

Execution of the Dynamic Capabilities Concept in China

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Abstract—This paper explores the contributions of technology development efforts of Chinese firms in the air-conditioning industry. We conducted a qualitative study of a Chinese multinational enterprise (MNE) and explored how the firm was able to develop, both in terms of production and technology over time. While considering its own distinct characteristics, the firm involved not only specific technologies and techniques but also broader acquisition and enhancement of various capabilities. Our study contributes to the nascent literature of Chinese firms' internationalization by conceiving the upgrading capabilities, transition into higher value added parts of the value chain, and fierce competition under a fast changing institutional environment in China.

Index Terms— Dynamic capabilities, internationalization of Chinese firms, value chain

I. INTRODUCTION

This paper proposes that while the dynamic capabilities theory has been used in studying MNEs in international business theory [1], especially when much has been done in the western context, how Chinese firms adopt different process to adapt, integrate and upgrade their capabilities throughout internationalization is still not clear. This study suggests that the use of the dynamic capability perspective helps us to solve the mystery of the phenomenal rise of Chinese MNEs [2-3] in the world supply chain industry.

II THEORETICAL DEVELOPMENT

China represents an important model of development in industrial upgrading which is often domestic driven, intense competition between both domestic and foreign firms simulate the upgrading efforts of domestic firms [4]. Participation in global value chain is one of the important hypotheses for the creation of potential for industrial upgrading in the value chain literature [5]. Chinese firms have entered into a new era of global expansion after the implementation of domestic liberalization in 2001 [6-7]. Their motivations, resources profile and developmental paths demonstrate unique patterns similar to those of emerging multinational enterprises (EMNEs) [8-10] with a strong emphasis on overcoming their internal resources deficiencies [11-13] and escaping unfavorable institutional environment

[14-15]. There is a consensus that Chinese government's supporting policies [16] represents a major driving force in shaping the developmental paths of Chinese MNEs' international activities in terms of resources acquisition [17], partner selection [18] and entry modes [19]. The highly regulated domestic environment, coupled with the institutional pressures to conform [20] created the impact of 'coercive isomorphism' [21] on the firms' strategies and structure [22-23] in which technology upgrade was prevalent among the Chinese MNEs

After an in-depth research summary of the internationalization of Chinese firms, it still remains unclear how Chinese MNEs upgrade their capabilities. In addressing the special pattern of the internationalization of Chinese firms described above, one important theories that can explain the present phenomenon are reviewed here, namely, dynamic capabilities. We offer a theoretical concept that addresses aspects of the research question by mainly relying on the notion of institutional change which will be clarified and limited by the contextual. Institutional change emanating from evolving economic, social and political situations has been instrumental in the liberalization within China, together with pressures from their integration into the global economy. As part of these reforms, the government implemented policies aimed at encouraging competition in the domestic marketplace, urging domestic firms to reach international levels of competitiveness, and allowing multinational enterprises (MNEs) to enter their erstwhile markets, thus necessitating organizational transformations to deal with new competitive dynamics. However, *how Chinese firms develop, upgrade and renew their capabilities when internationalizing abroad* still remains unclear.

Dynamic capabilities encapsulate wisdom from a variety of work on evolution of innovation and design [24-26], corporate effects associated with managerial capabilities [27], entrepreneurship [28], corporate level strategy [29], knowledge management [30], strategic process [31], capability lifecycles [32], internationalization processes [33-34], and organization routine [35-36]. The perspective of dynamic capabilities is attracting increasing attention because it is the only field that can capture how firms can change their valuable resources over time and do so persistently, to sustain and develop competitive advantages in responding the changing environments [37]. A dynamic capability is not a resource but a *process* that impacts upon resources. They are about developing the most adequate resource base and are future oriented, whereas capabilities are about competing today and they are 'static' if no capabilities are deployed to alter them. They consist of repeated processes that have evolved through time and related to how the resources base is changed in a dynamic environment by the use of dynamic capabilities. This means

Manuscript received June 28, 2016, revised July 28, 2016
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that the dynamism depends on the interactions of the dynamic capabilities and resources base, thus allowing the modification of the latter [38].

III. METHOD

We conducted a qualitative case study of a Chinese MNE which provided inductive logic and exploratory power to uncover the context—specific issues and nuances of the firm's internal capabilities [39-40]. Focusing on one critical case allow us to construct theory construction and elaborate the existence and influence of various capability development at various levels—firm, industry and country [41].

The focal firm under study was Chigo Heating and Ventilating Equipment Company Limited (Chigo HVAC), it was well suited to investigate the dynamic capability since we were able to triangulate extensive public sources and company data regarding the institutional evolution of domestic air conditioning firms in China, the comparisons to the transformation of the Chigo HVAC and its successful global strategic alliances entering more than 150 countries and regions after the upgrading process [42].

Forty-seven in-depth interviews were conducted between March 2012 and August 2013 and most of the respondents were from the managerial level. We interviewed Chigo HVAC's current and former employees, as well as former employees from one of its local competitors for international markets, Midea. With these insights, we gathered present and historical accounts and episodes [43] related to internationalization process and the impact brought by its upgrading process. We participated in internal meetings, trainings, site visits and informal meetings. Field notes and memos were made for different incidents. Our data were collected in a sequential manner until a state of data saturation of the research is accomplished [44].

We also triangulated these interviews and observational data with other internal and external archival data about the air conditioning industry. These pieces of information were gathered from 1978 which was considered as a starting point of Chinese firm's internationalization [45]. By doing this, we were able to highlight the multilevel nature of the supply chain effect and encapsulated the intra-industry heterogeneity across organizations.

Our data analysis consisted of three stages. First, we drew on the accounts from both primary and secondary data to build up 'event history database' [46]. This allowed us to unfold the causal relationships among different chronological events at different levels of analysis and highlighted the upgrading process of the air conditioning industry which have focused on how Chinese government and firms prepare for competition in the global markets. Second, all interviews were transcribed verbatim and textual data were imported into QSR NVivo 8. We identified initial codes, concepts and higher order themes emerged from both interviews and informed by existing concepts [47]. Last, we developed and verified the occurrence of broad themes that signified the reconfiguring process of dynamic capabilities.

IV. FINDINGS

In the development stage of Chigo HVAC's case, it faced two major problems in terms of internationalization: the "technology gap" and the "marketing gap." The technologies included both "hard" technologies, embodied in the

production machinery, and product design or "soft" management systems, such as quality control and supply chain management. The marketing gap was the result of the difficulty Chigo HVAC had in understanding and responding to changing consumer demand when it was disconnected from the markets. The global AC market was influenced by other highly concentrated retail sectors and the capital intensity of developing a brand. These two disadvantages were gradually mitigated when the firm successfully reconfigures its own architecture of capability

Reconfiguration is undertaken through a process of strategic routines by which decision makers continuously alter their existing capability base to create architectural innovations. This ability is based on the attribute of organizational capability to integrate individuals' specialized knowledge across all functions, including R&D, product and process development, manufacturing, human resources, and organizational learning [48-50]. Organizations that reflect the continuous changes in the competitive environment by being able to adapt their organizational design and behavior to change in strategy, and to do this rapidly and effectively, exhibit a second-order organizational capability that ensures they can fit with environmental changes [51]. This process requires firms to realign their organizational capabilities repeatedly, to adapt, mold, and change, thus enabling them to generate new value-creating strategy related to their specific circumstances and thus their environment [52]. Reconfiguration is needed to maintain evolution and helps firms to escape from unfavorable path dependencies [50, 53]. This process allows firms to integrate organizational capabilities from sources both external and internal to them and achieve architectural competence [54].

A. Research and development capability: In the initial stage of development, a large percentage of Chigo HVAC's air conditioners was exported by means of OEM. Its R&D mainly relied on domestic interorganizational cooperation to exchange design, technology and production techniques, which allowed the firm to fulfill the domestic export requirement. However, the majority of its production was not able to meet "highly efficient" level of grade 2 or above for the international standard. The overall energy efficiency was comparatively low and the products were poorly designed when compared to those of the AC producers in advanced countries. In principle, OEM allowed the firm gradually to form an international strategic alliance by selling under the name of the manufacturer; in so doing, they could successfully reduce R&D costs and manufacturing costs, and increase productivity.

Over the last decade, the firm has been able to increase the scales of its international alliances, which has allowed the firm to upgrade its R&D. As the demand for development in the AC industry always promotes technological progress, the R&D department realized the importance of international interorganizational cooperation, assisting it to improve its ability to conduct independent research, develop technological capabilities and increase core competitiveness. After 2009, the R&D department greatly improved its own test capability; it underwent a transformation in using computer and electronic technology, and implementing test device construction. Presently, various product test devices were fully automated, controlling operating conditions, adjusting various environmental parameters, and undertaking

data acquisition and analysis. Data could even be transmitted to other computers through networks to provide the users with valuable information gleaned through the various analyses and comparisons. Therefore, the speed of new product development and the level of product performance could greatly be enhanced, effectively guaranteeing product quality and resulting in progress and prosperity for the firm. Rather than merely following the domestic EER standard, the majority of its products were able to meet the standard of the international EER system, namely EER 3.0.

In addition to the significant improvements in its overall testing and design capabilities, the R&D department also tried to contribute more through designing new products. The department had developed its own research centers, and had increased cooperation with domestic and international research centers and the state universities to engage in various international projects and upgrade its capabilities in relation to design, redesign, manufacturing and testing technology, thus significantly facilitating the development of R&D teams within the company. Although the firm focused on buyer design, it also tried to organize, distribute, and use its own brand, and captured more in terms of post-production value-added products. New R&D capability enabled the firm to maintain extensive forward and backward linkages with its international partners. All in all, it was able to upgrade its products to meet the requirements set by different national quality inspection agencies.

Maintaining high local responsiveness was promoted by the R&D area. As the testing data derived from the international energy efficiency standards were inconsistent, different countries had used a range of international energy efficiency standards and labeling programs. To meet international standards, the R&D department had to promote the upgrading and transformation of testing facilities in line with the requirements of different countries' standards, such as those of the US, the EU, Japan, the Middle East, etc. Consequently, these independent defense R&D capabilities enabled the firm to develop upgrading potentials that served as a very productive incubator for the development of high technology AC manufacture.

B. Marketing and sales capability: Focusing on OEM, Chigo HVAC adopted a standardized global marketing strategy by promoting its international partners' brands in its initial stage of development. After 2009, the marketing and sales department classified the global markets into different regions according to their economic and technological development. A differentiated global marketing approach was adopted, which entailed targeting more distinct market segments with a multiple marketing mix rather than creating the same marketing mix for a broad range of potential buyers. This enabled the sales and marketing teams to focus and concentrate on their own regions; they were able to analyze different markets based on understanding developed through previous strategic partners and the new partners gained from its strategy of exploration in new international market networks. The regional sales and marketing teams accessed and built networks with different alliance participants, who provided various host countries' information according to their own product groups, thus enabling the department to differentiate heterogeneously across different locations with respect to country of origin, level of internationalization, and institutional characteristics.

By focusing on both international brands and local brands, the sales and marketing department developed intensive interaction with international customers; effective procedures for sales promotion and execution were adopted. The sales and marketing teams mainly adopted OEM and ODM approaches in the more advanced countries, such as North America, Europe, and some parts of well-developed Asian countries. These were mainly well-developed, matured market, high-end in terms of quality, and technologically based with a high entry barrier. Regional sales in these groups focused on promoting quality services and knowledge of complex capabilities to understand customer needs, and the provision of integrated solutions.

In contrast, the sales and marketing teams specializing in the developing or less-developed regions adopted OBM in locations where a low price strategy would typically be preferred. They recognized that international branding was not an important issue; rather, price was the main concern in this developing or mid-range class, such as Middle Eastern and South American countries. So, with future development in mind, maintaining brand management in these countries became the priority of the sales and marketing department; the teams had to promote the Chigo brand extensively in these countries, where they believed there was strong potential for the firm to be the early-entry international brand in the future.

C. Information management capability: Chigo HVAC placed more focus on sophisticated technological functionality than organizational capability to leverage technology in its operations in the initial stages. The functional area of information technology (IT) linked the internal and external domains after its configuration. The external domain was Chigo HVAC's business area, in which the firm connected its suppliers of raw materials, distributors of the finished AC, and potential strategic alliance partners. The internal domain concerned the choices regarding the logic behind the administrative structure, consisting of all the functional departments in Chigo HVAC and the particular reasons for the design and modification of key business procedures. These included acquiring and improving the personnel skills required to achieve the desired level of organizational competence as well as product delivery and development, customer service and quality control. The IT department used SAP in the very beginning. The firm found that this system helped them communicate, install data collectively and exchange information within the internal business arena. However, Chigo HVAC lacked the skills required to acquire, train and develop individuals with the necessary knowledge and capabilities to effectively manage and run the IT infrastructure between the organization and those external to it. This resulted in occasional misalignment and misunderstandings of the central work processes of IT. After 2009, the IT department replaced SAP with ERP. Using ERP allowed the firm to integrate internal and external parties and thus collect, store, manage, and interpret data from any business activity, including product planning, cost and development, manufacturing and service delivery, marketing and sales, inventory management, shipping and payment. Each functional area had to be trained in the specific IT processes and skills that related to its activities and those of its external partners. In replacing of the IT system, the IT department focused on providing a platform

for integration between Chigo HVAC's employees and business partners, and the capability simultaneously to generate, maintain and monitor information and data between the internal functions. This helped solve the inadequate fit between the external and internal domains of IT. Furthermore, the implementation of particular IT software was not evaluated solely on the basis of cost, but rather the level of functionality, service and strategic fit, with an eye to assisting the firm to focus on its competencies, functions and governance in the IT arena.

In contrast to its local competitors, which focused on OBM, firm-level upgrading was the key dimension of Chigo HVAC's long-term development. Without deepening its specific types of capabilities, there was little hope that the firm could address its weaknesses and make the transition to higher value added parts of the global value chain. So, by focusing on OEM and ODM in homogeneous product types, Chigo HVAC specialized in light commercial AC at the beginning of its development and upgraded step by step to the production of differentiated products, or an "integrated" production VRF system, and commercial AC.

V. CONCLUSION

This study has addressed the question raised about the influence of how Chinese firms can develop their firm-specific capabilities over time and their interplay with the broader home institutional environment throughout their process of internationalization. The case in this research - Chigo commercial AC sector began with the development of a strong brand in China, its home markets. Then, it utilized Original Equipment Manufacturing (OEM) brands to expand and become familiar with international market. By analyzing the data of the AC industry in China, a decade's industry growth and Chigo commercial AC sector's responses to the institutional changes, we then derived a new concept – "evolution" for dynamic capabilities.

REFERENCE

[1] J. Cantwell, "Revisiting international business theory: A capabilities-based theory of the MNE," *Journal of International Business Studies*, vol. 45, pp. 1-7, 2014.

[2] J. Dunning and S. Lundan, "Institutions and the OLI paradigm of the multinational enterprise," *Asia Pacific Journal of Management*, vol. 25, pp. 573-593, 2008.

[3] P. Gammeltoft, et al., "Emerging multinationals, emerging theory: Macro- and micro-level perspectives," *Journal of International Management*, vol. 16, pp. 95-101, 2010.

[4] L. Brandt and E. Thun, "The fight for the middle: upgrading, competition, and industrial development in China," *World Development*, vol. 38, pp. 1555-1574, 2010.

[5] J. Humphrey and H. & Schmitz, "How does insertion in global value chains affects upgrading in industrial cluster?," *Regional Studies*, vol. 36, pp. 1017-1027, 2002.

[6] P. J. Buckley, et al., "Historic and Emergent Trends in Chinese Outward Direct Investment," *Management International Review*, vol. 48, pp. 715-748, 2008.

[7] M. Warner, et al., "Late Development's Experience and the Evolution of Transnational Firms in the People's Republic of China," *Asia Pacific Business Review* vol. 10, pp. 324-345, 2004.

[8] A. Cuervo-Cazurra, "Selecting the country in which to start internationalization: The non-sequential internationalization model," *Journal of World Business*, vol. 46, pp. 426-437, 2011.

[9] A. Cuervo-Cazurra, "Extending theory by analyzing developing country multinational companies: Solving the Goldilocks debate," *Global Strategy Journal*, vol. 2, pp. 153-167, 2012.

[10] M. W. Peng, et al., "An institution-based view of international business strategy: a focus on emerging economies," *Journal of International Business Studies*, vol. 39, pp. 920-936, 2008.

[11] J. Mathews, "Dragon multinationals: New players in 21st century globalization," *Asia Pacific Journal of Management*, vol. 23, pp. 5-27, 2006.

[12] J. Mathews, "Competitive Advantages of the Latecomer Firm: A Resource-Based Account of Industrial Catch-Up Strategies," *Asia Pacific Journal of Management*, vol. 19, pp. 467-488, 2002.

[13] J. Mathews, "China, India and Brazil: Tiger technologies, dragon multinationals and the building of national systems of economic learning," *Asian Business & Management*, vol. 8, pp. 5-32, 2008.

[14] Y. Luo and R. L. Tung, "International expansion of emerging market enterprises: A springboard perspective," *Journal of International Business Studies*, vol. 38, pp. 481-498, 2007.

[15] M. A. Witt and A. Y. Lewin, "Outward foreign direct investment as escape response to home country institutional constraints," *Journal of International Business Studies*, vol. 38, pp. 579-594, 2007.

[16] X. Liu, et al., "Chinese economic development, the next stage: outward FDI?," *International Business Review*, vol. 14, pp. 97-115, 2005.

[17] P. Deng, "Why do Chinese firms tend to acquire strategic assets in international expansion?," *Journal of World Business*, vol. 44, pp. 74-84, 2009.

[18] M. A. Hitt, et al., "The Institutional Effects on Strategic Alliance Partner Selection in Transition Economies: China vs. Russia," *Organization Science*, vol. 15, pp. 173-185, March 1, 2004 2004.

[19] X. Liang, et al., "Outward internationalization of private enterprises in China: The effect of competitive advantages and disadvantages compared to home market rivals," *Journal of World Business*, vol. 47, pp. 134-144, 2012.

[20] P. S. Tolbert and L. G. Zucker, "Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reform, 1880-1935," *Administrative Science Quarterly*, vol. 28, pp. 22-39, 1983.

[21] P. J. DiMaggio and W. W. Powell, "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields," *American Sociological Review*, vol. 48, pp. 147-160, 1983.

[22] J. Child and S. B. Rodrigues, "The internationalization of Chinese firms: A case for theoretical extension?," *Management & Organization Review*, vol. 1, pp. 381-410, 2005.

[23] M. W. Peng, "The global strategy of emerging multinationals from China," *Global Strategy Journal*, vol. 2, pp. 97-107, 2012.

[24] G. Verona and D. Ravasi, "Unbundling dynamic capabilities: an exploratory study of continuous product innovation," *Industrial and Corporate Change*, vol. 12, pp. 577-606, June 1, 2003 2003.

[25] M. Augier and D. J. Teece, "Strategy as Evolution with Design: The Foundations of Dynamic Capabilities and the Role of Managers in the Economic System," *Organization Studies*, vol. 29, pp. 1187-1208, August 1, 2008 2008.

[26] C. Salvato, "Capabilities Unveiled: The Role of Ordinary Activities in the Evolution of Product Development Processes," *Organization Science*, vol. 20, pp. 384-409, 2009.

[27] R. Adner and C. E. Helfat, "Corporate effects and dynamic managerial capabilities," *Strategic Management Journal*, vol. 24, pp. 1011-1025, 2003.

[28] S. A. Zahra, et al., "Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda," *Journal of Management Studies*, vol. 43, pp. 917-955, 2006.

[29] C. Bowman and V. Ambrosini, "How the Resource-based and the Dynamic Capability Views of the Firm Inform Corporate-level Strategy," *British Journal of Management*, vol. 14, pp. 289-303, 2003.

[30] M. Easterby-Smith and I. M. Prieto, "Dynamic Capabilities and Knowledge Management: an Integrative Role for Learning?," *British Journal of Management*, vol. 19, pp. 235-249, 2008.

[31] K. M. Eisenhardt and J. A. Martin, "Dynamic capabilities: What are they?," *Strategic Management Journal*, vol. 21, p. 1105, 2000.

[32] C. E. Helfat and M. A. Peteraf, "The dynamic resource-based view: Capability lifecycles," *Strategic Management Journal*, vol. 24, pp. 997-1010, 2003.

[33] C. Prange and S. Verdier, "Dynamic capabilities, internationalization processes and performance," *Journal of World Business*, vol. 46, pp. 126-133, 2011.

[34] H. J. Sapienza, et al., "A capabilities perspective on the effects of early internationalization on firm survival and growth," *Academy of Management Review*, vol. 31, pp. 914-933, 2006.

- [35] S. G. Winter, "Understanding dynamic capabilities," *Strategic Management Journal*, vol. 24, pp. 991-995, 2003.
- [36] M. Zollo and S. G. Winter, "Deliberate Learning and the Evolution of Dynamic Capabilities," *Organization Science*, vol. 13, pp. 339-351, 2002.
- [37] M. Augier and D. J. Teece, "Dynamic Capabilities and the Role of Managers in Business Strategy and Economic Performance," *Organization Science*, vol. 20, pp. 410-421, 2009.
- [38] V. Ambrosini and C. Bowman, "What are dynamic capabilities and are they a useful construct in strategic management?," *International Journal of Management Reviews*, vol. 11, pp. 29-49, 2009.
- [39] R. E. Stake, *The Art of Case Study Research* Thousand Oaks: Sage, 1995.
- [40] R. K. Yin, *Case Study Research: Design and Methods*, 4 ed.: Newbury Park, CA: Sage, 2009.
- [41] A. C. Edmondson and S. E. Ecmannus, "Methodological fit in management field research," *Academy of Management Review*, vol. 32, pp. 1155-1179, 2007.
- [42] A. M. Pettigrew, "Longitudinal Field Research on Change: Theory and Practice," *Organization Science*, vol. 1, pp. 267-292, 1990.
- [43] K. M. Eisenhardt and M. E. Graebner, "Theory Building From Cases: Opportunities and Challenges " *Academy of Management Journal*, vol. 50, pp. 25-32, 2007.
- [44] A. Strauss and J. Corbin, *Basics of qualitative research: Techniques and procedures for developing grounded theory*, 3 ed.: London: Sage, 2008.
- [45] P. Deng, "Outward investment by Chinese MNCs: Motivations and implications," *Business Horizons*, vol. 47, pp. 8-16, 2004.
- [46] R. Garud and M. A. Rappa, "A socio-cognitive model of technological evolution: the case of cochlear implants," *Organization Science*, vol. 5, pp. 344-362, 1994.
- [47] K. M. Eisenhardt, "Building Theories from Case Study Research," *Academy of Management Review*, vol. 14, pp. 532-550, 1989.
- [48] B. Lawson and D. Samson, "Developing innovation capability in organizations: A dynamic capabilities approach," *International Journal of Innovation Management*, vol. 5, pp. 377-400, 2001.
- [49] R. M. Grant, "Prospering in dynamically-competitive environments: Organizational capability as knowledge integration," *Organization Science*, vol. 7, 1996.
- [50] D. J. Teece, *et al.*, "Dynamic capabilities and strategic management " *Strategic Management Journal*, vol. 18, pp. 509-533, 1997.
- [51] M. Beer and R. Eisenstat, "How to hold an honest conversation about your strategy," *Harvard Business Review*, vol. 82, pp. 82-89, 2004.
- [52] M. Beer, *et al.*, "Strategic management as organizational learning: Developing fit and alignment through a disciplined process," *Long Range Planning*, vol. 38, pp. 445-465, 2005.
- [53] D. J. Teece, "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance," *Strategic Management Journal*, vol. 28, pp. 1319-1350, 2007.
- [54] R. Henderson and I. Cockburn, "Measuring competence? Exploring firm effects in pharmaceutical research," *Strategic Management Journal*, vol. 15, pp. 63-84, 1994.