Dynamic bundle of capabilities and firm's international performance: A configurational analysis of Chinese technology-based international new ventures

Abstract: International new ventures need a variety of capabilities to tackle the liability of newness and foreignness to perform well in international markets. However, previous studies neglect the complex interactions between capabilities and leading to faulty theory and misspecified implications for practice. Our study addresses this gap by analysing the relationship between the configurations of dynamic bundle of capabilities and firm's international performance. We use the fuzzy-set qualitative comparative analysis to analyse a survey dataset of 88 Chinese technology-based international new ventures (TBINVs). Notably, our results show that none of our three types of dynamic bundle of capabilities is necessary or sufficient on its own but rather form configurations for TBINVs to achieve high international performance. Additionally, our analysis presents two successful paths to perform well, and five paths to perform poorly in international markets for TBINVs. Accordingly, we contribute to the capability-based perspective literature and the international entrepreneurship literature. Next to that, we provide practical implications for the owners of TBINVs and research suggestions for future study.

Keywords: Capability portfolio; China; dynamic bundle; dynamic capability; international new venture; QCA

Introduction

INVs are "business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries" (Oviatt & McDougall, 1994: 49). Benefits from international markets or through internationalization are conceptualised as international performance (Gerschewski & Xiao, 2015). Previous literature from the capability-based perspective (CBP) holds that firms' heterogeneous capability set can drive performance differences (Teece, Pisano, & Shuen, 1997). Capabilities help INV to tackle liability of newness and liability of foreignness (Oviatt & McDougall, 1994), and therefore enable INVs to perform well in international markets (Knight & Cavusgil, 2004).

A masterful study has been done on analysing the relationships between different types of capabilities and international performance in INVs. Key capabilities in the INV literature are marketing capabilities (Martin & Javalgi, 2016), technological capabilities (Zhang, Sarker, & Sarker, 2013b), and networking capabilities (Gabrielsson & Gabrielsson, 2013). However, previous studies treat different capabilities as if they work independent from another. This is problematic, as such a perspective neglects the complex interactions between capabilities (Black & Boal, 1994; Colbert, 2004; Sjödin, Parida, & Kohtamäki, 2016). Prior study holds that firm capabilities configure resources in interacting forms of compensatory, enhancing, and suppressing/destroying (Black & Boal, 1994). Studies that ignore interactions between capabilities may fail to uncover complex interdependencies that exist among capabilities, leading to faulty theory and misspecified implications for practice.

Here we draw on the idea of the dynamic bundle of capabilities (Peteraf, Di Stefano, & Verona, 2013) that enable INVs sustainable competitive advantage and lead to superior international performance. A dynamic capability bundle (Peteraf et al., 2013) is a

special type of capability portfolios that consists of both substantive capabilities and dynamic capabilities of the same kind, e.g. substantive and dynamic marketing capabilities (Waleczek, von den Driesch, Flatten, & Brettel, 2018). Dynamic bundle of capabilities address the uncertainty and flexibility in international markets for sustainable competitive advantage (Eisenhardt, Furr, & Bingham, 2010). To the best of our knowledge, there has been no study address dynamic bundle of capabilities in international entrepreneurship research.

Additionally, instead of suggesting an unidirectional linear relationship between dynamic and substantive capabilities (Isobe, Makino, & Montgomery, 2008; Waleczek et al., 2018), we argue that the mutual interactions (Colbert, 2004) among dynamic bundle of capabilities sustain ventures' competitive advantage and contribute to their international performance from a configurational approach. A configurational view focuses on patterns of capabilities that together form an internally consistent whole (i.e., their effects are mutually reinforcing) and draws a correlation between those patterns and organizational performance (Colbert, 2004; Doty & Glick, 1994). Configurational approach takes the advantage of constructing mutual reinforcing effects of substantive and dynamic capabilities on firm performance (Colbert, 2004).

Consequently, we address these gaps by investigating the relationship between dynamic bundle of capabilities and INVs' international performance from the configurational approach. We focus on the dynamic bundles of three types of capabilities: international marketing capabilities, technological capabilities, and international networking capabilities. Since these capabilities are identified as the most important capabilities for INVs in international markets (Jie & Harms, 2018).

To achieve this purpose, the present study applies a configurational comparative method, namely fuzzy-set qualitative comparative analysis (fsQCA) on a survey data

set of **88** Chinese technology-based international new ventures (TBINVs). FsQCA is an analytic technique that departs from standard QCA where cases are understood as configurations of attributes (Crilly, 2011). Building on fuzzy-set theory (Zadeh, 1965), fsQCA explains causal patterns by examining what attribute configurations belong to the subset of the set of outcome of interest (Rihoux & Ragin, 2009).

Our study is relevant in three folds. First, our study is relevant to the literature of the CBP. We uncover the complex interdependencies exist among capabilities by revealing how substantive and dynamic capabilities form the dynamic bundle of capabilities and relate to international performance. Second, our study is relevant to the literature of international entrepreneurship (IE). We present how TBINVs configure their capabilities to sustain competitive advantage and achieve high international performance equivalently. Third, our study is relevant to the practice in IE by providing multiple successful paths to perform well in international markets, also several failed paths to achieve low performance.

Theoretical framework

The Capability-based Perspective and INVs' International Performance

Capabilities are a source of a firms' competitive advantage. Day (1994: 40) highlights: "overall, capabilities are key determinants of a firm's competitive advantage and, thus, its performance". The capability-based perspective (CBP) is the theoretical lens that explains how capabilities are related to firm performance (Al-Aali & Teece, 2014; Knight & Cavusgil, 2004; Teece et al., 1997). The CBP argues that firm heterogeneity in performing specific actions can drive performance differences (Teece et al., 1997). A capability is "a learned and stable pattern of collective activity" (Zollo & Winter, 2002: 340) at the firm level. Capabilities that are valuable, rare, in-imitable, and non-

sustainable contribute to firm's competitive advantage (Autio, George, & Alexy, 2011; Martin, Javalgi, & Cavusgil, 2017; Teece, 2007). INVs face challenges of liability of newness and liability of foreignness (Oviatt & McDougall, 1994), since they are typically poor in tangible resources and need to deal with diverse environments across several foreign markets (Luo, 2000). Capabilities help INVs to achieve competitive advantages in international markets (Knight & Cavusgil, 2004).

The two basic types of capabilities are substantive capabilities and dynamic capabilities. Substantive capabilities are necessary for achieving and sustaining competitive advantage (Protogerou, Caloghirou, & Lioukas, 2012; Zollo & Winter, 2002). Substantive capabilities (Zahra, Sapienza, & Davidsson, 2006) are *firm activities that utilize available resources to accomplish tasks to create value, at least for the short term, for the organisation* (Teece, 2014: 331; Winter, 2003: 991; Zahra et al., 2006: 921). Substantive capabilities are also known as static (Collis, 1991), zero-level (Winter, 2003), operational (Helfat & Peteraf, 2003), and ordinary capabilities (Teece, 2012). Substantive capabilities involve administrative, operational, and governance-related functions that allow firms to accomplish tasks in higher quality and with lower cost (Teece, 2014). Many studies on INV performance illustrate positive performance implications of substantive capabilities (Martin & Javalgi, 2016; Ripollés & Blesa, 2012; Zhang, Tansuhaj, & McCullough, 2009).

Dynamic capabilities are necessary for INVs to address the dynamics and uncertainties in international markets to be flexible and maintain sustainable advantage (De Clercq, Sapienza, Yavuz, & Zhou, 2012; Zhou, Barnes, & Lu, 2010). Dynamic capabilities are *"the capacity of an organization to purposefully create, extend, or modify its resource base"* (Helfat, 2007: 1), which allow the firm to sense environmental changes,

formulate a response to the change, then take actions to implement the response (Teece, 2014). Dynamic capabilities are important for firms to avoid substantive capability liabilities (Wilden & Gudergan, 2014), when markets become turbulent (Leonard-Barton, 1992) and capability gaps arise (Day, 2011). Dynamic capabilities contribute to firm performance by configuring firm resources and substantive capabilities to address and even shape rapidly changing business environments in IE (De Clercq, Zhou, & Wu, 2016; Weerawardena, Mort, Salunke, Knight, & Liesch, 2014; Zhou, Wu, & Barnes, 2012). For instance, capabilities for network learning, market learning, and marketing contribute to innovativeness and early internationalization (Weerawardena et al., 2014). These dynamic capabilities help to acquire internationalization knowledge to reduce uncertainty in international markets, to acquire experiential knowledge to identify opportunities, and to transform the knowledge into resources, skills, and activities to meet customer needs.

Dynamic Bundles of Capabilities

Although dynamic capabilities are thought to improve firm performance and performance-related factors, researchers like Eisenhardt and Martin (2000) argue that effective dynamic capabilities are essential part of but not sufficient enough for competitive advantage. Peteraf et al. (2013) argue that the locus of competitive advantage lie in the form of dynamic bundle of capabilities, rather than in simple routines (substantive capabilities) or in complex routines (dynamic capabilities) in isolation.

Dynamic bundle of capabilities consists of both substantive capabilities and dynamic capabilities are based on dynamic capability frame (Teece et al., 1997). At the initial

stage firms have certain bundle of capabilities, however, it becomes necessary to develop or transform capabilities to have the long-term growth (Lichtenstein & Brush, 2001). In addition, dynamic capabilities are not supposed to generate value alone (Teece, 2012), which calls for the combination with substantive capabilities (Caloghirou, Kastelli, & Tsakanikas, 2004; Lee, Lee, & Pennings, 2001b; Peteraf et al., 2013). In the dynamic environments, firms need dynamic capabilities to change the way how they use their resources to address the turbulence (Eisenhardt & Martin, 2000). In the context of IE, dynamic capabilities influence venture's long-term economic return and global competitive advantage via capability upgrading (Luo, 2000).

Dynamic Bundle of International Marketing Capabilities (DBIMC)

Substantive international marketing capabilities. Firms with well-developed marketing capabilities tend to be high performing (Morgan, 2012; Morgan, Vorhies, & Mason, 2009). Substantive international marketing capabilities are activities that INVs conduct for efficient and effective execution of its marketing strategies to create value (Morgan et al., 2009; Vorhies & Morgan, 2005). These marketing capabilities allow firms to better understand their customers' current and future needs (Fowler, King, Marsh, & Victor, 2000), to deliver products/services better than competitors (Tan & Sousa, 2015), and to effectively analyse competitors and competition (Protogerou et al., 2012). With strong such capabilities, INVs can manage challenges such as cultural differences, language barriers, economic development differences, and local competitions across global markets (Knight & Cavusgil, 2004) better than their rivals. Consequently, substantive international marketing capabilities enable ventures to achieve high performance by delivering substantive value to customers (Morgan et al., 2009; Weerawardena, Mort, & Liesch, 2017; Zhang et al., 2009).

Dynamic international marketing capabilities. Marketing not only consists of delivering substantive value to the customer efficiently, but also calls for addressing the market trends and next generation of products (Tzokas, Kim, Akbar, & Al-Dajani, 2015), therefore TBINVs need dynamic marketing capability (Day, 2011; Morgan, 2012). Dynamic international marketing capabilities are those activities that ventures use "to absorb market knowledge in order to integrate this knowledge into the rest of the organization" (Barrales-Molina, Martínez-López, & Gázquez-Abad, 2014: 407) in international context. Previous scholars highlight that the international market knowledge and how efficient such knowledge is obtained critically influence entrepreneurial firms' international performance (Autio, Sapienza, & Almeida, 2000; Knight & Cavusgil, 2004). In IE literature, dynamic marketing capabilities benefit venture performance by operating business with higher efficiency (Blesa, Ripollés, & Monferrer, 2010), addressing rapidly changing markets and facilitate entering international market early (Zhou et al., 2012), and identifying and selecting the appropriate intended value propositions for target customers (Martin & Javalgi, 2016).

Dynamic bundle of international marketing capabilities. DBIMC combine the stable component of executing international marketing activities, meanwhile the dynamic component of finding and integrating new market knowledge to form new stable international marketing strategies and operations. Concretely, market knowledge acquisition activities facilitate firms to identify under-fulfilled customer demands (Slater & Narver, 2000), which contribute to firms' market expansion and revenue growth. Furthermore, sensing the dynamisms and new development trends in international markets earlier than competitors offer INVs more opportunities and flexibility to adapt to new environment (Ripollés & Blesa, 2012). Market knowledge assimilation refers to firm activities to exchange the acquired market information and

communicate on the ideas of how to use these collected knowledge in new innovations. Market knowledge assimilation ask for a deep understanding of the gathered new market knowledge (Morgan, 2012). Based on which, firms identify what need to be done to address the gaps and get prepared for the changing which provide firms competitive advantages and performance (Wu & Voss, 2015). Market knowledge transformation activities integrate external accessed market knowledge with internal existing resources to create innovations to address new market change, by which firms have competitive advantages and achieve performance in the end (Morgan, 2012). Market knowledge exploitation activities not only create new products to capture more customers, but also revise firms' substantive marketing capabilities to be more efficient than their competitors (Morgan, 2012).

Therefore, with the mutual reinforcing between the effective and stable delivery of customer value in international markets and the activities to consistently updating market knowledge, TBINVs can continuously capturing market value and achieve superior performance in international markets. Hence,

> *P1: The dynamic bundle of international marketing capabilities (DBIMC) can be an element of TBINVs' high international performance, but is not a sufficient component on its own.*

Dynamic Bundle of Technological Capabilities (DBTC)

Substantive technological capabilities. Technological capabilities are viewable as one of the most important sources of sustainable competitive advantage (Ortega, 2010). Substantive technological capabilities refer to firm's activities on using existing technology with existing innovation processes to engage in incremental innovation (Menguc, Auh, & Yannopoulos, 2014). Previous study indicates technological

capability as one key capability contributes to firms' competitive advantage and performance (Lavie, Kang, & Rosenkopf, 2011; McEvily, Eisenhardt, & Prescott, 2004). For example, refinement capability was found to contribute significantly to Japanese manufacturing SMEs' operational efficiency (Isobe et al., 2008). Meanwhile, firms with well-developed substantive technological capabilities tend to be more innovative (Tzokas et al., 2015) and achieve higher differentiations (Lee, Lee, & Pennings, 2001a). With these efficient operations and innovations, firms can transform the resource bases into outputs to cater market demands without excessive costs (Protogerou et al., 2012).

Dynamic technological capabilities. Dynamic technological capabilities address the new developments in relevant technological fields, contribute to firms' competitive advantage and firm performance in the end. Technology capabilities, such as IT capabilities (Zhang, Sarker, & Sarker, 2013a; Zhang & Tansuhaj, 2007) and technology/R&D capabilities (Efrat & Shoham, 2012) contribute to INVs' international performance by helping them to develop high value-added products, solve problems more efficiently, and coordinate experience inside the venture. We draw on a working definition of dynamic technological capabilities as a set of capabilities that ventures use to acquire new technologies and make innovations to update existing technologies and develop new products/services. We capture dynamic technological capabilities from activities of searching for new technologies (Peng, Schroeder, & Shah, 2008) and seizing and transforming new technologies (Lichtenthaler & Muethel, 2012).

Dynamic bundle of technological capabilities. "Firms cannot innovate in isolation" (Yam, Lo, Tang, & Lau, 2011: 393), they need to combine their substantive technological capabilities with external resources. Which indicates a combination of

substantive and dynamic technological capabilities, i.e. the dynamic bundle of technological capabilities (DBTC). DBTC combine the dynamic components of sensing, seizing, and transforming new technologies, and integrate them to form a new stable components of using technologies to develop products/services.

Specifically, sensing new technologies help to keep ventures stay on the leading edge of new technologies and consistently thinking the next generation technologies. In a rapidly changing environment, firms must develop new technologies and change their asset structure to adapt to new environmental opportunities (Karim & Mitchell, 2000). Because existing organizational practices and routines may reduce a firm's flexibility to adapt to new changes (Isobe et al., 2008; Levitt & March, 1988). Seizing new technologies refer to actions to combine the notion of new technologies with new product ideas and existing technology knowledge to create innovations. Seizing new technologies are the source of INVs' sustainable competitive advantages. Since how well ventures' internal and external resources are reconfigured determine whether INVs can capture new market opportunities in dynamic markets or not (Isobe et al., 2008). Transforming new technologies constitute activities to apply new technologies to renew current innovation processes and optimize firm's R&D activities to address the changing and new markets. Technological innovation capabilities enable firms to provide differentiated products, which satisfies customers new demand and capture new markets (Damanpour, 2010), and favour firms' performance in the end (Camisón & Villar-López, 2014). Moreover, transforming activities lead to production cost reduction and product quality improvements (Kotabe, Srinivasan, & Aulakh, 2002). Therefore, when enter into international markets, INVs with innovative products, lower production cost, or more efficient operational routines enjoy competitive advantages

(Kotabe et al., 2002; Porter, 2011), and achieve higher international performance accordingly.

With the mutual promoting effects from the substantive and dynamic technological capabilities, DBTC offer TBINVs continuous innovations and sustainable competitive advantages which lead to high international performance. Therefore, we propose that:

> *P2: The dynamic bundle of technological capabilities (DBTC) can be an element of TBINVs' high international performance, but is not a sufficient component on its own.*

Dynamic Bundle of International Networking Capabilities (DBINC)

Substantive international networking capabilities. A profusion of studies stressing the importance of networking for firms' competitive performance (Mu, 2013; Mu, Thomas, Peng, & Di Benedetto, 2017; Pittaway, Robertson, Munir, Denyer, & Neely, 2004). As conclude by Pittaway et al. (2004), networking contribute to firms' performance with benefits such as risk sharing, new market and technologies accessing, and product lunching speeding. Networking is especially important for INVs, as suggested by the literature: "young firms that are constrained by liability of newness should use their social networks to develop early reputation networks to foster firm development" (Lechner, Dowling, & Welpe, 2006: 535). Well-established coordination with partners suggest a positive indication in terms of firms' future prospects (Hitt, Dacin, Levitas, Arregle, & Borza, 2000). INVs used their networks and contacts to quickly establish international subsidiaries and distributors (Gabrielsson & Gabrielsson, 2013). Intense relational skills could lead to strong intentional strategic alliances. These strategic alliances may offer information and complementary resources as well as access to third party resources for INVs (Lee et al., 2001a), which in turn

promote their international performance (Das & Teng, 2000). Partner knowledge provides INVs with information benefits, and therefore the discovery of entrepreneurial opportunities (Lee et al., 2001a).

Dynamic international networking capabilities. We drew on a working definition on dynamic international networking capabilities from network relationship management (Mort & Weerawardena, 2006) as a set of activities that the venture uses to develop new international networks, and gain, integrate, and reconfigure knowledge from network relationships to support innovations and identify new opportunities. We capture dynamic international networking capabilities with four perspectives of "network sensing", "relational embeddedness", "partner integration", and "network learning" (Bonner, Kim, & Cavusgil, 2005: 1376) in international markets.

Dynamic bundle of international networking capabilities. With the growth of INVs, new networks are needed to expend markets also to explore new market opportunities. Therefore, ventures are required to have not only the capabilities of extending and building new partnerships, but also need to form new capabilities of keeping new relationships accordingly.

Network sensing constitutes activities to being alert to international market developments and actively gathering information for potential partners via various ways. Network sensing activities lead INVs to have new partners and therefore more sources of information and market knowledge. These marketing information networks offer young firms with effective means of detecting and exploiting market opportunities (Lechner et al., 2006). Relational embeddedness are activities that INVs conduct to flexibly deal with international partner relationships. Through relational embeddedness, the identified potential partners can be developed into strong partners for INVs (Bonner

et al., 2005). Partner integration refers to activities to systematically integrate the information or knowledge from their partners to firm strategy planning. Through which, ventures could have more strategic options in international markets (Karra, Phillips, & Tracey, 2008) and therefore be more flexible when in dynamic environments. Network learning consists of activities that INVs use to learn from their partners and review how well INVs have done in networking with their partners. These learning activities grant ventures market information and knowledge (Zhang et al., 2009), and reduce uncertainty during internationalization (Weerawardena et al., 2017) which in turn contribute to international performance (Kenny & Fahy, 2011).

Therefore, with the mutual reinforcements between the stable cooperation with international partners and the activities to continuously finding new partners, TBINVs can continuously find new market opportunities and achieve superior international performance. Hence, we propose that:

> *P3: The dynamic bundle of international networking capabilities (DBINC) can be an element of TBINVs' high international performance, but is not a sufficient component on its own.*

Additionally, since the functions of marketing, technologies, and networking are all necessary for the operation of organizations (Mintzberg, 1980), we argue that single type of dynamic bundle of capabilities are not enough to drive ventures' international performance. Consequently, we propose configurations of dynamic bundle of capabilities and state that:

> *P4: The DBIMC, DNTC, and DBINC can be elements of TBINVs' high international performance, but are not a sufficient component on their own.*

We visualise our set-theoretic conceptual model in **Figure 1**, where configurations of dynamic bundles of capabilities consist of both substantive and dynamic capabilities relate to TBINVs' high international performance.

INSERT **FIGURE 1** ABOUT HERE

METHODS

Sample and Data

Our questionnaire was pretested with nine entrepreneurs and ten academics for item wording and comprehension (DeVellis, 2016). We address the social desirability bias (Arnold & Feldman, 1981; Ganster, Hennessey, & Luthans, 1983) in questionnaire design stage. For example, we obtain the outcome and condition information from different respondents (Podsakoff & Organ, 1986), which also rules out potential common method bias (Chang, van Witteloostuijn, & Eden, 2010). We use a purposive sampling (Tongco, 2007) to identify respondents, which is recommended by scholars applying QCA method (Greckhamer, Furnari, Fiss, & Aguilera, 2018). We focus on ventures in two science parks in Xi'an city, China, which is known to host TBINVs (XHTZ, 2017). Additionally, we apply snowballing sampling (Goodman, 1961). The sampled TBINV each meets six criteria: (1) main business with technology base; (2) with no more than 300 full time employees; (3) younger than nine years (De Clercq & Zhou, 2014; Lu, Zhou, Bruton, & Li, 2010; Zhou et al., 2010); (4) with minimum 5% of international revenue; (5) privately owned; and (6) independently operated.

We collect the data via field self-administered questionnaire survey (Zhou et al., 2012; Zhou, Wu, & Luo, 2007), assisted with online self-reporting questionnaire survey. We identified two key informants for each venture, ensuring one informant possessed well-

rounded knowledge about the venture's international activities and another one about its overall functioning (De Clercq & Zhou, 2014). The data collection took place from May to November of 2018. At the end of our data collection, we get **88** valid responses from TBINVs across China.

Measures

To measure TBINVs' international performance (IP), we acknowledge the multidimensional nature of performance (Coviello & Yli-Renko, 2016), and draw on the objective, industry-related, and subjective dimension (Gerschewski & Xiao, 2015) of international revenue. We use these three dimensions and aggregate them in a formative first-order, reflective second-order construct.

For the causal conditions, we developed the 5-point Likert-type scale (from strongly disagree (1) to strongly agree (5)). First, we conceptualize each construct with our working definition (see *Section 2*), as we did not find a definition with the exact meaning of any of our constructs. Second, we identify relevant established scales with a systematic literature analysis in Scopus. Third, we select the most suitable scale based on the multi-item scale and content: perceived fit with the working definition. We adapt the established scale by (1) selecting dimension that fit the research context of TBINV, (2) modifying items to explicitly addressing a definition of SC respective DC, (3) rephrasing items with international focus to fit the research context of IE. All capabilities are measured with first-order reflective and second-order formative scales. **Table 1** shows the description and literature source of each measure. The items for each measure are available upon request. **Table 2** provides the descriptive statistics of each measure. Strong correlations between substantive and dynamic capabilities indicate

superior explanatory power for research models that contain both (Karna, Richter, & Riesenkampff, 2016).

INSERT **TABLE 1** ABOUT HERE

Method of Analysis

We use fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2009b; Rihoux & Ragin, 2009) to identify sets of conditions which are related to the outcome. FsQCA is an increasingly applied method to analysis the complex causal leading to an outcome in management (Fiss, 2011; Kraus, Ribeiro-Soriano, & Schüssler, 2018; Seny Kan, Adegbite, El Omari, & Abdellatif, 2016) and entrepreneurship (Chang & Cheng, 2014; Hughes, Filser, Harms, Kraus, Chang, & Cheng, 2017).

Building on fuzzy-set theory (Zadeh, 1965), fsQCA explains causal patterns by examining what attribute configurations belong to the subset of the set of outcome of interest (Rihoux & Ragin, 2009). Typically, fsQCA proceeds in four steps. The first step is calibration – transforming original values into membership scores range from 0.0 to 1.0. Three calibration anchors (full membership, cross-over point, and full non-membership) are decided by researchers based on theoretical and substantive knowledge (Greckhamer, 2016; Ragin, 2009b). In our case, we found no real reason to assume specific gaps for the level of international performance in the literature, neither for the level of capabilities. Therefore, we follow Greckhamer (2016) and consider being highly performed in international markets a relative quality, and capabilities are gradually developed. We finalise the anchors for set membership of “0”, “0.5”, and “1” at a logical value nearby the 5^{th}, 50^{th}, and 95^{th} percentiles of the data respectively

(Beynon, Jones, & Pickernell, 2016) after checking the data distribution. Through which, we avoid the generation of membership scores of exactly 0.5. The original percentiles and our final cut-offs are presented in **Table 2**.

INSERT **TABLE 2** ABOUT HERE

The second step involves the necessity check of causal conditions. A necessary condition must be present for the outcome to occur, but its presence does not guarantee that occurrence. In fsQCA, a condition is identified as necessary when consistency and coverage scores above 0.90 (Greckhamer et al., 2018). Consistency indicates how closely a perfect subset relation is approximated, coverage gauges empirical relevance or importance (Ragin, 2009a: 45). **Table 3** presents the necessity analysis results, which indicates no necessary capability for the outcome of high nor low international performance.

INSERT **TABLE 3** ABOUT HERE

The third step is the truth table construction, and truth table reduction by specifying the frequency and consistency threshold. This study involves six conditions generate 36 causal combinations by fs/QCA3.0. The truth table is available upon request. We apply the consistency threshold of 0.80 (Schneider & Wagemann, 2012), and the proportional reduction in inconsistency (PRI) score threshold at 0.65 (Greckhamer, 2016) to avoid contradictory configurations. In the last step, a reduced set of configurations lead to the outcome was achieved by applying Boolean algebra and algorithms to logically reduce numerous and complex causal conditions in fsQCA (Fiss, 2011).

RESULTS

Solutions in **Table 4** show high consistency (0.87), which indicates that they are sufficient recipes leading to the outcome. Also, the overall solution coverage is 0.67, which suggests that these solutions can explain a relatively high proportion of the outcome. We report the results in the combination of parsimonious solution and intermediate solution.

INSERT **TABLE 4** ABOUT HERE

Only one core solution (combines two sub-solutions) of the capability configurations for high international performance is identified. Solution 1a constitutes the presence of DBIMC and DBINC, while DBTC is unimportant. The unique coverage of this solution exceeds 0.30. This is the dominate capability configuration in our case. Ventures with this capability configuration achieve high performance by executing and updating their marketing activities, meanwhile building and extending their network partners in their foreign markets. This solution supports P1, P3, and partly P4 where state that with DBIMC, DBINC or the conjunction of both, firms are able to achieve superior international performance.

Solution 1b combines the presence of substantive international marketing capabilities and DBINC, while the absence of DBTC. The unique coverage for this solution is 0.04, means it is not a common but a unique solution for TBINVs to achieve high international performance. Ventures with such capability configuration probably only provide normal products/service, however they can achieve high performance in international markets via maintaining and extending networks reinforced by executing

international marketing strategies. This solution supports P3 and partly P4 indicate the presence of DBINC, while refutes P2 which address the presence of DBTC.

One feature of fsQCA is the analysis of asymmetry, which indicate that conditions lead to the occurrence and the non-occurrence of an outcome of interest are different (Schneider & Wagemann, 2012). Therefore, we further analyse the capability configurations for low international performance. We apply the same frequency cut-off (1 case), raw consistency cut-off (0.80), and PRI consistency cut-off (0.65) to be consistent with our above analysis (The truth table is available upon request). **Table 5** shows the results for low international performance, which also shows high consistency (0.89) and relative high coverage (0.64). Compared with the limited number of solutions for high international performance, the results show more paths of how TBINVs can perform poorly in international markets.

INSERT **TABLE 5** ABOUT HERE

Three groups of solution are identified. Group 1 contains two sub-solutions. Solution 1a combines the absence of DBIMC, DBTC, and substantive international networking capabilities. Solution 1b constitutes the absence of the DBIMC, DBINC, together with the absence of substantive technological capabilities. Solution 1a provides supports for P1, P2, and partly P4; Solution 1b supports P1, P3, and partly P4.

Group 2 also comprises two sub-solutions. In solution 2a, the DBTC is present, while the DBIMC and the substantive international networking capabilities are absent. In solution 2b, the DBTC is present, while the substantive international marketing capabilities, and the DBINC are absent. Solutions in group 2 indicate that new ventures with only highly developed DBTC but who lack DBIMC or DBINC achieve only low

performance in international markets. Such results reject P2 and partly P4, while support P1 and P3 on the contrary.

Solution in group 3 combines the absence of DBIMC and dynamic international networking capabilities, joint the absence of DBTC. Similar with solutions in group 2, ventures in group 3 also only good at using existing technologies for incremental innovation and seeking new technologies for new product development. However, lacking related marketing or networking capabilities they are not able to create competitive advantage and achieve superior performance in international markets. Solution 3 provides support to P1 and partly P4, while refuses P2.

DISCUSSION

We begin our discussion with general observations, before focusing on specific configurations. Our first general finding confirms the existence of the dynamic bundle of capabilities (Peteraf et al., 2013) and their effects on TBINVs' international performance (Waleczek et al., 2018). In the results, when the substantive and dynamic capabilities of the same kind co-occurred within a specific configurational path, it is one type of dynamic bundle of capabilities. The DBIMC and the DBINC take jointly effects in driving the international performance as shown in **Table 4**.

Our second general finding shows that single dynamic bundle of capabilities are necessary but insufficient for the achievement of high international performance. Our results present that one type of dynamic bundle of capabilities need to be co-occurred with other single capabilities or dynamic bundle of capabilities in driving international performance. Therefore, such results provide evidence for our propositions state the necessity but insufficiency of the dynamic bundle of capabilities. Also, this finding is consistent with prior literature in configurations (Fiss, 2011; Harms, Kraus, & Schwarz,

2009) that singular type of dynamic bundles of capabilities need to be configured with other capabilities as sufficient drivers of international performance.

As the third general finding, we identify two configurational paths lead to the high international performance, and five paths lead to the low international performance in TBINVs. For the high international performance, TBINVs can either be strong in the DBIMC and the DBINC, or be strong in the DBINC and the substantive international marketing capabilities while weak in the DBTC. For the low international performance, TBINVs are either weak in the DBIMC or DBINC and also weak in the DBTC or are weak in the DBIMC or DBINC but strong in the DBTC. Such results show the equifinality that is consistent with the previous literature that there are more than one way lead to the final outcome (Harms et al., 2009).

Specifically, most of the highly performed TBINVs in our sample show high level in the DBIMC and the DBINC, while do not care the DBTC (Solution 1a in **Table 4**). The result is consistent with prior studies address that international marketing capabilities (Morgan et al., 2009; Weerawardena et al., 2017; Zhang et al., 2009) and international networking capabilities (Mort & Weerawardena, 2006) drive international performance. Apparently, the DBTC seems to be un-important. However, an in-depth look into the cases in this solution shows that their mean values for the technological capabilities are as equally high as the other capabilities (see **Table 6**). Which means that being highly performed in both the substantive and dynamic technological capabilities are only the basic requirements for TBINVs to achieve high international performance. Being strong in the DBIMC and DBINC provides these ventures competitive advantages over their rivals in international markets. Still, our results are consistent with the previous literature that address the importance of technological capabilities in driving

international performance (Efrat & Shoham, 2012; Protogerou et al., 2012; Zhang et al., 2013b).

INSERT **TABLE 6** ABOUT HERE

Ventures in solution 1b (in **Table 4**) where the DBTC is absent but still achieve high international performance. A further look into their company profile found that the ratio from their largest international partner exceeds 70%. Which means they rely heavily on a single partner to maintain and increase their international revenue. For these TBINVs, maintaining stable relationship with their current main partners and keep on developing new trustworthy partners are on the top priority. In fact their scores for both substantive and dynamic technological capabilities are below the average level in high performed ventures (see **Table 6**). However, their superior networking capabilities to build stable partnership with main partners, together with some marketing capabilities, negate the need for high level technologies to perform well in international markets (Mort & Weerawardena, 2006).

For capability configurations of low international performance, solutions 1a&b show that ventures whose the DBIMC is absent, joint with the absence of the DBTC or the DBINC achieve low international performance. Cases in this group failed to develop appealing products, either do they deliver customer values efficiently, nor do they have the capabilities to build good relationships with partners or extend their business networks. Such findings conform to the previous literature that INVs need the DBIMC, the DBTC, and the DBINC to be highly performed in international markets.

Surprisingly, we find that DBTC is not a general driver for TBINVs to achieve high international performance but one key driver to the low international performance.

Focusing too much on technologies have put these new ventures fall behind in international performance than their competitors. Ventures in the solution 2a, 2b, and 3 are strong in the DBTC, while weak in either the DBIMC or the DBINC or both. We find that the mean value of their technological capabilities are much higher than mean values of other capabilities (see **Table 6**), even higher than ventures with high international performance. However, they only achieve low international performance. We find that these venture are located in technology highly intensive industry sectors after a further look at their profiles. These ventures have invested numerous resources into R&D and continuously develop new and competitive products. Therefore, they perform poorly in the marketing and networking aspect, as INVs are usually poor in tangible resources (Luo, 2000). Also, their profile show they are generally small in the employee size , which may explain why they are weak in the DBIMC and the DBINC.

Theoretical contributions. First, we contribute to the literature of CBP by capturing the notion of dynamic bundle of capabilities in a configurational approach and test how their presence or absence relate to TBINVs' international performance empirically. Prior studies test dynamic bundle of capabilities in an unidirectional linear approach (e.g. structural equational modelling), however, ignore the mutual interactions between components in the dynamic bundle of capabilities. We consider the mutual interaction effects between two components in the dynamic bundle of capabilities from the configurational approach (Colbert, 2004; Doty & Glick, 1994).

Second, we contribute to IE literature by presenting the possible capability configurations to achieve high international performance. More than one paths are found to drive TBINVs to perform well in international markets equivalently. Theories that reason from a configurational perspective acknowledge that firms may develop different successful capability combinations, thus focusing on identifying different

equivalent configurations (Sjödin et al., 2016). In using fsQCA, we demonstrate the value of employing a novel methodology that is particularly suitable to modelling the complex, multiple interactions inherent in configurational theories in general and the IE literature in particular.

Management implications. Our results have following implications for practice. First, one important implication for international entrepreneurs from our study is that we provide them with insights on how to achieve high international performance in multiple way. From our results, two configurations of dynamic bundle of capabilities lead to the high international performance. They are: (1) being highly performed in the DBIMC, the DBTC, and the DBINC; and (2) only highly performed in the DBIMC and the DBINC, but supplemented with single stable international partner. Hence, TBINV founders could choose a more suitable way according to firm endowments while lead to highly performing eventually.

In addition, we show the negative examples of how ventures configure their capabilities could lead to the low performance in international markets. Two types of TBINVs show low international performance in terms of dynamic bundle of capabilities: (1) ventures that are weak in the DBIMC or DBINC and also weak in the DBTC; (2) ventures that are weak in the DBIMC or DBINC but strong in the DBTC. For the former type of ventures, we advise them to build strong dynamic bundle of capabilities. While for the former type of ventures, we suggest that capturing international markets quickly by executing and updating marketing strategies as well as expending their networks are more important than keep developing leading technologies. Therefore, we advise managers to invest more resources in marketing and networking aspects and build corresponding dynamic bundle of capabilities to create and sustain competitive advantages.

CONCLUSION

INVs need a variety of capabilities to tackle the liability of newness and foreignness to perform well in international markets. However, previous studies neglect the complex interactions between capabilities and leading to faulty theory and misspecified practical implications. Our study addresses this gap by analysing the relationship between the configurations of dynamic bundle of capabilities and firm's international performance on Chinese TBINVs with fsQCA.

Notably, our results show that none of the three types of dynamic bundle of capabilities (i.e., the DBIMC, the DBTC, and the DBINC) is necessary or sufficient on its own but rather form configurations for TBINVs to achieve high international performance. Additionally, our analysis presents two successful paths to perform well, and five paths to perform poorly in international markets for TBINVs. Accordingly, we contribute to the CBP literature by empirically test the effects of dynamic bundle of capabilities on firm's international performance from a configurational approach. Furthermore, we contribute to the IE literature by showing several paths for TBINVs to achieve high performance in international markets. What's more, we also provide implications for the owners of TBINVs by offering insights on how to achieve high international performance in multiple ways.

Although contributive, our study have certain limitations which also open possibilities for future research. First, our study only confirmed the usefulness and revealed the possible combinations of dynamic bundle of capabilities on venture performance. However, we still lack understanding of how these highly performed ventures deploy their substantive and dynamic capabilities to build dynamic bundle of capabilities (Waleczek et al., 2018). Also, we do not know how these dynamic bundle of capabilities mutually interacted to drive performance. Therefore, future studies could conduct

qualitative case studies on such topics and reveal the mechanisms behind dynamic bundle of capabilities to uncover how these international entrepreneurial firms deploy and configure their capabilities. Second, we are unable to address the capability configurations cross industry sectors due to the limitation of our data which calls for future study. Future studies could compare how configurations of dynamic bundle of capabilities vary cross industry sectors, how the dynamism in different sectors influence the configurations, and even focus on how configurations change in different industry stages via longitudinal studies. Thus, we seek to encourage researchers in IE and the CBP to build on the present findings towards a better understanding of the dynamic bundle of capabilities and their relationship to venture performance.

Tables and Figures

Table 1 Description of measures for causal conditions

Construct	*Measurement*	*Source*
Substantive international marketing capabilities	Captured on a 16-item Likert scale (α=.920) that assesses the extent to which the venture conduct activities for the efficient and effective execution of its marketing strategies to create value.	Vorhies and Morgan (2005: 92)
Dynamic international marketing capabilities	Captured on a 16-item Likert scale (α=.934) that measures the degree to which the venture conduct activities to absorb market knowledge and integrate the knowledge into the rest of the organization.	Flatten et al. (2011: 110)
Substantive technological capabilities	Captured on a 12-item Likert scale (α=.923) that evaluates the extent to which the venture conduct activities to use existing technology with existing innovation processes to engage in incremental innovation.	Peng et al. (2008: 745) & Lichtenthaler and Muethel (2012: 1243) [1]
Dynamic technological capabilities	Captured on a 12-item Likert scale (α=.932) that evaluates the degree to which the venture conduct activities to acquire new technologies and make innovations to update existing technologies and develop new products/services.	
Substantive international networking capabilities	Captured on a 14-item Likert scale (α=.936) that assesses the extent to which the venture conduct activities to maintain the relationships with partners and try to get resources from these partners.	Walter et al. (2006: 561-562)
Dynamic international networking capabilities	Captured on a 16-item Likers scale (α=.917) that measures the degree to which the venture conduct activities to develop new networks, and gain, integrate, and reconfigure knowledge from network relationships to support innovations and identify new opportunities.	Bonner et al. (2005: 1376)

[1] We only adopt the items, no reference on the results or conclusions.

Table 2 Correlations, descriptive statistics, and calibration cut-offs

	IP	*SIMC*	*DIMC*	*STC*	*DTC*	*SINC*	*DINC*
SIMC	.588**						
DIMC	.429**	.762**					
STC	.075	.381**	.518**				
DTC	.072	.308**	.424**	.798**			
SINC	.499**	.602**	.670**	.436**	.435**		
DINC	.346**	.497**	.632**	.566**	.487**	.762**	
Minimum	1.67	2.00	1.56	1.92	1.75	1.86	2.63
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Mean	3.47	3.60	3.84	3.95	3.80	3.84	3.90
Std. Deviation	0.76	0.71	0.68	0.64	0.73	0.69	0.60
5th percentile	2.11	2.23	2.77	3.00	2.50	2.57	3.00
50th percentile	3.44	3.61	3.88	3.96	3.83	3.86	3.84
95th percentile	4.67	4.75	4.94	5.00	4.92	5.00	5.00
cut-off: 0.0	2.12	2.23	2.77	3.01	2.51	2.58	3.01
cut-off: 0.5	3.45	3.61	3.89	3.96	3.84	3.87	3.84
cut-off: 1.0	4.68	4.74	4.93	4.99	4.91	4.94	4.90

Notes: IP = International performance; SIMC = Substantive international marketing capabilities; DIMC = Dynamic international marketing capabilities; STC = Substantive technological capabilities; DTC = Dynamic technological capabilities; SINC = Substantive international networking capabilities; DINC = Dynamic international networking capabilities. **, correlation is significant at the 0.01 level (2-tailed). N = 88.

Table 3 Necessary condition analysis results

Conditions	*Outcome*			
	***High** International performance*		***Low** International performance*	
	Consistency	*Coverage*	*Consistency*	*Coverage*
SIMC	0.80	0.81	0.57	0.53
~SIMC	0.54	0.57	0.80	0.79
DIMC	0.73	0.77	0.57	0.55
~DIMC	0.57	0.59	0.76	0.72
STC	0.68	0.71	0.61	0.59
~STC	0.61	0.63	0.70	0.67
DTC	0.70	0.71	0.64	0.60
~DTC	0.60	0.65	0.68	0.68
SINC	0.77	0.79	0.58	0.55
~SINC	0.56	0.59	0.77	0.76
DINC	0.73	0.75	0.57	0.54
~DINC	0.55	0.58	0.74	0.72

Notes: The symbol (~) represents the negation of the condition.

Table 4 Capability configurations for *High* international performance

Conditions	*Solutions*	
	1a	1b
Substantive international marketing capabilities	●	●
Dynamic international marketing capabilities	•	
Substantive technological capabilities		⊗
Dynamic technological capabilities		⊗
Substantive international networking capabilities	●	●
Dynamic international networking capabilities	●	●
Consistency	0.87	0.90
Raw coverage	0.63	0.36
Unique coverage	0.31	0.04
Overall solution consistency	**0.87**	
Overall solution coverage	**0.67**	

Notes: ● = core condition present; • = peripheral condition present; ⊗ = peripheral condition absent; blank space = does not care. Consistency cut-off: 0.88; frequency cut-off: 1.

Table 5 Capability configuration for *Low* international performance

Conditions	*Solutions*				
	1a	1b	2a	2b	3
Substantive international marketing capabilities	⊗	⊗	⊗	⊗	⊗
Dynamic international marketing capabilities	⊗	⊗	⊗		⊗
Substantive technological capabilities	⊗	⊗	●	●	●
Dynamic technological capabilities	⊗		●	●	●
Substantive international networking capabilities	⊗	⊗	⊗	⊗	
Dynamic international networking capabilities		⊗		⊗	⊗
Consistency	0.89	0.88	0.93	0.93	0.93
Raw coverage	0.51	0.52	0.37	0.37	0.34
Unique coverage	0.01	0.01	0.03	0.03	0.01
Overall solution consistency			**0.89**		
Overall solution coverage			**0.64**		

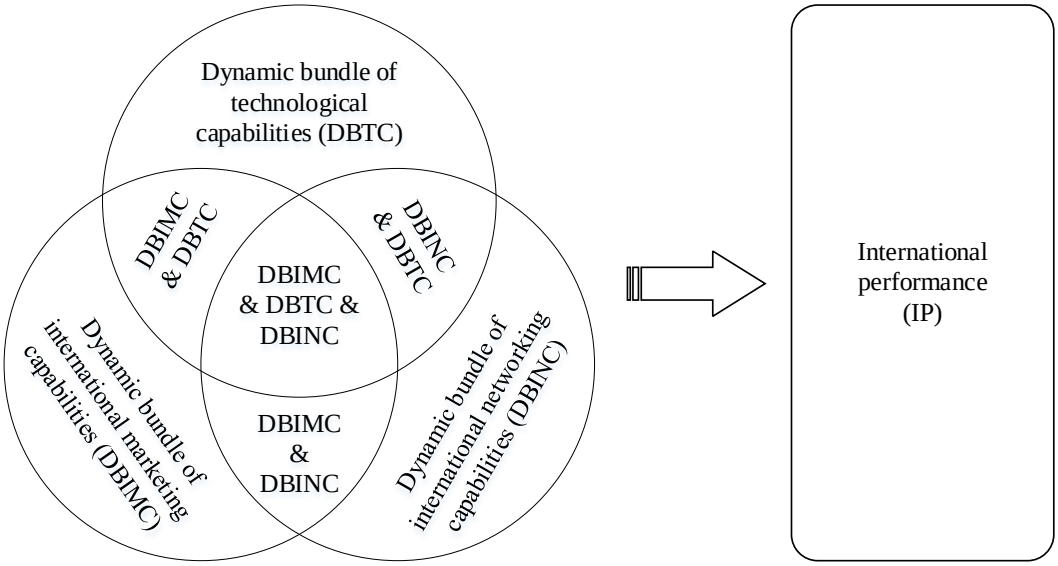
Notes: ● = core condition present; ⊗ = core condition absent; ⊗ = peripheral condition absent; blank space = does not care. Consistency cut-off: 0.89; frequency cut-off: 1.

Table 6 Mean values of condition in each solution

		IP	*SIMC*	*DIMC*	*STC*	*DTC*	*SINC*	*DINC*
High IP	Solution 1a	4.27	4.48	4.59	4.53	4.47	4.61	4.64
		0.29	*0.24*	*0.24*	*0.29*	*0.30*	*0.23*	*0.27*
	Solution 1b	4.83	4.72	4.31	3.62	3.08	5.00	4.44
		0.24	*0.40*	*0.97*	*0.22*	*0.35*	*0.00*	*0.44*
Low IP	Solution 1a	3.09	3.14	3.22	3.20	3.19	3.23	3.38
		0.25	*0.24*	*0.29*	*0.51*	*0.43*	*0.51*	*0.34*
	Solution 1b	3.10	3.13	3.21	3.20	3.23	3.22	3.34
		0.25	*0.24*	*0.30*	*0.52*	*0.41*	*0.52*	*0.32*
	Solution 2a	2.59	2.67	3.35	5.00	4.72	3.21	4.21
		0.89	*0.63*	*0.34*	*0.00*	*0.19*	*0.37*	*1.06*
	Solution 2b	2.67	2.72	3.75	4.96	4.88	2.96	2.94
		0.00	*0.75*	*0.53*	*0.05*	*0.06*	*0.05*	*0.09*
	Solution 3	2.67	3.28	3.56	4.62	4.42	3.64	3.40
		0.11	*0.11*	*0.27*	*0.34*	*0.42*	*0.56*	*0.36*

Notes: *Italics* are the standard deviation values.

Figure 1 Set-theoretic framework



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