three years.

[1] See here: https://www.globaltimes.cn/page/202107/1227877.shtml
[2] See here: https://www.scmp.com/tech/policy/article/3191908/china-has-named-nearly-9000-little-giants-push-preference-home-grown

Upon examining additional policies released by the Chinese government, China's position towards SADI companies can be summarised as follows[3]: first, SADI companies are encouraged to invest in scientific and technological innovation, enhance research and development capabilities, and promote technological innovation and industrial upgrading - especially in areas such as artificial intelligence, big data, the Internet of Things, and biotechnology. Second, SADI companies can benefit of simplified bureaucratic procedures such as the registration and approval processes for enterprises and the provision of entrepreneurship training and consulting services. Third, the government will work on strengthening the financial support system for SADI companies, by providing additional line of credits and venture capital funds, thus reducing the financing difficulties faced by these companies and promoting their rapid development. Finally, the government will encourage SADI companies to actively participate in international cooperation and expanding in overseas markets; in this regard, these companies will receive more support in terms of market access facilitation and intellectual property protection. Considered all together, these government supported initiatives make Chinese SADI companies inherently different from non-Chinese hidden champions. However, while the Chinese government's objectives and policy tools are clear, little is known about the impact of these tools on SADI companies' performance - and in particular the role played by local and international collaborations and business networks.

## Business networks and performance

Simon (2022) has shown that all hidden champions develop business networks as part of their own strategy; moreover, Lehmann et al. (2025) have found that these champions benefit from spillovers effects and spatial cluster proximity, i.e. business relationships are particularly important for the development of these companies. Using network theory as theoretical lens can help researchers to better understand a company's strategy in light of the presence of other stakeholders - i.e. considering the presence of inter-organisational relationships (Grandori & Soda, 1995; Ter Wal & Boschma, 2009). Business networks can support a stronger integration with upstream and downstream suppliers, enabling companies to strengthen their supply chain and becoming more competitive at global level. At the same time, Simon (2022) pointed out that, different from other SMEs, hidden champions are strongly vertically integrated; this is supported by Lee and Chung (2018) and Greeven et al. (2019), who found that these companies tend to avoid excessive formal dependency on others. Moreover, hidden champions have a strong tendency towards operating independently and not creating large networks (Din et al., 2013): they carefully select their partners based on their specialisation and capacity of providing support for innovation and technological advancement (Din et al., 2013; Petraite & Dlugoborskyte, 2017). In developed economies, therefore, business networks of hidden champions tend to be relatively narrow and deep, reinforcing existing value chains and allowing firms to protect proprietary knowledge while maintaining high quality standards (Audretsch et al., 2018; Simon, 2009). Collaboration is often oriented toward upstream and downstream partners in the same or closely related industries, and many relationships remain informal or customer-centred rather than formalised through equity ties (Din et al., 2013; Schenkenhofer, 2022). According to network theory, this selection process may be influenced by two opposite phenomena: homophily and heterophily. In the case of homophily, companies choose similar partners; in the case of heterophily, companies choose partners that possess different characteristics (McPherson et al., 2001).

However, what has been found for non-Chinese hidden champions might be different in the Chinese context. Because of their capacity to massively invest in R&D, and the opportunities offered by the aforementioned policy tools, SADI companies may be more pro-active in establishing formal partnerships with other companies to achieve a better performance. Moreover, these companies - which operate in high-tech and advanced manufacturing sectors such as electronics, information technology, robotics, and biotechnology (Ding et al., 2023) - are likely to establish formal partnerships in different industrial sector, and therefore following an heterophily-based approach, because of their niche expertise. According to Lei and Wu (2022), the Chinese context is characterised by a situation of continuous but unbalanced growth, and managers of SADI companies are better prepared to respond to external challenges in mature and concentrated industries. Hence, strengthening their position in their sector via the creation of new opportunities in other sectors, which can enable the exchange of

[3] According to the 'Opinions on Strengthening the Protection of Intellectual Property Rights', 'Opinions on Supporting the Strengthening, Improvement, and Growth of Small, Medium, and Micro Enterprises' and 'Several Opinions on Promoting the Innovation and Development of Small and Micro Enterprises' published by the General Office of the State Council of the People's Republic of China in 2015, 2016 and 2018, 'Guiding Opinions on Promoting High-Quality Development of the Manufacturing Industry' published in 2018 by the State Council of the People's Republic of China.

knowledge for innovation (Chen et al., 2022), can be a strategy for improving their financial performance. Greeven et al. (2019) pointed out that most of SADI companies are wary of formal partnerships, and they rather prefer to internalize R&D activities and production processes as much as possible: but they are also strongly committed to 'develop an indigenous R&D capability for creating a sustainable competitive advantage' (Greeven et al., 2019, p. 63). This may lead them to rely on networking with companies and stakeholders possessing a different expertise to strengthen their performance, as observed by Shao et al. (2025) and in contrast with non-Chinese hidden champions. For SADI companies, business networks therefore serve a broader role than for traditional hidden champions. Beyond supporting supply chain integration or market access, formal relationships such as joint ventures can be understood as mechanisms for capability building: they enable firms to tap into complementary technologies, managerial know-how, and market knowledge that may be underdeveloped internally due to their latecomer status and rapid growth (Chen et al., 2022; Wu & Lei, 2021). In other words, networks are not only relational assets but also learning platforms through which SADI companies can experiment with new domains, upgrade their innovation capabilities, and reduce the risks associated with entering unfamiliar industries or markets. This stands in contrast to many European hidden champions, whose networks primarily leverage already accumulated capabilities rather than substituting for them. Therefore, we propose the following hypothesis:

H1: Establishing formal business networks with companies in different industrial sector has a positive effect on the performance of SADI companies.

The establishment of business networks is also strictly related to the internationalisation strategy of a company. Business network studies have highlighted the importance of establishing global connections for improving key performance indicators of innovativeness, productivity, and market positioning (Cannizzaro, 2020; Cuypers et al., 2020): even the original authors of the Uppsala model (Johanson & Vahlne, 1977) have recently published a study for discussing the 'process of internationalization as one of co-evolution with network members' (Vahlne & Johanson, 2020, p. 5). In the case of hidden champions, there is an existing understanding that the internationalisation strategy of these companies has in the past followed a low commitment (Simon, 2009). Overall, hidden champions are considered an anomaly as they are very export focused yet have a large presence in international markets; these companies prefer adopting an export driven strategy but avoiding the use of intermediaries such as agents, thus relying less on what, in network theory, are called brokers (Cuypers et al., 2020). It is acknowledged that when hidden champions internationalise, they prefer to do this alone particularly with regards to establishing an overseas manufacturing, sales and service presence (Simon, 2009; Venohr & Meyer, 2007; Witt, 2010; Witt & Carr, 2013). Audretsch et al. (2018) argued that the reason for the witnessed internationalisation strategies of hidden champions is that they prefer a strong vertical integration strategy which is a requirement to protect themselves from knowledge theft as well as to maintain high their standard of quality of product and service offered. Following a property rights' point of view, it is expected that vertical integration is essential to potentially reducing the number of contracts lost to the market. This explains why a large number of direct export and wholly owned subsidiaries are witnessed in the internationalisation strategies of hidden champions (Witt, 2010). Since the origins and the success behind these companies are typically technology-based assets, hidden champions prefer direct export and their mode of international market entry as it permits them to retain a high degree of control given that they rely heavily on their own assets. Critically, having complete control allows them to protect their technological assets, for this reason, hidden champions will characteristically need to secure unequivocal property rights.

When considering SADI companies, scholars have highlighted similarities and differences with European and American hidden champions, in terms of internationalisation strategies. A different approach towards international networks has been recently observed in Asian companies (in particular, Koreans and Chinese) by Samson and Lee (2021) and Hänle et al. (2022b). In their paper, the latter showed that when these companies create new formal business relationships, they tend to associate with top-level partners, because this gives them legitimacy to operate in new markets. At the same time, they also want to be better embedded in global value chains (Galizzi et al., 2025), but sometimes this is not always feasible because of the lack of access to financing and the unpredictable institutional environment - which make internationalisation less appealing from an economic and financial point of view. Business network theory and social network theory have slightly different views on how to measure embeddedness in international business (Galizzi et al., 2025): as for the former, embeddedness can be measured at dyadic level, looking at the quality of business relationships; in social network theory, embeddedness is usually

measured as tie strength and considering the company's position in the network. Hence, according to the social network theory, alliance networks based on strong relationships may indicate the presence of a high level of embeddedness. Other authors (Hänle et al., 2022a) pointed out that recent literature on Chinese SMEs and SADI companies has shown how their internationalisation is driven by formal business networks. While non-Chinese hidden champions' performance may be influenced by their strong vertical integration, SADI companies may have an interest in strengthening international networks because of tangible and non-tangible benefits. Therefore, we argue that:

H2: Establishing formal business networks with companies in different countries has a positive effect on the performance of SADI companies.

# Methodology

## Empirical context and data

Empirical studies on hidden champions have concentrated on different countries: for instance, Germany (Audretsch et al., 2018; Mear & Werner, 2021; Rietmann, 2023), Greece (Voudouris et al., 2000), Japan (Namba, 2014), South Korea (Kim, 2016; Lee & Chung, 2018), and Türkiye (Yosun & Çetindamar, 2013). In recent years, a growing interest on China has emerged (Lei & Wu, 2022; Lei et al., 2022; Zhu et al., 2023), because of the increase of SADI companies (Simon, 2022) both in numerical terms and financial performance.

For mapping business networks, we use joint ventures data (referring to the 2017-2023 period) about Chinese companies collected from Orbis M&A. As pointed out by Opper (2023), inter-organisational networks such as joint ventures enable companies to access specialised knowledge and new distribution channels, thus making them more competitive. In the long run, companies may be able to generate synergies and therefore achieving economic and financial benefits. These formal relationships were chosen for mapping business networks because of the following reasons. First, in the international business and management literature, they are considered representative of a company's networking strategy (e.g. Chae et al., 2022; De Man & Duysters, 2005; Xia et al., 2018): they show what formal relationships have been established, the resources involved in establishing and maintaining such relationships, and their impact on the company's performance. Second, joint ventures are key for understanding companies' investment decisions and their likelihood to entering into new markets. Finally, joint ventures have been used in previous business studies to investigate companies' strategic behaviour in domestic and international markets (Carnovale et al., 2016; Shi et al., 2014; Yeniyurt & Carnovale, 2017). The focus on deals made by SADI companies relates to our choice of adopting a (national) case study approach. We aim to investigate the network dynamics characterising these companies, and we considered both domestic and international deals in order to test our hypotheses. A similar approach was taken by Shi et al. (2014) in their research on alliance networks for attracting foreign partners: they focused on strategic relationships at national level in China, to understand if network centrality has an impact on international partnerships.

The original dataset from Orbis M&A consisted of 1,128 deals involving 1,907 entities[4]. We merged this dataset with the last updated list of SADI companies published by the Ministry of Industry and Information Technology in 2022; this list can be found in the Zero One Think Tank platform, an executive secretary unit of the Digital Economy Research Group of the China Science and Technology System Reform Research Association. There are 9,279 companies included in this list, of which 248 from the first wave of companies recognized by the Chinese government[5], 1,744 from the second, 2,930 from the third, and 4,357 from the fourth. Around 20% of these 9,279 companies are located in just two provinces (Zhejiang and Guangdong), and in general the majority of them can be found in the eastern coastal area of the country. For the merging process, we used a combination of two different keys: the Bureau van Dijk identification number, which is available in all the Bureau van Dijk's databases, and the tax identification number. Since we want to test the impact of internationalisation and industry diversification on performance, our analysis concentrates on the companies from the first and second wave which established joint ventures. With those companies included in the third and fourth wave, we do not have enough data to test our hypotheses, because the last available observation year for financial data in Orbis is 2022. The merging process resulted in the identification of 100 companies, 14 from the first wave and 86 from the second wave, which

[4] Note: in ORBIS M&A, a potential entity is called "Individuals", which includes unnamed acquirors or targets. We treated this entity as a single one, but we are aware that it may include multiple actors. Therefore, 1,907 entities are a conservative estimate.
[5] The Chinese government launched the first wave in 2019; the list has been periodically updated with more hidden champions in 2020 (second wave), 2021 (third wave), and 2022 (fourth wave).

established joint ventures during the 2017-2023 period. Our final database is a balanced panel including these 100 companies and covering the post-policy period 2019-2022.

## Variables and method

Our dependent variable is financial performance, which is measured by using three main indicators: revenues, EBITDA, and profit margin in US dollars. We decided to concentrate on three different measures of performance because different networking strategies may have different impacts on performance, depending on what performance aspects are considered (Chen et al., 2025; Ferriani & MacMillan, 2017; Lau et al., 2020). Moreover, this helps in assessing the robustness of our results. These variables were collected from Orbis; in line with other studies focusing on hidden champions, we also collected data on R&D expenditures, number of employees, and company's age to be used as controls in our model (Johann et al., 2022; Lei & Wu, 2022; Rammer & Spielkamp, 2019).

For our independent variables, we used the following information: the company's name and tax identification number included in the list of SADI companies created by the Chinese government; the business activity of the company, expressed by its 1-digit NACE classification; and the geographical location of the SADI company which established a joint venture and its partners, distinguishing between Chinese and non-Chinese partners.

Our independent variables are created by using Social Network Analysis (SNA). In the literature, scholars have widely employed SNA for studying business networks and their impact on companies' behaviour and performance (e.g. Barros et al., 2022; Bartalevich, 2021; Chae et al., 2022; Dueñas et al., 2017; Waßenhoven et al., 2021; Yang et al., 2011), using network statistics to understand how companies's networking strategy are developed and what organisational dynamics occur when companies develop business collaborations (Mirc, 2015). The first independent variable (*ego_nace*) is a network statistic used for defining the homophily level for each SADI company in relation to their partners - when considering the industrial sector. This is an ego-network statistic: ego-networks are special networks made by a focal actor (the ego) and those alters with whom the ego is directly connected (Prell, 2012). In our business network mapping joint ventures, SADI companies are our egos, and their alters are those companies with whom they established a joint venture. The variable *ego_nace* is a measure of ego's homophily with their alters based on the 1-digit NACE classification, which is one of the attributes of the companies in the network. The score for this variable ranges from 0 to 1, and it is estimated by dividing the number of connections between the ego and an alter belonging to the same industrial sector by the ego's total number of connections: the higher the score, the higher the level of homophily shown by the ego. This means that SADI companies with a score close to 1 tend to create connections with other companies belonging to the same industry, while those with a score close to 0 tend to connect with companies from different industries. The second independent variable (*ego_country*) was created following the same approach, but instead of using the 1-digit NACE classification as company-level attribute, we used the geographical location of the company: in this case, SADI companies with a score close to 1 are those who created connections with other Chinese companies, while those with a score close to 0 established formal relationships with companies in other countries. All network statistics were estimated using UCINET 6 (Borgatti et al., 2002). Moreover, following an approach similar to Lei and Wu (2022), we decided to include degree of marketisation and ownership structure as moderating effects in the model, since they may moderate the impact of networking on companies' performance. With regard to degree of marketisation (*marketisation*), all SADI companies are recognised by the Chinese government as innovative and highly performative companies. However, the business environment in which they operate may differ from province to province (Xie, 2017), because of the presence of special economic zones or other local factors (Wang, 2013). Therefore, the institutional environment can be relevant in determining partner selection (Shi et al., 2012), thus impacting the performance of a company. As in Lei and Wu (2022), we relied on the marketisation index developed by the National Economic Research Institute of China: each company's score is determined by the score assigned to the province where its legal headquarters are located. With regard to ownership structure, the business network literature has widely investigated the impact of ownership networks on performance (Novoselova, 2022; Rowley, 1997), but not in the context of European and American hidden champions, probably because of their dimension. Nevertheless, Chinese SADI companies are larger and marked by the presence of multiple shareholders which can be found across multiple companies. This implies that sharing one or more shareholders may be a relevant factor when deciding with whom establishing a joint venture, i.e. if partnering with a company operating in the same industrial sector or partnering with a foreign company. In this study, we have created a variable called *shared_shareholders* which can assume three values: 1 if shareholders have shares

in only one company, 2 if there is at least one shareholder with shares in two or three companies, or 4 if there is at least one shareholder with shares in more than three companies.

Since we have a panel dataset with yearly data from 2019 to 2022, where our variables of interest (*ego_nace* and *ego_country*) are time-invariant[6], we estimated the following dynamic panel data model using the two-stage estimation procedure developed by Kripfganz and Schwarz (2019):

$$y_{it} = x'_{it}\beta + f'_i\gamma + u_i + e_{it} \quad (1)$$

where $i$ = 1, 2, ….N and $t$ = 1, 2, ….N represent companies and time, respectively, $y_{it}$ represents our dependent variable, $x_{it}$ is a vector of company specific time-varying variables, and $f_i$ is vector of observed company specific time-invariant variables. As dependent variables, we are using *log_revenues* (the logarithm of revenues), *ebitda,* and *profit_margin*; among the time-varying variables, we use the logarithm of expenditures in research and development in US dollars (*log_r&d*), the logarithm of the number of employees (*log_ size*), and the logarithm of company's age (*log_ age*); as time-invariant variables, we include *ego_nace* and *ego_country*, and the above moderating variables (*marketisation* and *shared_shareholders*) with the interaction terms.

The procedure developed by Kripfganz and Schwarz (2019) is a two steps procedure where the first stage is used for estimating a regression with the time-varying regressors only, and then in the second stage the first-stage residuals are regressed on the time-invariant regressors. We run the estimation in STATA 17 using the "xtseqreg" command; the lag length of the dependent variable(s) was imposed to be two periods, and we selected the number of instruments used in the analysis based on the performance of the Hansen's test.

# Results

Figure 1 shows the SADI companies' business network, whose density is almost null. In SNA, network density is measured as the ratio between the number of actual relationships and the number of potential relationships (Prell, 2012): a score close to zero indicates the presence of a very sparse network. Usually, joint ventures do not involve many companies, apart from some exceptional cases. Most of the joint ventures visible in Figure 1 were made between just two companies, and this is the reason of the low network density score. Table 1 shows the results of the correlation analysis: *ego_nace* is slightly positively correlated with *revenues* and *ebitda*, while *ego_country*'s stronger correlation is with *shared_shareholders*. Descriptive statistics are included in Table 2: overall, SADI companies are relatively young (around 20 years) and larger than European hidden champions, with an average workforce of around 747 employees per company. Most of the SADI companies in our database have established joint ventures with other Chinese companies (*ego_country* average score equal to 0.75), while their homophily level, i.e. *ego_nace*, is not particularly high (0.28 on average), i.e. they tend to establish joint ventures with companies from different industrial sectors.

[Figure 1 here]

[Table 1 here]

[Table 2 here]

The results of the analysis are presented in Table 3-5, where each table includes a different dependent variable (*log_revenue*, *ebitda*, and *profit_margin*). We estimated three different models per table: one testing for the impact of *ego_nace* and *ego_country* only; one incorporating *shared_shareholders* and its interaction terms with *ego_nace* and *ego_country*; and one incorporating *marketisation* and its interaction terms with *ego_nace* and *ego_country*. The Hansen's J-test confirms the validity of our modelling and its instruments in all cases.

[Table 3 here]

[Table 4 here]

[6] This is our own imposition because we 'collapsed' all the data points about joint ventures (occurring during the 2017-2023 period) into a cross-section, therefore assuming that *ego_nace* and *ego_country* are constant over time. This is because we wanted to map ego-networks with enough information to be used for the analysis. However, we can reasonably assume that joint ventures do not happen frequently, because it takes years to finalise one, and therefore we can say that in our period of analysis these variables were time-invariant.

[Table 5 here]

When considering the first and second lagged value for the three dependent variables, their coefficients are always negative, but they are statistically significant only for *ebitda* and *profit_margin*. Among the other time-varying control variables, the coefficients for *log_r&d* and *log_size* are always positive, while for *log_age* is always negative; however, their statistical significance changes across models.

By looking at the time-invariant regressors, the impact of *ego_nace* and *ego_country* does not change when considering revenues and ebitda as performance metrics, but it does change in the case of profit margins and when *shared_shareholders* intervenes as moderator. The variable *ego_nace* is always positive and statistically significant, except for its impact on profit margins. This means that when SADI companies establish joint ventures with other companies from the same industrial sector, this has a positive impact on their performance. However, this is effect does not hold when considering *marketisation* and *shared_shareholders* as moderators in the model: industrial homophily seems to have a negative impact on revenues and ebitda, but in none of the models presented in Table 3-4 the coefficient is statistically significant. This contradicts H1, and it offers new insights on the strategic approach taken by Chinese SADI companies. On the other hand, the results for *ego_country* are mixed. In all the models this variable alone shows a negative coefficient, which indicates that SADI companies creating joint ventures with other Chinese companies see a negative effect on their performance; however, there is no statistical significance observed. Nevertheless, in Table 3 the interaction effect between *ego_country* and *shared_shareholders* is negative and statistically significant: this means that the presence of a large number of shared shareholders reinforce the negative impact on revenues for those SADI companies who establish joint ventures with other Chinese companies. This is aligned with our second hypothesis; however, it is the only case where we observe a statistically significant value. Finally, *marketisation* does not seem to play a role in moderating the impact of networking on performance. Its impact on *log_revenues* and *profit_margin* is identical and completely opposite to *ebitda*; however, this variable, and its interaction effects, is never statistically significant.

# Discussion

Starting out as late-comers, Chinese SADI companies challenge long-standing assumptions in business network theory, particularly those derived from research on non-Chinese hidden champions. Prior work on German and other European hidden champions portrays them as deep specialists that rely on strong vertical integration, tight intra-industry ties and export- or FDI-based internationalisation while deliberately limiting formal alliances (Audretsch et al., 2018; Din et al., 2013; Petraite & Dlugoborskyte, 2017; Simon, 2009; Witt & Carr, 2013). These firms typically build networks that reinforce their position within a narrowly defined value chain and prioritise long-term customer relationships over complex inter-organisational networks (Schenkenhofer, 2022; Venohr and Meyer, 2007). By contrast, Chinese SADI companies emerge as state-recognised niche leaders in an institutional setting characterised by strong industrial policy support, uneven regional marketisation and more complex ownership structures (China Industry and Information Technology, 2023; Lei & Wu, 2022). Our evidence shows that these contextual differences go beyond policy labels: they translate into distinctive network strategies and performance patterns that differ in systematic ways from the 'classic' hidden champions in developed economies. Rather than being larger replicas of European champions, SADI companies display network strategies that reflect a mixture of inward- and outward-looking approaches, and these strategies influence their performance in ways that the existing studies have not yet explored. Network theory generally assume that firms benefit from inter-organizational connections to access resources, being innovative, and therefore achieving successful results on national and international markets (Audretsch & Guenther, 2023): our findings offer a more nuanced interpretation, showing that these assumptions do not hold uniformly in the Chinese SADI context and that new mechanisms are at play.

Similarly with established hidden champion in Western countries, SADI companies establish formal business networks with companies operating in similar industries. Previous studies on hidden champions demonstrated that they prefer to strengthen their supply chain positions by integrating with upstream and downstream players, thus implementing a low product diversification strategy (Baloh, 2013; Schenkenhofer, 2022). SADI companies benefit of a similar homophilous approach, searching for connections with other players that can guarantee some advantages from a technical point of view. However, our results are not confirmed when considering endogenous and exogenous factors (i.e. ownership structure and degree of marketisation) that may interfere with companies' networking strategies, and, more importantly, when looking at profit margins as performance metric. Differently from revenues and ebitda, profit margins can be considered a measure of efficiency: collaborating with similar

companies may be beneficial for immediate returns, but efficiency is sensible to the presence of costs which can be reduced by partnering with diverse companies.

Our findings also show that SADI companies are not fully benefiting of international formal collaborations: local and international dynamics may help to understand this unexpected result. A first explanation for this is China's significant regional disparities. Coastal provinces such as Guangdong, Zhejiang, and Jiangsu have experienced rapid economic growth due to their proximity to international trade routes and early exposure to foreign investments; as a result, they have developed vibrant manufacturing and export-oriented industries, and consequently a significant portion of SADI companies is located in these provinces. While this situation could have favoured these companies in the creation of international contacts, it is likely that others may have benefited more of such international openness. As illustrated by Tang et al. (2024), a system aligning SADI companies with the characteristics of their local business environments is still missing; however, this is necessary for supporting a fast transition toward specialisation and innovation, and the acquisition of competences and resources that makes SADI companies equipped for exploring international business networks. Moreover, while we agree with Audretsch et al. (2018) and Witt and Carr (2013) that hidden champions generally avoid formal agreements with other companies to protect their independence and technical expertise, we expected a different behaviour from SADI companies. This is because the Chinese government, via its policy, specifically aims to strengthen these companies' position in global value chains.

Our findings contribute to capability-based views of hidden champions by showing that business networks perform a broader strategic function for Chinese SADI companies than for their counterparts in advanced economies. Classical hidden champions rely heavily on deeply internalised, firm-specific capabilities developed over long periods, such as proprietary technologies, accumulated export experience, and tightly integrated value-chain processes (Simon, 2009; Venohr & Meyer, 2007). For these firms, business networks primarily reinforce existing strengths rather than compensate for internal weaknesses. By contrast, SADI companies operate as latecomer niche leaders that face capability gaps in areas such as internationalisation, governance systems, technological depth and managerial professionalisation. Our empirical findings show that cross-industry domestic alliances and selective joint ventures play a significant role in enabling these firms to acquire complementary knowledge, learn new technological routines and scale up more rapidly than their internal resources alone would allow. In this sense, business networks serve not only as relational assets but as capability-building mechanisms, allowing SADI firms to overcome structural latecomer disadvantages and accelerate upgrading. This provides a theoretical extension to the hidden champion literature by highlighting how emerging-market hidden-champion-type firms rely on inter-organisational networks as substitutes for internalised capabilities. While traditional hidden champions succeed through accumulated specialisation and internal depth, SADI firms succeed through network-enabled capability accumulation within a policy-driven, institutionally heterogeneous environment. This distinction advances understanding of how hidden-champion trajectories differ between developed and emerging economies.

Our work provides two main contributions to the business network literature. A first theoretical contribution concerns the role of industrial homophily. Establishing business relationships by exploiting vertical integration is considered a standard approach by Western hidden champions, because this reinforces value chains and ensure alignment of technical competences; however, this can be an issue for hidden champions because they may become 'skeptical about open innovation and innovation collaboration' (Lampe et al., 2025, p. 508). In our models, *ego_nace* is positive and statistically significant when considering only networking regressors for revenues and ebitda, which indicates that homophilous ties can be beneficial. However, in the case of profit margins, industrial homophily does not yield performance benefits at all. These results suggest that performance is tied to the ability to access knowledge from similar partners, but in order to become more efficient Chinese SADI companies would probably need to shift from classical value-chain strategies toward diversified value-network strategies. The theoretical implication is that business network strategy models built around homophily must be adapted for innovation-intensive firms in emerging economies.

A second theoretical contribution concerns country-level embeddedness. Across all models, *ego_country* always shows a negative coefficient; although not statistically significant, it indicates that domestic-only partnerships do not systematically enhance performance. More importantly, the interaction between *ego_country* and *shared_shareholders* has a negative and statistically significant impact on revenues. This suggests that domestic ties become detrimental when the firms involved share multiple shareholders, raising the possibility that

overlapping ownership generates governance frictions or conflicting strategic agendas. In contexts where ownership structures are common, the value of domestic network ties may be contingent on how concentrated or overlapping the companies' shareholder bases are.

## Policy implications

The networking behaviour of SADI companies carries several implications for policymakers. The Chinese institutional environment, strengthened by national programmes such as "Made in China 2025," has supported rapid technological advancement, enabling SADI companies to pursue diversified and cross-industry network strategies. However, our results show that international joint ventures do not yet contribute meaningfully to performance, despite policy objectives encouraging international collaboration.

SADI companies are growing rapidly because of their strong focus on innovation (Lu et al., 2025); however, this seems to be decoupled from internationalisation, differently from the traditional approach adopted by Western hidden champions (Witt et al., 2024). Thus, given their market strength and domestic state support, the natural progression for SADI companies will be to focus on cross-border relationships and understanding how these can become beneficial from an economic and financial point of view, therefore driving the internationalisation of Chinese companies. For this reason, we argue that cross-border targets can best prepare themselves for this process by carrying out thorough screening and vetting of proposals put forward by Chinese companies. This can also include the development of national policies focused on the safeguarding of SADI companies in strategic industries, which would therefore secure the country from external acquisitions. Policymakers aiming to promote the globalisation of SADI companies may therefore need to complement industrial upgrading programmes with an explicit framework for supporting international network formation, including capacity-building for international negotiation and risk-mitigation mechanisms for cross-border collaborations.

Since our findings indicate that SADI companies use formal partnerships to compensate for gaps in technological and managerial capabilities, policy interventions should not focus solely on R&D subsidies or tax incentives. Instead, policy programmes may need to enhance firms' absorptive capacity through training schemes, cross-sector innovation platforms, and international collaboration support mechanisms to ensure that network-based learning can be translated into performance improvements.

In this sense, our results also suggest that there is potential for intervening on the global supply chain with policy initiatives. Simon (2022) suggested that hidden champions may have underestimated the impact of global disruptive events such as the Covid-19 pandemic; governments should therefore concentrate on supporting companies to become more resilient, which can be achieved by investing in areas of technological innovation to offset risks associated with being overleveraged on a single supplier. According to the business network theory (Sharma et al., 2022), inter-organizational relationships can help overcoming these risks: thus, because of their official recognition by the Chinese government, SADI companies can be in a better position, compared to non-Chinese hidden champions, to benefit of policy incentives for strengthening and diversifying supply chain networks. These incentives can be coordinated with other business partners. Encouraging joint technological platforms and cross-sector innovation schemes, and therefore going beyond intra-sectoral collaborations, may help SADI companies consolidate their global footprint while maintaining the agility that characterises their strategic behaviour.

## Managerial implications

From a managerial perspective, our results highlight the need of strengthening internal capabilities to fully leverage the benefits of diversified international networks. Indeed, while government support can be instrumental in accelerating the growth of SADI companies, there are still visible limitations in the pursuit of international partnerships. Managers should therefore focus on enhancing their firms' technological capabilities and innovation cultures so that they are better positioned to absorb knowledge acquired through cross-country collaborations. Such internal strengthening is essential for achieving long-term competitiveness and drive sustainable growth in the long run (Shen, 2014; Yu et al., 2022).

The results also emphasize a potential weakness related to managerial expertise. Many SADI companies are led by managers with strong technical backgrounds (Lu, 2022): this is a strength when collaborating with similar technologically advanced partners, but potentially a limitation when building international partnerships that require strategic competencies beyond technical knowledge. Successful network strategies may therefore depend

on the development of leadership training programmes and a broader professionalisation of managerial roles (Lu & Gao, 2022). Identifying and nurturing individuals who combine technical expertise with other non-technical skills could be central to sustaining growth and ensuring that SADI companies can effectively navigate diverse and globalised business networks.

In addition, given the dual function of business networks as both relational and capability-enhancing mechanisms, managers should adopt a more strategic approach to partner selection. The positive performance effects of cross-industry collaborations indicate that partnering with technologically or organisationally complementary firms can support capability development. Prior studies suggest that many SADI companies are relatively young and still maturing in their managerial and organisational systems (Lei & Wu, 2022; Lei et al., 2025; Zhu et al., 2023). Domestic partnerships therefore provide a practical channel for acquiring external knowledge, improving production processes, and strengthening innovation capabilities. Managers may need to evaluate potential partners not only for technological fit but also for their potential to enhance organisational learning. The findings also show that international joint ventures do not yet translate into performance gains. This aligns with evidence that many SADI firms possess limited international experience and managerial readiness (Lu, 2022; Lu & Gao, 2022). To benefit from international collaborations, companies may need to invest in leadership development, international strategy capabilities, and more formalised internal decision-making structures.

# Conclusions

This paper explores the impact of networking on Chinese SADI companies' performance. SADI companies share some similarities with non-Chinese hidden champions, but at the same time they differ in several respects. In this vein, it is still unclear if SADI companies really differ from their European and American counterparts when it comes to their networking strategy. We found that the peculiar networking strategy of these companies is leading to mixed results. According to the most recent literature on both hidden champions and SADI companies, we were expecting a positive impact of business network diversification on performance, but this has not been demonstrated to be true. Finding partners from different industries, and potentially acquiring new knowledge for being more innovative, can help SADI companies to improve their performance. At the same time, if a better vertical integration positively influences revenues and earnings, SADI companies may be encouraged to follow this strategic path to achieve short-term benefits. On the other hand, internationalisation does not have a relevant impact on SADI companies' performance. While the first finding is making these companies more similar to 'traditional' hidden champions - which are not usually searching for business partners in different sectors - the latter is confirming what other studies say about hidden champions: when it comes to internationalisation, their main focus is on customer relationships, not formal business relationships (Schenkenhofer, 2022; Venohr & Meyer, 2007). In this case, SADI companies show unique qualities that are distinct only to the China context, and, unlike hidden champions seen in developed economies. Beyond these empirical findings, our results show that SADI companies follow a different network logic. As latecomer niche leaders, their domestic cross-industry partnerships function not only as relational assets but also as mechanisms for capability building. This indicates that business networks in the Chinese context play a dual role: supporting market access while accelerating organisational learning, which distinguishes SADI companies from traditional hidden champions.

Despite the above conclusions, our results still suffer from some limitations. First, the analysis primarily focuses on formal relationships (i.e. joint ventures) established by SADI companies, without considering informal relationships as well. Indeed, we are aware that these companies do not just rely on formal relationships, but also on the informal ones, and in some cases the latter are even more important than the former (Din et al., 2013). We encourage future research to map and analyse these networks of informal relationships: for example, the exchange of knowledge and communication, since they are highly important for internationalisation and innovation. In this respect, we agree with Zhu et al. (2023) that Chinese institutions should support a stronger cooperation between universities, research centres, and companies. Further research may be dedicated to investigating the relationships between these players. Second, our analysis is based on a limited dataset. The Chinese government has recently launched the national strategy for supporting niche champions (单项冠军) and specialized, advanced, differentiated, and innovative companies (专精特新); the first and second wave of companies officially recognized as SADI companies refer to 2019 and 2020, and therefore we do not have enough data on the recently added companies in the third (2021) and fourth (2022) wave to assess their performance, assuming that the policy has influenced their strategy. We encourage future studies to expand our work through a policy lens by using the most recent official list of SADI companies, and updated economic and financial data from these companies to

support exploration on the impact of the “Made in China 2025” policy and the strategy implemented by the Chinese Ministry of Industry and Information Technology resulting in potential economic and financial growth, innovation and internationalisation of SADI companies.

## Conflict of interest statement

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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