THE EVOLUTION OF CROSS-BORDER M&As AND INNOVATION STRATEGIES: EVIDENCE FROM CHINESE CONSTRUCTION MACHINERY FIRMS

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With 1 figure, 3 tables and 1 appendix
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Summary: Cross-border mergers and acquisitions (CBMAs) are an important mechanism of international investment and the configuration of global-local innovation networks. This study offers an evolutionary perspective to understand CBMAs sponsored by Chinese firms by focusing on the key actors and main changes at different stages: a primary stage with the target search process, an initial stage with light-touch integration, a fusing stage with emergence of new entities, and a mature stage with the reorganization of global-local innovation networks. The findings indicate that the innovation strategy of Chinese CBMAs corresponds with the structural integration and differentiation of innovation modes.

Zusammenfassung: Die Bedeutung von grenzüberschreitenden Fusionen und Übernahmen (CBMAs) wird im Prozess der internationalen Investitionen und des global-lokalen Innovationsnetzwerks weithin anerkannt. Diese Studie nutzt eine evolutionäre Perspektive, um CBMAs chinesischer Unternehmen zu verstehen, indem sie sich auf die Hauptakteure und die wichtigsten Veränderungen in verschiedenen Stadien des Übernahmeprozesses konzentriert: Als Stadien unterschieden werden eine Vorstufe mit der Suche nach dem Übernahmeobjekt, eine Initialphase mit der Integration mittels Light-Touch-Ansatz, eine Fusionsphase mit Entstehung neuer Einheiten, und eine Reifephase mit Reorganisation des Innovationsnetzwerks. Die Ergebnisse zeigen, dass die Innovationsstrategie chinesischer CBMAs mit der strukturellen Integration und der Differenzierung des Innovationsmodus korrespondiert.

Keywords: cross-border mergers and acquisitions; global-local innovation network; evolutionary perspective; construction machinery firms; China

1 Introduction

Research on cross-border mergers and acquisitions (CBMAs) is currently interested in the factors that potentially affect CBMAs (c.f. Colombo and Rabbiosi 2014; Deng and Yang 2015) and the impact of CBMAs on innovative performance and absorptive capacity (c.f. Orsi et al. 2015; Khan et al. 2015). Existing studies include representative samples (c.f. Spigarelli et al. 2013; Spigarelli et al. 2015; Zheng et al. 2016) and in-depth accounts of specific CBMA deals (c.f. McCarthy and Aalbers 2016; Ahammad et al. 2017). While they discover ongoing growth processes and changes prior to and after CBMA activities, the spatial perspective has been largely absent from this discussion. Moreover, the evolution of innovation strategies at different stages has rarely been analyzed.

China is rising and gradually developing into an innovation-oriented economy, having nurtured many domestic firms with a high innovative capacity during the past decade (Wang and Guo 2017). Additionally, driven by competitive pressures and the government-sponsored Going Global strategy, numerous Chinese multinational corporations (hereafter CMNCs) attempt to directly purchase advanced firms and their technology, including managerial expertise and patents, in order to alleviate competitive disadvantages of the Chinese parent company and to catch up with their Western counterparts (Zheng et al. 2016; Haasis et al. 2018). Correspondingly, China's outward FDI with CBMAs is currently a hot topic in the theoretical and practical domain (Zhu and Zhu 2016; Boateng et al. 2017; Haasis and Liefner 2019). A number of scholars have attempted to analyze CBMAs and related innovation strategies from an evolutionary perspective, for example the structural integration and degree of coordination in the post-merger phase proposed by Haspeslagh and Jemison (1991). Thus far, however, theoretical frameworks and empirical results have been largely based on studies in developed or western countries (Zhu and Zhu 2016). Hence, it remains an open question as to whether the mechanisms are valid in the specific Chinese context (Spigarelli et al. 2015; Meyer and Peng 2016).

There is, therefore, a need for more research that investigates the evolution of innovation strategies by taking CBMAs into account from a spatial perspective. In this paper, an attempt is made to address two important questions: What are the key features of innovation strategies at different stages of the CBMA process? What are the related spatial characteristics? The empirical analysis of this paper examines the structural integration of CBMAs by CMNCs from the construction machinery industry. The data was generated through semi-structured interviews conducted between 2016 and 2018.

The paper is organized as follows. Section 2 evaluates the related literature to develop an analytical framework. Section 3 briefly introduces the research design and the data sources. Section 4 focuses on the empirical analyses, applies the theoretical framework, and explains the most important results. Conclusions and implications for further research are discussed in the final section.

2 Towards a comprehensive model of the CBMA process by CMNCs

The research on CBMAs is usually regarded as part of international business and strategic management research. The literature on firm strategies to generate and implement foreign investment can be divided into two camps: (1) the Uppsala model (e.g. Johanson and Vahlne 1997; 2009), which generally posits the large multinational enterprises as objects and stresses the importance of a step-by-step internationalization strategy. In this model, firms usually operate and develop a market position in their home country for several years and enter overseas markets gradually. (2) In contrast, a growing body of literature emphasizes the rapid internationalization of some small and medium-sized companies, so-called Born Globals (e.g. Chetty et al. 2014). These firms possess a radical advantage that becomes relevant beyond national boundaries. Therefore, they tend to employ the strategy of rapid and immediate globalization.

Related contributions that seek to explain the internationalization of firms from technologically less advanced countries often refer to the motivation of technological catching-up through internationalization, and apply the LLL model (Mathews 2006) or the springboard theory (Luo and Tung 2007). The former points out that the knowledge base of a multinational from a country that is lagging behind can be broadened by accessing the resource base of another company as well as its related innovation network. The means to acquire new knowledge is referred to as linkage, leverage and learning (LLL), and helps the recipient to update and diversify their existing knowledge portfolios (Liefner et al. 2012; Si et al. 2013). The springboard theory emphasizes that technologically backward firms tend to employ an outward investment strategy as a springboard to acquire key resources in order to improve their competitiveness (Feng et al. 2019).

Consistent with these theories, China's current outward FDI via CBMAs often focuses on the acquisition of innovative resources and knowledge. Large Chinese firms (often state-owned or closely linked to the state) act as acquirers, using strong country-specific advantages, for example an enormous demand in the home market and institutional incentives, but face gaps at the firm level compared to firms from developed economies (Öberg and Leminen 2017). Chinese CBMAs are thus often meant to accelerate technology enhancement by accessing the knowledge pool and the network of the target (Puranam and Srikanth 2007). Case studies show that acquiring firms use their new knowledge to foster innovation and leapfrogging at their headquarters (Haasis et al. 2018). Regarding the interplay of M&A, knowledge acquisition, and the development of innovative capabilities, the two theories mentioned above explain motivations and outcomes but remain vague when it comes to understanding the underlying processes and patterns. As proposed by Quah and Young (2005), a phases approach can be useful in this context.

2.1 Primary stage: search process for a target

Target firms for Chinese CBMAs in developed economies possess strategic assets, resources, and markets that are complementary to CMNCs (Stiebale 2016; Haasis et al. 2018), including knowledge, managerial skills, talents, brands, patents, country-specific capabilities and networks (Spigarelli et al. 2015; Deng and Yang 2015). Two features are of particular importance during the target search process: (1) Knowledge relatedness. Horizontal and vertical CBMAs occur more frequently between firms with related capabilities in terms of technologies, products, and markets (Han et al. 2018). (2) Prior ties. Culture, institutions, and economic systems are a constraint for communication, and thus potentially limit knowledge creation in the post-merger phase (Li and Wang 2016). Potential targets are thus assessed with regard to their social and cognitive prox-

imity to reduce the asymmetries and risk of failure (cf. Si and Liefner 2014). The configuration of global production networks (Bany–Ariffin et al. 2016), distribution channels (Guadalupe et al. 2012), and prior cooperative relationships (Orsi et al. 2015) are considered.

2.2 Initial stage: light-touch integration

As described in many studies and cases, the acquired firms in developed economies are mostly more innovative, while the CMNCs face challenges associated with institutional and cultural distance at the micro and macro level (Orsi et al. 2015; Zheng et al. 2016). In this situation, CMNCs frequently apply a low-level integration strategy, the so-called light-touch integration (Liu and Woywode 2013).

Existing studies highlight several tangible features of the light-touch integration approach: (1) The Chinese parent company may provide strategic guidance only to a certain degree, while the acquired firm is maintained as an intact and independent entity with a separate organization structure, its own identity, and a high degree of freedom in decision-making (Liu and Woywode 2013). (2) Some forms of interaction and communication between the Chinese parent company and the acquired entities may be put in place (Haasis et al. 2018). They can be classified into two key linkages: frequent exchange of technical key personnel and a progressive permeation of the R&D personnel in the acquired entity. In a nutshell, the Chinese parent company at this stage resorts to accessing the pool of tacit knowledge of the target firm by linking up with existing routines, procedures, and personnel (Zheng et al. 2016).

2.3 Fusing stage: emergence of new entities

As a reaction to the coordination-autonomy dilemma (Zhu et al. 2015), the relation between the Chinese parent company and the acquired firm may include coordination mechanisms to foster further technology transfer, for example new joint venture entities and technology scouting units. The reasons for their formation are, on the one hand, key intentions of the acquired firm to expand product markets and to utilize the financial capability of the acquirer (Spigarelli et al. 2015; Öberg and Leminen 2017). Because of legal restrictions or investment risks, joint ventures are a preferred entry mode (Shimizu et al. 2004). On the other hand, listening posts are constructed in relevant global knowledge hot spots (Maskell 2014). The joint subsidiaries can hence absorb novel knowledge by acquiring the technological knowledge from local advanced entities and by exploiting relationships with individuals, competitors, and networks. In a similar vein, CMNCs establish subsidiaries overseas via CBMAs as a strategic approach to gain access to the assets of the acquired firms (Rui and Yip 2008).

2.4 Mature stage: global-local innovation network

Since innovation is the consequence of the interaction of firms with their cooperative partners in the nearby or distant locations (Lyu and Liefner 2018), two integration modes exist at this stage (Haspeslagh and Jemison 1991): (1) Absorption is a high-level form of integration and a means of dissolving the boundary and minimizing the autonomy of the acquired firm. (2) Symbiosis is characterized by co-existence and interdependence of the acquirer and acquired firm (Liu and Woywode 2013; Angwin and Meadows 2015). At this stage, CBMAs result in a reorganization of R&D operations and networks (Colombo and Rabbiosi 2014), which aims at a complete integration of the acquired firm into the operations of the acquirer.

The spatial pattern of this integration and the generation of joint innovation resources is characterized by multi-locational subsystems and structural coupling (Binz and Truffer 2017). Knowledge partners and industry partners may be located on different spatial scales (Fu et al. 2013). Hand in hand with government-sponsored guidance, collaboration with knowledge partners may occur on local and/or national scales, while industry partners are expected to be located on the global scale after a reorganization of R&D operations.

3 Research method and data collection

3.1 Research method

This paper's empirical findings stem from a thorough case study of the Chinese multinational Zoomlion, its German acquisition target M-tec, and its Italian acquisition target CIFA. This case study information is complemented with insights from a further seven cases of Chinese construction machinery firms and related producers. This approach

allows the development of a comprehensive model of the evolution of CBMAs and related innovation strategies by CMNCs.

3.2 Data collection

Based on the method of case identification and gathering by ZHENG et al. (2016), all Chinese CBMAs in the construction machinery industry in recent years were identified by information from academic journals, company reports, newspaper articles, and various websites. It was possible to gain access to nine firms, which form the empirical cases as shown in Tab. 1. Information was obtained from in-depth semi-structured interviews with representatives of Chinese and German firms at the Hannover Fair 2017, the 6th China International Robot Show 2017, the 19th China International Industry Fair 2017, the 2018 Bauma China, and on-site interviews in Germany from late 2016 to 2018. Five firms belong to the construction machinery industry (four firms in China, one acquired firm in Germany), the other four are general machinery manufacturers with close connections to the construction machinery industry.

Each face-to-face interview lasted between half an hour and one hour. Interviews were conducted in Mandarin (eight interviews) and German (one interview). The interviews in China were recorded by notes and the one in Germany was recorded by tape and transcribed into text word for word. As a supplement to established interview transcription, additional information was searched for on the internet, in books and periodicals, including public research and documents, financial reports, and biographies of executives and firms.

Tab. 1: Profiles of the empirical cases

Case	Ownership status	Country of the target firm	Year of first acquisition	Number of acquisitions	Position of the interviewee
Primary case study:					
Zoomlion	State-owned	England Italy Germany Netherlands Italy	2001	5	R&D department
M-tec	German target firm		2013	-	executive level
CIFA	Italian target firm		2008	-	R&D department
Additional case studies					
A	State-owned	USA	2010	1	R&D department
B	Privately owned	Germany	2012	1	management board member
C	State-owned	USA	2003	1	R&D department
D	State-owned	Italy	2015	4	R&D department
E	State-owned	Germany	2014	2	management board member
F	Privately owned	Italy USA	2016	2	R&D department
G	Privately owned	Italy	2014	3	R&D department

The main interview questions focused on the following topics: questions concerning the motivation and integration process of CBMAs, insights into the internal organization, technological innovation, talent cultivation and market development after the acquisition, and innovation networks, including detailed information on the evolution of linkages.

Furthermore, the activities of the firms interviewed were subdivided into the four stages proposed in the conceptual section: primary stage before the acquisition, initial stage (1 to 2 years), fusing stage (2 to 5 years), and mature stage (5 years and more).

Open and axial coding was used to figure out relevant concepts in the data and then group them into categories, which has been encouraged as the most applicable method to analyze the evolution of CBMAs and related innovation strategies by CMNCs. Specifically, as proposed by Strauss and Corbin (1997), the first step was to take Zoomlion and its CBMAs as the benchmark to investigate and decode the issues. The transcripts were conceptually labeled through constant comparison and divided into different groups. Afterwards, relationships between the factors identified were established, called axial coding, and then sorted into main categories (see Appendix).

4 Empirical findings on CBMAs of construction machinery firms from China

4.1 The overview of CBMAs in the construction machinery industry

In response to the new policy strategies of 'Going Global', 'Indigenous Innovation', and the 'Belt and Road Initiative', the Chinese government is drawing up several policies to pave the road for the improvement of innovation ability and internationalization. CBMAs are a tool that contributes to all these strategies and, hence, has received additional encouragement from governments in China at different levels. Chinese firms have been frequently adopting CBMAs to overcome latecomer disadvantages and improve their international competitiveness (Zhu et al. 2015; Zheng et al. 2016; Sun 2018). In the first half of 2016, the transaction value of China's CBMAs reached US$ 133.7 billion, which already exceeded the results for the entire year 2015. China became the largest foreign investor in the world for the first time during that period.

Based on the aim to contribute to a more holistic understanding of innovation strategies during the CBMA process, the construction machinery industry was chosen as an example for the following two reasons. Firstly, the Chinese construction machinery industry is in a catching-up stage, and recent decades have witnessed a dramatic rise via CBMAs in developed economies. Ten CMNCs, namely Zoomlion, Sany, LiuGong, XCMG, Csr Times, CIMC, QGM, Lovol, Shanxi TZ and Weichai Holding, have completed a total of 32 CBMAs, in Germany (10), Italy (6), England (5), the Netherlands (3), United States of America (3), Australia (2), Poland (1), Austria (1) and France (1). Via this mechanism, they have acquired urgently needed know-how, and the innovation strategy hence focuses mainly on the improvement of innovation ability and, to a lesser degree, on the expansion of markets. The cases therefore fit with the research purpose and the existing consensus that CMNCs employ CBMAs for accessing knowledge assets to overcome their latecomer disadvantages beyond a pure market expansion. Secondly, compared with other economies, the involvement of the Chinese government is a unique element with an impact on innovation activities not only in financial and other types of support, but also as an important factor to influence cooperation modes (Liefner and Jessberger 2016; Lyu and Liefner 2018). As an industry which is closely related to infrastructure construction and government procurement, innovation strategies during the CBMA process are not only shaped by the actors directly involved in the integration and technological progress, but also by the institutional framework. Therefore, construction machinery firms provide a suitable case to study Chinese peculiarities in the field of CBMAs.

4.2 Case study: the trajectory of CBMAs by Zoomlion

Zoomlion was founded in 1992 as an enterprise that was restructured from a public scientific research institute connected to the MoHURD (Ministry of Housing and Urban-Rural Development of the People's Republic of China). Zoomlion has been mainly engaged in developing and manufacturing high-tech equipment. Now, Zoomlion has 19 main manufacturing bases in 14 industrial parks in China and 5 abroad. In addition, Zoomlion has subsidiaries in nearly 20 countries as well as more than 50 representative offices around the world. CIFA, Italy, has been in the market for over 90 years and has created a sophisticated system of designing, producing and distributing construction machines ranging from mixing to distribution, from pumping to laying

concrete. M-Tec, Germany, was founded in 1965, and has become a famous brand in the field of pre-mixed construction materials such as dry-mix mortar. Its products are sold in 55 countries and regions worldwide. Faced with the trend of a shifting demand for dry-mix mortar to Asia, the acquisition of M-Tec by Zoomlion was initiated without public protest.

In general, Zoomlion's CBMAs have been analyzed in other studies that have pointed out their importance for Zoomlion's internationalization regarding access to sophisticated technology as well as expertise in R&D and global markets (Spigarelli et al. 2015; Lattemann et al. 2017). However, Zoomlion provides the most interesting case for the discussion on CBMAs by CMNCs provided here for the two following reasons. Firstly, in line with China's rapid industrialization, Zoomlion has developed from providing cheap low-tech products to producing more sophisticated and advanced equipment. Its innovation network is hence made up of local and global linkages with a strong involvement of various domestic and overseas actors. Secondly, Zoomlion already has a long history of takeovers in general and CBMAs in particular. It gathered initial experience as early as 2001, long before the recent boom of Chinese outward foreign direct investment. Zoomlion's portfolio comprises 9 acquired firms in China and 5 foreign firms (Fig. 1). It can be regarded as an outstanding example of M&As in China.

Both CIFA and M-Tec are globally leading enterprises that possess advantages in terms of knowledge and technology. The takeover of CIFA represents a horizontal merger because the core competencies of CIFA and Zoomlion are both in the field of construction machinery. In contrast, the takeover of M-Tec is a typical example of a vertical merger because the core competency of M-Tec is in the field of plant engineering and construction site engineering, and thus covers fields closely related to construction machinery. The M-Tec takeover allows Zoomlion to cover a larger part of the construction industry value chain.

Table 2 summarizes the evaluation of firm-specific elements and main incentives for CBMAs from the perspectives of Zoomlion, CIFA and M-Tec.

Zoomlioon cooperated intensively with CIFA and M-Tec prior to the CBMAs. The interviewees stated that "prior to the CBMA, the fundamental situation of the target firm must be considered. […] Will it be connected with our existing productivity and technology? […] As early as 2001, we already had a cooperative relationship with CIFA […] we have a greater understanding of its brand, product quality, advanced technology and excellent management". "We [Zoomlion and M-Tec] had the customer-supplier relation […], M-Tec built up a new business division in China […] and yet, four years ago, Zoomlion bought machine components from us".

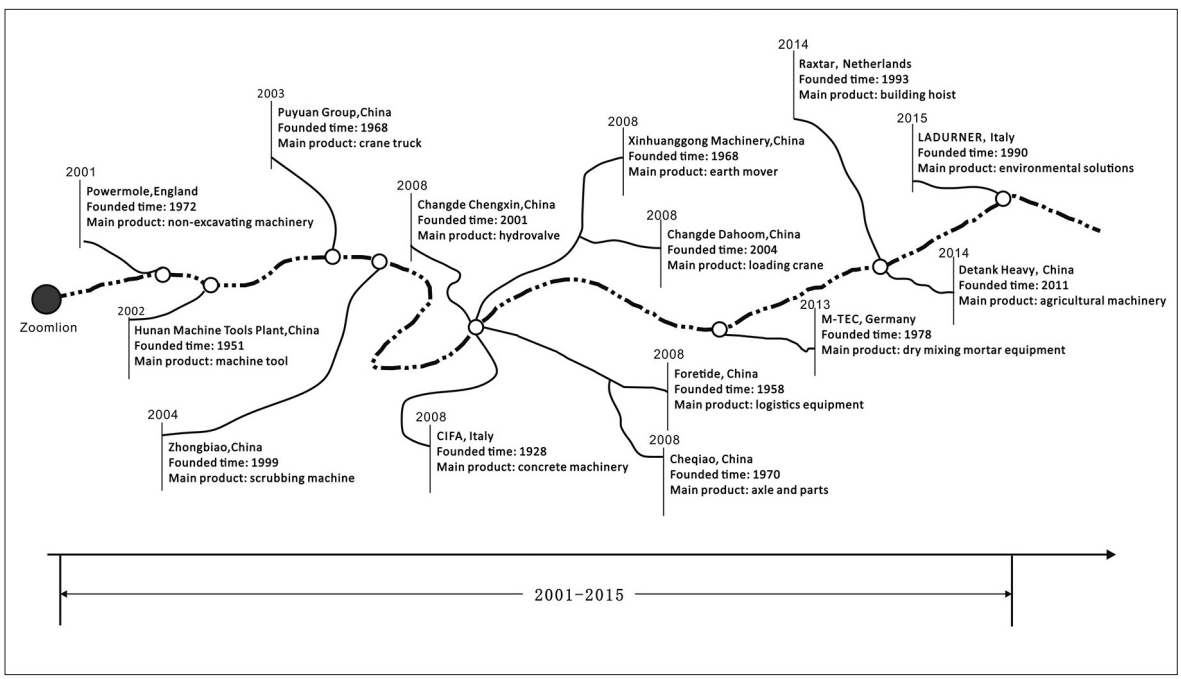

Fig. 1: The trajectory of CBMAs by Zoomlion

Tab. 2: The evaluation of Zoomlion, CIFA and M-Tec

	Firm-specific element	Main incentives of CBMAs
Zoomlion	Ranks second in terms of technological excellence in China, but still relatively weak in terms of international competitiveness. Benefits from the state-owned background and easy access to public research support	Internationalization strategy focuses on technology acquisition and improvement: technological and market know-how, patents, R&D and production of core components as well as advanced management experience.
CIFA	Possesses the most advanced technology in fields such as unilateral support and quick extension as well as intelligent anti-tip-off technology, combined with cost-efficient products. Mature and stable sales channels and cooperation network. Constrained access to financial resources, high debt-to-equity ratio.	Willingness to sell with the aim of gaining access to resources for further research and development.
M-Tec	Ranks No.1 in the world in the dry mixing mortar industry. The only firm in the world which has strong R&D and production capability of dry mortar construction equipment. Offers value-added services such as market analysis and consulting, raw materials analysis, optimization of product formula, etc. Barriers to enter the Chinese market.	Dry mortar plant engineering is still a new field in China with a vast potential for future development. The Chinese market is thus seen as a huge opportunity for further expansion.

Referring to the integration strategy in the initial phase, the statements of the interviewees provide evidence that explicitly demonstrates the nature of the light-touch integration. They referred to the blending of sufficient autonomy of the acquired firm and frequent interaction and exchange of technical talent. "We (Zoomlion) kept the target (CIFA) in an independent company, the stability of management team and staff in particular. As a basic principle, the R&D team was completely preserved […] that is for sure, we do not want to destroy the existing good foundation […] and we set up a collaborative office to ensure the connection with their R&D team. We believe both sides have the same background and are mainly engaged in technical R&D, the communication, therefore, can be easier". "We (M-Tec) don't have any Chinese executives here […] we are very independent and operate more like a medium-sized company, rather than a part of a corporate group […] we are on our own […] we have to take care of all the issues including tax, etc. […] there is a transfer of knowledge from the German side and we are training the Chinese engineers […] we provided the know-how in the form of drawings and components".

With further advancement of the bilateral communication and integration, some new joint entities emerged with the aim of realizing and sharing the benefits of geographical proximity and organizational proximity. The interviewees stated that "in 2009, we have a new joint venture company in China. […] The most special feature is that the workshop is separated by transparent glass; we work together and share the same R&D facilities. […] the new firm is managed by the merged team, which is in full accordance with the existing factory model in the motherland. […] This way, mutual understanding and trust is deepened, and the staff is willing to share know-how and technological tricks". "We have built up a completely new business unit under the umbrella of Zoomlion. Over the past two years, we have provided it with the necessary know-how and adapted it to the Chinese market".

4. 3 Complementary insights from a multi-case analysis

Based on the additional seven CBMA cases covered by interviews, this section addresses the structural and spatial characteristics of the CMNCs

in the CBMA process. Cases B and E refer to the German context as a key element (ref. Tab. 1).

The consequences of the changing degree of integration in each of the four stages for the relative importance of innovation strategies and modes can be summarized as follows (see also Tab. 3).

(1) Primary stage: Most of the CMNCs consider knowledge relatedness as the main criterion for their CBMA decision. This underlines the need for high-quality knowledge for the further improvement of their innovation abilities. In the search for potential CBMA targets, prior ties, such as pre-existing customer-supplier relationships or other forms of cooperation, generate a rather unintended bias towards certain target firms based on relational proximity. Moreover, the targets' locations and innovative endowments are important for selecting potential partners.

(2) Initial stage: The structural integration strategy adopted by CMNCs at this stage resembles the light-touch integration approach as described by Liu and Woywode (2013) and discussed by Haasis et al. (2018). It is characterized by a high degree of decision autonomy and structural independence of the acquired firm, which includes the retention of the company name and its brands as wells as an unchanged management and R&D team. Meanwhile, the Chinese parent company resorts to accessing know-how through multiple communication and cooperation channels with the target firm, which mainly includes the frequent exchange of technical talents and progressively a permeation of the R&D personnel in the acquired firm with Chinese staff. Based on the structural integration strategy, the configuration of innovation networks still retains the characteristics of the previous stage without showing large-scale changes and expansion.

(3) Fusing stage: The transferred technological knowledge can be further fortified by the appearance of new joint venture entities, such as joint venture firms, R&D joint centers, joint production bases, and sales and service offices. Similar trends are also shown by Haasis et al. (2018). The firm establishes headquarter functions in China and in the country of the acquired firm. Joint venture entities are positioned in main markets, knowledge hot spots, and global cities. They not only provide an integrated platform for the development of innovation ability, but also provide knowledge for continued product improvement and innovation. This structure may gradually evolve into a global-local innovation network.

(4) During the mature stage, the innovation network is further extended and deepened. Knowledge partners on the local scale are chosen according to the specific competitive advantages at the different location of the CMNC and its subsidiaries. The spatial structure of the network of industry partners reflects the spatial configuration of the respective global value chain. Given the influence of governments at different levels in China, which includes support for knowledge and innovation, the CMNCs can also access high-level research institutes on the national scale in China as cooperative partners.

5 Conclusion

Although numerous CMNCs attempt to employ CBMAs as a strategy to catch up with their Western counterparts, the existing theoretical frameworks and empirical results on CBMAs are largely based on studies in developed economies. Hence, it is questionable whether they can fully explain the situation in China. In order to respond to this drawback, this study has developed an analytical framework which focuses on the main characteristics at the different stages to explain CBMAs by CMNCs and the related innovation strategy. The empirical analysis is based on information from Chinese firms in the construction machinery industry generated through semi-structured interviews conducted between 2016 and 2018. The research results have some theoretical and practical implications for innovation strategies and CBMAs.

This study offers an evolutionary perspective for understanding CBMAs by focusing on the key actors and main changes in different stages: primary stage of target search, initial stage with light-touch integration, fusing stage with emergence of new entities, mature stage with the reorganization of global-local innovation networks. The findings indicate that the dynamics in innovation strategies correspond with the structural integration and differentiation of innovation modes. CMNCs move from peripheral to central positions, which allows the capturing of opportunities by creating linkages within a global industry. With regard to the initial phase after the CBMA, light-touch integration seems plausible to achieve a smooth transition. Moreover, new joint entities are identified as a frequently chosen pattern to realize further integration. They provide a carrier to formalize

Tab. 3: Stages of the CBMA process in the construction machinery industry

Stage 1: Target search	
Main Characteristics	**Quotations**
knowledge relatedness	The Chinese parent company also brings sufficient resources to help us to enter into more markets […] we can be complementary on business areas and product lines (case A).
	The two firms are relatively highly correlated in the industry, products, technology and market (case B).
	The goals of CBMA are twofold: one is to integrate into the local market, expand marketing networks; the other is relatively important to the key technologies and patents, as well as the core components.[…] the merged firm mainly aims to enter into the Chinese market.[…] our products have some correlations (case D).
	Although we have a good development, we are still technologically backward compared to western countries. […] the German firm possesses the […] technology and talents that we really need (case E).
prior ties	Since they are our supplier, we always use their products (case A)
	We have had a lot of cooperation in the past few years…we trust each other, the most important wealth between us (case C)
	In fact, we have had a lot of cooperation since the acquisition was launched. […] the engineers come to help us to improve the original products (case E).
contextual influence	We have another important reason to choose the German firm, local innovation resources. For example, local associations, […] we think they are very powerful for obtaining the related industry information (case B).
	Germany is the technical highland, where we can easily access the latest technical information, it is very helpful for us, […] the establishment of an R&D center in Germany can strengthen our personnel exchanges and technology transfer, and at the same time, it also helps to find superior talent (case E).
Stage 2: Light-touch integration	
Main Characteristics	**Quotations**
independent autonomy	The brands and products of the acquired firms are conserved. For example, in 2005 (the second year after CBMA), the acquired firm started to adjust its China policy and directly and systematically enter the Chinese market. […] we also launched a cooperation project. […] the new product was very successful in North America (case C).
	The management team has not changed. […] we offer the acquired firm a lot of autonomy in decision-making (case D).
	After the acquisition, we keep everything the same as before. […] the difficulty was effectively reduced and the cost was lower (case F).
	We promised no layoffs and reached an agreement with the local labor association too. […] and the target remained completely independent (case G).
technical talents	International talent comes to China for technological exchange and cooperation. […] At the same time, we will send our Chinese employees to go abroad for studying and learning (case A).
	We always respect that they are teachers and we have to work hard and learn from them (case B).
	They developed earlier than us. […] after CBMA, there is a constant exchange with the colleagues, especially R&D personnel. […] our domestic personnel can train abroad and then return for our domestic research and development (case D).
	The German technicians come to China and carry out the technical exchange one-on-one (case E).
	We set up two study groups, hoping to exchange new ideas through frequent communication (case G).

Stage 3: Emergence of new entities	
Main Characteristics	**Quotations**
joint venture entities	In order to access technology and marketing networks, we set up two joint ventures, each holding 50% of the shares. […] it is equivalent to moving the technology/management to China, bringing the teacher to China too (case B).
	In 2007, we invested 2.82 million U.S. dollars to set up the subsidiary in the USA to take charge of sales in North America. […] We built an R&D point in the merged firm to understand the latest technology and products, and then conduct R&D. […] together we built a new firm overseas in order to start a new business and improve innovation performance (case C).
	After one year, we have established a joint venture in China, which facilitates our further cooperation and helps the targets to realize the purpose of expanding in the Chinese market (case E).
	We recruit local technicians and sales personnel in our European subsidiaries. […] our new firm runs globally and sells the products to European and global markets more quickly (case F).
Stage 4: Global-local innovation Network	
Main Characteristics	**Quotations**
knowledge partners	Regarding university and research institutes, we prefer to cooperate with the local ones that are close to the firm and the other subsidiaries, such as Shanghai Jiaotong University, Institute of Electrical and Mechanical Changzhou. […] generally, the most important partners are still in China (case A).
	There are two types of cooperation partners: one is Chinese Academy of Sciences. […] the other is the universities and research institutes where the parent and subsidiaries are located (case C).
industry partners	Cooperation with customers and suppliers is very important […] The partners of merged firms are saved and then carry out further cooperation (case A).
	The merged firms have established the global networks not only in the home country, but also the important market scopes around the world, particularly stable customers, suppliers and innovation partners. […] after the CBMAs, we share the industrial chain and innovation partners. […] industry partners are therefore distributed all over the world (case B).
	In the R&D activities, independent innovation is the most important, followed by the cooperation with universities and research institutes. […] for the industrial chain cooperation, only limited to the peripheral components, collaborative R&D for core parts is almost non-existent (case C).

the integration into the rules, routines and shared norms, which then inspires more knowledge transfer and future knowledge co-development. The relationship between the Chinese parent company, the acquired firm and the other subsidiaries is central to improving innovation ability and performance. Cooperation partners in the field of knowledge transfer focus on the local scale according to the location-specific advantages of the firm and its subsidiaries. Industry partners link up with the global scale based on the configuration of the global value chain. The findings suggest that, contrary to the conventional wisdom, geographical proximity may still play an important role for innovation linkages with knowledge partners, and that distant high-quality research organizations are not yet the first choice. This is not only because of comparatively higher costs, but also because of the lack of opportunities for frequent face-to-face contacts and limited absorptive capacity.

With a focus on the particularities of the cases analyzed here, it has become clear that Chinese construction machinery manufacturing firms have grasped the opportunities to broaden their activities along value chains and to improve their innovation performance. Whilst the research provides some valuable insights into innovation networks and CBMAs, several limitations should be addressed in future research. In order to avoid industry-specific results, future studies should seek complementary information on different industries and broaden the empirical base.

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Appendix: Results of the Zoomlion case study coding procedure

Data analysis was supported by a coding procedure from the interviewees' transcripts and the other supplementary materials. Finally, 48 codes were generated, and the paper then collects and classifies 7 categories that can summarize the evaluation of CBMAs and its evolution from the perspective of Zoomlion (see below).

Stage	Evidence from the cases	Code	Category
1	the fundamental situation must be well known, we have a greater understanding of its brand, product quality, advanced technology and excellent management	a_1 mutual understanding	A_1 knowledge relatedness
	our Internationalization strategy focuses on technology acquisition and improvement	a_2 technology acquisition	
	……	……	
	we had the customer-supplier relation; four years ago, Zoomlion bought machine components from us	a_6 industrial relevance	A_2 prior cooperation
	as early as 2001, we already had a cooperative relationship with CIFA	a_7 prior cooperation	
	we kept the target firms in an independent company, the stability of management team and staff in particular. That is for sure, we do not want to destroy the existing good foundation	a_8 independent autonomy	A_3 independent autonomy
	……	……	
2	there is a transfer of knowledge from the German side and we are training the Chinese engineers	a_{12} talent training	A_4 technical talents
	as a basic principle, the R&D team was completely preserved	a_{13} R&D team preserved	
	……	……	
3	we set up a collaborative office to ensure the connection with their R&D team	a_{26} new R&D entity	A_5 construction of some new joint entity
	in 2009, we have a new joint venture company in China	a_{27} new company	
	we have built up a completely new business unit under the umbrella of Zoomlion	a_{28} new business unit	
	we believe both sides have the same background and are mainly engaged in technical R&D, the communication, therefore, can be easier; this way, mutual understanding and trust is deepened, and the staff is willing to share know-how and technological tricks	a_{29} talent integration	
4	the most special feature is that the workshop is separated by transparent glass; we work together and share the same R&D facilities	A_{30} R&D integration	A_6 cooperation mode
	the new firm is managed by the merged team, which is in full accordance with the existing factory model in the motherland	A_{31} management integration	
	over the past two years, we have provided it with the necessary know-how and adapted it to the Chinese market	A_{32} cooperation model	
	……	……	
	we share the external innovation partners	A_{39} open innovation	
	cooperation with universities is possible, especially the local universities which had the relationship with CIFA before ... and in our R&D center, we have a lot of students and professors from local universities	A_{40} universities	A_7 innovation network
	now we belong to one firm, and of course we can use the CIFA's suppliers or customers.	A_{41} industry partners	
	……	……	