Exploratory and exploitative OFDI from emerging markets: Impacts on firm performance

ABSTRACT

This study identifies exploratory and exploitative OFDI as two distinct approaches for emerging market (EM) firms to overcome their liability of foreignness in overseas markets. It assesses the performance impacts of both types of OFDI through investigating three sets of questions. (1) What are the differential impacts of exploratory and exploitative OFDI, and how long do they persist? (2) How do industry factors in the home country, including technological turbulence and competitive intensity, moderate these effects? And (3) how can firms balance these two types of OFDI across time? Based on multi-sourced data of 766 Chinese firms during 2008–2015, the results show that both types of OFDI promote performance, yet the positive effect of exploratory OFDI lasts longer than that of exploitative OFDI. Moreover, technological turbulence strengthens the effect of exploratory OFDI and weakens that of exploitative OFDI, but competitive intensity strengthens the effect of exploitative OFDI only. Finally, sequential ambidexterity improves firm performance through exploratory–exploitative OFDI process.

Keywords: Exploratory OFDI, Exploitative OFDI, Technological Turbulence, Competitive Intensity, Sequential Ambidexterity, Emerging Market (EM)

1. INTRODUCTION

As globalization accelerates, more and more firms from emerging markets (EMs) are engaging in outward foreign direct investment (OFDI). Data from the United Nations Conference on Trade and Development (UNCTD) show that FDI outflow stock from Brazil, Russia, India, China, and South Africa (BRICS) has almost quadrupled in the past decade—from $564.8 billion in 2007 to $2,016.2 billion in 2016 (UNCTAD, 2008, 2017). Previous studies have investigated why (Buckley, Clegg, Cross, Liu, Voss & Zheng, 2007; Li, Li, & Shapiro, 2012), where (Lu, Liu, Wright & Filatotchev, 2014; Ramasamy, Yeung, & Laforet, 2012), and how firms from EMs conduct OFDI (Barkema & Drogendijk, 2007; Luo, Xue, & Han, 2010). However, as EM firms' OFDI develops, the activities become both deeply embedded and wide ranging. Given this breadth and depth, both managers and academics question the accountability of OFDI activities, that is, whether and how such activities advance EM firms' performance outcomes (Berry & Kaul, 2016; Lyles, Li, & Yan, 2014).

Liability of foreignness (LOF)—the costs of doing business abroad—is one of the most important factor that shapes the performance consequences of EM firms' OFDI (Clegg, Lin, Voss, Yen, & Shih, 2016; Lyles et al., 2014). The international business (IB) literature has long recognized that foreign firms encounter extra costs compared to local players, as a result of "the unfamiliarity of the environment, from cultural, political, and economic differences, and from the need for coordination across geographic distance, among other factors" (Zaheer, 1995, p. 341). Firms from developed economies often overcome the LOF by importing firm-specific advantages (FSAs) to host countries (Hotho, Lyles, & Easterby-Smith, 2015). When FSAs such as reputable brands and technological expertise generate superior value after offsetting the extra costs caused by the LOF, then OFDI activities benefit the overall firm performance. However, such FSA is often unavailable to EM firms (Gaur, Ma, & Ding, 2018). Instead, they need to sharpen their learning capability and acquire new knowledge from the host environment to overcome the LOF and realize the potential of OFDI in improving performance.

Borrowing from March's (1991) pioneering work on organizational learning, which differentiates between exploitation as improving on existing components, technological trajectories, and exploration as searching for new capability and shifting to a different technological trajectory, we

suggest that EM firms use exploitative and exploratory learning to accumulate knowledge about international markets. Organizational learning is essential for firms to build their knowledge bases about a specific domain. They enter new markets to quickly expand their scope of knowledge (i.e., exploration) or enter familiar host markets that the firms have entered previously to draw from and refine their knowledge bases (i.e., exploitation, see, Barkema & Drogendijk, 2007). Prior research has found that firms prefer to engage in exploitation in order to gradually accumulate knowledge about overseas markets, while more recent studies contend that firms strive to learn faster than their competitors through rapidly expanding to diverse host countries (Clegg et al., 2016; Wang, Hong, Kafouros, & Wright, 2012). This phenomenon is particularly salient among EM firms, because these firms tend to leapfrog beyond their status as newcomers. Therefore, they may engage in both exploitative and exploratory learning to accumulate their knowledge about international markets.

Despite the importance of both exploitation and exploration in organizational learning, limited empirical research has considered these in differentiating different types of OFDI. Previous studies mostly measure OFDI in a holistic manner, either as the total number of foreign subsidiaries newly established in a given year (e.g., Clegg et al., 2016; Xia, Ma, Lu, & Yiu, 2014; Ramasamy et al., 2012), or as the number of initial subsidiaries established in a new overseas market (e.g., Kim, Hoskisson, & Lee, 2015; Lu & Beamish, 2001). However, these holistic OFDI measures do not reflect different learning patterns of EM firms in their international expansion and, hence, findings about OFDI's performance effects in the literature may be inconclusive and incomplete. Therefore, in this study, our first research objective is to address the lack of distinction between different types of OFDI based on their patterns of learning. In particular, we operationalize OFDI using two distinct but complementary measures: exploratory OFDI and exploitative OFDI. *Exploratory OFDI* is the extent to which firms explore entirely new markets by establishing new subsidiaries, while *exploitative OFDI* refers to the extent to which firms exploit markets they have already entered by establishing additional new subsidiaries (Barkema & Drogendijk, 2007). We argue that it is important to distinguish these two types of OFDI, because they reflect two different learning patterns of EM firms to overcome the LOF. The first is to explore new markets to upgrade firms' knowledge bases about international markets, but the second is to exploit existing knowledge of particular markets. By

distinguishing them, we aim to gain a more nuanced understanding about the differential impacts of different types of OFDI on firm performance over different time spans in EMs.

Moreover, previous research on the OFDI-performance link focuses on cross-country differences using proxies for institutional distance (e.g., Hoorn & Maseland, 2016) or cultural distance (e.g., Asmussen & Goerzen, 2013) between host and home countries, with limited attention to the influence of home country characteristics (for an exception, see Luo & Wang, 2012). Departing from the extant literature, our study focuses on the industry characteristics including technological turbulence and competitive intensity in the home country, and argues that they play important roles in how OFDI activities impact firm performance. To a great extent, EM firms expand to foreign countries to upgrade their competitiveness through acquiring valuable assets that are not available in their home markets. Whether these firms can effectively identify, acquire, and channel these assets to home countries heavily depends on the process of learning in OFDI. Firms have different resource demands and, hence, different learning patterns when they are situated in different industry conditions. Matching industry features with firms' learning patterns in overseas markets is therefore important for firms to realize the performance benefits of their OFDI activities. We adopt an industry-based view and argue that technological and competitive conditions of the home market affect firms' resource demands, changing their learning patterns in overseas markets and thereby varying the effectiveness of different types of OFDI in boosting the overall firm performance. By delineating the moderating effects of technological turbulence and competitive intensity, our second research objective is to contribute to the understanding of how industry conditions in the home country affect EM firms' gain from OFDI.

Finally, according to the ambidexterity literature, balancing exploration and exploitation benefits firm performance (O'Reilly & Tushman, 2013; Venkatraman, Lee, & Iyer, 2007). Though this ambidexterity hypothesis has been widely tested in various contexts like technology development and alliance formation, the existing literature does not clearly articulate how EM firms balance and capture value from different types of OFDI to achieve long-term success. In this study, we posit a recursive and circular relationship between exploratory and exploitative OFDI. We empirically examine the performance impact of two kinds of sequential ambidexterity, which we view as the joint

effect of exploratory OFDI at time $t - 1$ and exploitative OFDI at time t and that of exploitative OFDI at time $t - 1$ and exploratory OFDI at time t. While the ambidexterity perspective has been conceptually explored in the IB literature relating to EM firms (e.g., Luo & Rui, 2009), there is little empirical research to validate performance impact. As such, our third objective is to adopt a dynamic and co-evolutionary perspective to examine the performance effect of sequential ambidexterity between exploratory and exploitative OFDI.

In sum, we have three research questions.

1. Do exploratory OFDI and exploitative OFDI differ in affecting EM firm's overall performance across different time spans?
2. When do these two types of OFDI matter more or less, given different technological and competitive situations in home-country industry environments?
3. How can these two types of OFDI be sequentially balanced to enhance EM firm's overall performance?

To answer these questions, we draw from multiple, large-scale databases. Using China as the empirical context, we first obtain data for 766 Chinese listed manufacturing firms from 2008 to 2015 from the China Stock Market Accounting Research (CSMAR) database. We then match the data with the WIND database on R&D investment and firm performance. We supplement the data with measures of industry competitive intensity from China Statistical Yearbooks of various years and assorted institutional distance data from the World Bank. We select China as our empirical setting because it is experiencing a transition period and its firms have engaged in OFDI at different stages (Wang, Gu, Tse, & Yim, 2013; Xia et al., 2014). This context enables us to investigate the performance effects of different categories of OFDI, as well as derive meaningful implications for firms from other EMs.

2. THEORY AND HYPOTHESES

2.1. The LOF and exploratory and exploitative OFDI from EMs

IB scholars have long theorized that foreign firms encounter higher costs than local players when they do business in overseas markets. This 'liability of foreignness' arises from foreign firms' lack of familiarity with the local environment (Zaheer, 1995, p. 341). LOF occurs when firms enter a new

market and this basic assumption should hold regardless of the economic development level of the target country (Johanson & Vahlne, 2009). Existing literature indicates that not only firms entering developed countries encounter LOF (Barkema & Drogendijk, 2007; Delios, 2011), firms entering developing countries also suffer from it (Hsu, Chen, & Caskey, 2017; Zhang & Pezeshkan, 2016). Thus, no matter whether EM firms make investments in a new developed or a new developing country, they will face LOF due to difference between home and host countries. In fact, firms can only obtain extra gains from their OFDI activities after compensating for additional costs stemming from LOF in overseas markets. As such, how firms can overcome the LOF has been identified as an important research question in the IB literature (Asmussen & Goerzen, 2013). Two primary approaches have been proposed to mitigate the LOF. One is to import home-country strength to the host environment, and the other is to reduce unfamiliarity through learning. The first approach suggests that firms need to possess sufficiently high FSAs to offset the LOF, whereas the second approach emphasizes that firms need to learn about the local environment. Existing studies have highlighted the importance of leveraging FSAs in host countries to overcome the LOF (Gaur et al., 2018; Theodosiou, Kehagias, & Katsikea, 2012). When foreign firms have strong FSAs, which are scarce in host countries, there is relatively less need for them to engage in an extensive learning process in the local environment. For example, Nike has leveraged its reputable brand name as the dominant FSA to enter and operate in many Asia markets such as China, Malaysia, and Vietnam, acquiring considerable returns with relatively less effort to learn and adapt to the local business environment. However, because EM firms generally lack adequate FSAs to offset the LOF in overseas markets, they need to engage in substantial learning to develop their international knowledge (Lyles et al., 2014). Once familiar with the local environment of host countries, they are better able to mitigate the LOF in local markets (Delios, 2011; Lu & Beamish, 2004).

The organizational learning literature has suggested exploration and exploitation as two primary approaches for firms to develop their knowledge in a specific domain. According to March's (1991, p. 71) conceptualization, exploration captures processes "involving search, variation, risk taking, experimentation, play, flexibility, discovery, innovation", while exploitation reflects processes of "refinement, choice, production, efficiency, selection, implementation, execution". Put differently,

exploration emphasizes "new" knowledge and experience, whereas exploitation focuses on assets and experience that firms "already have". This categorization of exploration and exploitation has been used widely to understand firms' organizational learning endeavors in various fields. For example, scholars have summarized firms' technological development as exploration and exploitation (Auh & Menguc, 2005; He & Wong, 2004). The development of technologies in areas that are distant from firms' current expertise has been viewed as exploration, while the refinement of firms' existing technologic expertise is described as exploitation. This categorization has also been adopted in the literature investigating how firms learn to select their alliance partners, which considers firms' selection of new and unfamiliar partners as exploration, and the selection of existing partners as exploitation (Lavie & Rosenkopf, 2006; Rothaermel & Deeds, 2004).

We argue that categorizing activities as exploration or exploitation also applies to EM firms' efforts to develop their knowledge bases about international markets, which includes rules, procedures, conventions, and strategies about how to operate in various foreign cultures (Zaheer, 1995). On the one hand, firms can develop their international knowledge bases by conducting exploratory OFDI, which takes place when firms enter a market for the very first time. Exploratory OFDI enables firms to obtain fresh knowledge about institutional, cultural, and market conditions of new markets, and hence broaden firms' knowledge bases about international markets. On the other hand, firms can also engage in exploitative OFDI, which takes place when firms conduct subsequent investments in a certain country. Exploitative OFDI enables firms to gain deeper, more refined knowledge about a particular market. In fact, EM firms engage in both types of learning, which is their approaches to international expansion are both deep and broad (Lyles et al., 2014; Li, Gao, Shen, & Zhang, 2018). In this study, we suggest that both exploratory and exploitative OFDI are important for improving the performance of EM firms; yet, their paths for performance gain are through different mechanisms, for different periods, and subject to different industry conditions.

2.1.1. Exploratory OFDI and firm performance

Exploratory OFDI can benefit the performance of EM firms in three ways. First, exploratory OFDI can enrich and diversify firms' knowledge about how to operate in foreign markets (Barkema & Drogendijk, 2007; Miller & Chen, 1994). Expanding to a new overseas market requires firms to

manage unfamiliar and complicated contexts. To do so, they need to learn and develop new skills to coordinate subsidiaries in different markets, adjust marketing plans to suit local conditions, and optimize cross-country production and value chain activities (Piekkari, Nell, & Ghauri, 2010). From this coordination perspective, exploratory OFDI pushes firms to broaden their knowledge bases about international markets, which helps them address LOF, improve efficiency, and grow performance.

Second, as EM firms are born in places with less developed markets, weaker suppliers, and unsophisticated customers (Madhok & Keyhani, 2012), expanding into new markets allows them to identify and acquire valuable assets from broader overseas markets (Barkema & Drogendijk, 2007). By leveraging these assets, they can improve their image in host countries, reducing the overall level of the LOF they face in international markets. For example, acquiring IBM helps Lenovo take the 'less than world class' image to 'world class' in one quick step, strengthening Lenovo's specific assets and expanding its customer base in the global PC market (Nguyen, Okrend, & Tang, 2013).

Third, exploratory OFDI also helps EM firms overcome the LOF through identifying and seizing opportunities in overseas market. Because exploratory OFDI demands firms conduct substantial local learning, firms interact with local players including governments, suppliers, and customers, and build up local networks (Johanson & Vahlne, 2009). These local networks in host countries will strengthen EM firms' capabilities of identifying local opportunities, and thus, reduce their LOF in foreign markets and promotes their overall firm performance. Notably, some scholars argue that too much explorations carry risks and exploratory OFDI may first increase then decrease firm performance (Capar & Kotabe, 2003; Chen, Jiang, Wang, & Hsu, 2015). However, we argue that "the decrease part" is less likely to appear in EMs, because EM firms are still in infant stage of internationalization (Madhok & Keyhani, 2012; Ramamurti & Hillemann, 2018). Thus, we posit a linear positive effect of exploratory OFDI on firm performance:

H1a: Exploratory OFDI can positively affect firms' overall performance.

2.1.2. Exploitative OFDI and firm performance

Firms from emerging economies can benefit from exploitative OFDI in three ways. First, exploitative OFDI enables firms to gain knowledge about the local environment efficiently. Most firms that

engage in exploitative OFDI already possess certain levels of knowledge and experience about how to manage the local environment (Johanson & Vahlne, 2009). According to the perspective of absorptive capacity (Cohen & Levinthal, 1990), the greater the prior related knowledge of firms, the greater their capacity in learning new knowledge in the same domain. Thus, by establishing additional subsidiaries in the same host countries, EM firms can accumulate local knowledge and experience efficiently (Kim & Aguilier, 2015). They may then suffer less from the LOF in their operations in host countries and are more likely to achieve superior performance.

Second, exploitative OFDI bring EM firms incremental learning benefits. When firms have already established one or more subsidiaries in their target markets, they have acquired significant local knowledge. Because accumulated knowledge about the local environment can be transferred to additional entries, firms undertaking exploitative OFDI incur fewer learning and adaptation costs when setting up new subsidiaries. In addition, firms conducting exploitative OFDI have formed a rough evaluation about the foreign markets during their previous activities, so that subsidiaries established later may be well informed about what resources are valuable, where to find them, and how to obtain them (Johanson & Vahlne 2009). As a result, re-entering existing markets is less risky for firms, because their pre-existing local knowledge is useful in these new subsidiaries. Because exploitative OFDI has the advantage of less learning costs and a greater likelihood of engendering certain outcomes, it has the potential to improve performance of EM firms.

Third, many emerging countries, including China, are gradually shifting from labor-intensive to technology-intensive economies (Luo & Wang, 2012), so the increasing costs of labor and other factor inputs in domestic markets are stimulating firms to improve their operational efficiencies (Luo & Tung, 2018). Among subsidiaries that have already conducted exploration and evaluation of resources in target markets, those established later are better equipped with knowledge about local environment and resources (Johanson & Vahlne 2009). Thus, such firms are more likely to obtain valuable resources at lower cost and operate with higher levels of efficiency. Hence, we hypothesize:

H1b: Exploitative OFDI can positively affect firms' overall performance.

2.1.3. Time horizon of the performance impacts of OFDI

Although we acknowledge that both exploratory and exploitative OFDI can positively affect firm performance, we suggest that the impact periods of these two kinds of OFDI differ. Specifically, compared with exploitative OFDI, exploratory OFDI may have a longer-lasting positive effect on firm performance. First, exploratory OFDI enables firms to access new knowledge about diverse international markets. Through continuously assimilating and integrating new knowledge into their knowledge bases, firms significantly improve their capability to solve various issues related to international expansions and operations. This capability enhancement creates long-lasting benefits for the firm. In contrast, though exploitative OFDI also provides firms with new knowledge through incremental learning, it essentially refines firms' existing knowledge about a given market. It may even cause a firm to be overly focused on known markets, creating rigidity and prevent it from globalizing its business in the long run.

Second, as time passes, firms that engage in exploratory OFDI experience more new markets with more opportunities than those engaging in exploitative OFDI (Li et al., 2012; Lyles et al., 2014). New subsidiaries will become more familiar with their host countries and more embedded in local markets over time. They discover and leverage new opportunities, advance technologies, and adapt products to the new markets so as to continually improve overall firm performance. Exploitative OFDI transpires in a different fashion, leading to a firm's strengthened position in existing markets. However, the return may diminish over time, because firms engaging in exploitative OFDI will find it increasingly difficult to find new opportunities in given markets over and over again.

Third, exploratory OFDI leads to decreasing cost in the long run. Over time, continuous learning across different markets helps firms accumulate local knowledge and sharpen their competences. Thus, it is possible for them to continuously expand market share, improve efficiency, and enhance long-term performance. In contrast, while firms that engage in repeated exploitative OFDI in a given market also gain improved efficiency, the effect is less likely to last over a long period of time because the benefits generated by exploitative OFDI, such as refinement of skills and cost savings based on increased scale, are quickly absorbed by the firm and cannot be carried over to multiple years. Accordingly, we posit:

H1c: The positive effect of exploratory OFDI on firms' overall performance lasts longer than

that of exploitative OFDI.

2.2. Moderating role of industry dynamics

The industry-based view underscores the importance of industry dynamics in determining firms' strategy and performance (Porter, 1985). Firms must adapt to survive and prosper. Scholars have documented the impact of industry characteristics on firm performance (Gu, Hung, & Tse, 2008; Zahra, 1996). However, they have tended to ignore the question of how the industry dynamics of home countries shape firms' OFDI strategies and performance in emerging economies (Luo & Wang, 2012). In fact, the global success of EM firms is highly dependent on their operations in domestic markets; EM firms often use OFDI as a springboard to obtain knowledge and resources to augment their home competitiveness and capabilities (Luo & Tung, 2007). Industry characteristics, which substantially determine the competitive landscape, may alter the value of EM firms' OFDI endeavors and moderate the performance impact of OFDI. We focus our study on technological turbulence and competitive intensity as two key industry variables, mainly because they have long been identified as important variables that can reflect features of industry context and alter the value of firms existing expertise (Dai, Roundy, Chok, Ding, & Byun, 2016; Foss, 1988; Zhou, 2006). For instance, Foss' (1988) research indicates that in intensely competitive markets, FSAs are short-lived as competitive and environmental pressures quickly undermine any resource value or heterogeneity. Following this research, we investigate moderating effects of the two factors on performance outcomes of exploitative and exploratory OFDI.

The concept of *technological turbulence*, defined as the rate of change and the unpredictability of new technologies in an industry, is an especially important component of industry dynamics (Gu et al., 2008). Scholars find that rapid technology changes threaten firms with obsolescence of their core technologies (Dai et al., 2016; Wilden, & Gudergan, 2015). However, they also drive firms to build new competencies. Zahra (1996) suggests that in technologically turbulent environments, characterized by high levels of R&D spending and patenting, there are more technological opportunities than in low-level R&D industries (Uotila, Maula, Keil, & Zahra, 2009). Therefore, the level of industry technological turbulence may influence the value of the resources that firms acquire

from their OFDI activities, thereby altering the performance impacts of the two types of OFDI.

In this study, we argue that high levels of technological turbulence strengthen the positive effect of exploratory OFDI on firm performance. First, when firms reside in highly technologically turbulent industries, their technological competence may rapidly become obsolescent (Dai et al., 2016; Song et al., 2005). Firms hence need fresh learnings in their knowledge bases to update their technological competencies to maintain competitive advantages (Hung & Chou, 2013; Uotila et al., 2009). Engaging in exploratory OFDI enables firms to accumulate knowledge about diverse international markets, through which they can search, absorb, and recombine novel technological components from a wider scope. This also allows firms to be more efficient in innovation, which is critical for firms' survival and success in in technologically turbulent industries.

Second, drawing on their knowledge about different overseas markets, firms can more flexibly coordinate production and marketing activities worldwide (Luo & Tung, 2007) to reduce their vulnerability to technological change. This reduced risk helps them maintain steady growth. Moreover, diverse knowledge about international markets accumulated through exploratory OFDI gives firms valuable information about new technology trends and possible directions for innovation (Barkema & Drogendijk, 2007). It provides firms with greater ability to pursue opportunities and organize resources to build competitive advantage and augment performance. Therefore, we posit that firms in technologically turbulent industries benefit more from exploratory OFDI:

> **H2a:** Technological turbulence strengthens the positive relationship between exploratory OFDI and firms' overall performance.

However, the positive effect of exploitative OFDI on performance may be negatively moderated by technological turbulence. First, when technological development is less predictable, it is critical for firms to update their technological competence to flexibly accommodate to environmental change (Hung & Chou, 2013; Zahra, 1996). Though engaging in exploitative OFDI can help firms efficiently gain knowledge about a specific host country, it also reduces the capacity of firms to look beyond existing markets. At that time, firms may suffer from their limited capacity to identify new technology trends in a broader international context, which is a key element for firms to succeed in technologically turbulent industries. Second, when firms operate in technologically challenging

environments in their domestic markets, they face volatile customer demands (Wilden & Gudergan, 2015). In that situation, firms often need to flexibly coordinate their production and marketing activities internationally to better fulfill domestic customers' demand. EM firms often heavily rely on technologies developed in overseas markets to provide attractive offerings in domestic markets (Luo & Tung, 2007). However, because exploitative OFDI mainly generates and refines knowledge about a specific host country, firms may become inflexible, or even insensitive, to changes in technology, thereby eroding their competitiveness (Leonard-Barton, 1992). We hence have:

> **H2b:** Technological turbulence weakens the positive relationship between exploitative OFDI and firms' overall performance.

The concept of *competitive intensity* refers to situations in which competition is fierce because of the number of competitors in the market and the lack of potential opportunities for further growth; it is a key industry factor contributing to environmental hostility (Auh & Menguc, 2005; Katila & Shane, 2005). Intensified rivalry increases the importance of developing new capabilities and refining existing competencies. In the face of fierce competition, firms have to think creatively to innovate, explore new markets (Auh & Menguc, 2005), conserve resources, and improve efficiency by redeploying existing resources and changing business portfolios (Zahra, 1996). Extensive research on the impact of competition suggests that competition can pressure firms to improve efficiency and innovation (Beersma, Hollenbeck, Humphrey, Moon, Conlon, & Ilgen, 2003; Luo & Wang, 2012). Some scholars suggest that firms should engage in more entrepreneurial activities, such as innovation, exploration, and strategy renewal, to combat intensified competition (Martin & Javalgi, 2016). Others suggest that fierce competition stimulates firms to transform and make use of existing resources for improved efficiency (Ju & Zhao, 2009; Peng, Li, Xie, & Su, 2010). In the context of our study, we argue that competitive intensity strengthens the positive impacts of both exploratory OFDI and exploitative OFDI on overall firm performance.

Competitive intensity may enhance the performance benefits of exploratory OFDI and exploitative OFDI. First, firms within the same industry often compete for similar resources and offer comparable products or services (Xia et al., 2014). When domestic competitive intensity is low, there are abundant resources in the domestic market and the market potential is large; it is easy for firms to

expand or maintain advantage (Katila & Shane, 2005). However, when industry competition intensifies, numerous firms spring up and the limited resources in the domestic market cannot satisfy all firms' needs. Therefore, to maintain competitive advantage, it is important for firms to possess alternative access to resources (Beersma et al., 2003). Exploratory OFDI can offer firms knowledge about how to embrace abundant resources from new markets (Luo & Tung, 2007), whereas exploitative OFDI can endow firms refined knowledge about a specific host country, by which firms can escape from the competition over resources in domestic markets and acquire resources at a lower cost from existing overseas markets (Buckley et al., 2007; Rasiah, Gammeltoft, & Jiang, 2010). Because of the amplified value of resources in host markets, the positive performance effects of both types of OFDI are strengthened.

Second, whether firms can effectively deal with competition moves initiated by rivals is critical for their survival and success in highly competing settings (Beersma et al., 2003; Luo & Wang, 2012). Exploratory OFDI enables firms to learn about how to handle competition in various market conditions, and hence can enhance firms' capability to cope with competition in domestic markets (Barkema & Drogendijk, 2007). For firms engaging in exploitative OFDI, repeated investments in specific overseas markets enable them to learn how to effectively integrate domestic and international operations (Rothaermel & Deeds, 2004). Improved operational efficiency leads to more advantageous positions in the competitive sphere. Accordingly, we expect that:

> **H3:** Competitive intensity strengthens the positive effects of (a) exploratory OFDI and (b) exploitative OFDI on firms' overall performance.

2.3. Sequential ambidexterity of exploratory and exploitative OFDI

Our final hypothesis seeks to answer the question of how firms balance exploratory and exploitative OFDI to enhance performance. In strategic management and organization theory literature, a consensus view indicates that firms can pursue and benefit from conducting both exploration and exploitation (Gupta, Smith, & Shalley, 2006; Lavie & Rosenkopf, 2006). However, there have been concerns about which approach is more plausible and effective: explore and exploit simultaneously or take sequential and rotating moves? Some scholars point out that exploration and exploitation are orthogonal (Li et al., 2018) and that simultaneously maintaining high levels of exploration and

exploitation can promote firm performance (He & Wong, 2004). Others suggest that exploitation and exploration are recursively and co-evolutionarily related (Zollo & Winter, 2002), such that firms can enjoy performance improvement through time-paced, ambidextrous moves (Rothaermel & Deeds, 2004). To further investigate this question, Venkatraman et al. (2007) define two categories of ambidexterity: (1) synchronous exploration and exploitation as simultaneous ambidexterity, and (2) time-paced exploration and exploitation as sequential ambidexterity.

Noting these recent developments, we suggest that sequential ambidexterity is more appropriate in our context. In EMs, firms can engage in both exploratory and exploitative OFDI to expand their knowledge base about foreign markets (Luo & Tung, 2007). Although the two learning patterns may promote firm performance, they consume and compete for organizational resources (Lavie & Rosenkopf, 2006; March, 1991). This problem is especially acute for EM firms, which have insufficient resources to support both types of OFDI simultaneously. Sequential ambidexterity releases firms from resource pressures and allows them to concentrate on one aspect (exploration or exploitation) at one period of time, thereby improving firms' resource allocation efficiency and operational efficiency and leading to better performance (Venkatraman et al., 2007).

We further contend that a circular process of exploratory and exploitative OFDI benefits overall firm performance. In the exploration-to-exploitation process, EM firms can broaden their international knowledge base about various overseas markets (through exploratory OFDI), and then use the knowledge base to better judge which host countries are worthy of continuous exploitation and deep penetration. Exploratory OFDI helps firms avoid the risks of missing promising overseas markets or being locked in less valuable ones. Enriched international market knowledge acquired through exploratory OFDI can also enhance firms' capability to solve complex problems and reduce risks in their subsequent exploitation of specific markets.

In the exploitation-to-exploration process, repeated investments in existing markets can help firms accumulate international experience and develop routines and problem-solving skills in their overseas operations. When firms expand to unfamiliar markets subsequently, they can leverage knowledge gained from exploitative OFDI to tap the new market. Engaging in exploratory OFDI after

exploitative OFDI also drive firms to update their routines and skills in the new settings. Subsequent exploration can dislodge firms from preordained trajectories and prevent them from falling into competency traps that repeated exploitative OFDI may engender (Siggelkow & Levinthal, 2003; Zollo & Winter, 2002). Taken together, sequential ambidexterity helps firms explore and exploit at a rotating pace, thereby contributing to firm performance. The conceptual model is shown in Figure 1.

> **H4:** Sequential ambidexterity between exploratory OFDI and exploitative OFDI positively affects firms' overall performance.

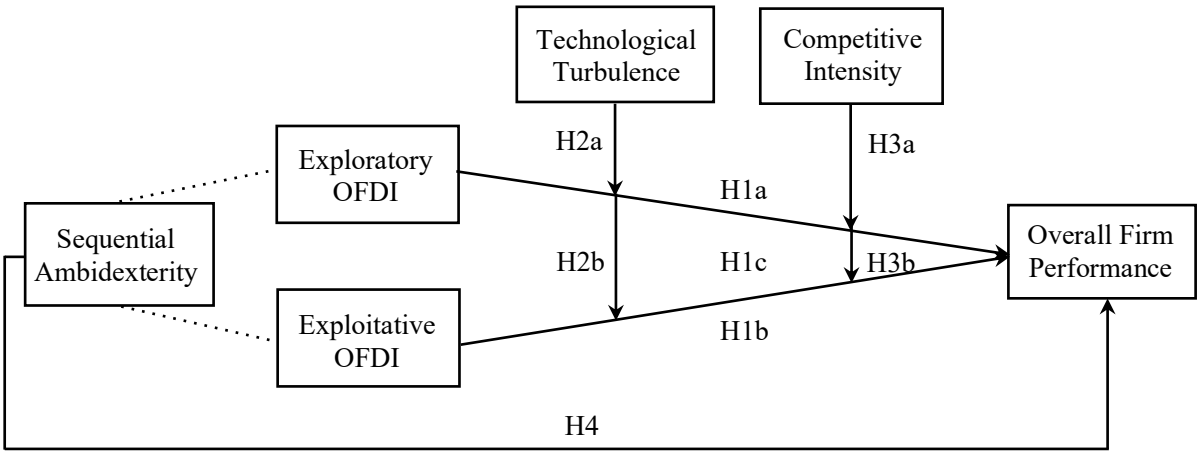

Figure 1 The conceptual model

3. METHOD

3.1. Data

We used panel data on Chinese manufacturing firms publicly listed on the Shanghai and Shenzhen Stock Exchanges over an eight-year period (2008–2015, inclusive). We chose this window because the China Securities Regulatory Commission (CSRC) enacted regulations to supervise and manage information disclosure in 2007, ensuring more accurate and complete information disclosure by publicly listed firms. We compiled data from four sources: the CSMAR database, the WIND database, China Statistical Yearbook, and the World Bank. Specifically, we extracted firms' basic information (e.g., number of employees, sales, debts) from the CSMAR database, which contains information about all listed firms on the Shanghai and Shenzhen stock markets and has been frequently used in prior international business research (Lyles et al., 2014; Xia et al., 2014). We obtained data on R&D investments and Tobin's Q from the WIND database, which is reliable and has been used in several

recent studies (Huang, Xie, Li, & Reddy, 2017). We also used the WIND database to obtain firms' subsidiary information from 2007 to 2015 to measure exploratory and exploitative OFDI in each year. Moreover, we obtained the number of firms in each sub-industry from China Statistical Yearbooks (2009–2016) as provided by the National Bureau of Statistics. Finally, we collected other related institutional indicators from the World Bank, which offers data about different countries over time.

We began our sample with all Chinese listed firms that have one or more overseas subsidiaries from 2008 to 2015 in manufacturing sectors, which revealed 823 manufacturing firms. Next, we excluded firms that published for less than three years or delisted before 2016, because they failed to provide complete data for further analysis. We also deleted firms in special sectors such as military manufacturing to ensure comparable findings with other studies. The final sample includes 766 firms across 26 manufacturing sub-industries, for a panel of 5,350 firm-year observations. We lagged all independent variables by one year to avoid possible endogeneity with the dependent variable, resulting in 4,584 observations for analysis.

3.2. Variable measurements

3.2.1. Dependent variable

We used *Tobin's Q* to measure firm's overall performance, because it takes time for firms to acquire and integrate foreign resources (Hung & Chou, 2013; Uotila et al., 2009). This lagged performance effect is associated with OFDI activities (Kim & Aguilier, 2015). Compared with accounting-based and past performance-based measures such as return on assets (ROA), Tobin's Q reflects firms' expected performance in the future based on market value. OFDI activities are firm strategies that are geared to future outcomes. Therefore, we consider Tobin's Q more appropriate for our research context (Gande, Schenzler, & Senbet, 2009). In addition, exploration and exploitation can influence firm performance in different ways and over different time periods. Tobin's Q has the advantage of capturing short-term performance and long-term prospects (Allen, 1993; Uotila et al., 2009), allowing us to operationalize both short- and long-period performance effects using a single performance variable. In our subsequent analysis, all performance is lagged for at least one year. In particular, Tobin's Q at time $t + 1$ serves as the dependent variable to examine the main effects of exploratory and exploitative OFDI and the moderating roles of industry dynamics. We use the average value of

Tobin's Q at times $t + 1$ and $t + 2$ as the dependent variable to test different time span effects of exploratory and exploitative OFDI. We also report robustness tests with averaged three-year Tobin's Q as the dependent variable.

3.2.2. Independent and moderating variables

Independent variables. Previous researchers have measured OFDI as the total number of subsidiaries newly established in a given year (Kim et al., 2015; Lu et al., 2014; Xia et al., 2014). Because this measure fails to reveal the learning pattern behind firms' OFDI activities, described previously, we distinguished two categories of OFDI. Specifically, we measured *exploratory OFDI* as the number of foreign subsidiaries newly established in totally new overseas markets (countries) in a given year, describing the extent that a firm can enrich its knowledge base through learning in new environments and cultures. We measured *exploitative OFDI* as the number of subsidiaries newly established in overseas markets (countries) that the firm previously entered in a given year, presenting the degree to which a firm exploits its pre-existing knowledge base in oversea markets. For example, in 2008, Firm A established one new subsidiary in India, where it had not previously established any subsidiaries; it established two subsidiaries in the United States, where it had not previously established any subsidiaries; it established three subsidiaries in Singapore, where it had not previously established any subsidiaries; and four subsidiaries in Japan, where it had already established subsidiaries. Therefore, the exploratory OFDI score for Firm A in 2008 is 3, and its exploitative OFDI score is 7.

Prior research suggests that oscillating between periods of exploitation and exploration is a way for firms to be ambidextrous (Gupta et al., 2006; O'Reilly & Tushman, 2013). Consistent with prior studies (e.g., Venkatraman et al., 2007), we measured the interaction of exploration in year $t - 1$ and exploitation in year t as one kind of *sequential ambidexterity*, and the interaction of exploitation in year $t - 1$ and exploration in year t as the other kind of *sequential ambidexterity* in year t. We collected relevant data from the WIND database and identified firms' OFDI by comparing the list of foreign subsidiaries in their annual reports. To avoid the possibility that firms established overseas subsidiaries for tax reduction purposes only, we restricted our sample to OFDI in foreign countries, excluding the tax havens of Hong Kong, Macao, Taiwan, and the Caribbean (Lu et al., 2014).

Moderating variables. To capture technological turbulence and competitive intensity, the extant

literature usually relies on questionnaire-style surveys (e.g., Theodosiou et al., 2012; Gu et al., 2008) or direct industry information (e.g., Adner & Kapoor, 2010; Uotila et al., 2009). We employed the second approach, because it helps avoid common method bias resulting from interviewees' subjective judgments and is considered more reliable. Following Uotila et al. (2009), we operationalized *technological turbulence* as industry R&D intensity and calculated it as the logarithm of total R&D expenditures of the industry divided by total sales of the industry. *Competitive intensity* refers to the extent of competition intensity in a particular industry (Porter, 1985); competitive pressure intensifies as the number of firms in an industry increases (Katila & Shane, 2005; Luo, 2003). Following previous research (Katila & Shane, 2005; Luo, 2003), we measured competitive intensity as the logarithm of the number of firms in the same industry in a given year. Both technological turbulence and competitive intensity are home country characteristics. We standardized them for model testing.

Instead of using traditional industry competition measures, such as the Herfindahl-Hirschman index (HHI), we measured competitive intensity according to the number of firms. The HHI is the sum of the squared fractions of all individual firms' market share, ranging from 0 to 1 (Herfindahl, 1950); it reflects the concentration of an industry, with a value of 0 suggesting an infinite number of firms having equally infinitesimal market share in the same industry, and a value of 1 representing the extremely unequal situation that one firm controls the entire industry market. However, Luo (2003) points out that the HHI may not be appropriate in most EMs; as a result of government intervention and the state-owned identity of leading firms, the inequality of firms' market share does not necessarily reflect the intensity of competition. Instead, the number of firms directly reflects how many rivals a firm faces in a specific industry, so it is an important indicator of competitive intensity in EMs (Ju & Zhao, 2009; Katila & Shane, 2005). Many researchers demonstrate that the number of firms in an industry signifies resource availability and reflects the intensity of competition (Adner & Kapoor, 2010; Katila & Shane, 2005). Thus, by using number of firms as a proxy for competitive intensity in the home country, we better explain how domestic industry competition alters the effects of OFDI on firm performance.

3.2.3. Control variables

Firm characteristics. We control firm-level, industry-level, and time-level variables that may

influence a focal firm's performance. The firm-level variables are firm size, leverage, state ownership, R&D intensity, advertising intensity, export intensity, OFDI experience, institutional distance, cultural distance, and economic distance. First, firms may have different resources and strategic needs depending on their size. Larger firms typically have more resources to support their international operations (Dunning, 1980). We measure *firm size* as the logarithm of the number of employees (Clegg et al., 2016). Second, we include *firm leverage*, which equals debt divided by assets, as suggested by Lu and Beamish (2004). Third, state ownership ties are likely to influence the regulated resources and policy treatment that a firm can acquire from the government (Xia et al., 2014), which changes the firm's competitiveness and performance. We added *state ownership* as a control variable in our model. Fourth, prior research indicates that the firm's intangible (e.g., technological, advertising) assets affect its international strategy and performance (e.g., Asmussen & Goerzen, 2013; Gandeet al., 2009), so we control for firm-level *R&D intensity* (R&D expenditures to sales) and *advertising intensity* (advertising expenditures to sales). Fifth, scholars suggest that a firm's exports help it gain market knowledge and accumulate international experience, thus promoting its performance (Berry & Kaul, 2016; Lu & Beamish, 2004). Following Kim et al. (2015), we control for *export intensity* (total export divided by total sales). Finally, firm experiences in deploying international assets significantly affects its ability to acquire experiential knowledge, which in turn influences its international operational capability and performance (Asmussen & Goerzen, 2013; Lyles et al., 2014). To account for the possible effect of firm's prior international experience, we include *OFDI experience* in our model, measured by the cumulative number of subsidiaries in each year since the year a firm established the first foreign subsidiary (Gaur & Lu, 2007).

Institutional distance. Institutional distance usually assesses the dissimilarity between the institutional environments of two or more countries in which a multinational firm is active (Asmussen & Goerzen, 2013). Scholars suggest that this dissimilarity can create various misunderstandings and legitimacy problems and challenges transfers of knowledge and organizational routines (Hoorn & Maseland, 2016). Prior literature has deeply investigated the critical influences of institutional distance on firms' international strategy and performance (Asmussen & Goerzen, 2013; Campbell, Eden, & Miller, 2012; Lu et al., 2014). We thus include institutional distance as an important control

variable, measured according to the World Bank Governance (WBG) indicators developed by the World Bank to quantify a firm's institutional environments. These data feature six aggregated indicators: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. Adopting the procedure of Campbell et al. (2012), we measure the institution distance of each subsidiary of the focal firm with the following formula:

$$Institutional\ distance_i = \sum_{d=1}^{6} (I_{di} - I_{dc})^2 / 6V_{d,}$$

Where I_{di} is the value of the WBG indicator for dimension *d* of the country in which subsidiary *i* is located, *c* indicates China, and V_d represents the inter-country variance of the WBG indicators along dimension *d*. We then compute each firm's institutional distance in the focal year as the average value of all its subsidiaries' institutional distance in that year (Gubbi & Elango, 2016).

Cultural distance and *economic distance* are also included in our model because cultural difference and economical difference are two of the most important sources of the LOF for a firm operating in foreign markets (Lu & Beamish, 2004). The basic date of different distance between various countries is from the research of Berry, Guillén, and Zhou (2010). In this study, we computed a firm's cultural distance and economical distance in the focal year as the average value of all its subsidiaries' institutional distance in that year.

Industry government support. Government support for an industry is also a key institutional variable that affects the value of firm resources and industry competition in EMs (Su, Peng, & Xie, 2016). Referring to the measurement used by Xia et al. (2014), we calculate industry government support as the average value of (1) the ratio of SOEs' assets, (2) the ratio of the number of SOEs, and (3) the ratio of SOEs' revenue in each industry; related data comes from China Statistical Yearbooks.

Industry effects and *time effects.* Institutional and economic development vary across sub-industries, so we include a set of industry dummy variables in the model. We also include year dummy variables to capture performance caused by potentially omitted variables that evolve over time (Xia et al., 2014). Specifically, we controlled for industry effects by using industry sector, drawn from the Industry Classification Guide of Listed Companies issued by the CSRC. To avoid multicollinearity, we used eight dummy variables representing nine industry subsectors. Similarly, we

controlled for time effects by adding seven dummy variables to the present year, from 2008 to 2015.

4. RESULTS

4.1. Tests before the regression and tests of hypothesized main effects

4.1.1. Tests before the regression

Table 1 provides the basic descriptive statistics and correlation matrix. The highest correlation coefficient is between the institutional distance and the economical (0.65 < 0.7). The absence of high correlations between the variables of interest implies that multicollinearity is not an issue in our research. We also checked the variance inflation factors (VIFs). The mean VIF is 2.77 and all VIF values are less than the accepted cut-off value, which indicates no serious multicollinearity problems in the estimation. In this study, we standardized all variables before calculating the interaction term to reduce multicollinearity.

[Insert Table 1 about here]

Fixed effects and heteroskedasticity. We implemented an overidentification test and Wald test before the regression. First, because our panel data are heterogeneous and unbalanced, we applied an overidentification test to examine the individual fixed effect (Newey, 1985). The test shows that the null hypothesis is rejected ($\chi^2(19) = 79.92$, $p < 0.001$); thus, there is a firm-level fixed effect in our data. There is also a year fixed effect (F-value = 68.62, $p < 0.001$). Second, we performed a modified Wald test for groupwise heteroskedasticity in the fixed effect model, implemented in Stata, using xttest3 command (Baum, 2006). The result indicates a heteroskedastic problem in our data ($\chi^2(766) =$ 3.8e+05, $p < 0.001$).

Endogeneity. Endogeneity also has been recognized as a concern for studies that examine the relationship between OFDI and firm performance. Although our panel data with a fixed effects model using lagged dependent variables partly solves the concern of endogeneity (Lu et al., 2014; Reeb, Sakakibara, & Mahmood, 2012), we conducted additional tests to confirm that endogeneity is not a threat. First, because firm performance and industry dynamics may lead to firms' exploratory or exploitative OFDI, we followed Zhou, Gao, and Zhao's (2017) approach to investigate the inverse relationship by using firms' performance, industry technological turbulence, and competitive intensity

at time t to predict OFDI at time $t + 1$. All the coefficients are insignificant (all $p > 0.05$), indicating that reverse causality is not an issue. Second, we applied the Davidson–MacKinnon (1993) test and found that the added residual is not significantly different from 0 ($F = 1.64$, $p > 0.1$; $F = 0.20$, $p > 0.1$), again suggesting that endogeneity bias does not exist. Third, following Reeb et al. (2012), we controlled for the possible effects of relevant firm attributes to properly gauge the relation between OFDI, industry features, and firm performance.

Model estimation. On the basis of the preceding tests, we applied a two-way fixed effect model with robust standard errors. We used a hierarchical regression analysis to test the hypotheses. Table 2 includes five models. Model 1 contains all the control variables as a baseline; Model 2 adds main effect variables, testing the effects of exploratory OFDI and exploitative OFDI. We separately examine the moderating effects of industry dynamics in Models 3 and 4. Model 5 is the full estimation, including all variables. All models are significant, according to the F-values. The changes in the *R*-squared values indicate improvement in overall model fit when we incrementally add the variables to each model. We lagged firm performance in the models for one year. Models 6–9 explore the continuing impact of exploratory OFDI and exploitative OFDI on firm performance. In Models 6 and 7, the firm performance is a two-year-averaged value; in Models 8 and 9, the performance is a three-year-averaged value.

[Insert Table 2 about here]

4.1.2. Tests of hypothesized main effects

Model 2 in Table 2 shows that the coefficients of both exploratory OFDI ($\beta = 0.13$, $p < 0.001$) and exploitative OFDI ($\beta = 0.12$, $p < 0.05$) are positive and significant, confirming Hypotheses 1a and 1b. In each subsequent model in Table 2, these effects are consistently positive and significant, leading us to confirm H1a and H1b. That is, both exploratory OFDI and exploitative OFDI promote firm performance. With regard to H1c, Models 7 and 9 show that exploratory OFDI contributes to firm performance for a longer time ($\beta = 0.07$, $p < 0.05$ Tobin's $Q_{avg(t+1, t+2)}$; $\beta = 0.05$, $p < 0.05$ Tobin's $Q_{avg(t+1, t+2, t+3)}$). However, exploitative OFDI has no significant effect on firms' long-term performance ($p > 0.1$ for both Tobin's $Q_{avg(t+1, t+2)}$ and Tobin's $Q_{avg(t+1, t+2, t+3)}$). Therefore, H1c is supported.

4.2. Moderating effects

4.2.1. The moderating effects of technological turbulence

H2a and 2b explore how technological turbulence affects exploratory and exploitative OFDI–firm performance relationships. According to the results in Table 2, we infer that technological turbulence significantly increases the positive effect of exploratory OFDI on firm performance (Model 3: β = 0.07, $p < 0.05$; Model 5: β = 0.08, $p < 0.05$). Figure 2 further depicts the moderating effects of technological turbulence and competitive intensity on firm performance. The value of firm performance is on the Y axis, and exploratory (exploitative) OFDI is on the X axis. The moderator variable is coded as high (one standard deviation above the mean) and low (one standard deviation below the mean) and the independent variables cover the ranges of exploratory and exploitative OFDI in our data. High technological turbulence (competitive intensity) is denoted with a solid line, whereas low technological turbulence (competitive intensity) is denoted with a dotted line. As Panel A of Figure 2 shows that when technological turbulence is low, an increase in exploratory OFDI only leads to a slight increase in firm performance. However, when technological turbulence is high, the regression slope becomes much steeper and more positive. H2a is supported.

[Insert Figure 2 about here]

The coefficients of the interaction between technological turbulence and exploitative OFDI are negative and significant (Model 4: β = –0.07, $p < 0.05$; Model 5: β = –0.08, $p < 0.05$), indicating damage to the positive effect of exploitative OFDI on firm performance. Thus, H2b is also supported. As we show in Panel B of Figure 2 that when technological turbulence is low, the effect of exploitative OFDI on performance is much stronger than when technological turbulence is high. That is, technological turbulence weakens the effect of exploitative OFDI. Combined with its moderating role in the exploratory OFDI–firm performance relationship, technological turbulence exerts the opposite moderating effect on the two types of OFDI, strengthening the effect of exploratory OFDI but weakening the effect of exploitative OFDI.

4.2.2. The moderating effects of competitive intensity

H3 examines the moderating effects of competitive intensity. As Table 2 shows, the coefficients of industry competition × exploratory OFDI are insignificant but positive, as expected (Model 3: β = 0.03, *n.s.*; Model 5: β = 0.02, *n.s.*). In Panel C of Figure 2, the slopes of the solid and dotted lines are

almost the same. Thus, H3a is not supported; exploratory OFDI's effect appears stable across varying degrees of industry competition.

The coefficients of the interaction between competitive intensity and exploitative OFDI are positive and significant in the relevant models (Model 4: $\beta = 0.11$, $p < 0.05$; Model 5: $\beta = 0.12$, $p < 0.05$). When competitive intensity is high, establishing new subsidiaries in familiar overseas markets is an effective strategy for improving firm performance. Such a strengthening effect can be seen in Panel D of Figure 2. The solid line shows that an increase in exploitative OFDI is associated with a higher level of Tobin's Q_{t+1}. However, when competitive intensity is low, there seems to be no significant change to Tobin's Q_{t+1}, even when exploitative OFDI increases. Therefore, competitive intensity strengthens the positive effect of exploitative OFDI, in support of H3b.

4.3. Sequential ambidexterity effects

Table 3 reports the regression results for H4, which assesses the effect of sequential ambidexterity on firm performance using hierarchical regression analysis. In Table 3, Models 10 to 12 predict the exploration–exploitation process. Model 10 contains all the control variables. Model 11 adds exploratory OFDI at time $t - 1$ and exploitative OFDI at time t, and Model 12 is the full model, including sequential ambidexterity measured as the interaction of exploratory OFDI at time $t - 1$ and exploitative OFDI at *T*ime *t*. Models 13 to 15 are similarly set to predict the exploitation–exploration process. In the exploration–exploitation process, the coefficients of exploitative OFDI (time *t*) in Model 11 re positively significant ($\beta = 0.12$, $p < 0.05$), consistent with our hypothesized main effects. Most importantly, the positively significant coefficient of sequential ambidexterity ($\beta = 0.03$, $p < 0.05$) indicates that EM firms can benefit from exploration–exploitation time-paced OFDI activities. However, the results in Models 13 to 15 do not support that a firm can promote its performance by adopting an exploration–exploitation process ($\beta = 0.02$, *n.s*). Thus, H4 is partially accepted.

[Insert Table 3 about here]

4.4. Control effects

We also find some significant effects for our control variables (Model 5, Table 2). First, we find that firm size decreases performance ($\beta = -1.52$, $p < 0.001$), consistent with results by Ju and Zhao (2009). A possible reason for the negative effect may be that larger firms often need to pay more for

employee training to help employees absorb new resources or knowledge. Second, firm leverage can positively affect performance ($\beta = 0.03$, $p < 0.01$), because high debts at reasonable levels offer more resources for firms to operate internationally. Third, technological assets are critical intangible assets that can affect firms' international strategies and performance. In this study, our findings provide proof of the positive effect of R&D intensity on firm performance ($\beta = 3.98$, $p < 0.05$), though the coefficients of advertising intensity and export intensity are insignificant ($p > 0.05$). Finally, the greater the institutional distance, the less the firm performance ($\beta = –0.08$, $p < 0.001$), while the influence of cultural distance and economic distance is not significant.

4.5. Robustness tests

We ran several models with alternative measures and subsamples to assess the robustness of the results. Tables 4 and 5 contain the results of these analyses (Models 16–31), most of which corroborate our main results, as detailed next.

First, we account for alternative measures of firm performance. Accounting-based performance and market-based performance are two important but different categories that often reflect performance during different time spans (Allen, 1993; Berry & Kaul, 2016). To test the reliability of our findings about different time spans of the performance effects of exploratory and exploitative OFDI, we used ROA as a dependent variable and ran additional regressions. As shown in Model 16 of Table 4, the coefficients of exploitative OFDI and related interactions are significant, whereas those of exploratory OFDI and two interactions are insignificant. Thus, when we replace Tobin's Q with ROA, the hypothesis testing of exploitative OFDI is robust, but the results for exploratory OFDI become insignificant. This finding is consistent with our expectation that the ultimate effect of exploratory OFDI on firm financials is more distant; it cannot be captured by historical, performance-based ROA. In contrast, the effect of exploitative OFDI is more immediate (Uotila et al., 2009).

Second, we account for alternative measures of exploratory and exploitative OFDI. There are two main measurements of OFDI in the prior literature: (1) number of newly established foreign subsidiaries in a given year (e.g., Xia, Boal, & Delios, 2009; Xia et al., 2014); and (2) number of newly entered foreign countries in the year (e.g., Kim et al., 2015; Lu & Beamish, 2001). To check for robustness, we conducted additional tests by measuring firms' exploratory (exploitative) OFDI as the

number of totally new (pre-existing) countries that firms entered in a given year. The results of these tests are shown in Tables 4 and 5, which largely confirm the results from our original OFDI measure. All hypotheses are supported except H3a ($\beta = 0.01$, $p > 0.05$); H4 is partially supported.

Third, we use subsamples from coastal areas and nontraditional industries to analyze the data. Economic and institutional environments in the eastern coastal areas of China are very different from those in western China. As a robustness check, we retained only the coastal area samples and ran regressions. We obtained similar results in related Models in Tables 4 and 5; the previous models are robust. Besides, subsamples of the investments in developed (versus developing) countries are also used to check the robustness of our main hypotheses. The performance effect of exploratory OFDI is robust across developed ($\beta = 0.14$, $p < 0.05$) and developing ($\beta = 0.14$, $p < 0.001$) countries.

Noting the distinct strategy demands across traditional industries and non-traditional industries (Xia et al., 2014), we also conducted additional tests by removing representatives of traditional industries (e.g., food and beverage). Related Models in Tables 4 and 5 show similar results to those with full samples, in support of our empirical findings.

[Insert Table 4 and Table 5 about here]

5. DISCUSSION

5.1. Contributions

This paper investigates how exploratory OFDI and exploitative OFDI differ in shaping firm performance in EMs. With a sample of 766 Chinese firms from 26 sub-industries over the period 2008–2015, we find that both types of OFDI are beneficial to firm performance, but the impact period of exploratory OFDI is longer, lasting up to three years, compared with a one-year influence of exploitative OFDI. Moreover, the empirical results show that these positive effects are moderated by technological turbulence and competitive intensity in the home country, such that technological turbulence strengthens the benefit of exploratory OFDI but weakens that of exploitative OFDI. Competitive intensity strengthens the effectiveness of exploitative OFDI. We also demonstrate that firms can balance exploratory and exploitative OFDI through sequential ambidexterity, which further enhances firm performance. Overall, three contributions emerge from this study.

First, we refine the study of OFDI by distinguishing two types of investment: exploratory and exploitative OFDI. In previous research, scholars mainly use the number of new subsidiaries (e.g., Xia et al., 2014), the number of new countries (e.g., Lu & Beamish, 2001), or combined measures of these two (e.g., Berry & Kaul, 2016; Lu & Beamish, 2004) to capture OFDI. Furthermore, they often treat a firm's OFDI as a single-dimensional variable to study its effect on firm performance. However, the OFDI of EM firms is complex and reflects diverse learning patterns (Barkema & Drogendijk, 2007). Instead of using these traditional holistic measures, we categorize OFDI as exploratory or exploitative OFDI to examine and compare their performance impacts. Although both types of OFDI benefit firm performance, the positive effect of exploratory OFDI lasts longer than that of exploitative OFDI. By disentangling the two dimensions of OFDI, this study sheds light on the different mechanisms through which exploratory and exploitative OFDI influence firm performance.

Second, by drawing on the industry-based view, we investigate the moderating effects of industry technological turbulence and competitive intensity in the home country. Industry characteristics are key factors that affect firm strategy and performance (Porter, 1985), particularly in EMs. Because EMs experience institutional transitions and rapid economic growth, environmental forces such as technological turbulence and competitive intensity are salient factors that influence the value of firms' knowledge and resources. Our results show that due to its ability to enhance the value of new knowledge, technological turbulence strengthens the beneficial effect of exploratory OFDI. In contrast, because knowledge is more likely to be obsolete when technologies change rapidly, the beneficial effect of exploitative OFDI weakens. We also find that though competitive intensity has no significant effect on the performance impact of exploratory OFDI, it amplifies the positive effect of exploitative OFDI on firm performance, possibly due to the heightened need to be cost efficient under intense competition. Therefore, our study highlights the significant role of domestic industry conditions, and contributes to the strategy tripod perspective on OFDI (Cuervo-Cazurra, Luo, Ramamurti, & An, 2018; Su et al., 2016). In addition to the institutional factors impacting OFDI performance, which has been much researched in the prior literature, our study confirms that resources generated from OFDI and home industry conditions also influence OFDI performance.

Third, this study investigates how firms in EMs balance exploratory and exploitative OFDI.

Unlike firms from developed economies that conduct OFDI mainly to apply their FSAs to other markets (Dunning, 1980; Theodosiou et al., 2012), firms from EMs need to learn local knowledge about the host country to manage their LOF and achieve their performance goals (Barkema & Drogendijk, 2007). As firms conduct different types of OFDI, it is important to strike a balance between them, given firms' limited resources. Previous research has ignored an important motivation for EM firms to internationalize, namely, to use OFDI to gain local knowledge in host countries in order to mitigate their LOF and improve their performance. In this study, we suggest a circular process of exploratory and exploitative OFDI and investigate how firms balance them through sequential ambidexterity. To the best of our knowledge, there has been no prior empirical work to investigate this potentially dynamic process of different types of OFDI. Our findings describe this dynamic process, shedding new light on the performance implications of OFDI from EMs.

5.2. Managerial implications

Our findings also provide three important implications for firms from EMs. First, exploratory OFDI and exploitative OFDI affect firm performance differently. Firms should pay attention to the different learning patterns and learning opportunities underlying different types of OFDI activities and make good use of them to promote firm performance. Specifically, firms that conduct exploratory OFDI experience new markets and acquire new knowledge about these markets. Our findings suggest that they should leverage this enriched and diversified knowledge base to overcome the LOF and improve performance. Firms that conduct exploitative OFDI benefit from their pre-existing international knowledge and experience, which helps to reduce costs and risks in their additional investments in existing markets, leading to higher firm performance. Our results also demonstrate different time spans for the performance effects of exploratory OFDI and exploitative OFDI, suggesting that firms with different performance goals should adjust their OFDI strategies accordingly. If firms aim to build new competencies and develop sustainable competitive advantage, they should have a greater focus on exploratory OFDI. However, firms focusing on exploiting existing knowledge to achieve short-term performance growth should place more emphasis on exploitative OFDI in their strategic plan.

Second, recent studies have pointed out the key role of environmental conditions in home countries in investigating firms' internationalization strategies and performance (Cuervo-Cazurra et

al., 2018; Luo & Wang, 2012). In respond to this call, we investigated the moderating effects of technological turbulence and competitive intensity on the exploratory (exploitative) OFDI–firm performance relationship. Our study provides guidance to EM firms with regard to adjusting their OFDI strategies to different industry conditions to improve performance. More specifically, the findings suggest firms can use exploitative OFDI to sustain their competitive advantage when competition is fierce, and can leverage exploratory OFDI to update their competitive advantage when technological turbulence is high. Our findings are also a reminder that misusing exploitative OFDI in a technologically turbulent industry may backfire, lowering firms' performance.

Third, our study offers guidance for EM firms with regard to balancing exploratory and exploitative OFDI to achieve long-term success. According to our findings, firms in EMs can benefit from engaging in exploratory–exploitative OFDI activities, because the enriched international market knowledge acquired through exploratory OFDI can enhance firms' capability to solve complex problems in exploitative OFDI, which may reduce the risk and failure rates of their subsequent exploitation of a specific host country market. According to our findings, after firms enter new markets and achieve learning outcomes with respect to the local environment (exploratory OFDI), they should attach importance to knowledge refinement and incremental learning in extant markets (exploitative OFDI). Firms in EMs can leverage this time paced process to avoid resource shortages and enhance their gains from both types of OFDI.

5.3. Limitations and future research directions

We also note several limitations in our study that present opportunities for research. First, we use only archival data to distinguish firms' exploratory and exploitative OFDI, according to whether they enter new or pre-existing markets. Although we suggest different types of OFDI can affect firm performance through different mechanisms, we do not have measures for the exact mechanisms. In-depth case studies using longitudinal methods will more clearly reveal the mechanisms through which the two types of OFDI independently and interactively influence firm performance over time. Thus, we call for more research to investigate the processes, micro-foundation, and dynamism in the ODFI–performance relationship in the context of EMs. In addition, because we used Tobin's Q as our dependent variable, the stronger and longer effect of exploratory OFDI may be due to the fact that

stock markets respond more strongly to an investment in a new market than to repeated investments in the same country. This signaling effect is worth noting. Future studies can investigate the signaling effects of different OFDI activities with varying learning patterns, locations, and entry modes.

A second limitation is that industry dynamics are not the only domestic environmental factors that affect the value of OFDI from EMs. Many other factors may influence the OFDI–performance relationship, such as resources, capabilities, location, market, and technological competencies. In particular, inward FDI in EMs may generate knowledge spillovers in the relevant industries, thus influencing the way firms integrate and use foreign resources in the domestic market, and the way they acquire and apply knowledge in foreign markets. Researchers could examine the moderating effect of inward FDI on the strategic value of outward FDI. While there are some studies on inward FDI–outward FDI links (Li et al., 2012), there is no distinction made between exploratory and exploitative OFDI. As such, it is interesting to examine how inward FDI impacts the performance impacts of exploratory versus exploitative OFDI.

Third, this study uses data from a single EM, and our framework cannot be used to make empirical comparisons between different EM settings. Emerging economies, however, are different along many dimensions, including the maturity of economic growth, institutional stability, and the level of protection of property rights and contract enforcement. It may well be the case that the path, process, and condition of relationships will vary according to different environmental parameters. Future research should test the generalizability of the present findings across a wider range of economies, markets, and firms. This research effort would not only add to our knowledge, but also provide valuable practical implications.

Lastly, due to the inherent conflicts between exploration and exploitation, it is interesting and important to explore the strategies and processes used to balance the two. While this study focuses on sequential ambidexterity, we invite future research to study different types of ambidexterity in EM firms' OFDI. Given there are only a handful of empirical studies on the topic (e.g., Li et al., 2018; Wang, Luo, Maksimov, Sun, & Celly, 2019), more research is needed to tackle the question of how firms balance exploration and exploitation in conducting OFDI to achieve temporal ambidexterity.

6. CONCLUSION

This study identifies exploratory OFDI and exploitative OFDI as two primary categories of OFDI in emerging economies. We examine and compare the performance effects of these two types of OFDI, investigate the moderating roles of industry conditions, and explain how EM firms can achieve long-term success through sequential ambidexterity. This study reveals positive effects of exploratory and exploitative OFDI and provides evidence for the sustainable benefits of exploratory OFDI. It also offers advice for firms with regard to adjusting their OFDI strategies in different industry conditions and balancing different types of OFDI in a time-paced manner.

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Table 1. Descriptive statistics and correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Tobin's Q_{t+1}	1																
2. Firm size	–0.38***	1															
3. Leverage	0.09***	–0.09***	1														
4. State ownership	–0.06***	0.13***	0.01	1													
5. R&D intensity	0.20***	–0.19***	–0.07***	–0.10***	1												
6. Advertising intensity	0.17***	–0.05**	–0.05***	–0.06***	0.11***	1											
7. Export intensity	–0.01	0.03*	–0.03*	–0.07***	0.04**	–0.21***	1										
8. OFDI experience	–0.09***	0.25***	0.01	–0.03	–0.01	0.02	0.07***	1									
9. Institutional distance	–0.06***	0.16***	–0.02	–0.05**	0.11***	0.04**	0.17***	0.26***	1								
10. Cultural distance	–0.08***	0.14***	–0.01	–0.01	0.02	0.00	0.10***	0.16***	0.35***	1							
11. Economic distance	–0.01	0.14***	–0.01	–0.05***	0.09***	0.03*	0.21***	0.26***	0.65***	0.42***	1						
12. Industry government support	–0.04**	–0.02	–0.01	–0.07***	0.09***	0.02	0.05***	0.07***	0.08***	0.02	0.10***	1					
13. Technological turbulence	0.04**	–0.01	–0.07***	–0.19***	0.38***	0.05***	0.07***	0.08***	0.19***	0.03*	0.16***	0.22***	1				
14. Competition intensity	0.08***	–0.06***	–0.06***	–0.11***	0.30***	0.14***	0.03*	0.02	0.10***	0.02	0.06***	0.10***	0.50***	1			
15. Exploratory $OFDI_{t-1}$	–0.04**	0.12***	0.00	0.00	0.04*	–0.02	0.09***	0.15***	0.27***	0.16***	0.22***	0.06***	0.08***	0.06**	1		
16. Exploratory $OFDI_t$	–0.02	0.11***	–0.00	0.00	0.04**	–0.02	0.08***	0.09***	0.30***	0.18***	0.25***	0.03*	0.09***	0.06***	0.15***	1	
17. Exploitative $OFDI_t$	–0.02	0.10***	0.00	–0.03	0.02	0.00	0.08***	0.32***	0.16***	0.11***	0.20***	0.04**	0.04**	0.02	0.24***	0.19***	1
Mean	2.10	3.42	0.49	0.04	0.03	0.07	0.21	3.48	1.23	2.75	2.89	0.05	0.06	0.03	0.22	0.24	0.06
SD	1.99	0.52	1.68	0.12	0.04	0.08	0.24	12.63	1.66	6.80	5.29	0.88	0.89	0.94	0.71	0.77	0.39

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. N = 766

Table 2. Main results related to H1–H3

Dependent variables	Tobin's Q_{t+1}					*H*	Tobin's $Q_{avg(t+1, t+2)}$		Tobin's $Q_{avg(t+1, t+2, t+3)}$		*H*
	Model 1	Model 2	Model 3	Model 4	Model 5		Model 6	Model 7	Model 8	Model 9	
Constant	5.64***	5.74***	5.74***	5.74***	5.75***		6.58***	6.59***	17.61***	17.93***	
	(1.18)	(1.16)	(1.17)	(1.16)	(1.16)		(1.09)	(1.09)	(4.23)	(4.27)	
Firm size	–1.49***	–1.51***	–1.51***	–1.52***	–1.52***		–1.40***	–1.40***	–1.05***	–1.06***	
	(0.33)	(0.32)	(0.32)	(0.32)	(0.32)		(0.31)	(0.31)	(0.23)	(0.23)	
Leverage	0.04**	0.03**	0.03**	0.03**	0.03**		0.00	0.00	0.04***	0.04***	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	
State ownership	0.11	0.09	0.09	0.09	0.09		0.06	0.07	0.09	0.08	
	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)		(0.26)	(0.26)	(0.21)	(0.21)	
R&D intensity	3.98*	3.93*	3.90*	3.88*	3.86*		3.88**	3.81**	1.14	1.15	
	(1.82)	(1.77)	(1.71)	(1.75)	(1.74)		(1.39)	(1.36)	(1.27)	(1.28)	
Advertising intensity	0.35	0.35	0.33	0.39	0.36		0.44	0.44	0.28	0.29	
	(0.73)	(0.72)	(0.72)	(0.71)	(0.71)		(0.61)	(0.61)	(0.57)	(0.56)	
Export intensity	–0.36	–0.42	–0.42	–0.44	–0.43		0.02	0.01	0.03	0.03	
	(0.34)	(0.34)	(0.34)	(0.34)	(0.34)		(0.30)	(0.30)	(0.29)	(0.29)	
OFDI experience	–0.00	–0.01	–0.00	–0.00	–0.00		–0.00	–0.00	0.00	0.01	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	
Institutional distance	–0.06**	–0.09***	–0.08***	–0.09***	–0.08***		–0.08**	–0.08**	–0.08**	–0.08**	
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)	(0.03)	
Cultural distance	0.00	–0.00	–0.00	–0.00	–0.00		–0.00	–0.00	–0.00	–0.00	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	
Economic distance	0.01	0.01	0.01	0.01	0.01		0.00	0.00	0.00	0.00	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.00)	(0.00)	
Industry government support	0.04	0.05	0.05	0.05	0.05		0.31	0.36	57.01**	58.54***	
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)		(0.75)	(0.76)	(18.87)	(19.01)	
Technological turbulence (TT)	–0.14	–0.14	–0.13	–0.15	–0.14		–0.10	–0.10	–0.04	–0.05	
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)		(0.08)	(0.08)	(0.07)	(0.07)	
Competition intensity (CI)	–0.10	–0.10	–0.10	–0.10	–0.10		0.01	0.01	0.06	0.06	
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)		(0.09)	(0.09)	(0.09)	(0.09)	
Exploratory $OFDI_t$		**0.13***	**0.09**	**0.13***	**0.09**	*H1a*	**0.08**	**0.07***	**0.05***	**0.05***	*H1c*
		(0.04)	**(0.04)**	**(0.04)**	**(0.04)**		**(0.03)**	**(0.03)**	**(0.02)**	**(0.02)**	
Exploitative $OFDI_t$		**0.12***	**0.11***	**0.13***	**0.12***	*H1b*	0.04	0.03	–0.03	–0.02	
		(0.06)	**(0.06)**	**(0.07)**	**(0.07)**		(0.04)	(0.03)	(0.06)	(0.04)	
Exploratory OFDI × TD			**0.07***		**0.08***	*H2a*		0.04		–0.01	
			(0.04)		**(0.04)**			(0.03)		(0.02)	
Exploratory OFDI × CD			0.03		0.02	*H3a*		0.02		–0.00	
			(0.04)		(0.04)			(0.04)		(0.03)	
Exploitative OFDI × TD				**–0.07***	**–0.08***	*H2b*		–0.01		–0.06	
				(0.04)	**(0.04)**			(0.04)		(0.05)	
Exploitative OFDI × CD				**0.10***	**0.10***	*H3b*		0.04		0.05	
				(0.06)	**(0.06)**			(0.03)		(0.04)	
N	766	766	766	766	766		745	745	727	727	
Observations	4584	4584	4584	4584	4584		3829	3829	3089	3089	
Degree	27	29	31	31	33		28	32	27	31	
R-square (%)	26.22	26.67	26.77	26.77	26.87		24.32	24.40	21.70	21.77	
F value	44.46***	41.37***	38.99***	38.61***	36.59***		27.00***	23.96***	33.01***	32.04***	

Notes: Standardized coefficients. The model controls for industry and time dummies, but the coefficients are not presented in the table.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; single-tailed tests.

Table 3. Main results related to H4

Dependent variables	Tobin's Q_{t+1} exploration-exploitation process			*H*	Tobin's Q_{t+1} exploitation-exploration process			*H*
	Model 10	Model 11	Model 12		Model 13	Model 14	Model 15	
Constant	5.64***	6.59***	6.59***		5.64***	6.57***	6.56***	
	(1.18)	(1.47)	(1.47)		(1.18)	(1.46)	(1.46)	
Firm size	–1.49***	–1.65***	–1.65***		–1.49***	–1.65***	–1.65***	
	(0.33)	(0.40)	(0.40)		(0.33)	(0.40)	(0.40)	
Leverage	0.04**	–0.09***	–0.09***		0.04**	–0.09***	–0.09***	
	(0.01)	(0.02)	(0.02)		(0.01)	(0.02)	(0.02)	
State ownership	0.11	0.21	0.22		0.11	0.17	0.17	
	(0.27)	(0.32)	(0.32)		(0.27)	(0.32)	(0.32)	
R&D intensity	3.98*	3.97*	4.04*		3.98*	3.94*	3.94*	
	(1.82)	(1.93)	(1.93)		(1.82)	(1.90)	(1.90)	
Advertising intensity	0.35	–0.77	–0.72		0.35	–0.47	–0.48	
	(0.73)	(1.10)	(1.10)		(0.73)	(1.15)	(1.16)	
Export intensity	–0.36	–0.71	–0.70		–0.36	–0.75	–0.74	
	(0.34)	(0.45)	(0.45)		(0.34)	(0.46)	(0.46)	
OFDI experience	–0.00	–0.01	–0.00		–0.00	–0.00	–0.00	
	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	
Institutional distance	–0.06**	–0.07**	–0.06*		–0.06**	–0.09***	–0.09***	
	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)	
Cultural distance	0.00	0.00	0.00		0.00	–0.00	–0.00	
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	
Economic distance	0.01	0.01	0.01		0.01	0.01	0.01	
	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	
Industry government support	0.04	0.04	0.03		0.04	0.04	0.04	
	(0.04)	(0.04)	(0.04)		(0.04)	(0.04)	(0.04)	
Technological turbulence	–0.14	–0.26*	–0.26*		–0.14	–0.26*	–0.26*	
	(0.10)	(0.12)	(0.12)		(0.10)	(0.12)	(0.12)	
Competitive intensity	–0.10	–0.07	–0.07		–0.10	–0.06	–0.06	
	(0.09)	(0.09)	(0.09)		(0.09)	(0.09)	(0.09)	
Exploratory $OFDI_{t-1}$		0.02	–0.01					
		(0.03)	(0.03)					
Exploitative $OFDI_t$		**0.12***	0.05					
		(0.06)	(0.05)					
Sequential ambidexterity [a]			**0.03***	*H4*				
			(0.02)					
Exploritative $OFDI_{t-1}$						0.01	0.03	
						(0.07)	(0.06)	
Exploratory $OFDI_t$						**0.14*****	**0.14*****	
						(0.04)	**(0.04)**	
Sequential ambidexterity [b]							0.02	*H4*
							(0.05)	
N	766	746	746		766	746	746	
Observations	4585	3843	3843		4585	3843	3843	
Degree	27	28	29		27	28	29	
R-square (%)	26.22	25.21	25.31		26.22	25.54	25.54	
F value	44.46***	27.34***	26.70***		44.46***	27.39***	26.50***	

Notes: Standardized coefficients. The model controls for industry and time dummies, but the coefficients are not presented in the table.

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; single-tailed tests.

[a] Examining the exploration-exploitation process, measured as exploratory $OFDI_{t-1}$ × exploitative $OFDI_t$

[b] Examining the exploitation-exploration process, measured as exploitative $OFDI_{t-1}$ × exploratory $OFDI_t$

Table 4. Robustness tests for H1–H3

Dependent variables	ROA_{t+1}	Tobin's Q_{t+1}			*H*	Tobin's $Q_{avg(t+1, t+2)}$			Tobin's $Q_{avg(t+1, t+2, t+3)}$			*H*
Robustness tests	*ROA*	*N. of countries*	*Coastal samples*	*Nontraditional industries*		*N. of countries*	*Coastal samples*	*Nontraditional industries*	*N. of countries*	*Coastal samples*	*Nontraditional industries*	
	Model 16	Model 17	Model 18	Model 19		Model 20	Model 21	Model 22	Model 23	Model 24	Model 25	
Constant	6.51***	5.74***	6.49***	5.72***		6.59***	7.09***	6.65***	17.84***	15.43***	19.01***	
	(2.10)	(1.17)	(1.28)	(1.20)		(1.09)	(1.20)	(1.13)	(4.20)	(4.10)	(4.35)	
Firm size	–0.76	–1.51***	–1.68***	–1.53***		–140***	–1.51***	–1.41***	–1.06***	–1.11***	–1.05***	
	(0.58)	(0.32)	(0.36)	(0.34)		(0.31)	(0.34)	(0.33)	(0.23)	(0.24)	(0.24)	
Leverage	0.11***	0.03**	0.03**	0.04**		0.00	–0.00	0.00	0.04***	0.04***	0.04***	
	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
State ownership	1.87**	0.10	0.17	0.00		0.07	0.13	–0.02	0.09	0.05	–0.02	
	(0.78)	(0.27)	(0.29)	(0.27)		(0.26)	(0.27)	(0.27)	(0.21)	(0.22)	(0.22)	
R&D intensity	–1.71	3.76*	3.44*	3.75*		3.75**	3.39*	3.72**	1.16	1.11	1.10	
	(3.32)	(1.72)	(2.00)	(1.73)		(1.33)	(1.66)	(1.35)	(1.28)	(1.31)	(1.28)	
Advertising intensity	–2.85	0.42	–1.38	0.33		0.45	–1.41	0.36	0.29	–2.15*	0.20	
	(2.02)	(0.70)	(1.05)	(0.73)		(0.61)	(1.22)	(0.65)	(0.56)	(0.95)	(0.63)	
Export intensity	0.68	–0.42	–0.26	–0.53		0.01	0.04	–0.08	0.03	0.05	–0.06	
	(0.97)	(0.34)	(0.35)	(0.33)		(0.30)	(0.32)	(0.29)	(0.29)	(0.31)	(0.28)	
OFDI experience	–0.02	–0.00	–0.00	–0.00		–0.00	–0.00	–0.00	0.01	0.01	0.00	
	(0.02)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Institutional distance	–0.13*	–0.09***	–0.10***	–0.07**		–0.08**	–0.10**	–0.08**	–0.08**	–0.09**	–0.08**	
	(0.07)	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	
Cultural distance	0.01	–0.00	–0.00	–0.00		–0.00	–0.00	0.00	–0.00	–0.00	0.00	
	(0.01)	(0.00)	(0.00)	(0.00)		(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	
Economic distance	–0.01	0.01	0.01	0.01		0.00	0.01	0.00	0.00	0.01	0.00	
	(0.02)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	
Industrial government support	–0.15	0.05	0.04	0.05		0.33	0.04	0.51	58.09	45.00	63.61	
	(0.13)	(0.04)	(0.04)	(0.04)		(0.76)	(0.86)	(0.77)	(18.67)	(18.42)	(19.43)	
Technological turbulence (TT)	–0.22	–0.15	–0.17	0.02		–0.10	–0.11	0.03	–0.06	–0.06	0.05	
	(0.28)	(0.10)	(0.10)	(0.09)		(0.08)	(0.09)	(0.07)	(0.07)	(0.07)	(0.06)	
Competitive intensity (CI)	–0.11	–0.09	–0.13	–0.14		0.01	–0.03	–0.03	0.07	0.01	0.01	
	(0.27)	(0.09)	(0.10)	(0.09)		(0.09)	(0.09)	(0.08)	(0.09)	(0.09)	(0.09)	
Exploratory OFDI	–0.05	**0.13****	**0.09****	**0.08****	*H1a*	**0.10***	**0.08***	**0.07***	**0.07***	**0.04***	**0.04***	*H1c*
	(0.09)	**(0.06)**	**(0.04)**	**(0.03)**		**(0.05)**	**(0.04)**	**(0.03)**	**(0.04)**	**(0.02)**	**(0.03)**	
Exploitative OFDI	**0.36****	**0.16***	**0.14***	**0.14***	*H1b*	0.08	0.02	0.04	–0.04	0.02	0.03	
	(0.15)	**(0.10)**	**(0.07)**	**(0.07)**		(0.06)	(0.05)	(0.04)	(0.08)	(0.05)	(0.04)	
Exploratory OFDI × TT	–0.06	**0.06***	**0.07***	**0.07***	*H2a*	0.02	0.04	0.04	–0.00	0.00	–0.01	
	(0.12)	**(0.03)**	**(0.04)**	**(0.03)**		(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	
Exploratory OFDI × CI	–0.17*	0.01	0.03	0.02	*H3a*	0.02	0.03	0.02	–0.01	0.01	0.01	
	(0.09)	(0.04)	(0.04)	(0.04)		(0.03)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)	
Exploitative OFDI × TT	**–0.20****	**–0.06***	**–0.12****	**–0.09***	*H2b*	–0.01	–0.01	–0.02	–0.06	–0.05	–0.04	
	(0.07)	**(0.03)**	**(0.05)**	**(0.05)**		(0.03)	(0.05)	(0.04)	(0.04)	(0.04)	(0.03)	
Exploitative OFDI × CI	**0.24***	**0.06***	**0.15****	**0.12***	*H3b*	0.02	0.04	0.05	0.04	0.03	0.04	
	(0.12)	**(0.04)**	**(0.06)**	**(0.07)**		(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	
N	766	766	708	729		745	687	708	727	669	691	
Observations	4584	4584	4130	4341		3829	3432	3622	3089	2750	2918	
Degree	33	33	33	32		32	32	31	31	31	31	
R-square (%)	5.85	26.73	28.16	27.19		24.38	26.01	24.84	21.82	24.05	21.59	
F value/Wald Chi^2	9.82***	36.40***	35.37***	37.01***		23.91***	21.42***	24.30***	33.19***	30.97***	32.17***	

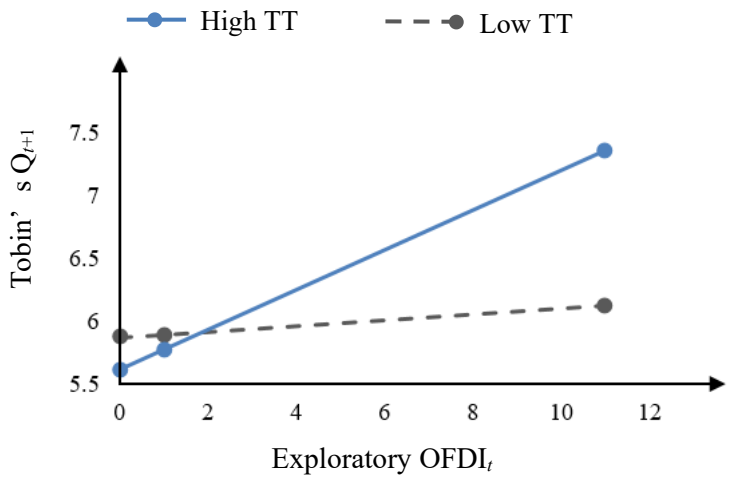
Notes: Standardized coefficients. The model controls for industry and time dummies, but the coefficients are not presented in the table.

Table 5. Robustness tests related to H4

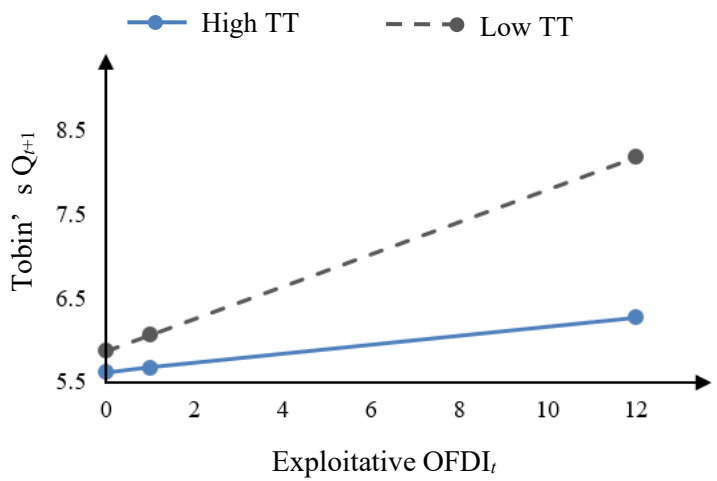
Dependent variables	Tobin's Q_{t+1} exploration-exploitation process			*H*	Tobin's Q_{t+1} exploitation-exploration process			*H*
Robustness tests	*N of countries*	*Coastal samples*	*Nontraditional industries*		*N of countries*	*Coastal samples*	*Nontraditional industries*	
	Model 26	Model 27	Model 28		Model 29	Model 30	Model 31	
Constant	6.58***	7.43***	6.46***		6.60***	7.39***	6.43***	
	(1.47)	(1.62)	(1.53)		(1.46)	(1.61)	(1.52)	
Firm size	–1.65***	–1.87***	–1.64***		–1.66***	–1.86***	–1.64***	
	(0.40)	(0.44)	(0.42)		(0.40)	(0.44)	(0.41)	
Leverage	–0.09***	–0.10***	–0.09***		–0.09***	–0.10***	–0.09***	
	(0.02)	(0.02)	(0.02)		(0.02)	(0.02)	(0.02)	
State ownership	0.22	0.40	0.19		0.19	0.37	0.15	
	(0.32)	(0.36)	(0.34)		(0.32)	(0.36)	(0.34)	
R&D intensity	3.91*	4.05	3.92*		3.86*	3.79	3.83*	
	(1.91)	(2.62)	(1.91)		(1.89)	(2.50)	(1.90)	
Advertising intensity	–0.63	–1.61	–0.84		–0.47	–1.31	–0.58	
	(1.13)	(1.26)	(1.10)		(1.16)	(1.34)	(1.17)	
Export intensity	–0.70	–0.47	–0.80*		–0.74	–0.51	–0.84	
	(0.45)	(0.45)	(0.45)		(0.46)	(0.46)	(0.45)	
OFDI experience	–0.00	–0.01	–0.01		–0.00	–0.00	–0.00	
	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	
Institutional distance	–0.06*	–0.08**	–0.05*		–0.09**	–0.10***	–0.08**	
	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)	
Cultural distance	0.00	0.00	0.00		–0.00	–0.00	–0.00	
	(0.00)	(0.01)	(0.00)		(0.00)	(0.01)	(0.00)	
Economic distance	0.01	0.01	0.01		0.00	0.01	0.01	
	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	
Industry government support	0.04	0.02	0.04		0.04	0.03	0.04	
	(0.04)	(0.04)	(0.04)		(0.04)	(0.04)	(0.04)	
Technological turbulence	–0.26*	–0.26**	–0.07		–0.27*	–0.26*	–0.08	
	(0.12)	(0.13)	(0.11)		(0.12)	(0.13)	(0.11)	
Competitive intensity	–0.07	–0.11	–0.11		–0.06	–0.10	–0.10	
	(0.09)	(0.10)	(0.09)		(0.09)	(0.10)	(0.09)	
Exploratory $OFDI_{t-1}$	0.00	–0.00	–0.01					
	(0.04)	(0.03)	(0.03)					
Exploitative $OFDI_t$	0.09	0.06	0.08					
	(0.11)	(0.06)	(0.06)					
Sequential ambidexterity [a]	**0.02***	**0.04***	**0.03***	*H4*				
	(0.01)	**(0.02)**	**(0.02)**					
Exploitative $OFDI_{t-1}$					0.09	0.03	0.04	
					(0.12)	(0.08)	(0.07)	
Exploratory $OFDI_t$					**0.19*****	**0.14*****	**0.14*****	
					(0.06)	**(0.04)**	**(0.04)**	
Sequential ambidexterity [b]					–0.06	–0.02	–0.02	*H4*
					(0.11)	(0.07)	(0.05)	
N	746	668	709		746	668	709	
Observations	3843	3446	3637		3843	3446	3637	
Degree	29	29	28		29	29	28	
R-square (%)	25.19	26.74	25.45		25.46	26.88	25.64	
F value	26.63***	26.36***	26.30***		26.36***	24.48***	25.85***	

Notes: The model controls for industry and time dummies, but the coefficients are not presented in the table.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; double-tailed tests.
[a] Examining the exploration-exploitation process, measured as exploratory $OFDI_{t-1}$ × exploitative $OFDI_t$
[b] Examining the exploitation-exploration process, measured as exploitative $OFDI_{t-1}$ × exploratory $OFDI_t$

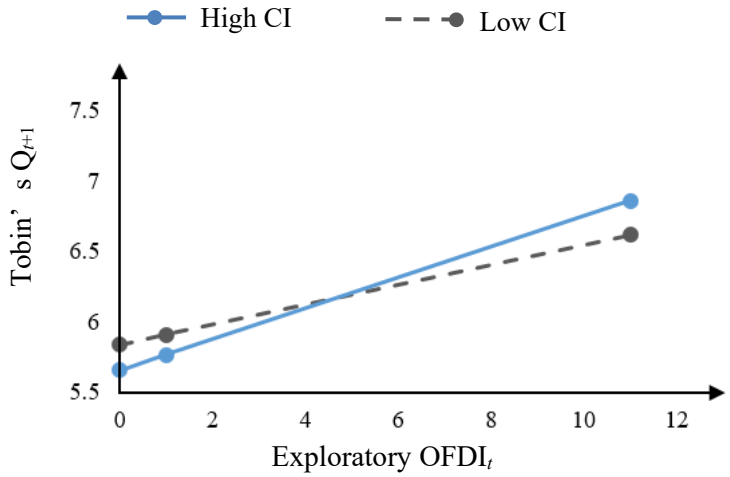
Panel A: TT moderates the exploratory OFDI–performance relationship



Panel B: TT moderates the exploitative OFDI–performance relationship



Panel C: CI moderates the exploratory OFDI–performance relationship



Panel D: CI moderates the exploitative OFDI–performance relationship

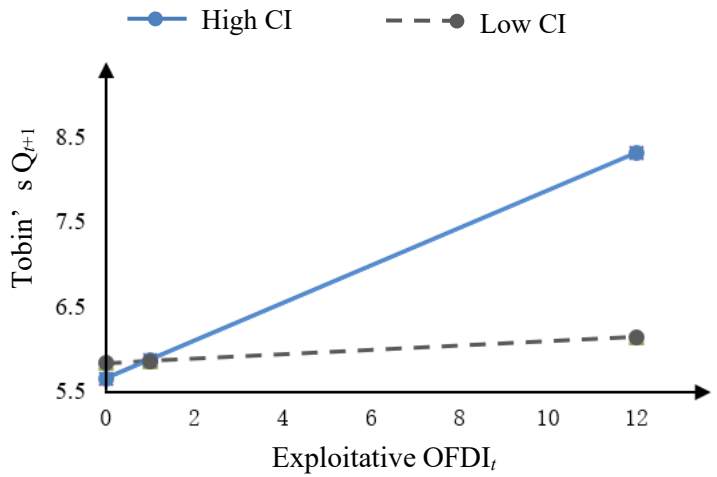


Figure 2

Moderating roles of technological turbulence (TT) and competitive intensity (CI)