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Facilitating speed of internationalization: The roles of business intelligence and organizational agility

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ABSTRACT

With the aim of bridging the gap between the firm's internationalization speed research and the emerging study of business intelligence (BI), this study draws on knowledge transformation as the theoretical lens for exploring how business intelligence leverages organizational agility to promote the speed of internationalization. By analyzing data collected from 258 Chinese firms in the Yangtze River Delta area, we conclude that: (1) Business intelligence has a significant influence on the speed of internationalization, and the organizational agility positively mediates such causal relationship. (2) Cultural distance negatively moderates the relation between organizational agility and speed of internationalization. The managerial implications of these findings and future research directions regarding the firm's internationalization speed are discussed.

1. Introduction

With the intensified international competition, the accelerating internationalization has been becoming an increasingly important route to competitive advantage for international companies (Hilmersson & Johanson, 2016; Lin & Si, 2019; Tan & Mathews, 2015). firms eagerly seeking to participate in international business are on the rise (Johanson & Kalinic, 2016), with the expectation that a faster internationalization strategy will facilitate them to seize fresh opportunities, enter into potentially global niches, and build first-mover advantages (Acedo & Jones, 2007; Jiang, Beamish, & Makino, 2014; Vermeulen & Barkema, 2002). The firm's speed of internationalization, a key aspect of international strategic decision-making, has become an important issue for expanding international markets (Chetty, Johanson, & Martín, 2014; Coviello & Cox, 2006; Prashantham & Young, 2011). It is particularly relevant for Chinese companies, which usually have strong motivations to catch up with competitors from developed markets as quickly as possible (Cheng & Yang, 2017; Deng, 2012).

Recently, the internationalization speed literature has increasingly shifted focus onto the relationship between a firm's internationalization speed and its international performance (García-García, García-Canal, & Guillén, 2017; Jain, Celo, & Kumar, 2019; Sea-Jin & Jay Hyuk, 2011). These emerging studies confirm the importance of experiential knowledge that promotes the firm's speed of internationalization by extracting such knowledge from embodied experience, such as operational experience and trust-building (Johanson & Vahlne, 1977, 2009). However, the experiential knowledge accumulation is a time-consuming activity and has been severely challenged in today's information-based competitive environment. Particularly, the extensive use and dispersion of ICT has accelerated information flowing throughout international markets (Lecerf & Omrani, 2019; Skudiene, Auruskeviciene, & Sukeviciute, 2015), and require enterprises to build an on-demand IT-based business system, such as business intelligence, to better support their international business running. Several researchers have tried to explore the effect of business intelligence on the company's international activity. For instance, Tarek, Adel, and Sami (2016) suggested that competitive business intelligence positively influences the firm's international expansion. Tarek, Zouhayer, and Adel (2019) indicated that the SMEs' international competitiveness is strongly relied on a company's business intelligence. Meanwhile, a few studies argued that business intelligence would not necessarily promote firm's internationalization speed because it depends on how firms appropriately absorb and adapt external knowledge that business intelligence provides (Chen, Chiang, & Storey, 2012). As late-comers to global competition, Chinese firms are usually lagging behind firms from developed countries to develop firm-specific advantages, especially in knowledge acquisition and transformation (Cheng & Yang, 2017). Hence, it is not clear whether business intelligence of firms from China plays a positive role in promoting firm's internationalization speed.

Drawing on firm's internationalization speed studies (Acedo &

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Jones, 2007; Chetty et al., 2014; Prashantham & Young, 2011) and business intelligence literature (Dishman & Calof, 2008; Elbashir, Collier, & Davern, 2008; Popovič, Hackney, Coelho, & Jaklič, 2012), we propose a theoretical model that examines the relationships among business intelligence, organizational agility, cultural distance and firm's internationalization speed in the context of Chinese firms. We argue that business intelligence of the internationalizing firms from China would promote firm's internationalization speed through organizational agility, a key mediator that captures the capability of the firm to interpret and apply diversified knowledge to their internationalization strategies (Fosfuri & Tribó, 2008; Gutiérrez, Cegarra Navarro, Cepeda Carrión, & Leal Rodríguez, 2015). Specifically, when Chinese internationalizing firms receive valuable knowledge via business intelligence, the internationalization speed will be accelerated if they exercise organizational agility to effectively manage this new knowledge provided by business intelligence. Additionally, the existing research indicated that the cultural distance resulting from limited understanding of the norms, values, and institutions in other countries (Laszlo, David, & Craig, 2005) may hinder a company's utilization of organizational agility to push its internationalization. We introduce cultural distance as a moderator of the link between organizational agility and the Chinese firm's internationalization speed. Therefore, we examine two important questions in this study: (1) how does business intelligence affect the speed of internationalization of Chinese firms via organizational agility? (2) How does cultural distance interaction with organizational agility influencing the speed of internationalization of Chinese firms?

2. Theory background and hypothesis development

2.1. Business intelligence and speed of internationalization

As a set of techniques, business intelligence (BI) is defined as a voluntary process whereby a firm can scan and absorb information from a turbulent environment to detect an available opportunity while minimizing the threats associated with uncertainty (Elbashir et al., 2008; Gudfinnsson, Strand, & Berndtsson, 2015; Tarek et al., 2016). Several key actions, data collection, data analysis, and the sharing and dissemination of information, have been identified in the analysis of BI's function (Dishman & Calof, 2008; Wamba et al., 2017). During internationalization, the application of BI is strongly influenced by which information is selected and how it is transformed into decision-making knowledge (Ferraris, Mazzoleni, Devalle, & Couturier, 2019; Wamba, Akter, Edwards, Chopin, & Gnanzou, 2015). Hence, the recent research concerning BI and a firm's internationalization has focused on data integration and analytical capability (Fink, Yogev, & Even, 2017; Popovič et al., 2012). Data integration aims to combine observable data residing at different sources to generate descriptive information, such as who, what, when, and how much the unified data affects (Ferraris et al., 2019; Wamba et al., 2015). Analytical capability is closely related to the firm's decision-making, and it can help transfer the useful information into the explicit knowledge with employee's engagement, which is conducive to the decision-making (Chen et al., 2012; Dubey, Gunasekaran, & Childe, 2019). We infer that data integration and analytical capability are the two important characteristics of BI that can help a firm to acquire business data, assimilate the valuable information, and finally provide new knowledge for the firm in the process of internationalization. Specifically, BI enables a firm's fast internationalization for the two following reasons.

On the one hand, the data integration of BI provides comprehensive information for firms to speed up their internationalization. In the firm's internationalization process, data integration involves filtering, summarizing, and sorting data from various sources, such as host markets, competitors and local governments, then systematizes a unified information from the gathered data (Popovič et al., 2012). The systematic information contributes to firms' deep understanding of the turbulent environment and can inform the most appropriate strategy for the firm's international learning and committing activities, which are the two core elements of internationalization speed (Casillas & Acedo, 2013; Chetty et al., 2014). This effect of data integration is especially important for Chinese firms, which are usually challenged with information deficit in their international business operation.

On the other hand, the analytical capability of BI is likely to assist in optimizing decision-making knowledge on the firm's internationalization speed. The involvement of the analytical capability enables these firms to transform descriptive information into instructive knowledge comprehensively and provides them feasible options for decision-making (Gudfinnsson et al., 2015). Hence, BI-based analytical capability can build trustful and instant communication to improve decision-making efficiency via sharing explicit knowledge, promoting the firm's internationalization. This BI function is particularly critical for Chinese companies, whose decision-makers usually lack international management experience (Cheng & Yang, 2017), and which have few experts in their areas of competence (Deng & Yang, 2015). Accordingly, we propose:

Hypothesis 1. BI is positively related to the firm's speed of internationalization.

2.2. The mediating role of organizational agility

Organizational agility is the capability to cope with rapid, relentless, and uncertain changes and to thrive in a competitive environment full of unpredictable opportunities (Goldman, Nagel, & Preiss, 1995; Volberda, 1997). The literature recognizes two types of organizational agility: market capitalizing agility and operational adjustment agility (Dove, 2001; Lu & Ramamurthy, 2011). Market capitalizing agility is defined as the ability to rapidly respond to the target market's need through continuous monitoring and exploitation of the business environment, and to perceive volatile environments as a fertile opportunity for new strategic directions (Sambamurthy, Bharadwaj, & Grover, 2003). Strong market capitalizing agility can help firms exploit existing information and knowledge to better position them to sense opportunities in target markets and be aware of the change in international markets (Lu & Ramamurthy, 2011; Swafford, Ghosh, & Murthy, 2008). Operational adjustment agility primarily concerns the firm's learning capability in international business operation and its rapid adaptation triggered by the opportunity emerging in the international markets (Mikalef & Pateli, 2017). It emphasizes a firm's learning capability to integrate own knowledge with temporal situations to organize new experiential knowledge to gain comparative advantage in turbulent contexts (Chakravarty, Grewal, & Sambarrturthy, 2013).

We contend that organizational agility serves as a bridge linking business intelligence with a firm's speed of internationalization. The influence of organizational agility on a firm's decision-making relies on the utility of BI for two reasons. First, BI provides extensive information and explicit knowledge for firms to improve the organizational agility (Lu & Ramamurthy, 2011; Mikalef & Pateli, 2017). Particularly, the knowledge based on BI is essential for the internationalizing enterprise to cope with unpredictable markets (Cavusgil & Gary, 2015; Van Oosterhout, Waarts, & van Hillegersberg, 2006). It is especially important for the internationalizing companies from China, because the explicitly international knowledge converted by BI reduces the difficulty for Chinese firms to understand the foreign markets, and makes up the deficiency of international experience and resources faced by many Chinese firms. Second, the propose of feasible options based on explicit knowledge is expected to improve the efficiency of resource committing and facilitate consensus on internationalizing expectations among different stakeholders (Dove, 2001). For Chinese companies, the useful knowledge originating from BI is always helpful to set feasible options, which are conducive for developing an organization routine to deal with the internal contradiction (Cegarra-Navarro, Soto-Acosta, &

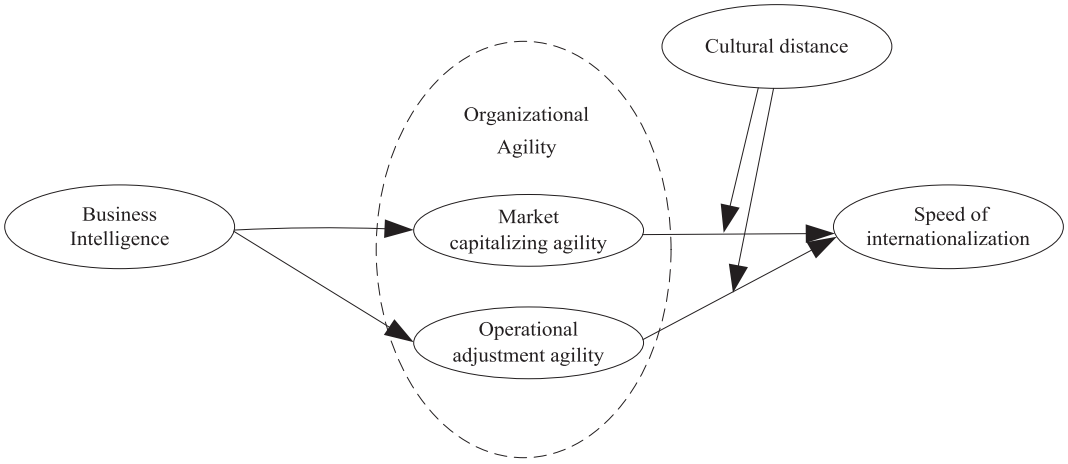

Fig. 1. Theoretical model.

Wensley, 2016). Hence, the internationalizing firm's organizational agility is enhanced by the explicit knowledge development founded on the utility of BI.

Organizational agility assumes great significance for the firm's internationalization speed for two reasons. On the one hand, market capitalizing agility can transfer the explicit knowledge into an experiential one to meet the requirement of the new market. For instance, it can use the structural knowledge to build well-defined norms (e.g., trust-building) to facilitate the monitoring of internationalization, and confidently deal with the threats from host markets (Swafford et al., 2008). On the other hand, operational adjustment agility can strengthen firms' international learning feedback, and help them to successfully apply and adopt this explicit knowledge to rapidly select optimum locations in targeting market and gain competitive advantage quickly (Tallon & Pinsonneault, 2011). Johanson and Vahlne (1977) also stated that it is beneficial for the multinationals to apply explicit knowledge to extract tacit knowledge from its successive operations. Hence, given these two capabilities of organizational agility, firms are more likely to prepare for the acquisition of the explicit knowledge to implement their international strategies (Dove, 2001; Sambamurthy et al., 2003). At the same time, some research also proposed that Chinese firms with strong organizational agility can gain experiential knowledge from external resources to promote their international strategies obviously (Tsai, 2001; Yang, Jiang, Kang, & Ke, 2009).

In summary, BI is vital for advancing organizational agility and, thereby, achieving higher speed of internationalization for Chinese internationalizing firms. Hence, we hypothesize that:

Hypothesis 2. Market capitalizing agility mediates the relation between BI and the firm's speed of internationalization.

Hypothesis 3. Operational adjustment agility mediates the relation between BI and the firm's speed of internationalization.

2.3. The moderating role of cultural distance

In international business settings, cultural distance between different countries is considered as a contingency factor affecting the relationship between organizational agility and a firm's speed of internationalization (Srilata, Margaret Spring, & Lilach, 2012). Culture distance refers to the degree of principal differences in national culture between the host country and home country (Laszlo et al., 2005; Oded, 2001; Stahl & Voigt, 2008). Empirically, recent studies reported the mixed results of the influence of cultural distance on the firm's internationalization (Laszlo et al., 2005; Reus & Rottig, 2009). For example, Cheng and Yang (2017) suggested that the link between technological innovation capability and cross-border M&As' performance is negatively moderated by cultural distance. Luis and Leslie (1997) argued that cultural distance helps firms to absorb advanced management knowledge, thereby improving their internationalization performance. There also exists some research proposing that cultural distance insignificantly impacts the enterprise's international performance (Deng & Yang, 2015; Yang, 2015).

In this study, we suggest that cultural distance negatively moderates the relationship between organizational agility and Chinese firm's internationalization speed. With greater turbulence from the diverse cultures in international markets, an internationalizing company is hard to interpret new market knowledge and undertake a series of learning and committing activities to seize potential international opportunities effectively (Pauluzzo & Cagnina, 2019; Reus & Rottig, 2009). Cultural distance limits a firm to timely spot the emerging opportunities in the international market, diminishing the speed of an enterprise's internationalization thereafter (Deng & Sinkovics, 2018). Likewise, the inhibition effect of cultural distance also weakens the positive role of operational adjustment agility on the firm's internationalization speed. In more detail, the decreasing efficiency of communication and knowledge integration brought by cultural distance hinders enterprises from making appropriate internal adjustment decision to cope with the change of international environment (Luis & Leslie, 1997), therefore, resulting in a lower internationalization speed finally. Thus, we propose:

Hypothesis 4. Cultural distance negatively moderates the positive effect of market capitalizing agility on the firm's speed of internationalization.

Hypothesis 5. Cultural distance negatively moderates the positive effect of operational adjustment agility on the firm's speed of internationalization.

The conceptual model is shown in Fig. 1.

3. Research methodology

3.1. Data

To test the hypotheses, we constructed a longitudinal survey collecting data from 258 firms in the Yangtze River Delta area in China. There are three considerations of selecting samples in this area. First, Yangtze River Delta area includes the largest number of internationalizing firms in China, where data is more achievable thereby ensuring its validity. Second, Chinese governments have encouraged companies to enhance their international competitiveness. Consequently, the governments frequently offer various financial subsidies and consulting services to promote these enterprises to adopt the

ICT-related technologies in international business operations. Third, this area has set up several industrial parks (e.g. Zhejiang overseas talents innovation park in Hangzhou), which are usually equipped with established information technology-based marketing, R&D, and product sales infrastructure. All these preferential policies and conditions provided by governments and industrial parks greatly improve the international firms' confidence of developing and applying business intelligence technology.

The respondents mainly include CIOs and senior managers in charge of business information management. Because of our sample consists some SMEs, which rarely publish documents, we collected the primary data via on-site surveys. Considering the great influence of government departments on the firms under their jurisdiction in China, the data collection process supported by local government agencies (e.g., Development and Reform Bureau, Department of Commerce) will be very convenient. Particularly, our study group has built long-term cooperative relationships with Zhejiang Department of Commerce and Jiangsu Development and Reform Bureau, these cooperative relationships help us to invite executives in charge of business information management in more than 400 internationalizing firms to attend our study meetings. At these meetings, we brief about the study's purpose and explain the survey procedures. Only those firms whose executives willing to participate are retained in the sample. With the consent of the local government agencies, we distribute the questionnaires and emails in the name of the government documents. We then collect data in two stages.

The first data collection is conducted in July–August 2017. 336 CIOs and information-related managers provide demographic information on their firms and their perceptions of BI and organizational agility. We use two types of data collection: interviews and emailed questionnaires. Of the 276 responses, 28.3% are interviews and 71.7% are emailed questionnaires. As our approach entailed potential single-respondent bias, we follow the recommendations of Podsakoff, Mackenzie, Lee, and Podsakoff (2003) by separately handling the two sections of the questionnaire. These results show that the main bias relating to different respondents does not exist in our study.

The second data collection is conducted two months later, with participants asked to provide objective information about their firms' internationalization speed. We need objective indicators for our two measurements of a firm's internationalization speed, namely speed of international learning and speed of committing internationally. For example, we use number of years since the first export order/number of years operating to measure the former, and the latter using number of languages used/number of years operating. Although this on-site survey strategy is rather labor- and cost-intensive, it helps to ensure respondents' commitment and gain access to available documents. In total, 276 participants provide their firms' internationalization speed information, of which 258 responses are usable (93.5%).

Hence, the final sample comprises 258 firms, an overall response rate of 76.8%. In terms of age, 27.4% of firms have been operating for 3–10 years, and the others are founded more than 10 years ago. Regarding ownership, 31.4% are state-owned firms and 68.6% are private firms. In addition, in terms of business size (referring to the standards issued by China's Ministry of Industry and Information Technology), 9.8% are small firms (Industrial Manufacturing, < 300 employees; IT Industry, < 100 employees), 33.9% are medium-sized firms (Industrial Manufacturing, 300–1000 employees; IT Industry, 100–300 employees), and 56.3% are large firms (Industrial Manufacturing, > 1000 employees; IT Industry, > 300 employees).

3.2. Measurement

3.2.1. Business intelligence

The successful application of BI is determined by data integration and analytical capability (Frisk & Bannister, 2017; Popovič et al., 2012; Wamba et al., 2017). Data integration aims to combine and provide a unified view of data residing at different sources (Ferraris et al., 2019; Wamba et al., 2015), while analytical capability concerns the effective deployment of analytical methods to transform business data into valuable decision-making knowledge (Chen et al., 2012; Dubey et al., 2019). We measure the level of data integration within firms through three indicators: "Compared with competitors, we can integrate diversified available data better", "The data from different data sources in our companies are more mutually consistent than competitors", and "Compared with competitors, our companies are well synchronized with other organizational databases in targeted markets". For analytical capability, we select three indicators most used previously (Fink et al., 2017; Popovič et al., 2012), and the sample indicators include: "Compared with competitors, we comprehensively analyze operational information on an ongoing basis", "Compared with competitors, we have better ability of knowledge codification", and "Compared with competitors, employees from different departments in our companies share knowledge and insights smoothly". Respondents are asked to evaluate on a 7-point Likert scale on their firms' effectiveness regarding each indicator compared with that of their main competitors.

3.2.2. Organizational agility

Organizational agility is measured through two components: market capitalizing agility and operational adjustment agility. The market capitalizing agility measurement comprises three items, and the sample's items include: "We are quick to make and implement appropriate decisions in the face of market/customer-changes"; "We treat market-related changes and apparent chaos as opportunities to capitalize quickly." The operational adjustment agility is measured by three items too, and the sample's items include: "We fulfill customers' rapid-response demands and special requests whenever they arise, and our customers have confidence in our ability"; "Whenever there is a supply disruption, we can quickly make necessary alternative arrangements and internal adjustments" (Lu & Ramamurthy, 2011). Response options range from 1 ("not at all true") to 7 ("very true").

3.2.3. Cultural distance

Cultural distance is measured as the extent of differences between the home and host country in terms of Hofstede's four cultural dimensions (power distance, uncertainty avoidance, masculinity/femininity, and individualism). Similar to the prior research (e.g., Brouthers, Brouthers, & Werner, 2008; Cheng & Yang, 2017), we follow Bruce and Harbir (1988) method, the most cited management paper by combining the four dimensions into one composite variable. A low score on this variable represents cultural proximity, while a high score means that the home and host countries are culturally distant.

3.2.4. Speed of internationalization

Many scholars refer to a firm's internationalization speed as the time it takes to internationalize from the firm's inception (Chen & Yeh, 2012; Chetty & Campbell-Hunt, 2004; Luo, Hongxin Zhao, & Du, 2005). However, this general measurement of internationalization speed implies a limited temporal perspective by only considering the time between the company's inception and its start of internationalization, unable to fully capture the complexity and connotations of the firm's internationalization speed. To address this criticism, we follow Chetty et al. (2014) by using speed of international learning and speed of committing internationally to measure it. These indicators respectively correspond to knowledge development and resource commitment emphasized in the Uppsala model (Vahlne & Johanson, 2017). Specifically, international learning speed is constituted by repetition and diversity of international activities, such as "speed of achieving regular exports", while the international committing speed is measured with three indicators, such as "speed of committing staff to international activities" (Chetty et al., 2014).

Table 1
Descriptive Statistics and Correlations.

	Mean	SD	1	2	3	4	5	6	7
1. Age	2.97	1.55	–						
2. Ownership	1.26	0.44	0.11	–					
3. Size	3.70	2.15	0.15*	0.02	–				
4. BI	2.64	0.70	0.02	0.07	0.09	–			
5. Market capitalizing agility	2.91	0.69	−0.16*	−0.13*	−0.001	0.27**	–		
6. Operational adjustment agility	2.94	0.74	−0.04	−0.09	0.025	0.29**	0.68**	–	
7. Cultural distance	3.38	0.57	0.01	0.02	−0.10	−0.08	0.05	0.09	–
8. Speed of internationalization	0.89	0.22	0.003	0.03	−0.04	0.18*	0.31**	0.29**	−0.01

* $p < .05$.
** $p < .01$

3.2.5. Control variables

We identify three relevant control variables. The first is firm age (i.e., number of years in existence). As a firm's operating experience and learning is often associated with age (Agarwal & Gort, 2002), it can predict how firms respond to opportunities and challenges and, in turn, affect their internationalization speed. Second, we control for firm size, which has often been associated with the level of available resources (Mishina, Pollock, & Porac, 2004). Thus, firm size can partly reflect a firm's strategic decisions (Chandy & Tellis, 2000). Third, we control ownership, which may support firms' acquisition of certain resources to offset the risks of internationalization (Luo & Tung, 2007), in turn influencing a firm's speed of internationalization.

4. Analyses and results

4.1. Mediated relations

Table 1 shows the descriptive statistics and correlations among all variables. BI is positively correlated with market capitalizing agility ($r = 0.27$, $p < .01$), operational adjustment agility ($r = 0.29$, $p < .01$) and a firm's internationalization speed ($r = 0.18$, $p < .05$). Both market capitalizing agility and operational adjustment agility are also positively related to the firm's speed of internationalization ($r = 0.31$, $p < .01$; $r = 0.29$, $p < .01$, respectively). Regarding the control variables, both firm age and ownership are negatively related to market capitalizing agility ($r = -0.16$, $p < .05$; $r = -0.13$, $p < .05$, respectively).

We use regression analysis to test our hypotheses, which is a fitting model owing to the need to incorporate moderator effects, polynomials, and relevant control variables (Hair, Black, Babin, & Anderson, 2010). A linear regression is conducted to test Hypothesis 1. First, setting speed of internationalization as the dependent variable, we enter control variables (age, size, and ownership) into the regression equation. Second, we add BI as the independent variable into the regression equation. As shown in Model 6 of Table 2, all of control variables have no significant effect on the firm's internationalization speed, but BI is positively associated to the firm's speed of internationalization ($r = 0.06$, $p < .01$), thus supporting Hypothesis 1.

According to Baron and Kenny (1986), there is a full mediating effect if the following conditions are met: (1) the independent variable (BI) is significantly correlated with the mediators (market capitalizing agility and operational adjustment agility); (2) the independent variable (BI) is distinctly associated with the dependent variable (speed of internationalization); (3) the mediating variables (market capitalizing agility and operational adjustment agility) are apparently related to the dependent variable (speed of internationalization); and (4) when the mediating variables (market capitalizing agility and operational adjustment agility) enter the regression equation, the relation between the independent variable (BI) and dependent variable (speed of internationalization) becomes non-significant.

Hypothesis 2 predicts that market capitalizing agility mediates the influence of BI on the firm's internationalization speed. As shown in Table 2, BI is positively related to market capitalizing agility ($r = 0.28$, $p < .01$; Model 2), and a firm's internationalization speed ($r = 0.06$, $p < .01$; Model 6) respectively. Market capitalizing agility is significantly and positively related to the firm's internationalization speed ($r = 0.11$, $p < .01$; Model 7). However, the relation between BI and the firm's internationalization speed is not significant when market capability agility is incorporated ($r = 0.11$, *ns*; Model 9). Therefore, the test reveals that market capitalizing agility is a full mediator between BI and the firm's speed of internationalization, supporting Hypothesis 2.

Hypothesis 3 predicts that operational adjustment agility mediates the influence of BI on the firm's internationalization speed. As shown in Table 2, BI is positively related to operational adjustment agility ($r = 0.31$, $p < .01$; Model 4) and the firm's internationalization speed ($r = 0.06$, $p < .01$; Model 6) separately. Operational adjustment agility is significantly and positively related to the firm's internationalization speed ($r = 0.09$, $p < .01$; Model 8). However, the linking between BI and the firm's internationalization speed is not significant when operational adjustment agility is incorporated ($r = 0.03$, *ns*; Model 10). Therefore, operational adjustment agility fully mediates the relationship between BI and the firm's internationalization speed. Moreover, as shown in Table 2, BI explains 4%, 8%, and 6% of the variance in Models 6, 9, and 10, respectively. Thus, Hypothesis 3 is fully supported.

4.2. Moderation of the mediated relationship

Hypotheses 4 and 5 propose second-stage moderated mediation models in which the moderator (cultural distance) respectively interacts with the mediators (market capability agility and operational adjustment agility), in turn related to the outcome variable (speed of internationalization). We first calculate the interaction terms (mean-centered) to minimize concern over multicollinearity (Porter, Aike, & West, 1994), then test the moderation effects. As shown in the regression results in Table 2, the interaction of market capitalizing agility and cultural distance is negatively associated with the firm's speed of internationalization ($r = -0.02$, $p < .1$; Model 11), as is the interaction of operational adjustment agility and cultural distance ($r = -0.04$, $p < .01$; Model 12). To plot the significant interactive effects, we adopt Aiken and West (1991) procedure of computing slopes by taking one standard deviation above and below the mean of cultural distance. Fig. 2 shows that the relationship between market capitalizing agility and the firm's speed of internationalization is stronger when cultural distance is lower. Likewise, Fig. 3 shows that the relation between operational adjustment agility and the firm's speed of internationalization is also strengthened when cultural distance is lower. Thus, Hypotheses 4 and 5 are both supported.

Table 2
Results of Hypotheses Testing.

	Market capitalizing agility		Operational adjustment agility		Speed of internationalization							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Control Variables												
Age	−0.07*	−0.07	−0.02	−0.02	0.000	0.000	0.01	0.001	0.01	0.001	0.01	0.002
Size	0.01	0.001	0.01	0.003	−0.004	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
Ownership	−0.18	−0.21	−0.14	−0.17	0.02	0.01	0.04	0.03	0.03	0.02	0.03	0.01
Independent variable												
BI		0.28**		0.31**		0.06**			0.03	0.03	0.03	0.03
Mediating variables												
Market capitalizing agility							0.11**		0.10**		0.09**	
Operational adjustment agility								09**		0.08**		0.08**
Moderating variable												
Cultural distance											−0.001	0.001
Interaction												
Market capitalizing agility × cultural distance											−0.02+	
Operational adjustment agility × cultural distance												−0.04**
R^2	0.04	0.12	0.01	0.09	0.002	0.04	0.11	0.09	0.12	0.10	0.13	0.13
F	3.34*	8.32**	0.81**	6.59**	0.21	2.4*	7.55**	6.4**	6.61**	5.74**	5.23**	5.49**
ΔR^2	0.04	0.08	0.01	0.09	0.002	0.03	0.11	0.09	0.08	0.10	0.13	0.13
ΔF	3.34*	22.4**	0.81	23.7	0.21	8.95	7.55	24.9	22.6	2.89	9.98	5.49

** p < 0.01.
* p < 0.05.
+ p < 0.1.

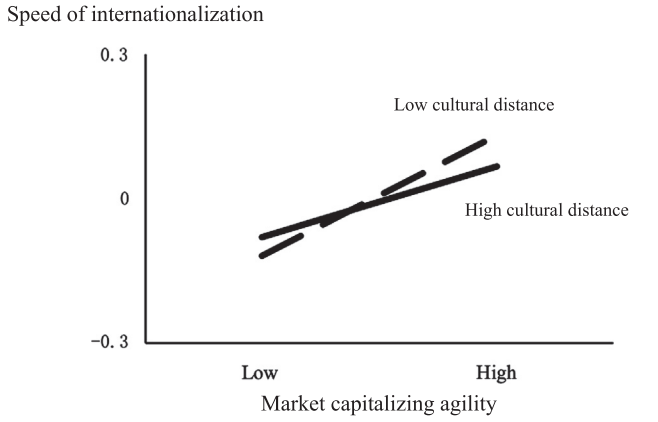

Fig. 2. Moderating effect of cultural distance on the relations between market capitalizing agility and speed of internationalization.

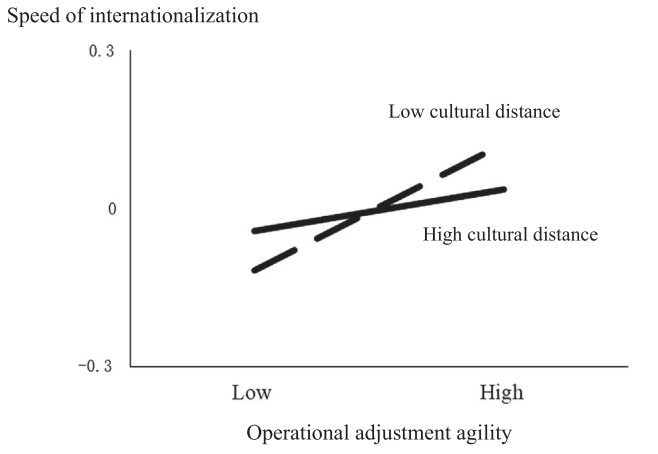

Fig. 3. Moderating effect of cultural distance on the relation between operational adjustment agility and speed of internationalization.

5. Discussion and implications

5.1. Findings and contributions

This study explores *how* BI influences a firm's internationalization speed through organizational agility in the setting of Chinese enterprises. Although BI plays an increasingly important role in a firm's internationalizing strategy in the information era (Božič & Dimovski, 2019; Caseiro & Coelho, 2019), its effect on firm's internationalization has yet to be thoroughly examined, particularly in the settings of the international companies from China. Hence, this study contributes to two different literature streams: business intelligence and international business. For business intelligence, this paper has deepened the recognition that data integration and analytical capability are two core components of business intelligence, and they play different but mutual reinforcing roles in a firm's internationalization. Specifically, data integration aims to collect diversified data from different sources to provide valuable information for the firm's internationalization. At the same time, analytical capability aims to generate explicit knowledge based on such valuable information and propose feasible options (Popovič et al., 2012). Comparing with previous literatures that mainly focus on the data collection and information diffusion activities of business intelligence (Tarek et al., 2016, 2019), our findings not only respond to the doubt raised by scholars that it is far from enough to merely examine the information-collection activities of BI (Michael & Augustinus Van Der, 2018), but also clarify that BI has profound impact on improving a firm's knowledge development (Larson & Chang, 2016; Shollo & Galliers, 2016). Thus, this study makes a great improvement to business intelligence literature.

For international business literature, our findings make the three following contributions. First, this study proposes a new channel to improve a firm's internationalization speed. In contrast to the previous studies emphasizing the antecedents of the firm's internationalization speed based on resource-based view and organizational dynamic capability (Li, Qian, & Qian, 2015; Teixeira & Coimbra, 2014; Yayla, Yeniyurt, Uslay, & Cavusgil, 2018), our study explores the driver of the firm's internationalization speed from the perspective of business intelligence. This line of inquiry is beneficial to the advance of the firm's

internationalization speed studies, especially in today's information and communication age (Michael & Augustinus Van Der, 2018). Hence, our study provides a new theoretical lens for future research on the firm's internationalization speed.

Secondly, our findings enrich the knowledge perspective of international business literature by introducing organizational agility. Given the critical mediating effect of organizational agility on the link between BI and a firm's internationalization speed, we suggest that firms need to construct the bridging role of organizational agility between the explicit knowledge based on BI and experiential knowledge for the internationalization business context. This empirical evidence approves the arguments that knowledge itself is outpacing the ability of BI to deploy knowledge effectively in a firm's international operation (Elbashir, Collier, Sutton, Davern, & Leech, 2013; IşıK, Jones, & Sidorova, 2013), and the firm's speed of internationalization depends heavily on the process of the knowledge transformation via firm's organizational agility.

Finally, our findings demonstrate the negative effect of cultural distance along the firm's internationalization activities. Cultural distance has been widely discussed in the international business (Bauer, Matzler, & Wolf, 2016; Cheng & Yang, 2017), but unfortunately its role remains uncertain (Laszlo et al., 2005; Reus & Rottig, 2009). Our study tries to explain this theoretical paradox by clarifying the inhibition effect of cultural distance on the international process of the firm's knowledge interpretation. It is an interesting theoretical discovery for the international context of Chinese companies, because they are short of international knowledge and valuable resources (Deng & Sinkovics, 2018; Yang, 2015); meanwhile, they are more sensitive to the obstacles caused by cultural distance (Cheng & Yang, 2017). Thus, the empirical findings extend the extant cultural distance and international business literature, especially for emerging markets.

5.2. Managerial implications

Our results provide managers with a clear understanding of the fact that BI and organizational agility promote the firm's speed of internationalization. As latecomers in the global competition, Chinese firms usually have disadvantages of international experience and valuable resources as compared with the competitors from developed markets (Cheng & Yang, 2017; Deng & Yang, 2015). On the one hand, the results show that BI is particularly important for Chinese firms' internationalization speed, because of BI could establish a rich and explicit knowledge basis for the firm's internationalization decision-making. Specifically, managers need have a deep understanding of the irreplaceability of BI in the recent global competition. When applying BI to their firms' international strategy in decision-making, they should pay more attention on the utility of data integration and analytical capability, for example, adopting big data analysis to collect the non-structural data, integrating the information distributed unevenly across markets and codifying a discernible knowledge. On the other hand, our results suggest that organizational agility is the critical role of linking BI and Chinese firm's internationalization speed. To be specific, organizational agility helps company managers recognize the importance of the knowledge transformation under the setting of the specific international business. This point requires practitioners to emphasize the strengthening of organizational capability, especially the knowledge-related capability, such as organizationally embedding the non-transferable knowledge, possessing the bundle of strategically relevant knowledge. Finally, our study also shows that cultural distance plays as a significant barrier for organizational agility promoting a firm's internationalization speed. Therefore, we suggest that the best choice to avoid the operation risk from cultural differences is advising managers to carefully select target markets which have the similar culture to China. If the internationalizing company need enter the market which has big cultural distance, it should learn from the partners or competitors who have rich experience in dealing with cultural distance.

5.3. Limitations and future research

Despite its contributions, the study is constrained by several limitations that future research should seek to address. First, the data used in this study is collected from the Yangtze River Delta area of eastern China, where more active international business activities are undertaking than those in other Chinese regions. Hence, the results may be affected by sampling bias, and future research should use data from other Chinese regions to further test the model. In addition, considering the fact that Chinese economy is in transition and that its firms are relative latecomers to internationalization, China's economy is obviously different from those of developed countries and other emerging ones, which may render our results statistically less significant than those found in the western developed economies and other developing markets. Future studies could extrapolate our findings to these countries to further test the validity of our empirical results.

Second, our study only examines the organizational agility's mediating role between BI and a firm's speed of internationalization. It would be interesting to investigate the mediating role of other factors such as dynamic capability, absorptive capability, or network alliance, which have all previously been demonstrated to play important roles in the firm's internationalization (Božič & Dimovski, 2019; Fink et al., 2017; Torres, Sidorova, & Jones, 2018; Weerawardena, Mort, Liesch, & Knight, 2007). Finally, we only examine the moderating role of cultural distance between organizational agility and the firm's speed of internationalization. Several other variables, such as institutional distance and market heterogeneity, may also weaken this relation, so future research should investigate these potential moderators in an international business context.

6. Conclusions

The findings of this paper shed lights on the relationship between BI and firm's internationalization speed. Through the theoretical lens of knowledge transformation, we propose a moderated mediation framework to examine how firm's internationalization speed is determined. The result of analysis reveals that BI directly affects firm's speed of internationalization. Meanwhile, the relationship between BI and firms' internationalization speed is fully mediated by organizational agility. This result showcases that simply implementing BI is not sufficient to improve firms' internationalization speed. It is vital to build organizational agility which can be used as the pipeline to transfer the explicit knowledge provided by BI to tacit knowledge which is instrumental to improve firm's internationalization speed. This study also displays the cultural distance's moderating role between organizational agility and firm's internationalization speed. This finding contributes to the extant literature of international business by identifying cultural distance as an obstructer, decreasing the efficiency of knowledge transformation in firm's internationalization process. Our research provides practical implications for managers working for Chinese internationalizing firms. To efficiently carry out the strategy of speeding up internationalization process via BI, they should understand the mediating and moderating roles of organizational agility and cultural differences, respectively.

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