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Do Internal and External Knowledge Function as Substitutes or Complements for Firm Exports?

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Abstract: Knowledge is one of the most important factors potentially influencing a firm's decision to internationalize, and to export in particular. In this study, we adopt a knowledge-based view of the firm to investigate the impact of internal and external knowledge on firms' export decisions. Based on data collected through a survey on private firms, we find that the accumulation of internal knowledge and the acquisition of external knowledge can positively influence private firms' propensity to export. We also find that whether the relationship between external and internal knowledge is complementary or substitutionary is contingent on the nature of the external knowledge: when the external knowledge is explicit, internal knowledge can substitute for external knowledge; when the external knowledge is implicit, internal knowledge functions as a complementary source. Moreover, the relationship between internal and external knowledge can also influence private firms' decision of exporting. These findings have both theoretical and practical implications.

Keywords: exports; knowledge-based view; knowledge management; private firms

JEL Classification Numbers: F14, D21, D22, D83.

1. Introduction

Exporting is one of the most frequently used foreign market entry modes and is often a viable option for firms seeking to internationalize. It not only provides firms with a cost-effective way to enter new foreign markets, but also allows for an appropriate degree of flexibility. Consequently, many theoretical and empirical studies in the international business field have paid close attention to export-related issues (Cooper and Kleinschmidt, 1985; Hoang, 1998; Dhanaraj and Beamish, 2003; Wei et al., 2014).

It has been argued that several factors can influence firms' export decisions and that one of the most fundamental factors is knowledge (Sui and Baum, 2014). Firms often consider knowledge as a strategically significant resource (Casillas, Barbero and Sapienza, 2015). Abundant knowledge about products, customers, and markets enables firms to recognize international opportunities and overcome the additional costs of operating in a foreign market (Casillas et al., 2009). Exploiting and exploring knowledge help firms form competitive advantages and do business in foreign markets successfully. Scholars also suggest that knowledge can be developed inside the firm as well as be acquired from outside. However, conclusions regarding firm preferences for different knowledge sources are

controversial, and findings on the relationship between internal and external knowledge are confusing. Additionally, the question of how this relationship influences firms' internationalization decisions, and export decisions in particular, requires further examination (Fernhaber et al., 2009).

One stream of literature argues that firms conduct internal and external knowledge acquisition activities simultaneously, which suggests that these activities are complementary (Caloghirou et al., 2004). Scholars posit that internal knowledge increases the marginal return to external knowledge acquisition (Cassiman and Veugelers, 2006) and that the combination of internal and external knowledge increases firms' international benefits. They also regard the accumulation of internal knowledge as a reflection of "absorptive capacity" (Cohen and Levinthal, 1990) and argue that such an accumulation of internal knowledge helps firms scan, screen, and thus absorb external international knowledge more effectively. Contrary to arguments put forth by the tenets of absorptive capacity, another stream of literature supports the substitution between internal and external knowledge. According to these scholars, the accumulation of internal knowledge reduces firms' dependence on external sources of knowledge. Similarly, a firm that can obtain knowledge externally does not need to rely heavily on internal knowledge to operate in foreign markets (Fernhaber et al., 2009). Thus, firms with only small amounts of internal knowledge can benefit more from external sources of knowledge. These two streams of research conflict. Why have scholars found competing results? How may we draw stable conclusions from the complementation and substitution arguments? These are important issues that require further discussion.

This study seeks to answer the above questions by investigating the relationship between a firm's knowledge and export decisions. Building on the knowledge-based view of firms (Grant, 1996) and the related internationalization literature, we develop a framework concerning how knowledge sources and their relationship influence export behaviour. First, we identify the possible internal and external sources of knowledge that can influence international decisions. Then, an in-depth investigation is conducted on the nature of external knowledge. By distinguishing between explicit and implicit knowledge acquired from outside the firm and explaining the mechanism through which internal and external knowledge interact, we provide new insights into the knowledge complementary vs. substitutionary question. Specifically, we find that internal knowledge and explicit knowledge acquired from outside the firm serve as substitutive resources that contribute to private firms' export decisions, while internal knowledge and implicit knowledge acquired from outside the firm function as complementary resources that contribute to private firms' export decisions. These findings offer important theoretical contributions.

First, we contribute to the literature on firm exports by arguing that both internal and external knowledge are vital to firms when making export decisions. Firms can acquire knowledge through internal research and development (R&D), by directly importing knowledge and experts, and by forming joint ventures with foreign companies. Moreover, internal knowledge and external knowledge interact with each other and have different effects on firms' export decisions. Although scholars have

recognized the importance of knowledge in international business research, few of them investigate how knowledge, especially knowledge from different sources, affects firms' export decisions. The findings of this study contribute to the literature on firm exports. Second, we contribute to the literature on knowledge management by pointing out that we cannot give an either/or answer to the knowledge complementary vs. substitutionary question. The answer of this question depends on the contingent nature of external sources of knowledge: when external knowledge is explicit, internal knowledge takes on the role of substitution; when external knowledge is implicit, internal knowledge functions as a complementary source. Third, the results of this study have implications for managers who are seeking to export products to overseas markets. Such managers need to know that knowledge is particularly important to the export behaviour of a firm. A proper configuration of knowledge bundles will directly influence the firm's propensity to export. A mismatch between knowledge drawn from different sources will restrict a firm's willingness to export.

The rest of this paper is organised as follows. The next section examines the theories used in this paper, and presents hypotheses regarding the relationship between knowledge and exports. Then, we use survey data to empirically test our hypotheses. The next section provides the regression results and discusses the basic findings of this study. We then discuss our findings from a theoretical perspective and provide suggestions for managers who are attempting to go global. We conclude by summarizing the findings and contributions of this study.

2. Theory and hypothesis development

2.1. Organizational knowledge in an international context

Scholars agree that one of the most important factors influencing the internationalization of a firm is the development and acquisition of knowledge (Johanson and Vahlne, 1977; Eriksson et al., 1997; Blomstermo et al., 2004). Several studies have pointed out that knowledge and organizational learning are the main elements in reducing uncertainty and potential for failure during decision-making regarding international operations (Ruigrok and Wagner, 2003).

Knowledge is very important for firms, especially firms seeking to compete in the global market. Knowledge can be divided into several types, each with different functions. Knowledge, in a broad sense, provides the framework for perceiving and formulating opportunities in foreign markets (Johanson and Vahlne, 1977). Acquiring preferential foreign market-related knowledge can help firms choose the appropriate entry mode and select the proper foreign market to enter, thus bypassing potential trade barriers. Moreover, managing multinational enterprises (MNEs) is different from managing domestic businesses, due to the complex structure of MNEs and the uncertainties in foreign markets. Acquiring useful managerial knowledge concerning managing MNEs and operating in foreign markets can ease this burden and reduce the cost of operating in foreign markets. In addition, knowledge and information about foreign customers, suppliers, institutional environments, and potential host country

employees can help shorten the distance between home and the host country, thus increasing a firms' propensity to enter a foreign market and reducing the uncertainties during the post-entry process. Finally, cutting-edge knowledge and technology acquired from foreign leading firms can help increase firms' capability to innovate. The capability to improve existing products and develop new ones strengthens a firm's competitive advantages and thus reduces the failure rate of operating in foreign markets. Consistent with this argument, Wagner (1995) has found a positive correlation between the use of advanced manufacturing technologies and export success. Knowledge stored inside the firm forms the basis of competitive advantages (Eriksson et al., 2000). Eriksson and colleagues (1997) find that the acquisition of 'internationalization knowledge', which includes knowledge about foreign customers and suppliers, doing international businesses, and operating in foreign markets and institutions, helps reduce the perceived cost of the internationalization process.

Since knowledge is essential to the internationalization process, firms often try to develop and acquire knowledge to help reduce uncertainties when deciding to go global. According to the knowledge-based view, firms have access to knowledge from both internal and external sources. Internal sources of knowledge include prior international experience, internal R&D, and employee training. External sources of knowledge include directly importing technology and professionals, sending employees overseas for training, forming partnerships with foreign companies, and obtaining supports from the host or home country government. In the next section, we discuss the impact of internal and external knowledge on international decisions.

2.2. Internal knowledge

The internationalization process always involves uncertainties and many unexpected obstacles. Thus, firms are extremely cautious about making the decision on whether to enter a foreign market (Ling-Yee, 2004). Since exporting firms must compete and grow in markets in which they have little or no previous experience, firms with limited internal knowledge and capabilities may hesitate to enter a foreign market. They may even feel overwhelmed when choosing an appropriate country to enter and an appropriate mode of entry. Moreover, firms without enough internal knowledge about technologies, products, customers, and foreign markets may find it difficult to operate in the foreign market after making the entry decision, because most of their problems will be new to them. Furthermore, failing in internationalization can be costly and even disastrous because firms have invested a large amount of time, resources, and efforts, and they often cannot afford the loss. Considering the consequences and costs of internationalization failure, firms lacking in knowledge and capabilities may abandon the decision to go global.

Internal knowledge can help with internationalization in several ways. First, internal knowledge functions as a base for firms to exploit, which helps firms develop the ability to search and recognize international opportunities. Second, as they accumulate knowledge, firms enhance their understanding of their own technologies, products, customers, and markets. Though this knowledge is sometimes

about the domestic market, it can still be used as reference when the firm is coping with unexpected problems in foreign markets. Third, the efforts made by firms to develop new knowledge concerning foreign markets helps them foster a set of capabilities with which to solve problems in foreign markets more efficiently (Lane et al., 2006), thus enhancing their chance of survival and growth in foreign markets. Fourth, firms with abundant internal knowledge, especially of advanced technologies, may find it easier to develop competitive advantages and may thus feel more confident when competing with other firms in foreign markets. Fifth, since knowledge is inherently mobile, knowledge-intensive firms can more effectively combine knowledge with other assets, such as overseas distribution channels, at lower costs (Autio et al., 2000). The reduction of costs significantly contributes to the success of exports. Therefore, we argue that internal knowledge and related capabilities possessed and developed by the firms themselves positively influence export behaviour. Hence, we hypothesize as follows:

Hypothesis 1. The higher the firm's level of internal knowledge, the higher its propensity to export.

2.3. External knowledge

Apart from accumulating internal knowledge through R&D and training, firms can also access external sources of knowledge by interacting with actors outside the firm. Given the fierce competition in the world market, firms' in-house knowledge may not always be adequate to solve complex problems regarding international issues. In fact, even the largest and strongest firms cannot rely solely on internal sources of knowledge. Thus, the significance of external knowledge has been emphasized (Menon and Pfeffer, 2003; Karlsen et al., 2003; Menon et al., 2006; Escribano et al., 2009). Through case studies, Menon and Pfeffer (2003) find that outside knowledge is preferred by firms because it is scarcer, which makes it more important and unique. However, Caloghirou and colleagues (2004) find that external and internal knowledge are equally important to the development of competitive advantages. During the exporting process, firms often need special and valuable knowledge about the foreign market. However, such knowledge is often not possessed by the firms, or at least cannot be developed inside the firms in the short term. Therefore, finding external sources of knowledge is necessary. Using external knowledge can make companies better able to start outward foreign investment, such as exporting products or building overseas subsidiaries. This argument is supported by scholars working on inward–outward connections. Firms that obtain inward investment from overseas investors or cooperate with some international firms in the domestic market will be more likely to conduct outward investment because they are able to learn related knowledge from these external investors or partners, which is important to their outward investment activities (Welch and Luostarinen, 1993; Korhonen et al., 1996; Karlsen et al., 2003; Hernández and Nieto, 2016).

External knowledge can be acquired in several ways. First, activities such as the direct import of technology, machinery, and semi-finished products from overseas provide domestic companies with opportunities to build relations with foreign actors (Karlsen et al., 2003). These activities can offer ways to learn what technology best applies to the foreign market and what product is favoured by foreign

consumers. Importing activities can help firms find niches in the foreign market and thus profit by supplying such niche markets with the products that consumers want. Firms can also acquire external knowledge by collaborating with other organizations from overseas, which offers opportunities to learn about foreign trade techniques, ways of using various operating models in the foreign market, and advanced technologies. Furthermore, cooperating with capable foreign companies provides domestic firms with valuable knowledge about how to manage complex MNCs, placing firms in a better position to start or extend outward foreign operations, such as product exports.

We can infer from the foregoing discussion that there are many different types of external knowledge, including explicit knowledge and implicit knowledge. Explicit knowledge is knowledge that has been articulated, codified, and stored, such as a certain kind of technology and production processes introduced from overseas. It can be readily transmitted to domestic firms through manuals, documents, procedures, and how-to videos. Thus, it is easy to understand what the knowledge is about and how to use it. However, the knowledge acquired from external sources can also be implicit. Implicit knowledge (or 'tacit' knowledge) is difficult to transfer to others by writing or verbalizing it (Polanyi, 1962). In the process of international collaboration, foreign partners always know more than they can tell because the effective transfer of tacit knowledge generally requires extensive personal contact, regular interaction, and trust, which makes the process time-consuming (Park, Vertinsky and Becerra, 2015). However, though the acquisition of such tacit knowledge is difficult and time-consuming, it is worthwhile because tacit knowledge is normally difficult for competitors to replicate, which contributes to the development of inimitable competitive advantages (Teece et al., 1997; Berman et al., 2002) and thus increases the success rate of entry and operation in foreign markets. We argue that exporting, a typical mode of entry to foreign markets, is also positively influenced by the acquisition of external knowledge. Hence, we propose the following:

Hypothesis 2a. The higher the level of a firm's explicit knowledge acquired through technology importation from overseas, the higher its propensity to export.

Hypothesis 2b. The higher the level of a firm's implicit knowledge acquired through international collaboration, the higher its propensity to export.

2.4. Internal vs. external knowledge sources: Complements or substitutes for exports?

We have established that both internal and external knowledge such as internal R&D, training, technology imports, and international collaboration can function as alternative sources for firms to use to acquire necessary knowledge about international market entry and operations. The separate roles of internal and external knowledge in firms' internationalization process have received considerable attention. However, scholars have reached no consensus concerning whether internal and external knowledge acquisition complements or substitutes for each other and how such complementation or substitution influences firms' export propensity. These are the central areas of inquiry in this study.

The literature offers two competing arguments. One posits that internal and external knowledge are

complementary (Cassiman and Veugelers, 2006; Escribano et al., 2009; Grimpe and Kaiser, 2010). Following this view, the accumulation of internal knowledge can promote the effective scanning, screening, and absorption of external knowledge. Thus, the output of knowledge when internal and external sources work jointly exceeds that generated when they work independently. The other stream of literature argues the substitutive relation between internal and external knowledge (Lu, 2002; Fernhaber et al., 2009). According to this view, when firms develop knowledge internally, their reliance on knowledge sourced from outside the firm is lessened. Thus, firms with limited internal knowledge benefit most from external sources of knowledge.

We develop a knowledge-based framework to explain the inconsistencies in the literature. We argue that scholars cannot give an either/or answer to the knowledge complementary vs. substitutionary question. The answer depends on the contingent nature of external sources of knowledge: when external knowledge is explicit, internal knowledge takes on the role of substitution; when external knowledge is implicit, internal knowledge functions as a complementary source.

Firms with rich internal knowledge about international markets will reduce their reliance on external explicit knowledge. First, explicit external knowledge is easier to be imitated, so firm's propensity to acquire and use it in making important decisions will be reduced. In certain circumstances, acquiring both internal knowledge and external explicit knowledge may cause unnecessary expenditure and poor returns, thus firms do not always pursue these two sources of knowledge simultaneously. Compared with implicit external knowledge, which is often difficult and time-consuming to transfer and absorb, codified knowledge (explicit knowledge) is easier to understand (Dhanaraj et al., 2004). This means that the use of explicit external knowledge does not rely heavily on absorptive capabilities (which are formed through the accumulation of internal knowledge), so firms do not need to have a high level of internal knowledge to leverage explicit knowledge acquired from overseas.

In the context of internationalization, and exporting in particular, explicit knowledge acquired from overseas such as technologies are originally designed for overseas markets and can be applied to other markets. Firms just need to know the technology, use it to produce products, and then sell the finished goods back to where the technology originated. Such firms' overseas sales will increase, which indicates that a low level of internal knowledge coupled with explicit knowledge will increase the propensity to export. By contrast, capable firms with high-level absorptive capabilities can gradually reduce their reliance on external explicit knowledge (e.g., technology, patents, semi-finished products, finished products) because capable firms can acquire and absorb explicit knowledge and then internalize it into their own internal knowledge system quickly. After the internalization process has been completed, firms will no longer rely on explicit knowledge from outside. In the export context, capable firms can quickly internalize knowledge and adapt it to other usages. Such knowledge can not only be used to produce products suitable for the host country from where the explicit knowledge was drawn but can also be adjusted for use in the domestic market. In reverse engineering, for example, after learning the technological principles and analysing the components and workings of foreign technologies, patents, or

products, capable firms can create new devices or programs that can be applied to the domestic market (Chikofsky and Cross, 1990). Additionally, given the explicit nature of knowledge, this analysis can be done quickly. Therefore, high-level internal knowledge coupled with external explicit knowledge will contribute to a lower propensity to export. Hence, we hypothesize the following:

Hypothesis 3. The positive relationship between explicit knowledge acquisition and export will be negatively moderated by the accumulation of internal knowledge.

However, implicit knowledge acquired from overseas is not as codified as explicit knowledge is and is difficult to transfer by verbalizing it or writing it down. Such unspoken, unwritten, and even hidden knowledge is held by practically every normal human being in the firm, based on his or her experiences, emotions, insights, intuition, observations, and internalized information. This kind of knowledge can be revealed only through association with other people and also requires shared or joint activities (Dhanaraj et al., 2004). In the context of internationalization, we argue that collaborations with foreign companies such as in joint ventures, collaborative R&D centres, and joint training programs are efficient external ways to acquire tacit knowledge. During the cooperation process, domestic firms are able to communicate, contact, and built trusting relationships with foreign partners, but this can take a long time.

We argue that, when external knowledge is implicit, internal knowledge takes on the role of complementation. First, because implicit knowledge is not codified and resides in individuals and teams, it is difficult to teach and be absorbed by both sides (Kogut and Zander, 1993). Additionally, due to its nature, implicit knowledge is inimitable and hard to substitute with other sources of knowledge, or at least takes a long time to imitate or replace. Second, when firms try to acquire valuable implicit knowledge from overseas, they must ensure that they can understand and successfully use the knowledge; otherwise, it is a waste of time and money. Abundant internal knowledge guarantees the absorption, exploitation, and exploration of implicit external knowledge in order to achieve competitive advantages (Dushnitsky and Lenox, 2005). This is supported by multiple studies (Kumar and Nti, 1998; Nielsen, 2005) and is consistent with the absorptive capability argument proposed by Cohen and Levinthal (1990). Hence, for firms seeking to go global, internal knowledge and external implicit knowledge can complement each other and thus give the firm confidence and strength to compete in the foreign market. Third, in forming joint ventures with foreign companies (as an example), knowledge about international products, customers, and markets usually cannot be acquired directly. Thus, firms in some emerging countries prefer to form joint ventures in the domestic country as a springboard to going global because foreign companies often have rich knowledge about the foreign market and international competitors. They know the most applicable and appropriate business model for foreign markets and know how to operate efficiently in a foreign country. However, learning from them is very hard because the knowledge is complex, and foreign companies often strongly protect their valuable organizational knowledge to prevent misappropriation. Thus, firms with limited knowledge and capabilities cannot successfully internalize the implicit knowledge of their foreign partners and thus cannot use it

dynamically. Therefore, domestic firms equipped with abundant internal knowledge and capabilities can more efficiently absorb and exploit the external implicit knowledge about international operation, and thus enhance their position in international competition. Therefore, they will be more likely to compete in foreign markets. Hence, we hypothesize the following:

Hypothesis 4. The positive relationship between implicit knowledge acquisition and export will be positively moderated by the accumulation of internal knowledge.

3. Methodology

3.1. Sample and data collection

In this study, we develop a knowledge-based model to investigate the role of internal and external knowledge in firms' export decisions. The data used for quantitative analysis are collected from a survey on private enterprises conducted in 2006 by the United Front Work Department of the Central Committee of the Communist Party of China (CCCPC), the All-China Federation of Industry and Commerce, the State Administration for Industry and Commerce, and the China Private Economy Association. This survey involved 31 Chinese provinces and more than 3000 firms. The questionnaire contains two main sections of questions. The first asks personal information about the private entrepreneurs, and the second asks questions about the firm's performance in the past year.

We use private firms as our research target because the behaviours of private firms are not distorted by political factors, as state-owned and collective enterprises are, and are more sensitive to the development of competitive advantages, and thus can better reflect the role of knowledge.

China has many 'miniature' firms run by fewer than eight people. These miniature firms do not have formal firm structures. They cannot even be considered firms, as they are more like individual businesses. We thus exclude private firms with fewer than eight people, which is also consistent with Chinese law.[1] We also exclude firms derived from the restructuring of state-owned or collective enterprises. Finally, we exclude observations with too many missing values. The final database contains 1457 private firms.

3.2. Measures

a. Dependent variable

We focus on decisions about internationalization, particularly private firms' decision to export. In the questionnaire, respondents are asked to report whether they export products themselves or through trade agents. The dependent variable is represented by a dummy variable, product exports, equal to 1 for firms that have engaged in exporting products and 0 otherwise.

b. Independent variables

Previous studies have associated internal knowledge development with R&D and training activities

within the firm (Lane et al., 2006). As Cohen and Levinthal (1990) have emphasized, R&D creates a capacity to assimilate and exploit firm knowledge. Therefore, R&D investment should be an important source of internal knowledge. In addition, since organizations are composed of people, it is widely agreed that the knowledge possessed by firms is also embedded in the people working inside the firm. Well-trained labour forces can cope more efficiently with unexpected problems in foreign markets than inexperienced ones can. Therefore, training investment should also be an important source of internal knowledge.

As we have emphasized, investment in R&D and human resources training are good indicators of the internal efforts firms are making to generate and acquire knowledge, as previous studies have found (Caloghirou et al., 2004). Hence, to captures the level of internal knowledge, we sum the total investment in R&D and staff training and then divide it by total sales.

External knowledge is composed of two parts: explicit and implicit. One typical way to acquire explicit external knowledge is by directly importing technologies from overseas. In the questionnaire, respondents are asked whether their enterprises ever imported advanced technology (e.g. patents, equipments) from overseas. We use a dummy variable, technology import, to capture external explicit knowledge (1 = yes; 0 = no). Regarding implicit knowledge, we argue that forming a joint venture with foreign companies is a good way to acquire external implicit knowledge. In the questionnaire, respondents are asked whether they have ever cooperated with foreign firms by establishing joint ventures in China (1 = yes; 0 = no). Answering 'yes' indicates that domestic firms have access to implicit external knowledge, and 'no' indicates a lack of external implicit knowledge. Therefore, international collaboration is used to measure implicit knowledge acquired from outside the firm.

c. Control variables

We also control for a number of related factors that may be relevant in the internationalization decision. First, we control the size of private firms. Larger firms often have more resources than small firms, thus have a stronger desire and more ability to engage in international competition (Wolff and Pett, 2000). Size is measured by the logarithm of the number of employees in the previous year. Second, we also include sales volume as a control variable. Since performance level or past success may influence firms' propensity to take risky actions such as expanding international activities, firms with a higher level of sales are more likely to export (Czinkota and Johnston, 1983). We thus control for sales volume. This variable is measured by the logarithm of total sales in the past year. Third, the age of a firm may influence a firm's propensity to internationalize because older firms generally have more resources and experience and are more likely to have competitive advantages and expend their market (Zahra et al., 2000). Thus, we include age as a control variable, measured by 2006 minus the founding year. Fourth, previous studies find that political factors can influence firms' decisions (Shi, Markóczy and Stan, 2014). Especially in emerging markets, the internationalization of firms is often country-led, and firms may go global just because they can obtain supports from their home country. Though we have tried to avoid the

distortion caused by political factors by studying only private firms, we still need to consider the role of political ties in affecting firms' internationalization decision (Dong, Li and Tse, 2013; Zhang et al., 2016). Thus, we also control for the role of political ties. Top firm managers are required to indicate whether they are a member of the National People's Congress or the national committee of the CPPCC. If the answer is 'yes', this means that there are ties between the firm and the government; thus, we code it as 1 and 0 otherwise. Fifth, the location of firms is also considered because firms in economically developed areas might have a higher chance getting to know foreign firms and thus have a higher propensity to internationalize. They may also be provided with more supports from the government than firms in remote areas. Hence, we include a region dummy in our model. If the private firm is in an economically developed city, we code it as 1 and 0 otherwise. Finally, we control for industry sector. Since firms in certain industries may be more likely to internationalize than those in other industries, the industry effect must be considered. Thus, we include industry dummies in the model.

3.3. Analytical methods

To empirically test the possible determinants of private firms' decision to export, we specify a model that estimates the probability of product exports as a function of internal knowledge, technology import, international collaboration, a set of control variables, and their interactions. Since the dependent variable is a dummy variable (export or not), the model is estimated via binary logistic regression.

Table 1 Descriptive statistics and correlation table

	Mean	S.D.	1	2	3	4	5	6	7	8
1.Product exports	0.287	0.453	1.000							
2.Internal knowledge	0.037	0.235	0.017	1.000						
3.Technology import	0.164	0.370	0.215***	0.037	1.000					
4.Collaboration	0.092	0.290	0.198***	0.047*	0.179***	1.000				
5.Size	4.233	1.291	0.293***	-0.033	0.150***	0.161***	1.000			
6.Sales	6.696	1.886	0.294***	-0.161***	0.116***	0.177***	0.664***	1.000		
7.Age	7.870	4.572	0.127***	-0.013	0.079***	0.113***	0.278***	0.257***	1.000	
8.Political ties	0.597	0.491	0.066***	0.045*	0.071***	0.086***	0.307***	0.285***	0.252***	1.000

Significance levels: ***p < 1%, **p < 5%, *p < 10%.

The summary statistics are presented in the descriptive statistics and correlation table. The mean age of the private firms is 7.9 years, ranging from 1 to 21 years. About 29% of the private firms have experience in outward investment activities. This suggests that going global was not popular or easy for private firms in 2006. Regarding internal knowledge accumulation, on average, private firms invest 3.7% of their sales in R&D and human resources training. About 16% of the private firms did nothing to acquire internal knowledge in the past year. However, about 6% of the firms in the sample made an effort to accumulate internal knowledge, investing more than 10% of their sales in R&D and training.

We observe that the correlations between other variables are all below the commonly used cut-off threshold of 0.7, suggesting that multicollinearity is not a severe problem in the models below.

Table 2 Estimation results of logistic regression

	Model 1	Model 2	Model 3	Model 4	Model 5
Independent variables					
Internal knowledge		0.584**	0.656**	0.536**	0.593**
		(0.250)	(0.281)	(0.250)	(0.262)
Technology import (external explicit)		0.672***	0.843***	0.671***	0.896***
		(0.195)	(0.213)	(0.195)	(0.213)
Collaboration (external implicit)		0.912***	0.934***	0.862***	0.689***
		(0.245)	(0.246)	(0.252)	(0.266)
Moderating effects					
Technology import*Internal knowledge			-3.903**		-5.511**
			(2.049)		(2.295)
Collaboration*Internal knowledge				0.782	5.220**
				(0.840)	(2.355)
Control variables					
Size	0.269***	0.206**	0.222***	0.207**	0.220***
	(0.081)	(0.083)	(0.084)	(0.083)	(0.084)
Sales	0.243***	0.250***	0.233***	0.252***	0.235***
	(0.059)	(0.061)	(0.062)	(0.061)	(0.062)
Age	0.012	0.006	0.006	0.007	0.008
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Political ties	0.124	0.090	0.103	0.089	0.123
	(0.160)	(0.164)	(0.164)	(0.164)	(0.164)
Region	Included	Included	Included	Included	Included
Industry	Included	Included	Included	Included	Included
Constant	-3.576***	-3.630***	-3.589***	-3.666***	-3.745***
	(0.548)	(0.563)	(0.565)	(0.567)	(0.579)
LR chi^2	504.74***	540.71***	545.30***	541.44***	550.49***
Log likelihood	-628.934	-610.948	-608.653	-610.586	-606.060
Pseudo R^2	0.2864	0.3068	0.3094	0.3072	0.3123

N = 1457; standard errors in parentheses

Significance levels: *** p < 1%, ** p < 5%, * p < 10%.

Dependent variable: product exports

We present our findings about knowledge and internationalization in Table 2. Model 1 is the baseline model. Model 2 incorporates the effects of internal and external knowledge on internationalization. In Models 3 and 4, we add the two interaction terms. Model 5 in the last column is the full model and includes all the variables. All the models have a higher R-squared than the baseline model, which indicates that our independent variables contribute to an increased explanatory power.

The effect of internal knowledge is positive and significant in Models 2, 3, 4, and 5 ($p < 0.05$). Thus, Hypothesis 1 is supported. The higher the level of internal knowledge accumulated by private firms, the

higher the possibility that the firms will engage in export. All other things being equal, the more effort made in the acquisition of internal knowledge through R&D and human resources training, the higher the firm's propensity to export products to overseas markets. Likewise, a lack of internal knowledge and capabilities may limit private firms' willingness to go global.

In Hypothesis 2a and 2b, we also argue for a positive relationship between external knowledge and the propensity to export. In Model 2, the relationship between technology import and propensity to export is positive and significant ($\beta = 0.672$, $p < 0.001$), which provides support for Hypothesis 2a. Thus, firms that have acquired explicit knowledge from overseas (external source) will be more likely to engage in product export than firms that have not acquired external explicit knowledge. Moreover, the relationship between collaboration and the export decision is also positive and significant in Model 2 ($\beta = 0.912$, $p < 0.001$). Thus, Hypothesis 2b is also supported. Firms that have acquired implicit knowledge from their foreign partners (external source) will be more likely to engage in export than firms that have no access to external explicit knowledge. The results are the same in Models 3, 4, and 5. The above results indicate that external knowledge about technologies, products, customers, and markets contributes to the search and recognition of international opportunities, thus increasing firms' propensity to participate in international competition.

In Hypothesis 3 and Hypothesis 4, we propose that the accumulation of internal knowledge moderates the relationship between external sources of knowledge and export propensity, but that, when the nature of the external knowledge differs, the effect of the internal knowledge also differs. In Models 3 and 4, we include the two interaction terms separately. In Hypothesis 3, we argue that the relationship between explicit knowledge acquisition and the export decision is negatively moderated by internal knowledge accumulation. The results in Model 3 support Hypothesis 3. The moderating effect of internal knowledge is negative and significant ($\beta = -3.903$, $p < 0.05$). Thus, high-level internal knowledge coupled with explicit knowledge acquired from outside the firm will decrease firms' propensity to export. In Model 4, the coefficient of the second interaction term is positive but not significant ($\beta = 0.782$, $p > 0.1$); it becomes positive and significant in Model 5, however, when both interaction terms are included ($\beta = 5.220$, $p < 0.05$), which is consistent with Hypothesis 4. This demonstrates that private firms' propensity to export increases when they are able to acquire implicit knowledge from outside the firm, and this propensity increases at a faster rate when private firms have abundant internal knowledge

During the development of Hypothesis 3, we also argue that the possession of both external explicit knowledge and internal knowledge will lead to a high propensity to serve the domestic market. Therefore, to make our results more robust, we also perform an additional test using domestic sales as a dependent variable. In the additional regression, the signs of the two interaction terms are reversed, which supports our argument. Though the effect is not significant, we can still infer that the possession of both explicit knowledge acquired from outside the firm and internal knowledge contribute to a higher level of domestic sales and that the possession of both external implicit knowledge and internal knowledge contribute to a lower level of domestic sales.

Of the controls, the size effect is positive and significant in all the models. Consistent with previous studies, we find that larger firms will be more likely to engage in international activities (Bonaccorsi, 1992; Calof, 1994). In addition, the coefficient of sales is also positive and significant, which indicates that firms with higher sales are more likely to engage in international competition (Cavusgil and Nevin, 1981; Czinkota and Johnston, 1983). However, we did not find any evidence supporting the effect of firm age. Whether private firms export or not has nothing to do with firm age. Moreover, political ties, which have been discussed by many scholars (Yiu et al., 2007; Du and Luo, 2016), have no significant effect in our model, indicating that the export behaviour of private firms is not driven by the political ties of their top managers.

4. Discussion

This study adopts a knowledge-based view of firms to build a framework verifying the role of knowledge in explaining private firms' propensity to engage in export. This study highlights the importance of knowledge acquisition in the internationalization decision-making of private firms. Since privately-owned firms are not always as established as stated-owned firms or collective-owned firms, knowing how to leverage knowledge effectively during internationalization becomes very important. By distinguishing between internal and external sources of knowledge, this study suggests that knowledge acquired from both internal and external sources are important for private firms when making decisions about exporting. The acquisition and accumulation of internal and external knowledge help private firms form competitive advantages and thus gain a better competitive position in the global market. These findings on the importance of internal and external knowledge for internationalization support those of earlier empirical studies (Johanson and Vahlne, 1977; Eriksson et al., 1997; Menon and Pfeffer, 2003; Blomstermo et al., 2004).

Based on these basic findings, we conduct more detailed research on the role and source of knowledge. We find that internal knowledge not only promotes the ability to search and recognize international opportunities but also helps firms develop better problem-solving capabilities in unexpected situations, thus enhancing their chances of survival and growth in foreign markets. Furthermore, we find that external resources can be acquired through direct technology imports and by cooperating with foreign companies. Importing technology that cannot be developed by the domestic firms in a timely manner shortens the research and development cycle as well as private firms' distance to leading international enterprises. Moreover, collaborating with foreign companies also contributes to a better understanding of international markets and advanced international management models, thus reducing uncertainties and strengthening competitive advantages. Therefore, abundant knowledge acquired from both internal and external sources leads to an increased propensity to internationalize.

The primary contribution of this study is the identification of the relationship between internal and external knowledge, which contributes to a better understanding of the resource-based view in the

context of exports. These findings are compelling and of great value because the question of whether internal and external knowledge complement or substitute for each other has been answered inconsistently. We argue that there is no either/or answer to the knowledge complementary vs. substitutionary question; the answer is conditional on the nature of the external sources of knowledge. The relationship between internal and external knowledge is not definitely complementary or substitutionary but is contingent: when external knowledge is explicit, internal knowledge takes on the role of substitution; when external knowledge is implicit, internal knowledge functions as a complementary source. As we have argued, the exploitation of explicit knowledge does not rely heavily on absorptive capability developed through internal knowledge accumulation, and explicit knowledge introduced from overseas is easier to substitute for than implicit knowledge is. Thus, the relationship between internal knowledge and explicit knowledge acquired from outside the firm is substitutive. Implicit knowledge is inimitable and hard to substitute for, and internal knowledge is necessary for understanding and using implicit knowledge acquired from overseas. Hence, the relationship between internal knowledge and external implicit knowledge is complementary.

Furthermore, as knowledge is considered an essential influential factor in a company's internationalization process (Casillas et al., 2009), we seek to determine how knowledge from different sources, as well as their relationship, influences export behaviour. Our findings suggest that external explicit (implicit) knowledge and internal knowledge serve as substitutionary (complementary) resources contributing to the propensity to export among private firms. Firms with limited internal knowledge are more likely to export when they have acquired explicit knowledge from overseas. Firms with abundant internal knowledge are more likely to export when they have acquired implicit knowledge from overseas. However, firms with abundant internal knowledge and external explicit knowledge are less likely to export. In an additional test about domestic sales, we find more evidences supporting our argument. We find that, when firms have acquired explicit knowledge from overseas, their high level of internal knowledge helps them internalize the external explicit knowledge and apply the knowledge to the domestic market, thus positively influencing domestic sales and negatively influencing exports. However, when the external knowledge is implicit, the effect of internal knowledge on domestic sales becomes negative.

The above findings are enlightening for managers seeking to internationalize their firms. Knowledge is the most valuable resources firms can possess. However, acquiring valuable knowledge is not easy. Therefore, how to acquire and arrange knowledge bundles effectively is important. We emphasize the match between internal and external knowledge, which is a match between types as well as amounts. Since internationalization is costly and risky, a mismatch will lead to a lack of competitive advantage and thus result in failure in international competition. When firms want to exploit implicit international knowledge, they must have high level of internal knowledge to ensure that they can understand and use the implicit knowledge. These findings also have implications for firms seeking to adopt appropriate ways to internationalize. For knowledgeable firms, collaborating with foreign companies will be a good

springboard for entering foreign markets. However, for firms lacking internal knowledge, a good way to enter the foreign market may be by directly importing technologies, patents, and equipment from overseas and then using these resources to produce products that foreign customers need. These facts indicate that not only the most capable firms but also firms lacking international knowledge can find effective ways to go global.

4.1. Limitations and extensions

Though this study highlights some interesting findings regarding the relationship between knowledge and propensity to export, it has several limitations. First, our sample is limited to China-based firms. In future studies, data should be collected in other emerging markets, such as India, Brazil, or Russia. It would be worthwhile to verify the findings of this study in other emerging markets and identify the relevant contingent factors. Second, given our data limitations, the two indicators of external knowledge are dummy variables. Thus, we can measure only whether firms have acquired external knowledge or not and cannot measure to what extent they have done so. Future studies should gather more detailed information about these variables. In addition, our study only examines product exports as a dependent variable. If possible, other indicators, such as international sales and international scope, should also be studied. Third, though we discussed the ways knowledge can function, the inherent mechanism is still not entirely clear. Because of data limitations, we were unable to measure absorptive capacities directly. Whether the accumulation of internal knowledge actually contributes to the formation of absorptive capabilities requires further discussion and empirical testing. Finally, a more in-depth and longitudinal analysis should be done. We used only cross-sectional data. However, in the long run, external knowledge and internal knowledge are interconvertible. In the long term, the boundary between internal and external knowledge, as well as that between explicit and implicit knowledge, are not clear. Therefore, a more complex and dynamic model is needed.

5. Conclusion

Following the knowledge-based view, we build a framework to investigate the effects of internal and external knowledge on private firms' propensity to engage in export. We find that the accumulation of internal knowledge through R&D and training, as well as the acquisition of external knowledge through technology import and international collaborations, can significantly influence private firms' export decision. We also find compelling answers to the knowledge complementation vs. substitution question. There is no either/or answer to the knowledge complementary vs. substitutionary question. Rather, the answer depends on the nature of the external knowledge: explicit knowledge acquired from outside the firm and internal knowledge serve as substitutionary resources contributing to the export behaviour of private firms; however, implicit knowledge acquired from outside the firm and internal knowledge serve as complementary resources contributing to the export behaviour of private firms. These findings

contribute to the literature on exports and have practical implications for the managers of private firms.

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Notes

[1] According to the Regulations of Individual Businesses issued by the State Council of the People's Republic of China, firms with fewer than eight people is defined as individual business. Firms with more than eight people (including eight) can register as companies.

References

Autio, E., Sapienza, H. J. and Almeida, J. G. (2000) "Effects of age at entry, knowledge intensity, and imitability on international growth", *Academy of Management Journal*, Vol. 43, No. 5, pp. 909-924.

Berman, S. L., Down, J. and Hill, C. W. (2002) "Tacit knowledge as a source of competitive advantage in the National Basketball Association", *Academy of Management Journal*, Vol. 45, No. 1, pp. 13-31.

Blomstermo, A., Eriksson, K. and Sharma, D. D. (2004) "Domestic activity and knowledge development in the internationalization process of firms", *Journal of International Entrepreneurship*, Vol. 2, No. 3, pp. 239-258.

Bonaccorsi, A. (1992) "On the relationship between firm size and export intensity", *Journal of International Business Studies*, Vol. 23, No. 4, pp. 605-635.

Caloghirou, Y., Kastelli, I. and Tsakanikas, A. (2004) "Internal capabilities and external knowledge sources: Complements or substitutes for innovative performance?", *Technovation*, Vol. 24, No. 1, pp. 29-39.

Calof, J. L. (1994) "The relationship between firm size and export behavior revisited", *Journal of International Business Studies*, Vol. 52, No. 2, pp. 367-387.

Casillas, J. C., Moreno, A. M., Acedo, F. J., Gallego, M. A. and Ramos, E. (2009) "An integrative model of the role of knowledge in the internationalization process", *Journal of World Business*, Vol. 44, No. 3, pp. 311-322.

Casillas, J. C., Barbero, J. L. and Sapienza, H. J. (2015) "Knowledge acquisition, learning, and the initial pace of internationalization", *International Business Review*, Vol. 24, No. 1, pp. 102-114.

Cassiman, B. and Veugelers, R. (2006) "In search of complementarity in innovation strategy: Internal

R&D and external knowledge acquisition", *Management Science*, Vol. 52, No. 1, pp. 68-82.
Cavusgil, S. T. and Nevin, J. R. (1981) "Internal determinants of export marketing behavior: An empirical investigation", *Journal of Marketing Research*, Vol. 18, No. 1, pp. 114-119.
Chikofsky, E. J. and Cross, J. H. (1990) "Reverse engineering and design recovery: A taxonomy. Software, IEEE", Vol. 7, No. 1, pp. 13-17.
Cohen, W. M. and Levinthal, D. A. (1990) "Absorptive capacity: A new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35, No. 1, pp. 128-152.
Cooper, R. and Kleinschmidt, E. (1985) "The impact of export strategy on export sales performance", *Journal of International Business Studies*, Vol. 16, No. 1, pp. 37-55.
Czinkota, M. R., and Johnston, W. J. (1983) "Exporting: does sales volume make a difference?", *Journal of International Business Studies*, Vol. 14, No. 1, pp. 147-153.
Dhanaraj, C. and Beamish, P. W. (2003) "A Resource‐Based Approach to the Study of Export Performance", *Journal of Small Business Management*, Vol. 41, No. 3, pp. 242-261.
Dhanaraj, C., Lyles, M. A., Steensma, H. K. and Tihanyi, L. (2004) "Managing tacit and explicit knowledge transfer in IJVs: The role of relational embeddedness and the impact on performance", *Journal of International Business Studies*, Vol. 35, No. 5, pp. 428-442.
Dong, M. C., Li, C. B. and Tse, D. K. (2013) "Do business and political ties differ in cultivating marketing channels for foreign and local firms in China?", *Journal of International Marketing*, Vol. 21, No. 1, pp. 39-56.
Du, X. and Luo, J. H. (2016) "Political connections, home formal institutions, and internationalization: Evidence from China", *Management and Organization Review*, Vol. 12, No. 1, pp. 103-133.
Dushnitsky, G. and Lenox, M. J. (2005) "When do firms undertake R&D by investing in new ventures?", *Strategic Management Journal*, Vol. 26, No. 10, pp. 947-965.
Eriksson, K., Johanson, J., Majkgard, A. and Sharma, D. D. (1997) "Experiential knowledge and cost in the internationalization process", *Journal of International Business Studies*, Vol. 28, No. 2, pp. 337-360.
Eriksson, K., Majkgard, A. and Sharma, D. D. (2000) "Path dependence and knowledge development in the internationalization process", *MIR: Management International Review*, Vol. 40, No. 4, pp. 307-328.
Escribano, A., Fosfuri, A. and Tribó, J. A. (2009) "Managing external knowledge flows: The moderating role of absorptive capacity", *Research Policy*, Vol. 38, No. 1, pp. 96-105.
Fernhaber, S. A., Mcdougall‐Covin, P. P. and Shepherd, D. A. (2009) "International entrepreneurship: leveraging internal and external knowledge sources", *Strategic Entrepreneurship Journal*, Vol. 3, No. 4, pp. 297-320.
Grant, R. M. (1996) "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17, No. S2, pp. 109-122.
Grimpe, C. and Kaiser, U. (2010) "Balancing internal and external knowledge acquisition: the gains and pains from R&D outsourcing", *Journal of Management Studies*, Vol. 47, No. 8, pp. 1483-1509.
Hernández, V., and Nieto, M. J. (2016) "Inward–outward connections and their impact on firm growth",

International Business Review, Vol. 25, No. 1, pp. 296-306.

Hoang, B. P. (1998) "A causal study of relationships between firm characteristics, international marketing strategies, and export performance", *MIR: Management International Review*, Vol. 38, pp. 73-93.

Johanson, J. and Vahlne, J. E. (1977) "The internationalization process of the firm-a model of knowledge development and increasing foreign market commitments", *Journal of International Business Studies*, Vol. 8, No. 1, pp. 23-32.

Karlsen, T., Silseth, P. R., Benito, G. R. and Welch, L. S. (2003) "Knowledge, internationalization of the firm, and inward–outward connections", *Industrial Marketing Management*, Vol. 32, No. 5, pp. 385-396.

Kogut, B. and Zander, U. (1993) "Knowledge of the firm and the evolutionary theory of the multinational corporation", *Journal of International Business Studies*, Vol. 24, No. 4, pp. 625-645.

Korhonen, H., Luostarinen, R. and Welch, L. (1996) "Internationalization of SMEs: Inward-outward patterns and government policy", *MIR: Management International Review*, Vol. 36, No. 4, pp. 315-329.

Kumar, R. and Nti, K. O. (1998) "Differential learning and interaction in alliance dynamics: A process and outcome discrepancy model", *Organization Science*, Vol. 9, No. 3, pp. 356-367.

Lane, P. J., Koka, B. R. and Pathak, S. (2006) "The reification of absorptive capacity: A critical review and rejuvenation of the construct", *Academy of Management Review*, Vol. 31, No. 4, pp. 833-863.

Ling-Yee, L. (2004) "An examination of the foreign market knowledge of exporting firms based in the People's Republic of China: Its determinants and effect on export intensity", *Industrial Marketing Management*, Vol. 33, No. 7, pp. 561-572.

Lu, J. W. (2002) "Intra-and inter-organizational imitative behavior: Institutional influences on Japanese firms' entry mode choice", *Journal of International Business Studies*, Vol. 33, No. 1, pp. 19-37.

Menon, T. and Pfeffer, J. (2003) "Valuing internal vs. external knowledge: Explaining the preference for outsiders" *Management Science*, Vol. 49, No. 4, pp. 497-513.

Menon, T., Thompson, L. and Choi, H. S. (2006) "Tainted knowledge vs. tempting knowledge: People avoid knowledge from internal rivals and seek knowledge from external rivals", *Management Science*, Vol. 52, No. 8, pp. 1129-1144.

Nielsen, B. B. (2005) "The role of knowledge embeddedness in the creation of synergies in strategic alliances", *Journal of Business Research*, Vol. 58, No. 9, pp. 1194-1204.

Park, C., Vertinsky, I. and Becerra, M. (2015) "Transfers of tacit vs. explicit knowledge and performance in international joint ventures: The role of age". *International Business Review*, Vol. 24, No. 1, pp. 89-101.

Polanyi, M. (1962) *Personal knowledge: Towards a post-critical philosophy*, Psychology Press.

Ruigrok, W. and Wagner, H. (2003) "Internationalization and performance: An organizational learning perspective", *MIR: Management International Review*, Vol. 43, No. 1, pp. 63-83.

Shi, W. S., Markóczy, L. and Stan, C. V. (2014) "The continuing importance of political ties in China",

The Academy of Management Perspectives, Vol. 28, No. 1, pp. 57-75.

Sui, S. and Baum, M. (2014) "Internationalization strategy, firm resources and the survival of SMEs in the export market", *Journal of International Business Studies*, Vol. 45, No. 7, pp. 821-841.

Teece, D. J., Pisano, G. and Shuen, A. (1997) "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18, No. 7, pp. 509-533.

Wagner, J. (1995), "Exports, firm size, and firm dynamics", *Small Business Economics*, Vol. 7, No. 1, pp. 29-39.

Wei, Y., Zheng, N., Liu, X. and Lu, J. (2014), "Expanding to outward foreign direct investment or not? A multi-dimensional analysis of entry mode transformation of Chinese private exporting firms", *International Business Review*, Vol. 23, No. 2, pp. 356-370.

Welch, L. S. and Luostarinen, R. K. (1993), "Inward-outward connections in internationalization", *Journal of International Marketing*, Vol. 1, No. 1, pp. 44-56.

Wolff, J. A. and Pett, T. L. (2000) "Internationalization of small firms: an examination of export competitive patterns, firm size, and export performance", *Journal of Small Business Management*, Vol. 38, No. 2, pp. 34-47.

Yiu, D. W., Lau, C. and Bruton, G. D. (2007) "International venturing by emerging economy firms: The effects of firm capabilities, home country networks, and corporate entrepreneurship", *Journal of International Business Studies*, Vol. 38, No. 4, pp. 519-540.

Zahra, S. A., Ireland, R. D. and Hitt, M. A. (2000) "International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance", *Academy of Management Journal*, Vol. 43, No. 5, pp. 925-950.

Zhang, X., Ma, X., Wang, Y., Li, X., and Huo, D. (2016) "What drives the internationalization of Chinese SMEs? The joint effects of international entrepreneurship characteristics, network ties, and firm ownership", *International Business Review*, Vol. 25, No. 2, pp. 522-534.