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CASE STUDY

Gert Bruche, Yingying Hong

Resource Acquisition, Internationalization, and the Catch-up Path of Chinese Construction Machinery Champions—The Case of Sany, XCMG, and Zoomlion

Abstract This study investigates the internationalization and resource accumulation process of the three largest Chinese construction machinery companies: Sany, XCMG and Zoomlion. It takes a longitudinal approach to analyze the internationalization process of the three companies over the last 25 years. Although the three companies' paths in the early acquisition of technologies and firm-specific advantages (FSA) differ significantly, however, their internationalization process exhibits similar pattern. They all exploit the same home-country based FSAs in their south-south expansion into other emerging markets, and seem to mimic each other in their strategic moves. In the south-north expansion into advanced economies they skip the export stage and rely almost exclusively on foreign direct investment of both forms, greenfield and M&A, to pursue asset augmenting objectives and overcome their "liability of origin". The study concludes by discussing several topics of interest, such as the implications of accelerated resource accumulation, the impact on competition with advanced multinationals in the home market or possible effects on the level of state support and risk taking behavior in the internationalization process by the companies' ownership type.

Keywords resource acquisition, internationalization, emerging market

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Gert Bruche
Department of International Management, Berlin School of Economics and Law, Berlin 10825, Germany
E-mail: gert.bruche@hwr-berlin.de

Yingying Hong (✉)
Department of Enterprise Application, Deloitte Consulting GmbH, Berlin 10719, Germany
E-mail: yihong@deloitte.de

multinationals, Chinese multinationals, catch-up, construction machinery

1 Introduction

The rise of emerging economies, and particularly of "emerging Asia" with its two "heavyweights" China and India, has shaped a new world economic order. The changing order has paralleled the growth and increasing resourcefulness of firms from these regions. When these firms—often after becoming national champions in their home-markets—appear on the international stage and engage not only in export but also in foreign direct investment, they develop into multinational companies or "emerging-market multinational companies" *(EMNCs)*. The prefix implies that these companies are a kind of "new breed", differ from the "traditional" multinational companies of the advanced economies of North America, Europe and Japan (advanced market multinationals—AMNCs). In the last decade, EMNCs have been the subject-matter of many practice-oriented reports as well as of a large number of academic studies mainly in the International Business (IB) and International Management research domain, but also, for instance, in innovation research, economic geography and sociology.

Today there are more than 100,000 companies which qualify as multinational companies (MNCs) or "Transnational Corporations" according to UNCTAD criteria, and the home country of almost a third of them is an emerging economy or developing country (UNCTADStat, 2014). Many studies about EMNCs have focused on the top stratum of these firms based on criteria such as company size, market position in their industry, degree of internationalization, etc. A consistent approach over time from a practice-oriented perspective has been provided by the Boston Consulting Group (BCG) which since 2006 has published an annual list of 100 "Global Challengers", a selection of leading EMNCs which according to BCG's criteria "challenge" the positions of AMNCs and also local champions from the advanced economies. BCG considers EMNCs such as Lenovo or Huawei (Number One in the PC- and telecommunications equipment market respectively) which have already achieved global leadership in their markets as "graduated" and removes them from their "challenger" list (BCG, 2006, 2008, 2009, 2011, 2012, 2013, 2014, 2015a and b). For 2014, BCG includes 29 Chinese (plus 3 "graduates"), 19 Indian (plus 1) and 13 Brazilian companies (plus 1). While these three countries cover some 60% of all "Global Challengers",

the remaining 40% come from 15 other emerging economies (BCG, 2015a). In addition to the reports and books by BCG there is a growing practice-oriented literature which gives advice to firms from advanced economies and increasingly also to EMNCs on how to strategically address their opportunities and challenges (see for example Accenture, 2008; Chattopadhay et al., 2012; Deloitte, 2012, 2013; Backaler, 2014; Bruche and Venohr, 2015).

In the academic literature, authors often start with referring to studies on earlier generations of EMNCs from Japan, South Korea and Chinese Taiwan (e.g. Lecraw, 1977; Wells, 1983; Lall, 1983) and then go on to study the "new generation" of 21st century EMNCs, particularly from China and India, and from some other emerging markets such as Brazil, Russia, South Africa, Indonesia or Mexico. Many of these studies take a *universal* theory perspective, i.e., they try to find *general* traits and patterns of EMNC internationalization and catch-up and contrast these with the "traditional" international business (IB) theories based on the study of multinationals from advanced Western economies (e.g., Mathews, 2002; Mathews, 2006; Luo and Tung, 2007; Amighini et al., 2009; Narula, 2012). Another approach involves case studies and quantitative surveys from a contingency perspective, i.e., they conceptualize and explain the strategies and internationalization of different EMNCs in the context of various influencing variables, for instance, home-country institutional environment, size of home-country market, industry characteristics, business group embeddedness, value chain position and state vs. private ownership, etc. The attempts to find a universal, generalizable theory of EMNCs are, from this perspective, less promising (for this argument, see for instance Aharoni, 2014 and the various contributions and discussion in Cuervo and Ramamurti, 2014).

Our case study of three EMNCs is written from the perspective of a contingency approach. We investigate the internationalization and resource accumulation process of the three largest Chinese construction machinery companies (CCMCs): Sany Heavy Industry & Co., Ltd. (Sany), Zoomlion Heavy Industry Science & Technology Development Co., Ltd. (Zoomlion), and Xuzhou Construction Machinery Group Co., Ltd. (XCMG). Important determinants on the strategic behavior and potential scope of action of these firms are their home-country China (the largest construction equipment market of the world, relatively open for foreign players) and the industry (a mature mid-tech manufacturing industry with a global oligopolistic structure and incremental

innovation processes, as well as strong upstream suppliers).

Following the introduction, we present in Section 2 a short review of the principal industrial economics of the global construction machinery industry. In Section 3 we take a longitudinal perspective and briefly describe the companies' histories. The questions we address here is: Who owns the company? What are the initial conditions and ways of entry of the companies into the industry? How have the companies broadly evolved over the 25 year period. We then turn to the internationalization process to answer the question: which main stages in the internationalization process of each company can be discerned? We also compare the three CCMCs with the two world leading AMNCs in the global construction machinery industry. In Section 4 we go more in-depth and investigate the following questions: how did the companies build their resource base and capabilities including access to technologies and complementary resources? (Section 4.1). As the companies' internationalization strategies differ strongly between other emerging markets (south-south strategy) and advanced countries (south-north strategy) we analyze the former (Section 4.2) and then the latter (Section 4.3) separately. South-north strategies in Section 4.3 are best understood from the companies" major strategic intent to "catch-up" with their peers from advanced economies, and we ask how the companies proceed and compete in five critical dimensions (R&D, critical inputs, manufacturing, sales/service, branding). In the concluding Section 5 we discuss several interesting aspects of the cases and further issues to be explored.

2 The Global Construction Machinery Industry

The construction machinery industry (CMI) produces a wide variety of equipment directly used in the construction of urban infrastructure, in transport systems, in mining facilities, as well as in commercial and residential real estate developments (Matsumoto, 2011). The industry can be broadly categorized into four main segments: earth moving machinery such as excavators, material handling machinery such as loader cranes, concrete & road construction equipment such as concrete machinery, and "others" such as heavy duty trucks and parts (Grand View Research, 2014). Core components including engines, transmissions, hydraulic parts etc. are either produced in-house or sourced from outside from well-known and strong suppliers such as, for example, ZF

Friedrichshafen, Cummins or Bosch Rexroth. Figure 1 provides a schematic overview of the industry value system, the core value chain and the segment coverage of the top two foreign as well as the leading six Chinese construction machinery companies.

The CMI is a mature mid-tech industry with a focus on efficiency and service. The quality, performance and technological level of construction machinery equipment are often driven by incremental technological advances in the core components such as engines, hydraulics, transmission and control systems (Zhao, 2014, p. 15). The existence of strong external suppliers with significant pricing power and the ability to fund R&D due to their scale advantages contributes to the industry's only modest operating margins of some 8%, and—given the high capital intensity—limited ROI in the order of 5% in 2013 (authors' calculations from company reports). The high capital and operating expenditure and long machine life leads buyers in the advanced economies to focus on "life time cost" in which the actual purchasing price is only one of several factors (Matsumoto, 2011). Fuel efficiency, maintenance cost, a well-established aftersales service including in-time repairs as well as financing conditions or rental opportunities are important key customer concerns which construction equipment manufacturers have to address in the competition.

The global construction machinery market was estimated at around 93.8 billion USD in 2013 (CCMA, 2014, p. 156). The market is subject to strong cyclical changes in demand and output. Industry sales boom in times of economic growth and fall steeply when growth rates go down or become negative. A typical cycle starts with a period of growth for five to seven years followed by a two-year downturn (KHL Group, 2014). There was a longer period of strong growth of the CMI market until the financial crisis started in late 2008 leading to a strong contraction of 35% in 2009, followed by an even more dramatic recovery in 2010 and 2011 (see Figure 2). In the period leading up to the crisis the combined share of North America, Western Europe and Japan of the global market decreased sharply from 61% in 2006 to 39% in 2009. In the same year, largely due to its economic stimulus program of 586 billion USD into housing, rural infrastructure, transportation etc., China increased its global market share from 11% in 2006 to 32% (for details on the program, see Xinhua, 2008). When the effects of the program ran out, China's market demand contracted strongly in 2012 and 2013 leaving Chinese construction machinery

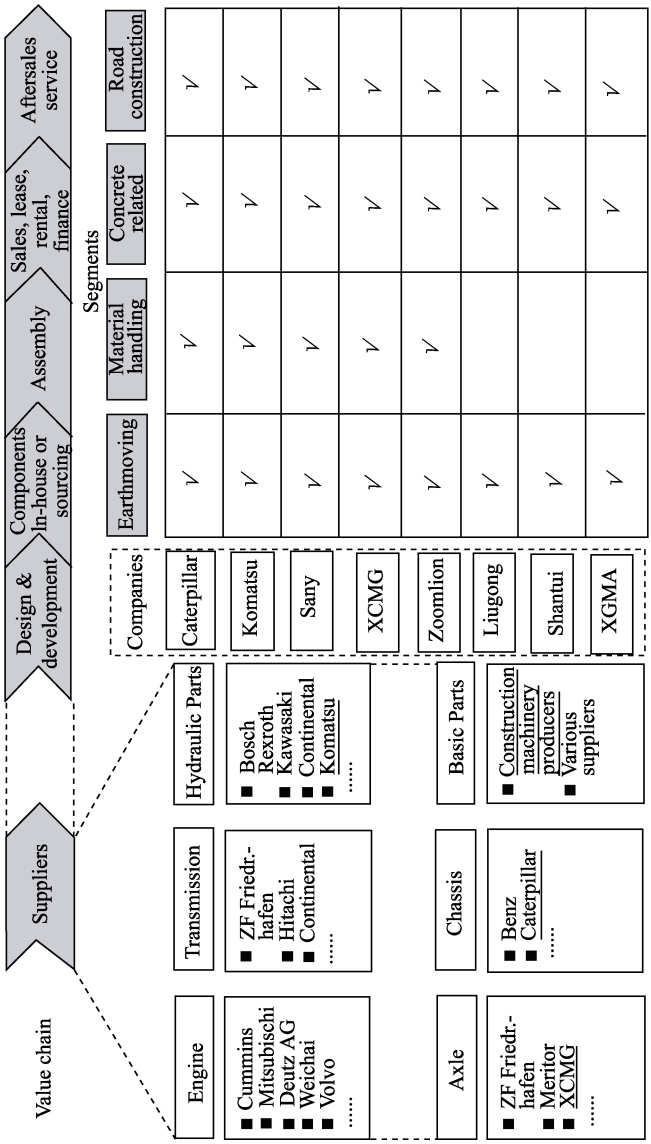

Figure 1 The Value System of the Construction Machinery Industry

Source: Authors' compilation from various sources.

companies in particular with significant overcapacity. At the same time the advanced markets of North America and Japan (home markets of the two top ranking companies Caterpillar and Komatsu respectively) recovered while Europe did not reach pre-crisis levels.

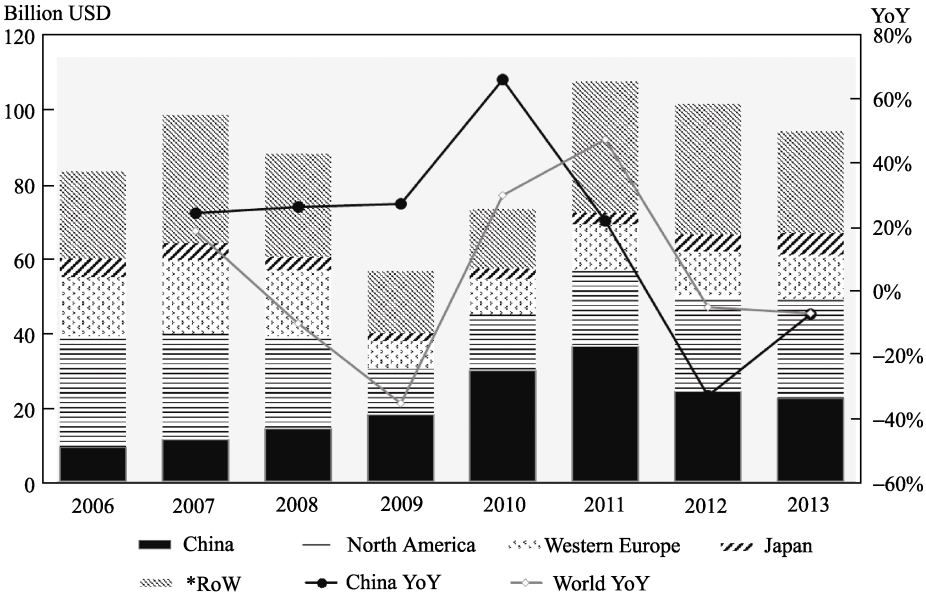

Figure 2 Global Construction Machinery Sales 2006–2013, by Region

*Note.** RoW: Rest of the World.

Source: CCMA, *China Construction Machinery Industry Yearbook 2007*: 119, 2010: 161, 2013: 190, 2014: 156.

The global CMI is dominated by an oligopoly of large players with different home countries. As can be seen in Table 1 the top two players (Caterpillar and Komatsu) share among them some 30% of the global market, the top four players have a market share of roughly 40%, and the 10 largest companies represent some 63% of the global market. Concentration ratios at the level of certain market segments are even higher than these figures for the market as a whole. Based on their leading position in the large Chinese market for construction equipment, Zoomlion and Sany occupy rank seven and eight among the top ten manufacturers while XCMG ranks eleventh.

Table 1 World top 10 Construction Machinery Manufacturers in 2013

World Rank	Company	Country	Construction equipment sales (in million USD)	World market share (%)
1	Caterpillar	United States	31,058	19.0
2	Komatsu	Japan	17,644	10.8
3	Volvo Construction Equipment	Sweden	8,130	5.0
4	Hitachi Construction Equipment	Japan	7,945	4.9
5	Liebherr	Switzerland	7,463	4.6
6	Terex	United States	7,084	4.3
7	Zoomlion	China	6,103	3.7
8	Sany	China	6,078	3.7
9	John Deere	United States	5,866	3.6
10	Doosan Infracore	South Korea	5,258	3.2

Source: KHL Group, 2014, P. 16.

3 Sany, XCMG, and Zoomlion: A Brief History

China is home to a large number of construction machinery companies. In terms of sales Zoomlion was the largest manufacturer in 2013, followed by Sany, and then XCMG. The combined share of the three companies in the Chinese market was 60% in 2013 and—based on their strong position in China—they held a combined world market share of 17% (Figure 2). Based on company websites, press announcements and various market reports, we provide in the following a description of the historic origins and of major events in the internationalization path for each company.

3.1 Sany Heavy Industry Co., Ltd.

Sany is a privately owned company headquartered in Changsha, Hunan Province. Listed on the Shanghai Stock Exchange, the company is majority-owned by its founder and CEO Wengen Liang (Sany, 2014, p. 39). Sany started operation in 1989 as a small welding material factory. In 1994, Sany entered the construction equipment market in order to exploit the opportunities of the rapidly growing Chinese construction market. Through a combination of reverse engineering and imitation complemented by internal R&D Sany achieved a leading market

position in the concrete pump and concrete pump truck markets in China by 2000 (Xu, 2013). Based on this successful experience, Sany started to diversify its product portfolio in particular to the crane and excavator markets, mainly by launching products based on its own designs.

The internationalization path of Sany has so far undergone three phases. After an opportunistic export phase, the company started to invest in foreign production. In order to exploit the growth potential of the largest emerging markets and overcome tariff barriers, it built two assembly plants in India and Brazil; it also invested in plants in the two most important advanced markets (USA and Germany) with the primary aim of augmenting its assets and capabilities by learning to operate in these demanding markets. While continuing to grow organically, the acquisition of Germany's Putzmeister, a world-leading concrete pump manufacturer, marked the start of another phase in which Sany also embarked on external growth and the acquisition of strategic assets through M&A and alliances.

3.2 XCMG Construction Machinery Co., Ltd.

Xuzhou Construction Machinery Group Co., Ltd. is headquartered in Xuzhou, Jiangsu Province and is a state owned company, listed on the Shenzhen Stock Exchange, with 49.26% of shares owned by the People's Government of Xuzhou City. The company was created in 1989 by the government merging Xuzhou Heavy Machinery Factory (founded in 1943, specialized in crane manufacturing), Xuzhou Construction Machinery Factory (founded in 1948, specialized in paving machinery), Xuzhou Loader Factory (founded in 1949, specialized in wheel loaders), and Xuzhou Construction Machinery Research Institute (founded in 1982, specialized in design and technology development of construction machinery) (Jing, 2009). XCMG began to catch up with its foreign rivals through what could be called "inward internationalization" by setting up seven joint ventures with international construction machinery manufacturers and key component suppliers in China. From 2002, XCMG started to export to South Korea and in 2007—as a result of intergovernmental agreements—XCMG set up its first overseas factory in Poland. In 2011, XCMG stepped into a new phase by acquiring two suppliers, specialized in hydraulic technology.

3.3 Zoomlion Heavy Industry Science & Technology Development Co. Ltd.

Zoomlion is headquartered in Changsha, Hunan Province. The company was originally set up as a state-owned company by Changsha Construction Machinery Research Institute in 1992. The company was then listed on the Shenzhen Stock Exchange in 2000 and also Hong Kong Stock Exchange in 2010. In total, the Hunan provincial government retains a minority position of 16.3% (Zoomlion, 2014, p.44). Benefiting from the research capability of the institute, Zoomlion developed its own concrete pump to take advantage of the rapidly growing construction needs in China at a time when over 95% of the concrete pump equipment was foreign branded (Wang and Zhang, 2010).

With the first orders from Egypt in 1997, Zoomlion started its export phase earlier than the other competitors. Zoomlion was also the first Chinese construction machinery company which took a more aggressive approach in mergers and acquisitions (M&A) starting in 2001 when China joined the World Trade Organization. After acquiring Powermole in the UK (D1CM.COM, 2001), with the main purpose of absorbing the company's trenchless technology, it later carried out various M&A of local Chinese construction equipment manufacturers. Another phase in Zoomlion's internationalization is characterized by a broad mix of approaches ranging from greenfield investments in foreign R&D centers and production plants, acquisitions and alliances.

3.4 Status quo in 2013

A comparison of the three leading Chinese construction machinery companies with the world leading manufacturers Caterpillar and Komatsu (see Table 2) reveals that Chinese construction machinery companies' internationalization process is still at a relatively early stage, with overseas sales ratios ranging from 7.2% to 29.9%, far behind Caterpillar (67.0%) and Komatsu (80.0%) (the relatively high ratio of Komatsu has to be seen, however, in the light of the relatively smaller share of Japan (~3%) in the global construction equipment market). The early stage of internationalization is further confirmed by the large differences in the overseas manufacturing footprint (see Table 2). In terms of R&D the three Chinese companies hold the same or higher ratios compared to Caterpillar and Komatsu which reflects their intent to catch up on technology development through internal R&D. However, the much larger revenue base of

Caterpillar and Komatsu (between four and ten times) translates into much higher absolute R&D spending: compared to the highest Chinese spender, Sany, Komatsu invested more than double the amount in 2013, and Caterpillar spent more than six fold.

Table 2 Comparison of Status Quo in 2013

Indicators	Sany	XCMG	Zoomlion	Caterpillar	Komatsu
Revenue, bn USD	5.9	4.2	6.2	55.7	19.6
Operating margin, %	7.4	6.0	11.8	7.4	11.2
Overseas sales, bn USD	1.8	0.7	0.5	37.3	15.7
% Overseas sales/total revenue	29.9	17.5	7.2	67.0	80.0
R&D expense, bn USD	0.312	0.163	0.294	2.046	0.647
% R&D expense/total revenue	5.2	3.7	4.7	3.7	3.3
# of serving countries	125	159	>80	180	151
# Overseas manufacturing bases	4	3	3	58	34
World market position (Yellow Table 2014)	No.8	No.11	No.7	No.1	No.2
Listing	SSE	SZSE	SZSE & HKEx	NYSE	TSE
Ownership	Private	State	Hybrid	Public	Public
Actual controller	Wengen Liang	People's Gov't of Xuzhou City	Two stronger interests: Gvt./priv.	-	-

Source: Company annual reports and industry reports.

4 National Championship, Internationalization and Technological Catch-up

In the following section we analyze three dimensions of CCMC development and internationalization strategy: origins and fundamental capability building to become national champions in the domestic market, "south-south internationalization" to capture selected other emerging markets, and south-north strategies to catch up with their more advanced peers from the US, Europe and Japan and build positions in these markets.

4.1 Origins and the Path to National Championship

The emergence of the three leading CCMCs and their overtaking of the dominant

position from foreign branded producers in their home country, China, was essentially based on their capability to provide products which were "good-enough" so that Chinese customers would consider them for their operations. Their products offered an attractive value proposition (price-performance wise) for a rapidly growing *mid-tech segment* compared to the foreign competitors in China which focused on the *high end* of the market.

As the original Chinese companies were technologically very much behind the AMNCs and some companies were even newcomers to the construction equipment markets, the most widely used way to acquire "modern products" was through the imitation or reproduction of existing designs of their advanced western counterparts. A successful imitation, reverse engineering, copying or in-licensing requires a certain minimum knowledge base in order to recognize the value of new, external information, and assimilate and apply the information for commercial ends. This necessary condition has been defined as "*absorptive capacity*" by Cohen and Levinthal (1990, p. 128). The ways in which the CCMCs acquired and used this fundamental capability show differences as well as commonalities.

4.1.1 Strategic Variants in Early Resource & Capability Building

Sany established its initial absorptive capacity primarily through heavy investment into its own R&D capacity (probably helped by spillovers from AMNC activities in the Chinese market). In 1998, three years after releasing its first concrete pump, Sany developed a concrete pump with its own 37 meter long boom, ending China's reliance on the imported boom, and further expanded into the excavator market and crane market with their own internal designs. In contrast, *XCMG* could rely on earlier investments in a state-owned R&D institute which was merged into the newly created company in 1989. Based on the in-licensed older production technology of all-terrain cranes, truck cranes and chassis from Japanese and German companies, the institute helped in updating technology already in the 1980s (Jing, 2009, p. 58; XCMG, 2012). This later helped to absorb knowledge gained through linkages with foreign technology via joint venture (JV) projects, and through technology in-licensing. In 2002, XCMG developed China's first 25-ton all-terrain crane, resolving the bottleneck in production technology such as hydro-pneumatic suspension, and entered into the

high-end (premium) crane market (Xue and Du, 2013). Finally, *Zoomlion* relied in its early capability and capacity building phase on its original base as a state research institute and on various acquisitions of leading niche market players. Beginning with the acquisition of the UK's Powermole in 2001, Zoomlion began an aggressive expansion path in which the company acquired more and more experience in post-merger integration and improved its capacity to absorb resources and capabilities from the acquired companies. In comparing the three companies' earlier history it can be concluded that there was no one path to building fundamental capabilities, but different strategic variants (emphasis on internal capability accumulation, main reliance on inward-linkages, and more reliance on outward linkages) which were shaped by the concrete historic antecedents of each of them. All three companies managed in different ways to become national champions in the Chinese construction equipment market.

4.1.2 Domestic Production Clusters as Eco-systems

With China becoming the world's largest construction machinery production country and one of the main markets, six production clusters have emerged across China. They are Xuzhou, Changsha, Changzhou, Xiamen, Liuzhou and Jining. For example, there are hundreds of smaller construction machinery companies in Xuzhou city. As well as XCMG, the largest company, sole proprietorship companies and JVs from Caterpillar, Liebherr, Thyssen Krupp and other leading foreign construction machinery and spare parts companies all locate in Xuzhou (Wang, 2007, p. 106). The construction machinery and spare parts cluster in Xuzhou provides an important "eco-system" for XCMG by facilitating easy access to qualified staff, service companies, parts providers and other relevant resources. In addition to linkages through JV projects, XCMG has also benefited from "knowledge spill-overs" from other foreign players in this context. For Sany and Zoomlion the Changsha cluster which produces more than 30% of China's construction machinery output (KPMG, 2013) offers a rich eco-system of suppliers, engineering staff and trained workers, and complementary resources such as logistics and finance support which facilitated their growth and enhanced their capability to cope with the fast increases of demand in the domestic market.

4.1.3 Home-Country Based Production Economies and Product-Sequencing

The enormous growth in market demand linked with China's real estate and infrastructure construction boom and the resulting huge market size helped these companies to rapidly build and expand productive capacities. They were able to achieve significant economies of scale in components manufacturing and assembly and speed up the learning curve for new products just from serving the Chinese market. Production costs were further kept low based on low labor and land costs and access to cheap capital all contributing to an advantageous cost position. The large demand allowed also for fast "*product-sequencing*", i.e. implementing quality improvements in successive product generations (on the product sequencing model, see Helfat and Raubitschek, 2000).

4.1.4 Access to Government-Sponsored Construction Projects Abroad

All three companies maintain strong business relationships with their customers, especially with important Chinese construction companies. Inter-governmental initiatives between China and other countries, particularly with emerging and developing countries in Southeast Asia, Africa and South America often lead to major construction projects financed by Chinese soft loans. As large Chinese construction companies (such as China State Construction Engineering Corporation or China Communications Construction Co.) are the contractors for these projects, the CCMCs can follow their customers abroad.

4.2 South-South Strategy: Internationalization to Exploit Existing Resources

The geographic trajectories of internationalization strategies of CCMCs can be roughly broken down into south-south (entry into other emerging markets) and south-north (entry into advanced economy markets) strategies. As illustrated in Figure 3 the *south-south internationalization strategy* of the three CCMCs followed the "classic" market-seeking logic in phases of increasing commitment from export to foreign direct investment (on the process perspective, see also Meyer, 2015). After a period of achieving a strong position in their national markets they first took advantage of random export opportunities: XCMG's first export order came from South Korea in 1992, the first order for Zoomlion came

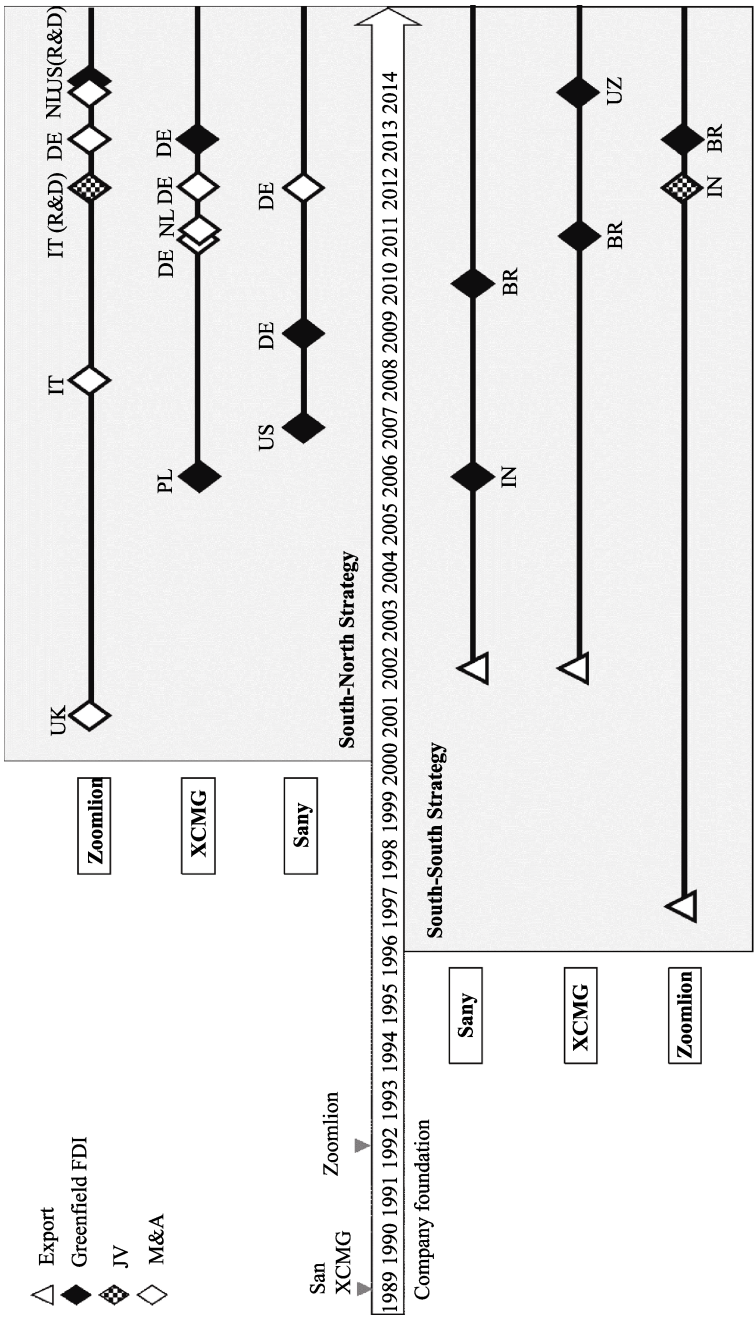

Figure 3 Internationalization in Terms of Geographic Coverage and Value Chain Strategies

Source: Authors' illustration (for a more extensive overview see appendices).

from Egypt in 1997 and the first order from Morocco for Sany in 2002. The three CCMCs then set up overseas offices, established their dealer network or even set up sales subsidiaries in a number of host countries, mainly in neighboring countries or emerging markets in Southeast Asia, Latin America and Africa. As a vehicle to better coordinate and control the international sales process they all established their own international trade company: XCMG set up its own international trade company in 1997, Zoomlion in 2002, and Sany in 2005.

After the initial learning from this export-based internationalization process, the companies started to set up manufacturing bases, but so far only in the two biggest emerging markets, India and Brazil (and one medium-sized market: Uzbekistan). For instance, Sany launched its first overseas direct investment with 60 million USD for building a manufacturing facility and local R&D center in Pune, India in 2006. Zoomlion set up a JV with ElectroMech, a local Indian crane manufacturer, in 2012 in order to exploit its competitive strength in tower cranes based on ElectroMech's distribution network (Zoomlion, 2014). Three years after the establishment of Sany South America Ltd., its sales subsidiary in San Paulo, Brazil in 2007, Sany invested 200 million USD in a factory in the same city (SANY Group, 2010). The construction equipment market of Brazil was expected to grow rapidly with a CAGR of 15% from 2010 to 2014 (Roland Berger, 2011). XCMG also set up its own local manufacturing base to gain a share of the market in 2011. Five years after Zoomlion presented itself in the South America market with its export products in 2008, Zoomlion made a strategic movement in Brazil. Its first wholly owned overseas manufacturing base, Zoomlion CIFA Brazil, was founded for the production and sales of concrete machinery not only for the Brazilian market, but for the whole American region. It is obvious that the companies follow very similar, if not identical strategies in target market selection and localization of assembly for the selected markets. While this behavior may follow a rational strategic logic of focusing on the most rewarding opportunities it may also be influenced by the intense competition among CCMCs themselves and their tendency to (rapidly) mimic competitors' moves to maintain competitive parity (on business imitation strategies, see also Lieberman and Asaba, 2006).

4.3 South-North Strategy: Internationalization as a Springboard for Catching up

While CCMCs in their south-south strategy followed a classic market-seeking

approach exploiting firm-specific advantages firmly rooted in home-country conditions and going in this process from export to selected manufacturing investments, the same resources and capabilities did not provide a sufficient base to enter the advanced (high end) markets of North America, Europe or Japan. This is illustrated in figure 3 which reflects the fact that there were no significant exports by CCMCs to advanced markets as a precursor to foreign direct investments. But even in their domestic market the three CCMCs would in the longer run come under pressure for two reasons: local customers would gradually expect better quality and services even in the mid-market for "good-enough" products, and foreign players like Caterpillar, Liebherr or Komatsu would start entering the mid-markets through various approaches such as acquisition of local companies or stripped down versions of some of their premium products. The acquisition of better products and the exposure to advanced markets therefore became a strategic necessity. In this competence-constraint view, CCMCs pursue international expansion in their south-north strategy as a "springboard" to compensate for their competitive shortcomings compared to AMNCs (Luo and Tung 2007).

With Zoomlion having already acquired UK's Powermole in 2001 as an early move, the CCMCs' foreign direct investment into advanced markets started to intensify around 2006/7. The global financial crisis starting in 2008 then created a special opportunity as construction machinery companies in Europe and the U.S. suffered serious business losses as a result of the sudden strong fall in global demand. At the same time, due to China's economic stimulus package, Chinese construction machinery companies grew even faster than before. Capitalizing on this window of opportunity, CCMCs started acquiring smaller and mid-sized European companies. With their advanced products and strong brands, their development and design capabilities and distribution networks, the acquired firms would provide an entry point into advanced market economies and provide a basis for upgrading the CCMCs established operations (see the two case examples below).

Case 1: Zoomlion's acquisition of CIFA, Italy

In 2008, Zoomlion acquired CIFA from Italy, a world leading company in the concrete machinery market. The acquisition of CIFA strengthened Zoomlion's

leadership position in the concrete machinery market in China by leveraging the advanced technology of CIFA. Moreover, it gave Zoomlion fast access to European markets, so that it could extend its market leadership in concrete machinery to Europe, and to emerging markets such as Russia and India. While leveraging CIFA's global distribution network and global brand, Zoomlion pursued a dual brand strategy: the Zoomlion brand would represent the more cost-effective products being sold across the entire CIFA network and would target price-sensitive customer groups (the "mid-markets" for "good-enough" products). The acquired CIFA brand was positioned as a premium brand expanding beyond concrete machinery to compete with well-established international brands. Manufacturing synergies were achieved through "a factory-within-a-factory" global production scheme. In this scheme, the original CIFA plant was transformed into a final assembly plant, taking advantage of highly skilled workers for more value-added activities. Meanwhile, CIFA established its own factory in Zoomlion's manufacturing base in Changsha, leveraging the cost advantage of production in China. Besides Zoomlion's general strategic motivation, the acquisition was also driven by concerns of future overcapacity and severe competition in China.
Source: Lerner and Jin, 2012.

Case 2: Sany's acquisition of Putzmeister, Germany

In early 2012, Sany bought Putzmeister, the global world market leader in high tech concrete pumps for an enterprise value of just over 500 million EUR. Putzmeister which had around 3000 employees at the time of the take-over had been hard hit by the financial crisis: revenues had fallen from a record 1 billion EUR in 2007 to about half during 2008 and 2009 and had not fully recovered thereafter. The company's founder, aged 79, had trouble in finding a successor and therefore sought an investor. With the acquisition, Sany became the owner of one of Germany's Mittelstand Champions, a premium brand in its global niche, advanced technologies, and a global distribution network. After the acquisition, Putzmeister became a business unit of the Sany Group kept under German management with a high degree of operational autonomy. The Putzmeister unit was also given the role of managing the international sales of the Sany Group while Putzmeister products were supported by Sany's Chinese distribution system. Globally and in China the Putzmeister brand is positioned as a separate

brand along with the Sany brand. In July 2012, Sany made its second purchase in Germany when it acquired truck mixer manufacturer Intermix for 8.1 million EUR through Putzmeister. While Putzmeister's sales recovered somewhat to 691.4 million EUR in 2014, the 2 billion EUR for 2016 envisaged by Sany at the time of the takeover are far from being achievable.
Source: Various Press Releases and Newspaper Reports.

In their moves to catch up and build positions in advanced markets through greenfield investments, M&A or JVs, the CCMCs focus on only a few countries: the US (2 major investments), and on five European countries with Germany being the core (with 6 investments). These countries are obvious candidates as they have strong construction machinery industries, are large markets in themselves or provide a platform for accessing other country markets. Moreover, motives to maintain competitive parity or even government recommendations which singled out certain countries for Chinese investment in the context of China's "Go-out policy" may have played a role in their host country selection.

A closer look at the resource acquisition and catch-up intent of the *south-north internationalization strategies* of CCMCs leads us to five strategic dimensions which we analyze in turn: R&D, critical inputs, manufacturing, sales & service, and branding.

4.3.1 Building R&D Capabilities in Host Countries

CCMCs set up R&D centers in Europe or in the U.S. with an intention to attract local high-skill talent, observe the latest technology trends, or to directly acquire technology know-how (on the function of R&D centers as "listening posts", see Di Minin and Zhang, 2010). All three companies have R&D centers in Europe. Sany and Zoomlion also run R&D centers in North America, while XCMG plans to set up an R&D center in North America as well. Besides these greenfield investments, the three companies also acquired R&D capacities and capabilities as part of their acquisitions.

4.3.2 Securing Critical Components & Supplier Management Capability

Due to the lack of advanced technologies with respect to certain critical components and also as a kind of co-branding for the CCMCs' still weak brands,

they often use key components from recognized foreign suppliers. The relationship with key components suppliers plays therefore an important role in product development and production. The international expansion of CCMCs can also be seen as a way to get closer to their critical suppliers and enhance bilateral cooperation. To achieve this, Sany invested in a manufacturing base in Germany, Zoomlion acquired CIFA for its favorable purchasing contracts and its local presence in Europe, and XCMG established a European procurement center to focus on building partnerships with key suppliers. Of course, if possible, CCMCs would also tackle the bottleneck in critical components more directly through "vertical" acquisition such as, for instance, XCMG with the acquisition of Fluitronics GmbH.

4.3.3 Upgrading Home-Based Manufacturing and Operational Capability

As manufacturing techniques and processes are important in terms of quality and cost and CCMCs are still behind their peers from advanced countries, all three have numerous projects running with a focus on operational management improvement and business process optimization. Their horizontal acquisitions of competitors with advanced manufacturing processes provide the basis for technology transfer programs from their new subsidiaries to their core operations. Furthermore, CCMCs also recruit manufacturing experts from their foreign major competitors to join their local manufacturing base and bring in the latest manufacturing practices.

4.3.4 Various Ways to Establish Sales and Service Capability

Whether firms can offer comprehensive and in-time maintenance service with good quality is one of the key purchase criteria for customers in the construction machinery market. If the companies do not have their own service organizations in various countries, their service quality depends on a third party distribution network of qualified agencies which is one of the determining factors of their overseas sales performance. One main approach to obtain new sales and service capabilities are again their horizontal acquisitions. Moreover, establishing joint ventures with local distributors or local producers was another way used to get fast access to existing distribution networks. For instance, Sany used the

partnership with Palfinger to leverage its distribution network in Europe and CIS markets. Zoomlion set up joint ventures with an Indian producer and a Japanese distributor which allows it to appropriate the established distribution network.

4.3.5 Overcoming the "Liability of Origin"

In the internationalization process, CCMCs have faced the challenge of changing the negative quality image of products "Made in China" (for the discussion on the "liability of country of origin see Ramachandran and Pant, 2010; Newburry, 2012). Using "quality components" from top suppliers as mentioned above has been one approach to mitigate this situation. With respect to their acquired firms, the CCMCs usually opted for a dual brand strategy thereby keeping the acquired premium brands separate from the product portfolio of their core company; in such a strategy, positive effects on the acquirers' brand image would be limited. A particular approach to improve its core company brand was chosen by Sany. By setting up its own manufacturing bases in Germany and the U.S. for specific product segments, the company pursued the explicit aim to create "Sany - Made in Germany" or "Sany - Made in the U.S." and in this way helped lift the brand image for the whole company (Caixin.com, 2012).

5 Concluding Discussion

In this concluding section, we discuss and review several issues emerging from this case study which need further research: the accelerated growth and internationalization of CCMCs and the role of time in resource accumulation; different internal vs. external paths in building firm-specific advantages; the industry-specific role of "mid-markets" in the internationalization process; the need to take a longer-term learning perspective; and the influence of ownership.

5.1 Accelerated Resource Accumulation and Growth

In a direct comparison of the history timelines of the three CCMCs with the three world leading AMNCs listed in Table 1, large "age differences" are obvious: the AMNCs look back at a history of some 90 (Caterpillar), 95 (Komatsu) or 60 (Volvo) years since the foundation of today's legal entities compared with 26

years for Sany and XCMG and 23 for Zoomlion (all companies had—often multiple—smaller predecessor organizations). However, consideration of these organizations would increase the age difference as those of the AMNCs were significantly older than the EMNCs due to earlier industrial development in their home countries). The AMNCs already started building their substantial international footprint in the 1950s and 1960s whereas the EMNCs started their internationalization process with exports just 13-18 years ago—and their first major foreign direct investments have been made mainly in the last 10 years.

The three CCMCs have evolved into very large companies in a very short time ranking 7th, 8th and 11th globally in terms of revenue in 2013 (the global market rank is however still mainly based on the CCMCs' position in the large Chinese construction equipment market). They have also started to build substantial positions in selected foreign markets. Compared to the much longer, more gradualist growth of the AMNCs, their resource accumulation process can be characterized as "*accelerated*". One interesting question for further study would be whether the accelerated resource accumulation process involves "*diseconomies of time compression*" (Dierickx and Cool, 1989; Cool et al., 2014) which are reflected in the relative weak competitiveness of the products and services, capabilities and organizational practices of the three CCMCs so that the real catch-up with their mature rivals will eventually still be a long-term marathon rather than a short distance race.

5.2 Internal vs. External Paths in Building Initial Firm-Specific Advantages

Our study demonstrates that there is *no one path* even for companies in the same industry and the same country in how they acquire early firm-specific advantages (FSAs) which provide one of the conditions of their growth into local champions. While Sany and Zoomlion relied from the beginning on investing in their *own internal R&D capability,* XCMG acquired its core design and manufacturing capabilities mainly through access to *externally* sourced *technology transfer* via seven joint ventures with different partners from advanced economies. Zoomlion displayed an especially strong intent to access foreign technology through cross-border M&A already in 2001, i.e. at an early stage. XCMG's FSAs were enhanced through particularly strong relationships with a customer network of state-owned construction companies, and Zoomlion developed a particularly

strong network-based M&A capability which facilitated the company's aggressive domestic M&A strategy in the early phase. The different paths in building initial FSAs are influenced by differences in strategy which might be related to differences in the ownership (see below).

5.3 Mid-market Competition at Home as a Determinant of South-North Internationalization

An important country- and industry-specific feature is the emergence of a large "mid-market segment" between the premium market served by the foreign players and a rapidly shrinking low-end market. The early success in the fastest growing mid-market segment for "good-enough" products was one of the core drivers for the transformation of the three CCMCs into national champions. Starting around mid-2000, a strong urgency for upgrading technological capabilities and product quality arose from the intensifying competition by AMNCs in the construction machinery sector as the latter started to enter the mid-market segment as well, e.g. through acquisition of local Chinese companies (Brandt and Thun, 2010). The CCMCs' south-north internationalization and the urgency to catch-up was therefore increasingly driven by the need to defend a position in the home market, and to react to the AMNCs' attack in the mid-market segment. Through acquiring foreign companies and technologies they could upgrade their mid-market products and in selected segments now also enter the premium segment, i.e. the home turf of AMNCs, in their home market (often through dual brand strategies). In this sense the south-north internationalization strategy served also to defend national champion positions in the home market.

The high importance of the mid-market segment is typical for machinery/equipment industry markets. In other industries the mid-market segments quickly eroded—if they appeared at all—; examples are, for instance, pharmaceuticals, smartphones or passenger cars where customer demand converges more quickly toward global standards (on this issue, see with respect to the motorcycle markets the overview in Rugman and Nguyen, 2015, pp. 72–75).

5.4 Need of a Dynamic Learning Perspective?

In their south-north internationalization path, the CCMCs acquire "assets" such as brands, distribution networks, technologies, advanced production plants in the case of M&A or try to recruit local talent for their greenfield R&D investments. These moves are usually well publicized and this is why researchers including ourselves go for these more visible moves first. As Williamson and others have pointed out, the existing models of entry mode choice are not that helpful when one tries to understand EMNCs from a *dynamic learning perspective* which is necessary if one tries to understand the "catch-up process" with AMNCs (Williamson, 2014). From this perspective, internationalization is a process of "learning from the world," and enhancing the companies' deeper organizational, innovative and relational practices as well as experience base. As we have only identified so far the formal *events of asset acquisition,* further research is needed to understand the mobility characteristics of the acquired resources, capabilities, and knowledge and the way in which they have (or have not) been integrated in the Chinese parent organization so that the overall organization is lifted to a higher capability level. This requires inter alia studies of the *post-merger integration strategies* of CCMCs in advanced economies which have been characterized often as "light touch" or arm's length management of the acquired companies (Liu and Woywode, 2013). Studies about the post-merger integration of CCMCs require a longitudinal perspective (over a time span of many years or even a decade) and access to internal information which the companies—in view of the sensitive (intercultural) relationships between the acquired companies and the parent—are reluctant to provide and therefore such studies face formidable implementation hurdles.

5.5 Influence of Ownership Form?

The three CCMCs represent three different ownership forms: Sany is majority-owned by Wengan Liang, one of China's richest men. We categorize Sany therefore as a privately owned company. XCMG is majority-owned by the provincial government and is clearly a state-owned enterprise (SOE). Finally, Zoomlion was turned into a publicly listed company (on the Shenzhen and Hong Kong stock exchanges) in which the Hunan province government holds a

significant minority position. We therefore classify the company as a *hybrid* between private and state ownership.

Sany, as a privately owned company, prefers a corporate management approach with a maximum degree of control and minimum uncontrollable risks, typically internal development and greenfield investment. One reason for this could be a less easy access to state subsidized credit compared to the two other players. The penetration into the crane and excavator markets was largely based on internal R&D. In order to gain access to high skill talents in the European market or the U.S. market, Sany preferred greenfield investment instead of acquisitions. Zoomlion, as a hybrid company, has been more aggressive and willing to take risks. Zoomlion's growth path mainly consists of M&A in China as well as abroad, either to expand production capacity, to penetrate new product markets, or to acquire advanced technologies, brands and global distribution networks. XCMG, as an SOE, has benefited from state support, reflected by the extensive cooperation through JVs with foreign incumbents in the construction machinery industry or in upstream industries, and at the same time acted in some ways more out of state interest than out of business interests. For instance, XCMG established its first overseas factory in Poland based on government initiatives for relationship building between the two sister cities, Xuzhou City and Łowicz City. The setup of a JV in Uzbekistan for excavator production, targeting the raw material and natural resources of Uzbekistan, also showed hints of state influence. The influence of ownership on strategic behavior of EMNCs is a field which recently has received more attention and needs further study (see Luo et al., 2010; Wang et al., 2012).

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Appendix

A: Key Milestones of Sany's Internationalization Process by Region

Time	Event	Entry mode	Scale	Where	Purpose
South Asia & Southeast Asia					
2002	Established Sany India	Office (S.)	100%	IND	Initiate internationalization in India.
2006	Constructed first overseas manufacture base in Pune, India	WOS (P.)	100%	IND	Production and sales of concrete machinery for India, Bangladesh, Sri Lanka. 2009 production starts.
2011	Set up industrial park in Indonesia	WOS (P.)	100%	IDN	Tap growing Indonesia market.
Africa					
2006	Registered Sany South Africa Ltd.	WOS (S.)	100%	ZAF	Sales and service for Sany's products in Africa market.
South America					
2007	Established Sany South America Ltd.	WOS (S.)	100%	BRA	Initiate internationalization in South America.
2010	Set up industrial park in Brazil	WOS (P.)	100%	BRA	CKD plant for assembly of excavator and crane, responsible for South America market. 2011 production starts.
North America					
2007	Established Sany America Inc.	WOS (P.)	100%	USA	CKD plant for assembly of crane, excavator and concrete pumps, responsible for U.S., Canada and Mexico markets. 2012 local production begins.
West Europe					
2009	Set up factory in Germany	WOS (P.)	€100 m.	DEU	Leverages created resources to enter high end market; close to key component suppliers; change brand perception with "Made in Germany". 2011 operations starts.
2012	Acquired Putzmeister	M&A (90%)	$ 423 m.	DEU	Acquire technology knowhow and global distribution channel for concrete machinery market.
2012	1st JV with Palfinger PalfingerSany	JV (50%)	50%	AUT	Distribute Sany wheeled mobile cranes in Europe, America and CIS.

Source: Compiled from various sources including company websites and market reports.
Notes. WOS: Wholly-owned subsidiary, M.: Management, P.: Production functional area, Pu.: Purchase functional area, S.: Sales functional area, M&A: Mergers and acquisition, JV: Joint venture.

B: Key Milestones of XCMG's Inward Internationalization by Region

Time	Event	Entry mode	Scale	Where	Purpose
1993	JV with PAT GmbH (acquired by International Road Dynamics Inc. in 2003)	JV (50%)	/	Xuzhou CHN	Production and sales of weigh-in-motion systems, traffic data collection systems, portable weigh scales and other related ITS products and services.
1995	JV with Caterpillar Inc. (US)	JV (40%)	$32.8 m.	Xuzhou CHN	Production and sales of Excavator Cooperation ends in 2008. XCMG starts to produce its own excavator afterwards.
1995	JV with Liebherr-Cmctec GmbH (Germany)	JV (40%)	/	Xuzhou CHN	Production and sales of concrete machinery. Cooperation ends in 2005.
1996	JV with Meritor, Inc. (US)	JV (40%)	/	Xuzhou CHN	Production and sales of Offway Axle (key component).
2002	JV with Thyssen Krupp AG (Germany)	JV (40%)	/	Xuzhou CHN	Production and sales of slewing bearing and industrial steel ball (key component).
2006	JV with Hirschmann Automation and Control GmbH (Germany)	Equal share 50%	€1.2 m.	Xuzhou CHN	Development and production of electronic control systems for construction machinery (key component).
2009	JV with Dossan Group (South Korea)	Equal share 50%	￥340 m.	Xuzhou CHN	Production and sales of diesel engines for construction machinery, heavy duty trucks and power generators (key component).

Source: Compiled from XCMG homepage and market reports.

C: Key Milestones of XCMG's Internationalization Process by Region

Time	Event	Entry mode	Scale	Where	Purpose
South Asia & Southeast Asia					
2002	Entered India market	EXP	/	IND	Initiate internationalization in India.
2012	Established XCMG Machinery India Private Limited	WOS (S.)	/	IND	Sales and after sales service.
South America					
2004	Entered South America market	EXP	/	BRA	Initiate internationalization in South America.
2011	Signed investment agreement with Brazil government	WOS (P.)	$200 m.	BRA	Start local procurement, production, sales and service in 2014, covering crane, excavator, road loader etc. Annual production capacity 7000 units.

(*To be continued*)

(*Continued*)

Time	Event	Entry mode	Scale	Where	Purpose
Central Asia					
2014	JV with Uzbekistan Temir Yollari (SOE)	JV	/	UZB	Set up plant for hydraulic excavator and construction materials, assist exploitation of raw material and natural resources.
West Europe					
2007	XCMG Europe Construction and Road Machines Factory	WOS (P.)	/	POL	Producing wheel loaders, graders and rollers for Europe and CIS markets 2009 start operations.
2011	Acquire AMCA Hydraulic Fluid Power BV	M&A (100%)	/	NLD	Acquire supplier of key component – high-end hydraulic valve.
2011	Acquire Fluitronics GmbH	M&A (70%)	/	DEU	Acquire supplier of hydraulic system.
2012	Acquired Schwing GmbH (Germany)	M&A (52%)	/	DEU	Acquire technology know-how, brand and global distribution network, secure market position in concrete machinery industry.
2013	Established XCMG Europe GmbH	WOS (M.)		DEU	XCMG's regional HQ, serves as strategic investment and business & shareholding platform in Europe.
2013	Established European Procurement Center	WOS (Pu.)	€ 36 m.	DEU	XCMG's procurement center in EU, in order to cooperate better with European suppliers and improve SCM process.
2013	Established XCMG European Research Center GmbH	WOS (R.)		DEU	Focus on production technology of hydraulic valve and system, in cooperation with FT and AMCA Technology resources and outstanding R&D and manufacturing.

Source: Compiled from various sources including company websites and market reports.

D: Key Milestones of Zoomlion's Internationalization Process by Region

Time	Event	Entry mode	Scale	Where	Purpose
South Asia & Southeast Asia					
2002	Set up Zoomlion International Trading Co., Ltd.	WOS (S.)	/	HK, CHN	Restructure organization for better focus on oversea market.
2003	Entered India market	AGE	/	IND	Initiate internationalization in India.
2012	JV with Electromech	JV (70%)	/	IND	Bypass trade barrier and leverage established distribution network to quickly tap growing market in India.

(*To be continued*)

(*Continued*)

Time	Event	Entry mode	Scale	Where	Purpose
2014	Set up sales subsidiary in Indonesia	WOS (S.)	/	IDN	Increase market penetration by building up local distribution network.
Eastern Europe & Central Asia					
2006	Entered Russia market	AGE	/	RUS	Initiate internationalization in Russia.
2008	Set up office in Kazakhstan	Office (S.)	/	KAZ	Investigate local investment environment and economic development.
2009	Set up sales subsidiary	WOS (S.)	/	RUS	Increase market penetration by building up local distribution network.
2014	Set up office in Mongolia	Office (S.)	/	MNG	Investigate local investment environment and economic development.
2014	Set up sales subsidiary in Kazakhstan	WOS (S.)	/	KAZ	Increase market penetration by building up local distribution network.
Africa					
2007	First export in Algeria	EXP	/	DZA	Export benefits from the increasing construction project undertaken by Chinese Construction SOE in Africa.
2010	Set up Zoomlion South Africa	WOS (S.)	/	ZAF	Increase market penetration by building up local distribution network.
Middle East					
2007	Set up Zoomlion Gulf FZE	WOS (S.)	/	UAE	Increase market penetration by building up local distribution network.
South America					
2008	First export in Brazil	EXP	/	BRA	Export concrete trailer pump into Brazil.
2013	Established Zoomlion CIFA Brazil	WOS (P.)		BRA	Start local production and sales of concrete machinery.
Western Europe					
2001	Acquired Powermole	M&A (100%)	$1.96 m	GBR	Acquire technology knowhow in construction machinery production.
2005	First export to Europe	EXP	/	GBR	Concrete pump truck passes European CE standard and delivered to British customer.

(*To be continued*)

(*Continued*)

Time	Event	Entry mode	Scale	Where	Purpose
2008	Acquired CIFA	M&A (60%)	$215 m.	ITA	Acquire technology knowhow, brand and global distribution channel for concrete machinery market. In 2012, Zoomlion offered 236 million USD to buy up the rest.
2012	Inlicensing JOST	Inlicensing	/	DEU	Absorb advance technology in tower crane market.
2012	JV with Riba	JV (49%)	€2.45 m.	ITA	Technology cooperation of research into carbon fiber application technology for concrete machinery.
2013	Acquired M-Tec	M&A (100%)	/	DEU	Acquire technology knowhow in dry mixed mortar equipment market (concrete machinery).
2014	Acquired Raxtar	M&A (35%)	/	NLD	Acquire technology knowhow in construction hoisting technology.
Oceania					
2006	Set up office	Office (S.)	/	AUS	Investigate local investment environment and economic development.
2009	Set up Zoomlion Australia-New Zealand Pty Ltd	WOS (S.)	/	AUS	Offer sales and service of Zoomlion's product in Australia, Papua New Guinea and pacific nations.
North America					
2013	Established Zoomlion Heavy Industry NA, Inc.	WOS (R.)	/	USA	R&D center focus on engineering and developing of agricultural equipment.
Japan					
2011	First product export to Japan	EXP	/	JPN	Export to Japan shows that Zoomlion's concrete machinery has competitive strength in the high end market.
2014	JV with Japanese distributor	JV (35%)	/	JPN	Tap the local construction machinery market and fast access to market through established distribution network.

Source: Compiled from various sources, including Zoomlion homepage, Zoomlion news center and market reports.