

What Promotes International Sustainable Development of Green Ventures? The Joint Effects of Entrepreneurial Orientation and Home Country-Based Networks

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Abstract

Purpose – Along with the growing awareness of environmental sustainability, international green entrepreneurship is expected to realize international sustainable development (ISD) by introducing ecological innovation results, using fewer resources consumption, and reducing negative environmental impacts. Building upon contingency theory and social network theory, this paper attempts to explore the role of home country-based networks (technology ties and business ties) as contingent factors that might impact the effectiveness of entrepreneurial orientation (EO) in promoting ISD among green ventures.

Design/methodology – Original data were collected from 127 green ventures in China based on the random sampling technique. These green ventures mainly focus on the lower use of energy or materials, lower CO2 emissions, and higher ecological benefits located in the Fujian province, which highlights green economic growth and economic cooperation with international markets. Moderated hierarchical linear regression analysis was conducted to test our hypotheses concerning the main relationship between EO (innovativeness, proactiveness, and risk-taking) and ISD as well as the moderating effects of home country-based networks (technology ties and business ties) on the main relationship.

Findings – Empirical results indicate that: first, both innovativeness and proactiveness positively affect ISD; second, both technology ties and business ties at home might significantly strengthen the positive relationship between innovativeness (or proactiveness) and ISD. However, this study did not find significant moderating effects of technology ties or business ties at home on the relationship between risk-taking and ISD.

Originality/value – Since previous literature often gives more focus on the host country context of social networks, this study shifts to a home country-based network context. Therefore, our research might enrich the international green entrepreneurship literature by empirically investigating the contingent value of home country-based networks in the relationship between EO and ISD in the context of an emerging economy such as China.

Keywords: Entrepreneurial Orientation, Home Country-based Business Ties, Home Country-based Technology Ties, International Green Entrepreneurship, International Sustainable Development

JEL Classifications: F18, R15

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1. Introduction

As an increasing number of countries are concentrating on sustainable development and green consumption in recent years, international green entrepreneurship has become a popular vehicle for international business. Indeed, the primary incentive of green ventures to enter the international market is to increase market power, develop a first-mover advantage, and improve return on return rapidly. In the case of China, it has realized remarkable success in economic growth since the open policy initiative started in 1978, it also induced many problems such as huge resource waste, severe environmental pollution, and abominable ecological damage. In 2015, the Chinese central government officially proposed a new concept “lucid waters and lush mountains are invaluable assets” that emphasizes the importance of ecological environment sustainability and economic sustainable development. Hence, numerous green ventures have been successfully launched in response to such state-level policy. Green ventures can be defined as “high-tech ventures using green technologies in their businesses or offering green products/services,” which can make critical contributions to leveraging economic and environmental profits (Mrkajic, Murtinu, and Scalera, 2019). Along with the intense promotion of “the Silk Road Economic Belt and the 21st-Century Maritime Silk Road” initiatives in recent years, an increasing number of Chinese green ventures have also attempted to leverage international green markets for rapidly increasing market size, improving return on clean technology investment, learning cutting-edge environmental knowledge, and obtaining critical location advantage (Du and Zhang, 2018; Hall, Matos, and Bachor, 2019). Compared to those only operating in domestic markets, green ventures entering international markets face greater challenges that originate from the liability of foreignness (Batjargal et al., 2013; Lisboa, Skarmeas, and C. Saridakis, 2016). Unlike big enterprises, green ventures as one specific type of small and medium-sized enterprises (SMEs) often lack sufficient resource endowments to develop high-level environmental innovations and critical strategic competitive capabilities for participating in the global competition of the green marketplace (Costa, Cool, and Dierickx, 2013; Zehir, Can, and Karaboga, 2015). In this respect, both external threats and inherent weaknesses may threaten the Chinese green ventures’ IDS, leading to severe survival constraints and high failure rates. According to the international entrepreneurship literature, deploying a high level of EO may help green ventures overcome limitations posed by their deficiency of strategic resources, thereby improving their sustainable development and creating superior international performance (Stam and Elfring, 2008; Wiklund and Shepherd, 2011; Zhang et al., 2016). This is because a high level of EO may help green ventures develop creativity in international expansion, anticipate various entrepreneurial opportunities associated with green innovation results, and take further risks of consumers’ environmental product preferences that can generate strategic competitiveness and develop the first-mover advantage for ISD (Varadarajan, 2017). However, some prior research on the effectiveness of EO is not inconsistent (e.g., Baker and Sinkula, 2009; D’Angelo and Presutti, 2019; Jin, Jung, and Jeong, 2018), implying that EO may be necessary, but not a sufficient condition, for the ISD of green ventures (Yang, Dess, and Robins, 2018). In this regard, having a better understanding of the relationship between green ventures’ EO and ISD should require a contingent view.

More recently, social network theory suggests that the paybacks of EO may be consistent with a firm’s network connections, which it can utilize to access, obtain and integrate various critical resources (Stam and Elfring, 2008; Zhang et al., 2016). In the field of international

entrepreneurship, relevant studies mainly focused on the contingent role of host country-contextual networks (e.g., network connections with host country government, suppliers, customers, and cooperators) in the outcome implications of EO (Chung, Yen, and Wang, 2020; Oparaocha, 2015). However, the liability of foreignness restricts green ventures to gain initial legitimacy in international markets, making it difficult for green ventures to entice host country stakeholders to collaborate or provide access to resources necessary for local survival and thus harming ISD (Bloodgood et al., 2017). For the green ventures who are often isolated from host country networks, it is difficult to directly obtain resources from international markets or local partners by utilizing host country stakeholders. With the emerging role of China in global markets, in contrast, home country stakeholders (e.g., multinational enterprises, customers, government, and other organizations) that have accumulated various experience and knowledge in aspects of internationalization might reserve resources necessary for green ventures (Cuervo-Cazurra et al., 2018). Hence, searching for resource support via network connections with such home country stakeholders may be an alternative means for Chinese green ventures to promote their ISD. However, whether home country-based networks can shape the relationship between EO and green ventures' ISD remains unclear. This leaves a theoretical gap in the possible connections between EO and ISD from the perspectives of green ventures' technology ties and market ties at home.

At first, home country-based technology ties might reflect the degree to which a firm develops technological connections with domestic technology developers, such as universities, R&D institutes, and technology intermediaries. These ties may assist in accessing technological assets (e.g., highly educated talent, new knowledge, and cutting-edge technologies) and approaching technology transfer services at home (Gu and Su, 2018; Prashantham and Birkinshaw, 2015). As Chinese green ventures often have weak connections with international technology developers and limited knowledge of global technology trends that may restrict the deployment of EO, home country-based technology ties may provide critical insights into tracking worldwide green innovation results, foreseeing international green technological changes, and employing risky strategies associated with consumers' environmental product preference (Cuervo-Cazurra et al., 2018). That is because since green technologies (e.g., cleaner production processes, renewable energies, and environment-friendly materials) are employed to deal with various environmental problems in recent years, an increasing number of Chinese universities, R&D institutes, and technology intermediaries actively participate in global low-carbon cooperation, and thus, have accumulated a wealth of knowledge on global green technology development. In this regard, home country-based technology ties can enhance environmental innovation and a proactive stance while implementing EO for developing strategic competitive advantage and promoting ISD in global markets.

The second major contingent factor that may affect the relationship between EO and ISD is the home country-based business ties. Business ties at home enable Chinese green ventures to access and acquire marketing resources held by their business partners, such as critical capabilities related to environmental sustainability, tacit knowledge regarding sustainable innovation, and critical skills in green marketing (Varadarajan, 2017). As a result, this not only can help green ventures build a better understanding of the international green market, but also enables green ventures to develop trust relationships with stakeholders in the host country, and thus, successfully implement EO for promoting sustainable development in host countries (Prashantham, Dhanaraj, and Kumar, 2015). Meanwhile, China has attracted a large amount of foreign green direct investment in the past decades, implying that many

foreign green enterprises may have built stronger market connections with Chinese organizations, and thus contribute to improving the marketing capabilities of green ventures in international markets (Feng, Zeng, and Ming, 2018; Park and Ghauri, 2011). In this sense, home country-based business ties are crucial for developing customized green products, forecasting local market changes in environmental products, and taking foreign business risks associated with ecological technologies, thereby boosting the sustainability of EO.

Drawing on the contingency and social network theories, this study constructs a theoretical model of whether the effect of EO on ISD varies across two critical home country-based networks (technology ties and business ties). If yes, we examine whether the moderating effects of these two network connections function differently. Research findings are expected to help us develop a deeper understanding of the contingent role of home country-based networks in the paybacks of EO in the emerging green economy context of the ISD of green ventures.

The rest of this paper is organized as follows. Section 2 develops several hypotheses based on the theoretical analysis and literature review. Section 3 describes the research methods, including variables' measurement, data collection, and statistical techniques. Section 4 demonstrates the empirical results. In Section 5, we present research findings, theoretical contributions, managerial implications, limitations, and potential directions for future research. Finally, a conclusion is made in Section 6.

2. Theoretical Review and Hypothesis Development

2.1. EO and International Green Entrepreneurship

EO can be defined as processes, practices, and decision-making styles that drive new business creation and operations under complicated environmental conditions, which can simultaneously bring various business opportunities and threats to entrepreneurial firms (Lumpkin and Dess, 1996). Empirical studies (e.g., Boso, Story, and Cadogan, 2013; Su and Sohn, 2015) proved that firms with high levels of EO are more likely to develop new technologies or ideas, anticipate business opportunities, and gain a first-mover advantage, thereby responding to rapid changes in market demand and customer preferences. In the international entrepreneurship literature, EO has also received considerable attention from scholars and practitioners in recent years. Some scholars considered EO as a strategic decision-making style for international entrepreneurial firms in developing their competitive advantage in rapidly changing global business environments (Acosta, Crespo, and Agudo, 2018; D'Angelo and Presutti, 2019). Furthermore, Stam and Elfring (2008) defined EO as "the simultaneous exhibition of innovativeness, proactiveness, and risk-taking" and thus focus on the ISD of an international firm's overall entrepreneurial posture. In this sense, EO reflects the international entrepreneurial firms' strategic decisions regarding how to develop their competitive advantage and promote ISD in the unfamiliar international market (Acosta, Crespo, and Agudo, 2018). Following Mcdougall and Oviatt (2000), this study conceptualizes EO as a multi-dimensional construct, including the three dimensions of innovativeness, proactiveness, and risk-taking.

2.1.1. *Innovativeness*

Innovativeness can be defined as an international firm's "proclivity, receptivity, and inclination to adopt ideas that depart from the usual way of approaching business" (Menguc

and Auh, 2006). Since knowledge is deeply embedded within a firm's internationalization in the era of the knowledge economy, innovativeness becomes an important foundation for developing innovative products and creating superior customer value. If Chinese green ventures rely on their prior knowledge or experience too heavily in their ISD, their technology advantage and competition strategies are likely to be exposed and understood by international rivals (Ren et al., 2015). Hence, prior studies argued that firms should apply creative and innovative techniques in international markets in which consumer demand differs from domestic consumers (Acosta, Crespo, and Agudo, 2018; Ma, Ding, and Yuan, 2016). That is because innovativeness may help green ventures engender ecological ideas, create clean technologies, develop creative environmental processes, and generate an international positional advantage by increasing exclusive knowledge as a mechanism to solve customer pain points and promote sustainable innovations in forms of resource use efficiency, resource use elimination, and resource use substitution (Hult and Jr Ketchen, 2001; Varadarajan, 2017). In other words, successfully realizing sustainable development in international green markets mainly rely on upgrading environmental products, introducing low-carbon production processes, creating cutting-edge ecological technologies, and promoting sustainable marketing strategies realized by innovativeness, while using fewer resources and decreasing environmental negative impacts (Opper and Nee, 2015). In this regard, we proposed that:

H1a: *Generally speaking, innovativeness has a universal positive effect on ISD among green ventures.*

2.1.2. Proactiveness

Proactiveness is conceptualized as "seeking new opportunities which may or may not be related to the present line of operations, introduction of new products and brands ahead of the competition, strategically eliminating operations which are in the mature or declining stages of life cycle" (Venkatraman, 1989). In an environment with the characteristics of growing awareness of sustainable development, introducing clean innovations and producing environmental products have become a global hot issue that may help overcome various ecological problems and limit severe climate change. While going global, however, green ventures often have little knowledge of consumers' preferences toward green products, the progress of clean technologies, international green market information, and local policies regarding environmental regulations, which are very crucial for the success of international green entrepreneurship (Muralidharan and Pathak, 2017). That is, international green business is often confronted with more rapid institutional changes, higher operational uncertainty, more uncertain environmental regulation, and more severe challenges, leading green ventures to worse international business performance and higher failure rates (Feng, Zeng, and Ming, 2018). To stimulate ISD of green ventures, it needs to improve its proactive ability to foresee the potential changes more accurately in international green markets, customer preferences for environmental products, clean technological progress, and even local environmental regulations. In this regard, we proposed that:

H1b: *Generally speaking, proactiveness has a universal positive effect on ISD among green ventures.*

2.1.3. Risk-Taking

For green ventures, risk-taking might reflect their proclivity in assuming risks along with developing clean technologies, producing environmental products, and making strategic decisions in international green markets (Zahra, 2018). In general, higher risk often involves greater potential benefits. Previous empirical studies also demonstrated that those firms which are unwilling and conservative to take risks associated with international entrepreneurial activities are often confronted with high failure rates (Clarke and Liesch, 2017; Zahra, 2018). Therefore, green ventures should acknowledge that the pursuit of ISD is risk-taking (Luo and Bu, 2018). Considering that international green markets might present higher uncertainty and more challenges relative to domestic markets, green ventures should enhance their willingness to assume international business risks which can affect their attitudes toward exploration and exploitation as well as their ability to search for international green market opportunities (Wennberg, Wiklund, and Wright, 2011). Otherwise, conservative attitudes toward international business could impede the ability of green ventures to develop a first-mover advantage and may induce a lower possibility of ISD.

H1c: Generally speaking, risk-taking has a universal positive effect on ISD among green ventures.

2.2. Two Typical Network Conditions for International Green Entrepreneurship: Home Country-Based Technology Ties and Business Ties

As discussed above, we have hypothesized that the three dimensions (innovativeness, proactiveness, and risk-taking) of EO may have a universally positive effect on green ventures' ISD. Moreover, the previous literature suggested that releasing the potential of EO requires strategic resources such as highly-educated talent, knowledge-based assets, good financial position, and new manufacturing processes (Wiklund and Shepherd, 2003; Yang, Dess and Robins, 2018). Compared to multinationals, however, green ventures usually face resource scarcity while deploying their EO for creating strategic competitiveness and promoting ISD. In other words, the success of EO should be supported by the fact that green ventures can strategically acquire, develop, and leverage their resources, which are heterogeneously distributed across green ventures (Wong, 2014). The social network theory and resource dependency theory suggest that green ventures with characteristics of resource deficiencies cannot possess all resources necessary for underpinning the implementation of EO, and thus, need to mobilize external resources held by network partners (Yang, Dess, and Robins, 2018; Zhang et al., 2016). This implies that the EO of green ventures can benefit from their relational-based resources through leveraging external network ties (Park and Ghauri, 2011). That is to say, green ventures' networks might be the contingent factor that changes the degree and nature of the EO-ISD relationship. Although some studies have taken into account network factors, they mainly focused on the host country context rather than the home country context. The general argument here is that home country-based networks may promote relational-based resource mobilization between green ventures and their partners at home, thus enhancing the sustainability benefits of EO in foreign markets (Prashantham and Birkinshaw, 2015). In this sense, there is a need for developing a deeper understanding of whether deploying high levels of EO can benefit from home country-based networks.

Furthermore, we mainly focused on the contingent value of home country-based technology ties and business ties, as discussed in the introduction.

2.2.1. The Moderating Effects of Home Country-Based Technology Ties

In the past several decades, China's rapid economic growth heavily relies on large energy consumption and huge resource investment, implying that China has accumulated little critical knowledge regarding environmental sustainability, green innovation, and sustainable development (Feng, Zeng, and Ming, 2018; Pan et al., 2019). Owing to the liabilities of foreignness, meanwhile, most Chinese green ventures also have a limited understanding of international green markets and local competitors' strategies, so they are often confronted with strategic resource mismatches and higher failure of green product innovativeness (Wu and Salomon, 2017). Social network theory suggests that establishing strong connection ties with technology partners may help access and acquire technological resources necessary for environmental innovations (Acosta, Crespo, and Agudo, 2018). Considering that Chinese green ventures often weakly link to technology developers of host countries, we propose that home country-based technology ties may be an alternative means to boost the effects of innovativeness on ISD. That is to say, such ties enable Chinese green ventures to develop innovative products through accessing and integrating technological resources held by technology partners (universities, research institutes, and technology intermediaries) at home (Zhang et al., 2016). To catch up with the developed countries in terms of cutting-edge green technology or environmental innovations, these technology partners are often encouraged to track global green technology trends and have frequent connections (in terms of joint technology development, technology transfer, and technological learning) with international environmental technology organizations (Del Giudice, Carayannis, and Maggioni, 2017). Hence, building connection ties between green ventures and home-country technology partners might increase the possibility of technology absorption from international green markets, and further underpin the development of clean production processes or innovative environment products to spur ISD (Zhang and Gallagher, 2016). Therefore, we propose that,

H2a: Home country-based technology ties might strengthen the relationship between innovativeness and ISD.

ISD is associated with international environmental turbulence that might simultaneously bring opportunities and threats for green ventures (Clarke and Liesch, 2017; Jin, Jung, and Jeong, 2018). As environmental pollution and climate change have become a global hot issue that may harm social sustainability and human health, an increasing number of countries concentrate on environmental innovations and green technologies to develop a first-mover advantage. For international green entrepreneurship, there is a need for identifying global environmental technology changes. Without a doubt, accurately forecasting the technological changes in foreign markets requires a firm to have relevant technical skills and knowledge (Brettel, Chomik, and Flatten, 2015). Considering that it is difficult to obtain technological resources from host countries owing to the liabilities of foreignness, building an information-sharing mechanism with home country technology partners may be an alternative means for green ventures (Zhang et al., 2016). Moreover, home country-based technology ties might help green ventures access technical resources to develop environmental products and enhance creativity, and thus outperform international rivals in an unfamiliar international

green market. In this sense, the effect of proactiveness on ISD is more likely to be enhanced when technical knowledge and this situation can be better understood through frequent interactions between green ventures and home country-based technology partners. Therefore, we propose that,

H2b: *Home country-based technology ties might moderate the relationship between proactiveness and ISD.*

Although risk-taking is often considered a strategic propensity necessary for stimulating international green entrepreneurship, lowering the risk of failure needs to utilize connection ties with technology partners at home (Luo and Bu, 2018). First, home country-based technology ties can reduce Chinese green ventures' perceived risks of doing international green business by adding technological advantages of innovative green products or sustainable innovation (Varadarajan, 2017). It implies that stronger network connections with technology partners at home results in more technological assets available for Chinese green ventures. This enhances their willingness to take further risks in unfamiliar international markets. Second, previous literature has well realized that geographic, cultural, and institutional differences across countries are one critical cause that leads international firms to face high risk and high rates of failure while pursuing strategic aims in foreign markets. Drawing on home country-based technology ties, Chinese green ventures may access international entrepreneurial opportunities and valuable technological exchanges "that are constrained in terms of geographic, psychic and linguistic distance" (Ellis, 2011). Hence, we argue that green ventures might better realize international sustainable benefits of their risk-taking by building strong ties with home country-based technology partners. Therefore, we propose that,

H2c: *Home country-based technology ties might moderate the relationship between risk-taking and ISD.*

2.2.2. *The Moderating Effect of Home Country-Based Business Ties*

There is a time gap "between the emergence of new preferences and the development of new products" in international markets (Su et al., 2013). Hence, green ventures should concentrate on how to reduce this "time lag" and build a better understanding of which innovative green products or creative business models can be more easily accepted by international customers. The open innovation view suggests that customers, suppliers, partners, and even competitors can provide possible access to critical resources regarding underpinning the deployment of environmental innovativeness (Saebi and Foss, 2015). Accordingly, home country-based business ties may be an alternative source for supporting the innovativeness of green ventures. Home country-based business ties imply that green ventures have connections with domestic business partners, some of whom may have successful experiences in international business operations (Muralidharan and Pathak, 2017). Moreover, these domestic business partners may have accumulated valuable knowledge or various capabilities regarding how to build legitimacy or respond to international needs. As a result, a rapid increase of firms expanding into new markets may help Chinese green ventures successfully introduce original green products to international markets, and further enhance the sustainable benefits of innovativeness (Zhang et al.,

2016). Therefore, we propose that,

H3a: *Home country-based business ties might moderate the relationship between innovativeness and ISD.*

The extant literature has demonstrated that learning from business partners is necessary for being proactive in anticipating international business opportunities and successfully launching green products or environmental services (Acosta, Crespo, and Agudo, 2018). Considering that most Chinese green ventures are at the early stages of internationalization, the lack of firm legitimacy and being isolated from host country business networks often impede Chinese green ventures to acquire and integrate critical knowledge regarding doing international green business (Zhang et al., 2016). As mentioned above, utilizing home country business ties (connections with material suppliers, early international firms, capital suppliers, and business lawyers at home) may assist firms in acquiring resources related to international green business (Prashantham and Birkinshaw, 2015). Accordingly, we propose that the proactiveness-ISD relationship may be contingent on business ties at home for two reasons. First, maintaining strong connection ties with home country business partners might provide Chinese green ventures with the necessary knowledge or information for anticipating entrepreneurial opportunities and participating in international green markets. Second, stronger home country-based business ties can help Chinese green ventures foresee international green market changes, and thus, more effectively respond to international competitors' actions, and maintain their sustainable growth in rapidly international business environments. Therefore, we propose that:

H3b: *Home country-based business ties might moderate the relationship between proactiveness and ISD.*

Foreigner disadvantages such as information asymmetry, regulatory bias, and cultural differences might lead green ventures to a higher possibility of failure in international expansion and anticipating local high-risk projects with high market potential (Wu and Salomon, 2017). It means that relative to domestic expansion, operating in international green markets often requires green ventures to take more risks associated with the liability of foreignness. To strengthen the positive effects of risk-taking on ISD, Chinese green ventures should draw upon business ties to build legitimacy in host countries. Since it is difficult for international business partners to build strong collaborative connections, business ties at home may help Chinese green ventures to increase confidence in taking risks abroad (Zhang et al., 2016). First, home country-based business ties might provide valuable information and critical knowledge necessary for addressing international green business uncertainties and global environmental changes (Ellis, 2011). Second, business partners at home who have successfully operated in host countries can assist Chinese green ventures in avoiding entrepreneurial risks and reducing the fear of international green entrepreneurship failure (Ma, Ding, and Yuan, 2016). In sum, it is believed that home country-based business ties may moderate the process in which risk-taking is converted into enhanced ISD while helping Chinese green ventures enter high-return international green business projects and minimize their risk. Therefore, we propose that:

H3c: Home country-based business ties might moderate the relationship between risk-taking and ISD.

3. Methods

3.1. Sample and Data Collection

Over the past decades, the dramatic success of economic growth in China heavily relied on huge investment in natural resources (e.g., minerals, energy, forest, and land), which has induced various environmental problems, such as severe ecological damage, huge energy consumption, high waste pollutant emissions, and conspicuous social disharmony (Gu and Su, 2018). Moreover, such a resource-driven economic growth model is not beneficial for Chinese enterprises to develop strategic competitiveness and realize ISD in the global marketplace. Since green entrepreneurship has become an important force for responding to environmental concerns in recent years, China has launched a series of policies concerning the development of green innovations. For instance, as three strategic emerging industries, new energies, new energy vehicles, and energy-saving and environmental protection are employed to seize advantageous positions in the global industrial chain and develop a first-mover advantage in environmental technologies. As a result, an increasing number of green ventures based on these innovations have entered global markets for international sustainability (Gedajlovic, Cao, and Zhang, 2012; Ren, Eisingerich, and Tsai, 2015). Compared to big enterprises, however, Chinese green ventures have little knowledge of international expansion and few connection ties with foreign stakeholders, such as local customers, technology organizations, and business partners (Ma, Ding, and Yuan, 2016). As a result, home country-based networks might be an alternative means for green ventures to access resources necessary for competing in global green markets. In this sense, we believe that China provides an ideal research setting for examining the relationship between EO, home country-based networks, and ISD among green ventures in emerging economies.

Data for testing our hypotheses were collected from 127 green ventures in China based on the random sampling technique. These green ventures mainly focused on the lower use of energy or materials, lower CO₂ emissions, and higher ecological benefits in the Fujian province, where green economic growth and economic cooperation with international markets were highlighted. To ensure the reliability of firm-level data and reduce the common method bias, only top managers or entrepreneurs who were strategic decision-makers were invited to participate in this survey. In the first phase, all items of the questionnaire were derived from the previous literature and translated into Chinese (Su et al., 2017). To ensure conceptual equivalence, two scholars and two entrepreneurs were invited to evaluate all items in the Chinese version before data collection. In the second phase, a total of 550 green ventures were randomly chosen from a list provided by the Department of Commerce of Fujian province, and these firms were invited to participate in the survey by telephone or e-mail. As a result, 152 green ventures focusing on international business (mainly in the forms of exporting, cross-border licensing, and joint venturing) agreed to participate in our research. The survey was conducted from October 2019 to December 2019. After excluding responses with missing data (not providing complete information or giving the same score on most scale items), 127 green ventures were included in the final analysis (an effective response rate of 29.2%).

3.2. Measures of Constructs

To ensure the reliability and validity of constructs, all items for each variable were based on previous studies, and only minor changes were made to fit the Chinese context (Acquaah, 2007; Boso, Story, and Cadogan, 2013). Table 1 shows the measurement items for each construct and their respective factor loadings, alpha values, and other important statistical indicators.

3.2.1. *EO*

The conceptualization of EO followed Acosta, Crespo, and Agudo's (2018) definition to reflect the strategic inclination regarding how green ventures gain a competitive advantage in competing with international rivals in the rapidly changing global business environments, which captures green ventures' innovativeness (4 items), proactiveness (3 items), and risk-taking (3 items). The reliability of innovativeness ($\alpha=0.873$), proactiveness ($\alpha=0.818$), and risk-taking ($\alpha=0.801$) exceeded the 0.7 benchmark.

3.2.2. *Home Country-based Networks*

Per the previous literature, home country-based networks mainly focused on typical network conditions for international green entrepreneurship: home country-based technology ties and home country-based business ties. The former consisted of three items that were developed based on the research of Gu and Su (2018), while the latter also included three items adopted by Peng and Luo (2000) and Zhang et al. (2016). The reliabilities of home country-based technology ties ($\alpha=0.705$) and business ties ($\alpha=0.806$) were well above the recommended threshold.

3.2.3. *ISD*

In this study, ISD was employed to measure the benefits of EO. The analysis followed mainly the measurement method in Zhang et al. (2016) and thus required the informants to report the following growth indicators concerning their firms for the last three years or since its founding (if the firm age is less than three years): (1) sustainable growth of international profitability, (2) sustainable growth of international sales, and (3) sustainable growth of international market share. The primary reasons why we use subjective measures to assess green ventures' ISD is that (1) subjective indicators are more accessible than objective indicators; and (2) detailed economic indicators may be sensitive or commercial secrets (Stam and Elfring, 2008). Furthermore, their responses were measured using a five-point Likert-type scale. Its Cronbach's alpha was 0.785, indicating acceptable reliability.

3.2.4. *Control Variables*

To improve the estimation accuracy of the contingent research model, previous studies on international entrepreneurship suggested that there is a need for controlling venture age, venture size, and international experience, which may reflect the degree which green ventures possess initial resource bases and further affect ISD (Anderson and Eshima, 2013; Zhang et al., 2016). In this study, informants were invited to answer the number of years since establishment for measuring venture age, and the number of full-time employees for measuring venture size. Considering that international experience might assist green ven-

tures in accumulating critical knowledge and important skills (Mohr and Batsakis, 2019), informants were also required to state the number of years since the green venture entered international markets. As suggested by Anderson and Eshima (2013), these three control variables were log-transformed to normalize their distribution and then standardized for estimating our research model.

3.4. Common Method Bias

Common method bias might be present when all items of the questionnaire are subjectively judged by informants' perceptions. To minimize common method bias, we conducted two approaches. First, informants mentioned that this anonymous survey was only for scientific research and there were no right or wrong answers to questions, and thus they did not need to have any fear of personal privacy issues. Meanwhile, each questionnaire was divided into two parts, which were completed by two informants in each firm. That is, a total of 304 pairs of questionnaires were distributed to our sampling firms (152), and 127 questionnaires that were fully completed by 254 informants from 127 green ventures were valid. Such process control is believed to minimize common method bias. Second, following the previous literature (Bagozzi and Yi, 2012), we employed Harman's single-factor test to check for common method bias. If one general factor accounts for most of the covariance among the variables, there may be significant common method variance. After a factor analysis of multi-item constructs, we found five factors with initial eigenvalues higher than 1. In addition, our analysis results showed that each factor accounted for between 10% and 20% of the total variance. These results suggest that the presence of common method bias was not a serious threat in our study.

3.5. Multicollinearity Checking

For testing our hypotheses using moderated hierarchical linear regression analysis, all variables were mean-centered to minimize the threat of multicollinearity in equations. In addition, the variance inflation factors (VIF) were calculated to check for multicollinearity (Disatnik and Sivan, 2016), and all VIF values ranged from 1.007 to 1.181. In addition, the Pearson correlations for all variables were smaller than the 0.7 benchmark. Therefore, we believe that multicollinearity is unlikely to be a serious issue in our study (Tabachnick and Fidell, 1996).

4. Results

4.1. Assessment of Measures

To test the reliability and validity of our measures, we used the SPSS software and maximum likelihood estimation to examine all scales in confirmatory factor analysis (CFA). First, we estimated Cronbach's α and composite reliability (CR) to check the reliability. As shown in Table 1, all Cronbach's Alpha values and CR values exceed the 0.7 benchmark. Second, we measured construct validity by examining the factor loadings and average variance extracted (AVE) values. Both factor loadings and AVE values were higher than 0.6, indicating good construct validity. Third, table 2 displays that all Pearson correlations were smaller than the square roots of the average variance extracted (marked in bold type in table

2), implying that all measures have good discriminant validity (Fornell and Larcker, 1981). In addition, we also used chi-square (χ^2) differences to assess the discriminant validity of all constructs in pairs. All chi-square differences are significant.

Table 1. A Confirmatory Factor Analysis, Standard Estimates, and Alpha Values (N=127)

Variable constructs and measurement items	Loading
Innovativeness (Boso, Story and Cadogan, 2013; Zhang et al., 2016)	
<i>(Alpha=0.873; CR=0.911; AVE=0.719)</i>	
(1) Our firm keeps creative in business operation in international green market;	0.887
(2) Our firm often launches innovative products or services in international green market;	0.828
(3) Our firm is known as an innovator in international green market;	0.783
(4) Our firm looks for new ways to do international business;	0.890
Proactiveness (Boso, Story and Cadogan, 2013)	
<i>(Alpha=0.818; CR=0.887; AVE=0.725)</i>	
(1) Our firm seeks to anticipate technological, market or institutional changes in international green market ahead of our rivals;	0.873
(2) Our firm seizes initiatives whenever possible in international green market;	0.905
(3) Our firm acts opportunistically to shape the international business environment in which we operate;	0.770
Risk-taking (Boso, Story and Cadogan, 2013)	
<i>(Alpha=0.801; CR=0.880; AVE=0.709)</i>	
(1) Our firm prefers to invest in high-risk projects in international green market;	0.833
(2) Our firm encourages take calculated risks;	0.827
(3) Our firm tolerates high-risk in international green market;	0.867
Home country-based technology ties (Gu and Su, 2018)	
<i>(Alpha=0.705; CR=0.836; AVE=0.632)</i>	
(1) Our firm (or top managers) often utilizes connections and networks (or personal ties) with universities (or their top managers) in China;	0.674
(2) Our firm (or top managers) often utilizes connections and networks (or personal ties) with R&D institutions (or their top managers) in China;	0.825
(3) Our firm (or top managers) often utilizes connections and networks (or personal ties) with technology intermediary organizations (or their top managers) in China;	0.872
Home country-based business ties (Peng and Luo, 2000; Zhang et al., 2016)	
<i>(Alpha=0.806; CR=0.883; AVE=0.716)</i>	
(1) Our firm (or top managers) often utilizes connections and networks (or personal ties) with buyers' firms (or their top managers) in China;	0.845
(2) Our firm (or top managers) often utilizes connections and networks (or personal ties) with supplier firms (or their top managers) in China;	0.833
(3) Our firm (or top managers) often utilizes connections and networks (or personal ties) with peer firms (or their top managers) in China;	0.861
Sustainable development (Zhang et al., 2016)	
<i>(Alpha=0.785; CR=0.875; AVE=0.701)</i>	
(1) International profitability growth in the past three years;	0.891
(2) International sales growth in the past three years;	0.857
(3) International market share growth in the past three years.	0.758

Table 2 reports the means, standard deviations, and a correlation matrix of all constructs to show the interrelationships between these constructs. These green ventures ranged in size from 6 to 193 employees and averaged 48.378 employees. The average venture age and international experience were 7.591 and 4.976, respectively. It was found that venture size ($r=0.173$, $p<0.05$), innovativeness ($r=0.576$, $p<0.001$), and proactiveness ($r=0.324$, $p<0.001$) were positively related to green ventures' ISD, providing some initial evidence for supporting hypothesis 1a and 1b.

Table 2. Means, SDs, and Correlations for Variables (N=127)

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Venture age	7.591	3.826									
2. Venture size	49.598	33.565	0.192 [*]								
3. International experience	4.976	3.294	0.157 ⁺	0.186 [*]							
4. Innovativeness	3.202	0.636	0.087	0.071	0.145	0.848					
5. Proactiveness	3.449	0.672	0.045	-0.019	-0.023	0.083	0.851				
6. Risk-taking	3.795	0.911	-0.110	-0.139	-0.027	0.103	0.066	0.842			
7. Home country-based technology ties	2.933	0.684	-0.072	-0.030	0.047	0.053	-0.153 ⁺	0.083	0.795		
8. Home country-based business ties	4.462	0.640	-0.051	-0.064	-0.050	0.057	0.174 ⁺	0.251 ^{**}	0.057	0.846	
9. International Sustainable Development	3.304	0.716	0.110	0.173 ⁺	0.097	0.576 ^{***}	0.324 ^{***}	-0.061	0.035	0.031	0.837

Notes: 1. *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

2. Numbers in bold type indicate the square root of the AVE (average variance extracted)

4.2. Hypothesis Testing

Moderated hierarchical linear regression analysis was conducted to test our hypotheses concerning the main relationship between EO (innovativeness, proactiveness, and risk-taking) and ISD as well as the moderating effects of home country-based networks (technology ties and business ties) on the main relationship (Stam and Elfring, 2008; Wood et al., 2018). Previous literature in entrepreneurship has argued that moderated hierarchical linear regression is a suitable analytical technique for evaluating the contingent research model (Anderson and Eshima, 2013). Table 3 demonstrates the regression results in estimating the direct and moderating effects and shows the changes in the variance explained (ΔR^2).

In the first step, we controlled for firm characteristics (venture age, venture size, and international experience) that may influence a venture's strategic posture to anticipate ISD. As shown in Table 3, venture age ($\beta=0.184$, $P>0.1$), venture size ($\beta=0.355$, $P>0.1$), and international experience ($\beta=0.023$, $P>0.1$) have no statistically significant effect on green ventures' ISD. Unlike some previous studies focusing on international business performance, our empirical results suggested that there were no significant differences in green ventures' ISD in terms of their venture age, venture size, and international experience.

In step 2, the three dimensions of the antecedent (EO) were entered to test their direct effects on ISD (Model 2: $R^2=0.448$, $P<0.001$). The results indicate that innovativeness ($\beta=0.154$, $P=0.019$) and proactiveness ($\beta=0.137$, $P=0.036$) have positive effects on green ventures' ISD, providing support for H1a and H1b. This finding is consistent with previous studies that found new ventures with a high level of EO tend to feature greater levels of innovativeness and proactiveness, leading to a more successful entrepreneurial strategic posture than those with low-level EO (Anderson and Eshima, 2013; Su and Sohn, 2015). However, we failed to find any significant role in risk-taking ($\beta=0.094$, $P=0.177$), implying that H1c is not supported in our study.

In the third step, we simultaneously entered two moderating variables (home country-based technology ties and business ties). The results for Model 3 indicate that neither network connection (technology ties: $\beta=0.042$, $p=0.547$, nonsignificant; business ties: $\beta=0.014$, $p=0.792$, nonsignificant) had a significant direct relationship with green ventures' ISD, which is inconsistent with the previous social network literature highlighting the direct role of network connections on firm performance.

Six two-way interaction terms were included in the next step to test the contingency hypotheses (H2a, H2b, H2c and H3a, H3b, H3c). The results for Model 4 ($R^2=0.607$, $P<0.001$) show that both technology ties and business ties at home may moderate the relationship between innovativeness (or proactiveness) and green ventures' ISD. However, we failed to find any significant contingent value of technology ties at home (or business ties at home). In sum, the empirical results provide support for H2a, H2b, H3a, and H3b, but not for H2c and H3c.

Table 3. Moderated Regression Analysis Results

Variables	Model 1		Model 2		Model 3		Model 4	
	β (SE)	T(sig.)	β (SE)	T(sig.)	β (SE)	T(sig.)	β (SE)	T(sig.)
Constant	-0.921 (0.501)	1.836 (0.069)	-0.962 (0.390)	2.468 (0.015)	-1.096 (0.403)	2.723 (0.007)	-0.864 (0.398)	2.174 (0.032)
Ln (Venture age)	0.184 (0.325)	0.567 (0.571)	0.352 (0.252)	1.396 (0.165)	0.332 (0.256)	1.295 (0.198)	0.290 (0.257)	1.130 (0.261)
Ln (Venture size)	0.355 (0.239)	1.483 (0.141)	0.500 (0.186)	2.689 (0.008)	0.498 (0.187)	2.661 (0.009)	0.397 (0.187)	2.125 (0.036)
Ln (International experience)	0.023 (0.201)	0.117 (0.907)	0.151 (0.157)	0.962 (0.338)	0.166 (0.160)	1.036 (0.302)	0.135 (0.159)	0.852 (0.396)
Innovativeness			0.154 (0.070)	2.201 (0.019)	0.143 (0.071)	2.011 (0.033)	0.132 (0.068)	1.941 (0.053)
Proactiveness			0.137 (0.068)	2.012 (0.036)	0.125 (0.063)	1.982 (0.047)	0.121 (0.061)	1.983 (0.048)
Risk-taking			0.094 (0.069)	1.359 (0.177)	0.092 (0.072)	1.280 (0.203)	0.075 (0.076)	0.992 (0.323)
Technology ties					0.042 (0.070)	0.604 (0.547)	0.082 (0.073)	1.129 (0.261)
Business ties					0.014 (0.068)	0.206 (0.792)	0.018 (0.088)	0.204 (0.838)

Table 3. Moderated Regression Analysis Results

Variables	Model 1		Model 2		Model 3		Model 4	
	β (SE)	T(sig.)	β (SE)	T(sig.)	β (SE)	T(sig.)	β (SE)	T(sig.)
Innovativeness							0.165	2.705
×Home country-based technology ties							(0.061)	(0.007)
Proactiveness							0.133	2.463
×Home country-based technology ties							(0.054)	(0.015)
Risk-taking							-0.007	0.086
×Home country-based technology ties							(0.080)	(0.932)
Innovativeness							0.188	2.548
×Home country-based business ties							(0.074)	(0.012)
Proactiveness							0.141	2.431
×Home country-based business ties							(0.058)	(0.017)
Risk-taking							0.041	0.470
×Home country-based business ties							(0.087)	(0.639)
F	1.565		16.225		12.034		21.983	
	(sig.0.201)		(sig.0.000)		(sig. 0.00)		(sig.000)	
R ²	0.037		0.448		0.449		0.607	
Adjusted R ²	0.013		0.420		0.412		0.576	
△ R ²			0.411		0.001		0.158	

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0$.

5. Discussion

Global environmental concerns (e.g., pollution emission, climate change, and disease transmission) may provide emerging opportunities for international green entrepreneurship to concentrate on the development of green technologies and environmental products for pollutant reduction, ecological recovery, and social sustainability (Abdelkafi and Hansen, 2018). In other words, international green entrepreneurship is expected to help stimulate global social and economic sustainability. To improve the success of the international expansion, green ventures should identify the relationships between EO, home country-based networks, and ISD.

5.1. Research Findings and Practical Implications

Social network research has long emphasized the importance of network connections in international entrepreneurship, such that business ties or political ties might strengthen or weaken the positive effects of innovativeness, proactiveness, or risk-taking on ISD (Acosta, Crespo and Agudo, 2018; Chung, Yen and Wang, 2020; Ellis, 2011; Zhang et al., 2016). Little research, however, has focused on the context of home country-based networks and examined important topics on which home country-based networks (e.g., technology network and business network) can be instrumental in shaping EO leading to their enhanced green ventures' ISD in an emerging economy. As a result, the existing research findings cannot provide practical implications for emerging economies' green ventures to establish legitimacy, while they are confronted with the liabilities of foreignness and difficult to be legitimated by groups of host country stakeholders. In this regard, home country-based networks may be beneficial for green ventures to establish firm legitimacy and promote international green entrepreneurship. To address our research question, we modeled the effects of a contingency of EO and home country-based networks (technology ties and business ties) on green ventures' ISD. Using data from 127 green ventures in Fujian province, China, we concluded several findings and then attempted to provide managerial implications for international entrepreneurs or green ventures per our empirical results (Table 4).

Table 4. Summary of Empirical Results

Hypothesis		Expected direction	Result
H1a	Innovativeness→ISD	Positive	Accepted
H1b	Proactiveness→ISD	Positive	Accepted
H1c	Risk-taking→ISD	Positive	Rejected
H2a	Innovativeness×Home country-based technology ties→ISD	Positive	Accepted
H2b	Proactiveness×Home country-based technology ties→ISD	Positive	Accepted
H2c	Risk-taking×Home country-based technology ties→ISD	Positive	Rejected
H3a	Innovativeness×Home country-based business ties→ISD	Positive	Accepted
H3b	Proactiveness×Home country-based business ties→ISD	Positive	Accepted
H3c	Risk-taking×Home country-based business ties→ISD	Positive	Rejected

First, both innovativeness and proactiveness are directly related to the ISD of green ventures. On one side, it highlights that to survive and grow in international green marketplaces, Chinese green ventures should concentrate on innovativeness to develop high-quality environmental products or provide environment-friendly services that create value for local customers and outperform international competitors (Prajogo, 2016). On another side, forecasting inclination also helps Chinese green ventures to effectively anticipate the global green market and environmental innovations that are experiencing rapid changes, and thus improve the ability to realize sustainable growth (Bloodgood et al., 2017).

Interestingly, unlike most previous literature (e.g., Muzychenko and Liesch, 2015; Zhang et al., 2016) highlighting that international firms with a high risk-taking propensity can

directly affect international success, our empirical results suggested that for green ventures, risk-taking has no significant effect on ISD. One possible explanation is that simply taking further risks cannot help Chinese green ventures realize rapid international expansion in an unfamiliar foreign market in which geographic, cultural, institutional, and economic aspects may heavily differ from their home country (D'Angelo and Presutti, 2019; Ma, Ding, and Yuan, 2016). That is because the risk-averse nature of Chinese culture could potentially influence how the Chinese green ventures take risks and develop strategies for promoting ISD (Oppen, Nee, and Holm, 2017). In this regard, we strongly argue that the effect of risk-taking on green ventures' internationalization might vary across their "strategic asset-seeking intent, financial abundance, and inward internationalization" (Luo and Bu, 2018). Moreover, there is a need for taking some risks to promote international success, but it does not imply that the higher the risk-taking propensity, the better ISD the green ventures can realize.

The second finding suggests that despite home country-based networks (in terms of technology ties and business ties) are not directly related to ISD, they might strengthen the positive effect of innovativeness (or proactiveness) on green ventures' ISD. On the one hand, green ventures should utilize their connection ties with technology partners to keep innovative or foresee environmental technology changes in the global green market, to develop a competitive advantage in clean technologies. On the other hand, Chinese green ventures also need to build high-quality connection ties with business partners at home and further establish firm legitimacy through the network diffusion process (Bloodgood et al., 2017). In this sense, international green ventures need to build technology networks and business networks at home in order to acquire technological and business resources to underpin the deployment of EO in foreign markets (Mohr and Batsakis, 2018; Semrau, Ambos and Kraus, 2016).

5.2. Theoretical Contributions

This study makes important contributions to the literature by demonstrating whether home country-based networks can shape the relationship between the deployment of a high level of EO and ISD in the context of green entrepreneurship. First, despite previous literature in international entrepreneurship finding that social networks are significant moderators of the effectiveness of EO (e.g., Acosta et al., 2018; Stam and Elfring, 2008), such research has mainly focused on the context of the host country and typically ignored the home-country context. The present study considers two potentially critical network conditions at home, namely home country-based technology ties and business ties, at the theoretical level in the context of China's economic transition. Therefore, our study might provide new insights into why deploying high levels of EO should consider the contingent value of the home country-based networks for stimulating green ventures' internationalization.

Second, the previous literature on international entrepreneurship often examined the contingent effects of business ties (e.g., Li and Lee, 2015; Zhang et al., 2016), institutional ties (e.g., Acosta, Crespo and Agudo, 2018; Wong, Fang, and Tjosvold, 2012) or social ties (e.g., Barrick et al., 2007; Milanov and Fernhaber, 2014), and ignored the importance of technology ties at home. In the knowledge-based economy era, firms should maintain strong connection ties with technology developers such as universities, research institutes, and technology transfer centers to build technological advantage and create competitive products (Castro,

2015). For international green ventures, developing high-quality products is also very crucial for rapidly establishing firm legitimacy and successfully competing in foreign markets.

5.3. Limitations and Outlook for Future Research

Like all scientific research, our study also has some limitations that might provide potential directions for future research. The first limitation is the fact that the sample only included operating firms. However, the failure rate is relatively higher for emerging economies' green entrepreneurship, and therefore future research should consider failed green ventures for a deeper understanding of the roles of EO and network connections at home in international green entrepreneurship.

The second limitation is that our data were derived from the perceptual judgment of international green ventures' top managers. Although this method is widely adopted by previous studies of international entrepreneurship, it may not precisely capture objective information. Future research can explore the topic of how to collect performance data from other sources, such as statistical reports and firm databases. Moreover, such a design also can reduce possible concerns of common method bias and improve the statistical accuracy of empirical analysis.

The third limitation is the fact that this study only considered the contingent effects of home country-based networks, but did not take into account the boundary conditions that might alter the contingent effects. In this regard, future research can explore whether the moderating effects of home country-based networks on EO and ISD can be influenced by configurational factors such as firm ownership, geographic location, and industrial types (Zhang et al., 2016).

6. Conclusions

Emerging environmental concerns require that Chinese green ventures should be more sustainable and environmentally responsible in global markets (Demirel et al., 2019). However, the liabilities of foreignness and firm legitimacy may restrict Chinese green ventures to underpin the performance implications of EO. Building on social network theory and institutional view, we propose that home country-based technology ties and business ties might provide green ventures with the strategic resources necessary, which are important for underpinning the deployment of EO aiming at promoting ISD. Drawing from a sample of 127 Chinese green ventures, empirical results show that ISD of innovativeness and proactiveness may be contingent on home country-based networks (in terms of technology ties and business ties), but we failed to find moderating effects of risk-taking. Since previous literature often gives more focus on the host country context of social networks, this research shifts to a home country-based network context. It may extend the social network and contingency theories in the field of international green entrepreneurship.

Meanwhile, international green entrepreneurship may be one strategic choice for Korea to revitalize its economy and develop global competitiveness in the post-COVID-19 era. That is because international green entrepreneurship has become an emerging force for stimulating economic growth, job creation, technological progress, environmental protection, and

sustainable development (Varadarajan, 2017). In this regard, the Chinese experience can provide useful implications for Korea, which is widely and deeply influenced by Confucianism and network connections. Moreover, we believe that international green ventures in Korea can benefit from their closer connection ties with home country stakeholders (e.g., business partners, critical customers, technology developers, and research institutions), thus improving their international survival ability and in turn contributing to developing industrial advantages at the state level.

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