



“Outside in”: Global demand heterogeneity and dynamic capabilities of multinational enterprises

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Abstract

We conceptualize the dynamic capabilities of multinational enterprises (MNEs) as learning and adaptation capabilities that address the pressure of global integration and local responsiveness. Complementing the extant literature on dynamic capabilities, which is focused on the supply side, our study draws attention to the demand-side influences, especially in terms of global demand heterogeneity. We propose that global demand heterogeneity provides pressures and opportunities for MNEs to learn and adapt and, thus, positively relates to the development of MNE dynamic capabilities. However, external sources per se may be insufficient. Firm-specific advantages, particularly human capital (at the managerial and employee levels), facilitate the internalization of external knowledge and pressure into the development of dynamic capabilities. An empirical study of Chinese multinational service firms strongly supports these arguments.

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INTRODUCTION

A dynamic capability perspective on multinational enterprises (MNEs) highlights the importance of building core capabilities and leveraging the core competencies of MNEs on a global scale (Al-Aali & Teece, 2014; Luo, 2000; Pitelis & Teece, 2010; Prange & Verdier, 2011). MNEs have the potential to seize global resources and opportunities to upgrade their capabilities considering extended market opportunities and resources (Lundan & Li, 2019; Luo, 2000). However, simultaneously, MNEs must adjust their competencies to address the different demands of local markets (Hamel & Parahalad, 1989; Teece, 2010). Previous studies have acknowledged that the global environment is a source of MNE dynamic capabilities (Lundan & Li, 2019; Luo, 2000; Zahra & George 2002; Zollo & Winter, 2002). However, minimal attention has been paid to internalizing external sources of knowledge in developing MNE dynamic capabilities. The present study aims to demonstrate



theoretically and empirically the help of global demand heterogeneity, an important aspect of the global demand environment, in developing dynamic capabilities.

Global demand heterogeneity is defined here as differences in the segments of global consumers with regard to the benefits they seek or their responses to products and services. This aspect captures heterogeneous customer groups embedded under different institutional environments in various countries with diverse preferences toward products or services (Hoenen & Kostova, 2015; Luo & Park, 2001; Siqueira, Priem, & Parente, 2015). Global demand heterogeneity is associated with the global integration and local responsiveness of MNEs because they integrate the overlap in customer preferences across countries to build global competencies and deploy resources to adapt products and services in accordance with the size and preference differences of each foreign market. Although achieving global integration and local responsiveness has benefits, the limited organizational capability of MNEs is a critical constraint (Bartlett & Ghoshal, 1989; Prahalad & Doz, 1987). In the present study, we combine the integration–responsiveness framework with the dynamic capability perspective (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997; Zollo & Winter, 2002). Moreover, we conceptualize the MNE dynamic capabilities as *learning* and *adaptation* capabilities that address the pressures of global integration and local responsiveness when facing the complex global demand environment.

The demand-side perspective, which looks outside the focal organization toward consumers and product markets to explain managers' strategic decisions, suggests that customers can exhibit a push-and-pull effect on organizational change (Priem, Li, & Carr, 2012; Ye, Priem, & Alshwer, 2012). With the increase in global demand heterogeneity, firms are compelled to sense changes, understand and interpret divergent markets, and make adjustments in each market. Moreover, increased heterogeneous demand provides ample opportunities for firms to learn, and the potential combination of diverse knowledge precipitates a potential renewal and upgrading of their internal capabilities. Considering the dual effects, we are expecting a positive associative relationship between global demand heterogeneity and the learning and adaptation capabilities of MNEs. In addition, we propose that a firm's human capital including the managerial international experience

and employee human capital, as a firm's distinctive resources, strengthen the positive association between global demand heterogeneity and dynamic capabilities.

The results of an empirical study on Chinese multinational service firms strongly support these arguments. The present study aims to realize the following contributions. First, our study theoretically and empirically reveals the help of global demand heterogeneity in developing MNE dynamic capabilities, thereby enriching our understanding of the internalization of external opportunity into dynamic capabilities (Luo, 2000; Nonaka, 1994; Zollo & Winter, 2002). Second, we link the extant literature on dynamic capabilities with the demand-side perspective. In addition to the factors identified in prior research (Schilke, Hu, & Helfat, 2018), customers can also be an important source that stimulates the development of MNE dynamic capabilities. This finding contributes to the growing literature on the role of demand-side research in international business research (e.g., Xie & Li, 2015; Zhang, Zhong, & Makino, 2015).

THEORY AND HYPOTHESES

Dynamic Capabilities of MNEs

We conceptualize dynamic capabilities as a firm's learning and adaptation to address global integration and local responsiveness. Our conceptualization of the dynamic capabilities of MNEs is twofold. First, our definition is based largely on previous work on dynamic capabilities, and we regard learning associated with a firm's core competency and adaptation associated with the modification of the core competency to fit different contexts. Learning here includes activities, such as learning-by-doing and deliberate learning (Zollo & Winter, 2002). Learning is also associated with the capability for learning that facilitates organizational and strategic change (Schilke, 2014), as well as modifies a firm's resource bases (Teece et al., 1997). Thus, learning in our conceptualization focuses on the processes and outcomes of organizational learning.

Second, we focus on the global context. While MNEs are exposed to new markets, ideas from new cultures, and access to new resources, competitors, and markets (Luo, 2000: 358), the global integration of these resources requires a firm to sense, seize, and reconfigure all opportunities (Teece, 2007), which are associated with learning. Sensing



opportunities require firms to engage in a constant search to identify opportunities (Nelson & Winter, 1982). Seizing opportunities is associated with a firm's learning capability to interpret external knowledge (Teece, 2007). Transforming also requires a firm to assimilate and apply knowledge (Nonaka & Toyama, 2007). Therefore, learning is at the core of the dynamic capabilities of MNEs. In addition, successful learning enables firms to integrate global resources and knowledge to upgrade the capability of MNEs (Luo, 2000). Furthermore, in terms of adaptation, we highlight the ability of MNEs to address or cater to local demands. While learning can address global integration, adaptation requires MNEs to modify their existing routines or resource bases flexibly to address the changing local requirements (Wan, 2005; Whitley, Morgan, Kelly, & Sharpe, 2003).

Global Demand Heterogeneity

Customers are a source of a firm's competitive advantage (Adner & Zemsky, 2006; Priem et al., 2012). A central premise of the strategic management research from the demand-side perspective is that firm strategies must be supported by broadly considering the sources and extent of customer values and demand (Adner & Zemsky, 2006; Priem, 2007; Schmidt & Keil, 2013). Customers can demonstrate pull and push effects on a firm's business activities. Under the pull perspective, considerable literature on learning from customers is available (e.g., Bogers, Afuah, & Bastian, 2010; Nambisan & Baron, 2010). Customers are a source of external learning (De Loecker, 2011; Salomon, 2006) because customers can provide the knowledge associated with low costs, timely updates, and enhanced accuracy (Bowen, Seihl, & Schneider, 1989). Customer-specific knowledge creates many opportunities for firms to add value to their customers, which in turn contribute to the firms' competitive advantage (Chatain & Zemsky, 2007; Priem, 2007). By contrast, the customer push perspective highlights the forces from customers to make changes on the firm operations or even strategy. For example, recent studies have shown that client diversification frequently stimulates firms' diversifications given the requirement for customer synergy (Mawdsley & Somaya, 2018; Ye et al., 2012).

Global demand heterogeneity is associated with substantial knowledge available to MNEs: Customers from different geographies and nations frequently hold different ideas and knowledge,

and the recombination of diverse knowledge can increase a firm's potential to update their capabilities, such as innovative capability (Wang, Chen, & Chang, 2011; Xie & Li, 2018). However, to identify and even shape the opportunities associated with heterogeneous demands, MNEs must constantly scan and search for ideas (Almeida & Phene, 2004; Song, Asakawa, & Chu, 2011). In practice, such scanning and searching activities are reflected in firms' investment in research activities toward the understanding of global environments, such as a particular culture and language of a nation, and competitors and other business participants in a global ecosystem. To address or seize opportunities further, MNEs are stimulated to engage in deliberate learning to enable them to decode external knowledge (Nonaka, 1994; Zollo & Winter, 2002).

In addition, the increase in global demand heterogeneity consistently challenges a firm's existing routines and stimulates it to modify its routine for local adaptation. Similar transaction exchanges that share a common language and core knowledge can lead to economies of scale and scope of routines (Conner, 1991). By contrast, dissimilar transactions require a firm to consistently modify its routines to tailor each individual transaction to local tastes and preferences. Thus, with an increase in global demand heterogeneity, a firm must modify its routines frequently to address customer demands. For example, in knowledge-intensive buyer-supplier relationships, customers are likely to drive adaptation because they are responsible for delivering value to end-customers; this feature is emphasized in the demand-side perspective (Priem, 2007; Priem & Swink, 2012). In this end, the firm's adaptation capability is improved. Thus,

Hypothesis 1: Global demand heterogeneity faced by MNEs will be positively associated with their dynamic capability development, *ceteris paribus*.

Helping Role of Human Capital

From the demand side, customers provide ample opportunities and pressures for MNEs to upgrade their capabilities. However, from the supply side, firms are heterogeneous in their absorptive capability to acquire, assimilate, transform, and reconfigure the external knowledge and pressures into developing firms' dynamic capabilities (Zahra & George, 2002). For example, external knowledge is frequently associated with the "liability of outsidership," which requires firms to have the capability to



decode applications (Vahlne, Schweizer, & Johanson, 2012). We focus on a firm's human capital at the managerial and employee levels to illustrate the method through which human capital further internalizes the demand-side knowledge and pressures into developing dynamic capabilities.

Managerial international experience Managerial international experience refers to the top managers' exposures to the foreign markets, examples including: the extent to which the manager had engaged in foreign travel; the number of languages spoken by the manager; and whether the top decision-maker was born abroad, lived abroad or worked abroad (Miesenbock, 1988; Reid, 1981). International experience equips managers with improved intercultural communication and cognitive skills (Black, Mendenhall, & Oddou, 1991; Selmer, 2002), which are valuable for sensing, seizing, and transforming external knowledge (Kogut & Zander, 1993; Teece, 2007). Experience yields capability. Thus, when the managerial international experience is high, managers are keen at sensing global demands, translating and interpreting them, and further integrating them into the upgrading of a firm's internal capability (Daily, Certo, & Dalton, 2000; Le & Kroll, 2017). In addition, managerial international experience is associated with high cognitive skills, thereby enabling firms to sense the requirement for change to address demands more quickly than their competitors (Takeuchi, Tesluk, Yun, & Lepeak, 2005; Zahra, Korri, & Yu, 2005).

By contrast, when the managerial international experience is low, managers may not be vigilant in terms of opportunities and threats. Even when faced with diverse knowledge, top managers are unlikely to sense opportunities and threats. As such, they will be unable to transform opportunities and threats into further developing their firms' knowledge base. Similarly, when faced with the requirement to adapt, firms may be minimally capable of addressing an issue (Lee & Sukoco, 2010). Therefore,

Hypothesis 2: The positive association between a MNE's global demand heterogeneity and the development of its dynamic capabilities is stronger when the MNE has higher managerial international experience.

Employee human capital Decision-makers play a crucial role in sensing market opportunities, whereas employees are required to seize and transform external knowledge to implement integration

and adaptation because they are a primary repository of firm-specific knowledge (Lado & Wilson, 1994; Prescott & Visscher, 1980; Tomer, 1987). Employee human capital, which refers to knowledge, skills, and expertise of employees (Becker, 1964; Schultz, 1971), is associated with a firm's capability to manage the demand environment. When the human capital of employees is high, employees tend to have a favorable understanding of external customer knowledge and can integrate it into their existing knowledge through teamwork among the different subunits of an MNE (Lengnick-Hall & Lengnick-Hall, 2003). In addition, high employee human capital is frequently associated with high flexibility, and employees can adapt to changes in different global contexts and the various work activities (Dyer & Shafer, 1999).

By contrast, when employee human capital is low, misunderstanding and conflicts within and across subunits can occur (Brown & Duguid, 1991; Walsh & Ungson, 1991). Therefore, assimilating external customer knowledge into developing dynamic capabilities is hampered. In addition, low human capital is frequently associated with inertia (Lepak & Snell, 1999), thus impeding quick responses to local demands. Therefore,

Hypothesis 3: The positive association between a MNE's global demand heterogeneity and the development of its dynamic capabilities is stronger when the MNE has higher employee human capital.

DATA AND METHODS

Data and Sample

We tested our hypotheses by collecting data from a sample of Chinese firms that offer cross-border services to customers in multiple countries. We conducted our research in 2009, that is, when the National Bureau of Statistics of China started formally collecting data on the internationalization of service firms. We collected our data in Jiangsu Province, whose GDP has been ranking in the top three among all provinces in China for decades and whose service firms are representative of those in China. We first identified and acquired a sample of service MNEs from a comprehensive database compiled and provided by the Jiangsu Provincial Commission of Foreign Economic Relations and Trade, which is in charge of foreign economic affairs for all MNEs in the province. We established the



following criteria to select our samples. First, the firms must possess full control, thus excluding foreign firms and joint ventures. This criterion mitigates the complexity of cross-cultural management (Luo, Shenkar, & Nyaw, 2002). Second, given that we are interested in firms that provide services to global customers, we excluded firms with only domestic customers. Finally, we obtained 1786 firms that satisfied our criteria for location, which is across nine cities in Jiangsu Province. On the basis of the GDP weight of each city over that of the province, we randomly selected 500 firms in the nine cities for further investigation and asked the government agency for assistance. Among the 500 firms, 237 firms agreed to participate, thereby yielding a response rate of 47.4%.

For each firm, we developed three questionnaires for three senior managers, that is, the CEO, CFO, and another senior manager. In the surveys, the CEOs were asked to provide information on strategic importance and upper echelons of the firm. The CFO provided information about certain objective indicators (e.g., return on assets) and perceived internationalization performance. Another senior manager, such as the corporate operation or sales manager, was also asked about the firm's operational issues. "Appendix" presents the respondents' answers about our key variables. By deleting the answers with missing values, we obtained 167 observations.

Dependent Variable

Dynamic capabilities We operationalized dynamic capabilities by combining innovative capability and strategic flexibility. Empirical works on dynamic capabilities require focusing on specific functional activities to capture dynamic capabilities (Schilke, 2014; Schilke et al., 2018). A firm's learning can be reflected in many business activities, of which innovation activities (e.g., research and development investment) are the most salient (Cohen & Levinthal, 1989; Hitt, Hoskisson, & Kim, 1997). We operationalized adaptation as a strategic flexibility, which has been considered a complementary dynamic capability (Eisenhardt & Martin, 2000) that enables MNEs to overcome inertia and quickly respond to varying contexts by adapting their core competencies (Bock, Opsahl, George, & Gann, 2012; Brouthers, Brouthers, & Werner, 2008).

Innovative capability emphasizes a service firm's capacity and capability to innovate. Three items were adapted from the innovativeness measure used by Lumpkin and Dess (1996). The reliability

coefficient is 0.83. Strategic flexibility emphasizes an MNE's ability to interact with and adapt to the changing environment. Three items were adapted from Ybarra and Wiersema (1999) and Wang and Lo (2003). The reliability coefficient is 0.76. Given that dynamic capabilities pertain to a combination of innovation capability and strategic flexibility, we also calculated their weights in accordance with the loading using factor analysis and then summarized them as a proxy for measuring dynamic capabilities. The reliability coefficient is 0.82.

Independent Variables

Global demand heterogeneity Global demand heterogeneity has two main aspects. First, customers in different countries may have distinct tastes or preferences for products or services given their diverse cultural backgrounds. Second, even within the same country, customers may differ in their selections of products or services. Given the two-fold meaning, providing a measure of the global demand heterogeneity that encompasses the two dimensions is difficult. By exploiting the survey, global demand heterogeneity is constructed by asking the CEO and another senior manager about various services demanded by global customers, including not only those demanded by customers within a foreign country but also those demanded by customers from multiple countries. Such a measure is at the perception level. This variable ranges from 1 = very low to 7 = very high.

Moderators

Managerial international experience is established by asking the CEO about the extent of the international experience among the top management team members. This survey item ranges from 1 = very low to 7 = very high.

Employee human capital can be improved by hiring qualified employees and training existing employees to improve their capabilities. Five items were adapted from the measure of Skaggs and Youndt (2004). Example items include "spending more money on training" and "hiring employees with high levels of prior experience." The reliability coefficient is 0.76.

Control Variables

We included numerous control variables to exclude alternative explanations. At the firm level, we first controlled for the *learning orientation* of a firm using five items adapted from Sinkula, Baker, and Noor-dewier (1997) because we expect that learning



orientation is important for a firm's dynamic capabilities. Given that firms that demonstrate favorable financial performance may be capable of upgrading their capabilities, we also included firms' prior financial performance, *return on assets*, measured by the profit over its total asset. We controlled for *firm size* (the natural logarithm of total employees) because large firms have considerable resources to build dynamic capabilities (Drnevich & Kriauciunas, 2011). *Firm age*, which is measured by the number of years since the firm was founded, is expected to negatively affect dynamic capabilities because older firms are subject to organizational inertia, which reduces dynamic capabilities (Lewin & Massini, 2003; Sapienza, Autio, George, & Zahra, 2006). Although our focus is the demand environment, we also controlled for the *competitive intensity* of the task environment. This variable follows a seven-point scale, with 1 denoting least competitive and 7 indicating the most competitive (Zhou, Yim, & Tse, 2005). Considering that the region where a firm is embedded can affect the firm's capability to develop its dynamic capabilities (Cooke, Clifton, & Oleaga, 2005), we also controlled for the *regional economic development*, which is measured by the natural logarithm of the GDP of the city where the firm is located. Finally, we controlled for industry effects to restrict the influence of industries on dynamic capabilities and location dummies to control for the unobservable effects of regions.

RESULTS

Table 1 lists the means, standard deviations, and correlation matrices of all variables used in this study. The average variance inflation factor for our

predictors is lower than 1.22, which is well below the acceptable level of 5, thereby indicating that multicollinearity is not a major concern in our study (O'Brien, 2007).

Table 2 summarizes the results of the ordinary least squares (OLS) estimations for dynamic capabilities. Model 1 includes only the control variables. Model 2 is used to test Hypothesis 1 by arguing that global demand heterogeneity is positively associated with the development of dynamic capabilities. The coefficient estimate of *global demand heterogeneity* is positive and statistically significant ($\beta = 0.12, p < 0.01$), thus supporting Hypothesis 1. In terms of economic magnitude, when global demand heterogeneity increases from its mean minus one standard deviation to its mean plus one standard deviation, dynamic capabilities increase by 65%.

Hypothesis 2 proposes that managerial international experience strengthens the positive relationship between global demand heterogeneity and dynamic capabilities. In Model 3, the coefficient estimate of the interaction between *global demand heterogeneity* and *managerial international experience* is positive and statistically significant ($\beta = 0.02, p < 0.05$), supporting the hypothesis 2. When managerial international experience takes mean minus one standard deviation, dynamic capabilities increase by 27% when global demand heterogeneity increases from its mean minus one standard deviation to its mean plus one standard deviation. However, when the managerial international experience takes the maximum value, dynamic capabilities increase by 34% for the same increase in the global demand heterogeneity.

Table 1 Summary of statistics and correlations

	Mean	S.D.	1	2	3	4	5	6	7	8	9
1 Dynamic capability	5.60	0.85									
2 Global demand heterogeneity	5.38	1.33	0.30								
3 Managerial international experience	5.70	1.47	0.44	0.07							
4 Employee human capital	5.51	0.93	0.21	0.14	0.13						
5 Learning orientation	6.17	0.95	0.29	0.20	0.18	0.46					
6 Return on assets	0.15	0.36	0.04	0.08	0.05	0.10	0.01				
7 Firm size	4.23	1.14	-0.02	-0.01	0.11	-0.02	-0.02	0.11			
8 Firm age	1.90	0.57	-0.01	0.02	-0.06	0.00	0.03	0.05	0.36		
9 Competitive intensity	5.53	1.41	0.20	0.16	0.05	0.25	0.23	-0.04	-0.02	0.05	
10 Regional economic development	9.05	0.56	0.07	0.01	0.27	-0.03	-0.08	-0.04	0.17	0.03	-0.05

Absolute values of correlations greater than 0.16 significant at $p < 0.05$; $N = 167$.

**Table 2** The OLS model predicting the dynamic capabilities

	(1)	(2)	(3)	(4)	(5)
Global demand heterogeneity (H1)		0.12* (0.03)	0.12** (0.03)	0.11** (0.03)	0.11** (0.03)
Global demand heterogeneity × Managerial international experience (H2)			0.02* (0.01)		0.02† (0.01)
Global demand heterogeneity × employee human capital (H3)				0.05* (0.02)	0.05† (0.02)
Managerial international experience	0.24** (0.02)	0.24** (0.03)	0.24** (0.03)	0.24** (0.03)	0.24** (0.03)
Employee human capital	0.02 (0.03)	0.02 (0.02)	0.01 (0.02)	0.01 (0.03)	0.00 (0.03)
Learning orientation	0.07** (0.02)	0.06* (0.02)	0.06* (0.02)	0.06** (0.02)	0.06** (0.02)
Firm size	− 0.05 (0.03)	− 0.05 (0.03)	− 0.05 (0.03)	− 0.05 (0.03)	− 0.05 (0.04)
Firm age	0.05 (0.08)	0.04 (0.08)	0.04 (0.08)	0.03 (0.08)	0.04 (0.07)
Return on assets	0.11 (0.13)	0.06 (0.12)	0.05 (0.12)	0.03 (0.12)	0.03 (0.11)
Competitive intensity	0.09 (0.05)	0.08 (0.04)	0.07 (0.04)	0.08 (0.05)	0.08† (0.04)
Regional market development	0.40 (0.26)	0.46 (0.40)	0.43 (0.40)	0.52 (0.38)	0.50 (0.39)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.49 (2.03)	0.23 (3.35)	0.42 (3.36)	− 0.49 (3.14)	− 0.30 (3.19)
N	167	167	167	167	167
R ²	0.38	0.40	0.41	0.41	0.42

Standard errors in parentheses.

† $p < 0.1$, * $p < 0.05$, ** $p < 0.01$.

Hypothesis 3 suggests that employee human capital strengthens the positive relationship between global demand heterogeneity and dynamic capabilities. In Model 4, the coefficient estimate of the interaction between *employee human capital* and *global demand heterogeneity* is positive and statistically significant ($\beta = 0.05$, $p < 0.05$), supporting Hypothesis 3. When employee human capital takes its mean minus one standard deviation, dynamic capabilities increase by 33% when global demand heterogeneity increases from its mean minus one standard deviation to its mean plus one standard deviation. However, when employee human capital takes its mean plus one standard deviation, dynamic capabilities increase by 49% for the same increase in global demand heterogeneity.

Common Method Variance

Some of the study variables were reported by one respondent, so they may suffer from common method variance. To mitigate this concern, researchers frequently use post hoc Harman one-factor analysis to check for common method variance (Chang, Witteloostuijn, & Eden, 2010; Fuller, Simmering, Atinc, Atinc, & Babin, 2016; Gaur, Ma, & Ding, 2018). Harman's One Factor Test indicates problematic common method variance if an exploratory factor analysis with all study variables produces eigenvalues suggesting the first factor accounts for more than 50% of the variance among variables (Fuller et al., 2016; Podsakoff & Organ, 1986). Following this, we conducted a principal component factor analysis of all questionnaire-based variables. The variance explained by the first principal component is 19.72%, which does not constitute half of the total variance. Thus,



the test yields neither a single factor nor an overarching factor, suggesting an absence of common method variances (Chang et al., 2010; Livingstone, Nelson, & Barr, 1997).

Supplementary Analysis

Dynamic capabilities can provide firms with a competitive advantage (Teece et al., 1997). Thus, we assume that dynamic capabilities will promote the internationalization performance of MNEs in our context. Following Hult et al. (2008), to measure the internationalization performance, we used a four-item seven-point Likert scale to measure the extent to which the respondents were satisfied with market shares, sales growth, profitability, and return on investment. The reliability coefficient of our measure is 0.95. In an unreported table, the coefficient estimate of *dynamic capabilities* is positive and statistically significant ($\beta = 0.57, p < 0.01$), thus suggesting a positive relationship between dynamic capabilities and internationalization performance.

Robustness Check

First, although our study emphasizes the positive side of global demand heterogeneity, it may have a disadvantage. An excessive variation in demand may not constantly be beneficial for developing dynamic capabilities. One reason is that heterogeneity increases ambiguity, which may distract a firm from learning from its customers. In addition, excessive heterogeneity requires MNEs to adapt continuously and thus may even disrupt the firm's core activities and raise uncertainty in predicting future environmental changes (Bowen & Jones, 1986). Ultimately, the chances of upgrading capabilities are destroyed. Therefore, we tested whether an inverted U-shaped association exists between global demand heterogeneity and dynamic capabilities. However, we did not find this inverted U-shaped relationship from the data. This outcome may be due to the fact that global service firms in China were at an early stage of expansion, and global demand heterogeneity had not yet reached a turning point that may inhibit the development of dynamic capabilities. Future research may test this possible inverted U-shaped relationship using other datasets.

Second, global demand heterogeneity is measured by the subjective reporting of managers. Thus, we attempted to verify the relationship with another measure using a country scope, that is, the number of countries to which the firms provide

their services. Country scope is a typical type of global demand heterogeneity, which indicates that customers in different countries may have distinct tastes and preferences for products/services. We determined a positive and significant relationship between country scope and dynamic capabilities.

Third, given that an omitted third variable may drive the positive association that we proposed between global demand heterogeneity and dynamic capabilities, we applied the control function method to mitigate endogeneity concerns (Wooldridge, 2015). We have seven industries in our sample; thus, we used *average global demand heterogeneity* at the industry level in the first stage. We expect that this industry-level heterogeneity may affect the global demand heterogeneity of individual firms but not their dynamic capabilities. The correlation between industry-level heterogeneity and individual global demand heterogeneity is 0.16, but the correlation between industry-level heterogeneity and dynamic capabilities is 0.002, which satisfies our expectation. In an unreported table, we found a positive relationship between global demand heterogeneity and dynamic capabilities with the control functions.

DISCUSSION AND CONCLUSION

What drives the dynamic capabilities of multinational firms? Previous research has identified that firm-specific advantages (FSAs) can be combined with the development of dynamic capabilities (Rugman & Verbeke, 2001, 2003). Our study reveals that the demand environment is also a source of the dynamic capabilities of MNEs. Our study also makes dynamic capabilities actionable by empirically demonstrating the relationship as we argued, thereby responding to the recent call for additional empirical work on the dynamic capabilities of multinationals (Lundan & Li, 2019). Associated with our research context, our moderators, human capital, are typical FSAs that can help transform the demand-side opportunities and pressures into the development of dynamic capabilities. Thus, our findings suggest that the dynamic capabilities of MNEs go beyond the FSAs and are a combination of internal resources and external opportunities/forces. Our study has the potential to enrich subsequent literature and has timely and important managerial implications.

We contribute to international business research by bringing the demand-side perspective into the discussion of the dynamic capabilities of MNEs.



The conventional application of internalization theory has extensively concentrated on shaping internalization by the requirement to deploy and exploit FSAs. However, demand-side research has recognized the role of consumers' heterogeneity of demand as an important contributor to firm heterogeneity (Priem, Butler, & Li, 2013: 478). While MNEs face a more complex but resourceful demand environment, research on the global demand environment must have the potential to enrich our understanding of the capability upgrading and renewal of MNEs. Unexpectedly, limited research has been conducted to explicate the role of the demand environment. Nevertheless, Teece (2014) has called for the research of market heterogeneity including the demand heterogeneity in developing the dynamic capabilities of MNEs. Our study is among the pioneers to demonstrate the benefits of the global demands faced by MNEs in the learning and adaptation of MNEs.

While MNEs are born facing a complex environment, existing literature still portrays dynamic capabilities as firm-level entities premised on organizational routines (Helfat et al., 2007; Helfat & Winter, 2011). However, routinized, history-dependent processes are not constantly capable of reconfiguring resources to adapt to future changes (Abell, Felin, & Foss, 2008; Teece, 2012). Previous studies have shown that micro-level factors, such as employees, can stimulate a firm's dynamism in terms of creativity and innovation (Helfat & Peteraf, 2015). However, the demand-side perspective provides another explanation. That is, customers are a source of knowledge and pressures for firms to renew their competencies and demonstrate flexibility. While we have argued customer pull and push effects in developing dynamic capabilities, future research may further differentiate this dual effect on developing dynamic capabilities. While learning and adaptation can be simultaneous, which is an assumption of our argument, our supplementary analysis has implied that in certain circumstances, learning and adaptation might be competing. Thus, future research can be also promising by considering the contextual influences on the relationship between learning and adaptation, and finally the dynamic capabilities.

While our study examines the global demand heterogeneity, the global demand environment is multifaceted and complex. Future research may consider other dimensions of the global environment and examine the influence of the demand factors on the MNEs' creation of new resources, as

well as the adjustment of resources to the local environment. For example, an emerging stream of research in strategic management has focused on the influence of the demand characteristics, such as demand variations (Claussen, Essling, & Peukert, 2018) and client diversification (Mawdley & Somaya, 2018), on the firm strategies. All of these findings might be extended into the context of multinational firms, which in turn can contribute to the understanding of the demand-side perspective highlighting the role of customers in a firm's competitive advantage (Priem, 2007).

Conventional knowledge suggests that managers of MNEs must exploit and invest in FSA resources to upgrade their capabilities. In addition, our findings suggest that managers at the headquarter and subsidiary levels must also be attentive to their customers' demands and incorporate the customer into the consideration of the firm's strategy. Focus on the customer is crucial, especially for professional service firms. A typical and common practice for them is to establish a research team on the collection and repository of customer data at different levels to obtain customer information on the global market. For example, the 10th annual Global Consumer Insights Survey (GCIS) of PwC, which gathers the sentiments of more than 21,000 online consumers in 27 territories, shows that, in addition to the traditional return on investment (ROI) metrics used to determine a company's success, we must introduce another metric, one with a laser focus on customer experience, that is, return on experience. In this concept, customer information is not only valuable to the professional service firm but also to other firms. With the popularity of new business models that enable customers as innovators, assimilating customer demands into the firm's strategy is vital to its success.

We also aim to acknowledge a few limitations of our study. First, we used a survey approach to measure our key constructs. However, the method suffers from subjective reporting biases of managers. Given that the world is currently in the big data era, future research may collect detailed information on customers and use objective data to measure key constructs, such as global demand heterogeneity. Second, our cross-sectional data sample is relatively small and may not represent the overall situation of MNEs. Nevertheless, our conceptual model is applicable to manufacturing firms, although we used service industry data. Future research may utilize big data to conduct a



longitudinal study in the manufacturing industry to further test our theory.

In conclusion, we hope that this study will spur a renaissance of research that explores the fertile intersection of demand-side research and dynamic capabilities of multinationals. In the global environment that is constantly evolving, firms and managers must actively consider the changes in customer preferences and requirements. Moreover, they must adapt their own strategies to seize the opportunities and address the threats and thus finally achieve competitive advantage.

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NOTES

¹Although increasing global demand heterogeneity helps improve the adaptation capability, excess heterogeneity might distract firms from learning to build the core competence. We may need to take

account of the net effect of global demand heterogeneity on learning and adaptation. Thus, we will conduct a supplementary analysis later and extend this argument in the discussion section.

²A total of 167 observations are obtained for the analysis across the following industries: computer and software development, testing, and consulting (53.29%); information (28.74%); industrial engineering (7.78%); telecommunications (0.6%); animation and movie design (4.19%); logistics engineering (4.19%); and research and development and testing (1.2%).

³Tables mentioned in the supplementary analysis and robustness check are all available upon request.

⁴The control function method is similar to the two-stage least squares regressions. The endogenous explanatory variable tends to be exogenous in the second-stage equation after including the appropriate control functions. The residual from the first-stage regression with excluded instrumental variables frequently serves as the control functions that have exogenous variations. In essence, finding an exogenous instrumental variable is the key to implementing the control function method.

⁵<https://www.pwc.com/gx/en/industries/consumer-markets/consumer-insights-survey.html>.

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APPENDIX: KEY CONSTRUCT AND MEASUREMENT

Construct	Measurement	Respondents
Dynamic capabilities	Combination of innovation capability and strategic flexibility	
<i>Innovative capability</i>	<i>In terms of the following aspects, please indicate the extent to which your firm makes an effort</i> To spend heavily (well above your industry average) on research and development (R&D) To introduce numerous new products/services to the market To lead the development of breakthrough innovations in its industry	CEO
1 = "none at all" 7 = "to an extreme extent"		
<i>Strategic flexibility</i>	<i>In terms of the following aspects, please indicate the extent to which your firm is capable of adjusting itself</i> Capability of redirecting strategic positioning quickly and effectively Capability of redeploying strategic resources Capability of responding to environmental changes, such as customers' demands and competitors' actions	CEO
1 = "not capable at all" 7 = "completely capable"		
<i>Global demand heterogeneity</i>	<i>In terms of the following aspects, please indicate the extent to which your firm is equipped with the feature</i> Great difference in global customer demands	CEO Senior manager
1 = "not at all" 7 = "to an extreme extent"		
<i>Managerial international experience</i>	<i>In terms of the following aspects, please indicate the extent to which your firm is equipped with the feature</i> The top management team has abundant international experience	Senior manager
1 = "not at all" 7 = "to an extreme extent"		
<i>Employee Human capital</i>	<i>In terms of the following aspects, please indicate the extent to which your firm is equipped with the feature relative to competitors</i> Spending more money per employee on training	Senior manager
1 = "not at all" 7 = "to an extreme extent"		

Construct	Measurement	Respondents
	Spending more hours annually training employees Hiring employees with high levels of prior experience Hiring employees with high levels of prior training Hiring employees with high levels of education	
<i>Internationalization performance</i>	This market is too competitive; price wars frequently occur. Overseas market share Overseas sales growth Overseas profitability Overseas return on investment	CEO CFO
1 = "not satisfied at all" 7 = "completely satisfied"		

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