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Born global firms' growth and collaborative entry mode: The role of transnational entrepreneurs

Purpose- This paper aims to investigate the role of transnational entrepreneurs in growing born global firms, with a focus on the growth process facilitated by collaborative entry mode.

Design/methodology/approach- We chose the solar photovoltaic (PV) industry as our empirical setting. This industry is a particularly good context for our study because many firms in this industry sell knowledge-intensive products internationally from their inception. Our primary data consist of 32 in-depth interviews with entrepreneurs, industry association representatives, research institute scholars, and professional service firms.

Findings- Our study highlights the importance of transnational entrepreneurs who develop born global firms to maturity by using their technological knowledge, international connections, and bicultural advantages to navigate and leverage institutional complexity.

Collaborative entry mode with distributors enables born global firms' high growth rapidly, whereas transnational entrepreneurs play a central role in building and expanding international network. IPO in overseas stock exchange accelerates the high growth trajectory of born global firm by signalling its maturity.

Research limitations/implications- We took a process perspective by examining the growth and maturity of born global firms by collaborative partnership; our focus on the role of transnational entrepreneurs highlighted entrepreneurs' sensitivity to institutional complexity along the growth trajectory.

Practical implications- We recommend both incumbent and entrepreneurial firms in developed economies collaborate with transnational entrepreneurs in various business areas. Industry firms may be able to cooperate on product and marketing development, and professional service firms can offer services to expand born global firms further, because transnational entrepreneurs follow the global "rules of the game".

Originality/value- We shed important light on the role of transnational entrepreneurs throughout the growth of born global firms via collaborative entry mode. Furthermore, we develop a multilevel framework for analysing the combined influence of transnational entrepreneur and institutional complexity on the growth of born global firm.

Keywords: transnational entrepreneur, born global firms, growth by collaboration, maturity, institutional complexity, solar photovoltaic industry

Paper type Research paper

1. Introduction

As an important form of international new venture, born global firms have received significant attention from both scholars and practitioners over the past two decades (McDougall-Covin, Jones, & Serapio, 2014). Born global firms are commonly characterised as young, knowledge-intensive organisations that typically sell innovative, self-developed technology-based products to global markets (Almor, 2011; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994). To date, scholarship on born global firms has investigated why and how born global firms internationalise early on (Almor, Hashai, & Hirsch, 2006; McDougall & Oviatt, 2000), yet a dearth of research addresses their growth and maturity (Jones, Coviello, & Tang, 2011; Keupp & Gassmann, 2009).

We argue that accounting for individual entrepreneurs' role and taking a process perspective on growth significantly enhances the field's understanding of entrepreneurial growth in general and born global firms' growth in particular. First, despite theoretical and empirical progress in the study of born global firms, various authors note that born global literature rarely accounts for the role of the individual entrepreneur(s) behind born global firms (Andersson, 2000; Wright, Westhead, & Ucbasaran, 2007; Yeung, 2002). Because entrepreneurs are the ones who envision, initiate, and develop born global firms, researchers have called for more scholarly attention to individual entrepreneurs and their roles in establishing and developing born global firms (Madsen & Servais, 1997). By focusing on entrepreneurs - individual managers of born global firms, the accelerated internationalisation and strategic orientation of born global firms can be better understood (Freeman & Cavusgil, 2007; Freeman, Deligonul, & Cavusgil, 2013). Aligning with this line of argument, we suggest that a focused, nuanced analysis of the entrepreneur(s) behind born global firms can provide novel and deeper insights into the born global phenomenon.

Transnational entrepreneurs migrate from one country to another and maintain business links in both their former and their current locations (Drori, Honig, & Wright, 2009). By extension then, transnational entrepreneurial activities involve cross-national contexts and are initiated and carried out by actors who are embedded in at least two different social and economic arenas. Because of their dual (or multiple) embeddedness, the actions of such entrepreneurs are enabled and/or constrained by the institutional structures in which they operate (Saxenian, 2007). We suggest that these particular characteristics of transnational entrepreneurs are highly relevant for the growth trajectory of the born global firms.

Combining a process view with a focus on the transnational entrepreneur(s) behind a born global firm, we aim to examine how transnational entrepreneurs grow born global firms. Specifically, we explore the roles of their technological knowledge, international experience, and social capital (Gassmann & Keupp, 2007). An entrepreneur's international experience helps mobilise knowledge flows beyond geographical boundaries and facilitates global market dispersion (Terjesen & Elam, 2009). Furthermore, the social capital of entrepreneurs behind born global firms is crucial for growing new ventures globally (Coviello, 2006). Moreover, collaborative entry mode constitutes an important organisational form for firms entering overseas markets (Gomes, Weber, Brown, & Tarba, 2011). However, the existing

born global literature fails to acknowledge the importance of collaborative entry mode and its influence on born global firm's growth. We thus investigate: How do transnational entrepreneurs develop born global firms' growth by collaborative entry mode?

Furthermore, as Yeung (2002, p. 30) points out, transnational entrepreneurial activities must adapt to the institutional relations in both home and host countries, while "These institutional relations may be defined by the social and business networks in which these transnational entrepreneurs are embedded, the political- economic structures, and the dominant organisational and cultural practices in the home and host countries." By fulfilling the global market demand for knowledge-intensive products, born global firms may exhibit a high growth trajectory by standardising high-tech products (Almor et al., 2006). Thus, the second research question we examine is as follows: How do transnational entrepreneurs respond to institutional complexity in growing born global firms?

To investigate our research questions, we chose the solar photovoltaic (PV) industry as our empirical setting. This industry is a particularly good context for our study because many firms in this industry sell knowledge-intensive products internationally from their inception (Haley & Schuler, 2011). The nature of our research questions led us to choose qualitative research methods, adopting a methodological pluralism approach (Coviello & Jones, 2004; Leitch, Hill, & Neergaard, 2010). Our primary data consist of 32 in-depth interviews with entrepreneurs, industry association representatives, research institute scholars, and professional service firms. We carried out interviews from August 2010 to September 2011. We collected the secondary data used in our analysis from sources such as annual reports and government regulatory and policy documents.

We structure this article as follows. We begin by discussing the current research on born global firms, transnational entrepreneurs, and institutional complexity—in particular, the influences of transnational entrepreneurs and institutional complexity on born global firms' growth. We then present the research context and design. Next, we discuss our empirical findings. We conclude by proposing a multilevel process model and outlining theoretical and managerial implications, as well as future research directions.

2. Theoretical background

Born global firms and transnational entrepreneurs

According to a seminal article, born global firms are "small, technology-oriented companies that operate in international markets from the earliest days of their establishment" (Knight and Cavusgil, 1996, p. 11). Researchers commonly characterise born global firms as young, knowledge-intensive organisations that sell mainly innovative, self-developed, technology-based products to global markets (Almor, 2011; Knight & Cavusgil, 2004, 2005; McDougall & Oviatt, 2000; Oviatt & McDougall, 1994, 1995). Despite theoretical and empirical advances in studying born global firms, few studies have examined the roles of individual entrepreneurs in developing born global firms (Karra, Phillips, & Tracey, 2008). Scholars urge that primary consideration should be given to the past experiences, current ambitions,

and motivation levels of born global leaders when investigating the born global phenomenon (Madsen & Servais, 1997).

The knowledge-based view has been applied to studying the internationalisation of born global firms (Hohenthal, Johanson, & Johanson, 2014). Entrepreneurs who possess the required technological knowledge and international knowledge play a critical role in developing a born global firm (Nordman & Melén, 2008). One study that examines the born global phenomenon in the context of Brazilian software firms highlights the influence of entrepreneurs in driving the born global path instead of the traditional internationalisation process (Dib, da Rocha, & da Silva, 2010). As for rapid knowledge development, born global entrepreneurs can use both preexisting and newly formed relationships to quickly and proactively develop new knowledge for the rapid commercialisation of their products (Freeman, Hutchings, Lazaris, & Zyngier, 2010).

Transnational entrepreneurs who bridge national boundaries have been argued to have a significant impact on the development of local industries (Saxenian, 2002, 2007; Wadhwa, Jain, Saxenian, Gereffi, & Wang, 2011). Extant research has discussed returnee entrepreneurs, but for our purposes, transnational entrepreneurs differ from returnee entrepreneurs significantly. In particular, returnee entrepreneurs are largely oriented toward their original home country markets, though they could adopt an international orientation using their experience and affiliation with the countries from which they have returned (Lin & Tao, 2012). In contrast, transnational entrepreneurs are more inclined to capitalise on the global market by leveraging their transnational experience, becoming active wherever they perceive demand for their products or services. Terjesen and Elam (2009) show that the founding entrepreneur's international experiences help mobilise knowledge flows beyond geographical boundaries and facilitate global market dispersion. The international experience of transnational entrepreneurs reduces barriers and helps smooth a born global firm's interactions and negotiations with firms from different cultures (Kuemmerle, 2005). Furthermore, the social capital of migration plays a critical role in influencing the international growth of new ventures (Prashantham & Dhanaraj, 2010). Transnational entrepreneurs with international social capital could facilitate a firm's rapid growth on a global scale. Consequently, compared with returnee entrepreneurs, transnational entrepreneurs are more likely to develop born global firms on a global rather than national or binational scale. Transnational entrepreneurs with both advanced technological know-how and an entrepreneurial orientation can take advantage of the technological advances and develop more alliances with international markets.

Transnational entrepreneurs tend to exhibit the characteristics of bicultural people, those who can identify with two (or more) distinct cultures by internalising more than one set of cultural schemas (Brannen & Thomas, 2010). Biculturals not only develop more complex cultural representations but also seem to develop increased cognitive complexity across domains (Tadmor, Tetlock, & Peng, 2009). These cognitive capabilities are necessary to understand the institutional elements and environmental impact of an individual's venture creation decision (Lim, Morse, Mitchell, & Seawright, 2010). Urbano et al.'s (2011) Spanish case study concludes that sociocultural factors affect the development of transnational

entrepreneurial activities. Consequently, a transnational entrepreneur's cognitive capabilities may facilitate the born global firm's growth.

Collaborative entry mode and born global firms' growth

Entry mode decision is critically important for firms expanding abroad. Existing research documented the influences of institutional and cultural factors on entry mode choice and firm performance (Brouthers, 2013). Foreign market entry strategies affect post-entry growth performance (Tan, 2009). Most recently, scholars suggested entry mode studies should consider the evolution of operations resulting from the peculiar entry mode choice (Hennart & Slangen, 2014). Collaborative entry mode constitutes an important organisational form for firms entering overseas markets (Gomes et al., 2011). For instance, collaborative arrangement can assist firms to gain access to the required resources (Speckbacher, Neumann, & Hoffmann, 2014). Furthermore, knowledge safeguards and institutional safeguards influence foreign market entry mode choice of small and medium-sized enterprises (Maekelburger, Schwens, & Kabst, 2012). Hence, the influence of collaborative entry mode on firm growth warrants serious scholarly investigation.

We subscribe to the growth as a process view (Leitch et al., 2010) and argue that by juxtaposing the process perspective with institutional context, we can gain a nuanced understanding of born global firms' growth as we consider the transnational entrepreneur's role. During this growth process, collaborative entry mode plays a critical role for the following reasons: 1) the nature of born-global firms to export products overseas; 2) collaborative entry mode may overcome resource constraints; 3) collaboration is conducive to managing uncertainty. First, born-global firms generate income mainly through overseas market operation (Coviello, 2015). The nature of born global firms requests the intensive interaction with overseas partners in operating and growing the business. The collaborative entry mode is associated with a dynamic characteristic, such as sellers and buyers interact with each other over time (Narayandas & Rangan, 2004). Collaborative entry mode enables the born-global firms to dynamically observe and adapt their interactive relationships with overseas partners. One recent study revealed that maturing technology-based born-global firms can increase their chances of survival by acquiring other firms (Almor, Tarba, & Margalit, 2014).

Second, born-global firms normally possess limited resources as the firms began pursuing global strategy since inception, this can significantly constrain its entry mode choice. A recent study investigated the born-global maturing process and found out the HRM practices of born global firms evolved over time as the resource constraints changed (Glaister, Liu, Sahadev, & Gomes, 2014). Another study based on 700 SMEs in Germany revealed that SMEs tend to undertake a cooperative approach in collaborating with other firms to cope with talent management in order to overcome the resource constraints (Festing, Schäfer, & Scullion, 2013). Collaborative partnership, such as selling produces through distributors, can help born global firms to mitigate the influence of resource constraints. Third, due to the institutional differences between home and host country contexts, a high degree of

uncertainty may put additional obstacle for born global firms. The dynamics and potential vulnerability of the supplier-buyer relationship may further enhance uncertainty. A recent study found that entrepreneurs choose to establish and nurture collaborative partnership in managing uncertainty (Liu & Almor, 2014). Therefore, we argue collaborative entry mode may facilitate born global firms manage and navigate through institutional complexity in the pursuit of growth.

Born-global firms and institutional complexity

The institutional context constitutes a crucial factor for entrepreneurial and born-global firms' growth (Welter, 2011; Wright & Stigliani, 2013). Multiple competing institutional demands necessitate that organisations deploy appropriate responses when dealing with institutional complexity. (Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011). Scholars have begun to explore actors' interaction with institutional complexity by examining institutional logics in action (Lounsbury & Boxenbaum, 2013), such as how individuals in hybrid organisations respond to competing institutional logics (Pache & Santos, 2013). Pache and Santos (2013), for example, use a comparative case study of four French work integration social enterprises and find that they used selective coupling to navigate competing demands. Another study of entrepreneurs from China, Russia, France, and the United States notes the influence of institutional complexity on venture growth (Batjargal et al., 2013).

To capture institutional complexity, we focus on two important aspects that researchers have noted have a significant impact on born global firm's growth: international networks and IPO (initial public offering). First, networking competences to develop alliances and collaborative partnership with suppliers, distributors and joint venture partners can assist born global firms to overcome resource constraints to achieve rapid growth internationally (Freeman, Edwards, & Schroder, 2006). The network development necessitates internal firm resources and entrepreneurial orientation, that in turn, facilitate the process of capturing the network benefits, such as tapping new opportunities, enhancing competitive advantages and lowering uncertainty and risk exposure for business to business born global firms (Sepulveda & Gabriellson, 2013). However, there exists the export manufacturers' dilemma in international expansion, namely manufacturers need to develop stronger local market competence while minimising the cost of distributor opportunism simultaneously (Cavusgil, Deligonul, & Zhang, 2004; Wu, Sinkovics, Cavusgil, & Roath, 2007). Hence, it is of significant importance to leverage experiential network knowledge to enhance the value of business relationship in the foreign market (Hohenthal et al., 2014).

Furthermore, the transnational entrepreneur can play a key role in driving growth by leveraging his or her knowledge of the global market. One study articulated strategic restructuring of born-global firms using outward and inward-oriented activity by highlighting the central role played by entrepreneur in driving born global firms strategy and growth (Freeman et al., 2013). Their exploration of the managerial mind-set of these smaller born-global firms leads to the identification of four states of commitment to accelerated internationalization by top management. Another study based on 107 Israeli born global firms

indicates that internal factors, such as an entrepreneur's market knowledge, can drive the long-term performance of born global firms (Efrat & Shoham, 2012). Understanding the global market and developing customer intimacy-based innovative products are associated with born global firms' enhanced performance (Mort, Weerawardena, & Liesch, 2012). Therefore, we argue that transnational entrepreneurs may leverage their bi-cultural experience in dealing with international distributors by building trust and using international experience.

IPO constitutes another important factor to institutional complexity, because IPO in foreign market encounter institutional environment that may differ extensively from firm's home country institutional environment. The effectiveness of born global firms to navigate different institutional contexts affects their development and growth. IPO is an important milestone for firm growth, which arguably can be regarded as the indicator for firm maturity (Almor, 2013). One study found out that firms that possess financial, innovational, and managerial slack resources are sending a positive signal to potential investors regarding the quality of the IPO (Mousa & Reed, 2013). The challenges imposed by a transnational context require transnational entrepreneurs to be aware of diverse institutional, structural, and cultural factors, which can significantly affect born global growth. Consequently, the entrepreneur's ability to navigate through competing institutional demands can be crucial for born global firms' growth trajectory. Therefore, we argue that transnational entrepreneurs can accelerate born global growth by their effective management of institutional complexity.

3. Research Methodology

Research context

We chose born global firms in the Chinese solar PV industry as the context of our analysis. Although Chinese firms contribute significantly to the production side of the solar industry, global consumption is driven by developed economies, such as U.S. and Western European countries. Specifically, a major driver is the "feed-in tariff" available in Germany and Spain, which provides incentives for consumers to install solar panels on their houses (Haley & Schuler, 2011). China has become one of the most important players in the world for the solar PV industry. In 2009, it announced an ambitious goal of deploying 20 gigawatts of solar power by 2020, more than the available total global solar PV capacity in 2008 (Solar Plaza 2009). As with many high-tech products in the renewable energy industry, solar companies produce a knowledge-intensive standardised product for the global market. Considering that almost no domestic Chinese PV market exists, Chinese solar companies are good examples of born global firms, because they were created to address global markets and have done so since their inception.

We chose Jiangsu Province as our geographic focus, because it has a high concentration of solar PV manufacturers, and Suntech Power, our primary source, was founded in Wuxi City, Jiangsu Province. Jiangsu Province is host to more than 50 solar PV companies, 70% crystalline cell producers and 30% thin-film producers. In 2009, six solar PV companies from Jiangsu Province belonged to the top 10 national cell production companies. Their combined

total cell production was 2142 megawatts, occupying some 54% of nationwide capacity, 93% of that in Jiangsu Province (Grau, Huo, & Neuhoﬀ, 2012). Therefore, we selected four companies as our sample (see Table 1) that largely represent the Chinese solar PV sector. They mainly produce solar cells and panels in the module-manufacturing phase. The four firms also support comparative purposes; they include born global firms founded by transnational entrepreneurs (Suntech and Canadian Solar [CSI]) and their counterparts founded by domestic entrepreneurs (Trinasolar and Solarfun). This comparative approach enabled us to isolate the role of transnational entrepreneurs in born global development.

Insert Table 1 About Here

Qualitative research methods

Scholars have emphasised the advantages of using a methodological pluralism approach in examining born global firms (Coviello & Jones, 2004; Leitch et al., 2010). The nature of our research questions suggests qualitative methods as the appropriate research methodology. We utilised a multi-method approach consisting of case studies (Eisenhardt & Graebner, 2007; Welch, Piekkari, Plakoyiannaki, & Paavilainen-Mäntymäki, 2011), storytelling (Gartner, 2007), and content analysis (Krippendorff, 2012). Finally, we sought to reveal the underlying mechanisms and social dynamics by using several complementary sources of data and methods of analysis (Vaara & Monin, 2010). Furthermore, prior research has emphasised the need to adopt a process perspective when investigating entrepreneurship, to aid researchers in unpacking the complexities and dynamics that characterise entrepreneurial activities (Moroz & Hindle, 2012; Wright & Marlow, 2012). We suggest that adopting such a view, to investigate the growth of born global firms empirically, can contribute to the theoretical and empirical advancement of our understanding of firm growth.

Case studies and international marketing

Qualitative research method is valuable for theory development in the field of international marketing. As acknowledged by marketing scholars, the marketing practices in emerging markets may challenge the assumptions of received body of knowledge (Sheth, 2011). The international marketing strategy of emerging market firms might pursue different strategy against the conventional wisdom (Vrontis, 2003; Vrontis, Thrassou, & Lamprianou, 2009). Therefore, it is of significant importance to explore the emerging phenomenon and to examine the boundary conditions of extant theory when investigating emerging markets firms by using case studies (Siggelkow, 2007). A recent systematic review of qualitative international marketing - focused publications in *International Marketing Review* from 1990 to 2010 highlighted the value of qualitative research for advancing theory in the field of international marketing (Andriopoulos & Slater, 2013).

Narratives and storytelling interviews

As a research method, storytelling carries particular advantages for studying complex, dynamic organisations and management topics. Qualitative in-depth interviews with key actors can provide insightful information (Eisenhardt & Graebner, 2007), beyond what can be extracted from the documentary data. Storytelling interviews offer the possibility of uncovering hidden information. For example, one research project uses storytelling to examine the institutional change dynamics of an Israeli high-tech firm after the bubble (Zilber, 2006, 2011). The temporal dimension awaits in-depth empirical investigation in international entrepreneurship, particularly in the context of emerging economies (Kiss, Danis, & Cavusgil, 2012). In addition, we use the storytelling research method that is suitable to studying complex and dynamic organization and global marketing topics (Liu, Xing, & Starik, 2012). Narrative and storytelling are both useful, effective methods to unpack contextual factors, thus contributing to the advancement of entrepreneurship research (Short, Ketchen, Combs, & Ireland, 2010).

Data collection and analysis

We collected our primary and secondary data as part of a broader research project on the Chinese solar industry, technology entrepreneurship, and institutions. We opted to focus on four born global firms that had reached maturity, as manifested by their overseas initial public offering (IPO). We collected the primary data through personal and professional networks and several cold calls based on desk research. In fall 2008, we interviewed three researchers working at various institutions in the United States and China as a pretest to refine research questions. From August 2010 to August 2011, we conducted face-to-face, in-depth interviews with high-tech solar entrepreneurs, managers, and directors from a range of energy associations and professional service firms.

Next, in September 2011, we conducted additional interviews at the 26th European PV Solar Energy Conference and Exhibition (EU PVSEC), an international solar PV trade fair and symposium held in Hamburg, Germany. In total, we conducted 32 in-depth interviews with solar entrepreneurs, industry association representatives, research institute scholars, and professional service firm managers. Throughout the data collection, we sought to discuss the interviews and observations that formed the basis of our data. This sharing process allowed us to adjust our inquiry directions and hone interview techniques continuously. We ended the primary data collection when additional interviews did not engender significant new insights with respect to our research questions (Yin, 2003). Table 2 displays informants included in this study in a role-ordered matrix (Miles & Huberman, 1994).

Insert Table 2 About Here

The interviews were recorded and transcribed. We structured and analysed them using the software tool NVivo 9. During this process, NVivo 9 facilitated the organisation of the data

and the process of data analysis to enhance the trustworthiness of qualitative research (Sinkovics & Alfoldi, 2012).

We used a semistructured guideline that consisted of three main sections: the institutional environment regarding energy policy, renewable energy in particular; the Suntech story and related anecdotes; and the regional policy on technology entrepreneurship. The interview questions were developed based on theoretical literature review, in particular the previous studies in transnational entrepreneurship, collaborative partnership, and born-global firms. In addition, we also develop questions based on the contextual situation and industry specific factors, namely emerging economies and renewable energy industry. We drew the secondary data from archives such as company annual reports, media articles in national and international press, and governmental documents to triangulate our data analysis based on primary data collection. Most important, the annual reports of the four case firms from 2006 to 2011 were accessed through United States Securities and Exchange Commission and systematically analysed. Furthermore, we collected industry policy reports and regulatory documents from 1997 to 2010 related to renewable energy and solar PV at both regional and national levels. We used content analysis (Krippendorff, 2012) to evaluate these secondary sources.

4. Findings

We present our findings and report on the empirical evidence with a focus on the growth development of born global firms via collaborative partnership. First, we shed light on the role of the transnational entrepreneur on born global growth, according to technological knowledge, international knowledge, and social capital. Second, we analyse born globals' responses to institutional complexity and elucidate how the transnational entrepreneurs managed institutional complexity to achieve born global maturity.

The transnational entrepreneur's role in born global growth

As a high-tech sector, the solar PV industry involves advanced technological knowledge and complex manufacturing and production processes (Haley & Schuler, 2011). For example, to create the polysilicon production chain, various technology firms are required to cover the whole production spectrum, ranging from upstream to module manufacturing to downstream.

Our analysis shows that transnational entrepreneurs play a critical role in carrying the advanced technological knowledge needed for born global firm development. Australia's advanced development in the solar energy sector has made it a major source of technological knowledge. Solar born global firms are heavily influenced by Australian firms and research institutes through transnational entrepreneurs who carried the technology and know-how beyond geographical boundaries. One important example was Suntech Power, whose founder and chief executive officer (CEO) Dr. Shi conducted research at the University of New South Wales in Australia and gained industrial experience by working for the Australian company Pacific Solar. Equipped with in-depth knowledge and rich experience in solar technology, Dr. Shi founded Suntech in 2001 in Wuxi, China, and commercialised his solar energy technology.

Research has documented the significant impact of transnational entrepreneurs in high-tech industry development. The knowledge circulation of transnational entrepreneurs from Silicon Valley to periphery economies such as Israel and Taiwan has helped these economies become successful technology centres (Saxenian, 2007). One study on the emergence of the information and communications technology industry sectors in emerging economies underscores how returning entrepreneurs played an important role in the expansion and growth phase of the industry after indigenous entrepreneurs and policy makers had laid the groundwork for the industry (Kenney, Breznitz, & Murphree, 2013). Our analysis resonates with this line of argument, emphasising the role of transnational entrepreneurs in developing and growing born global firms in the solar PV industry.

The second important dimension is the international knowledge that the transnational entrepreneur possesses. Although local scientists and private entrepreneurs established the first few solar energy firms in China in the late 1990s, our analysis revealed that it was not until transnational entrepreneurs arrived that the Chinese solar PV firms realised the rapid growth path as born global firms. An early solar PV firm, Trinasolar, was founded in 1997, during which time the solar energy sector was merely stimulated by the central government's policy push. The chair of China's renewable energy industry association related:

In the [late 1990s], there was no market for solar panel. It was Chinese central government that urged using renewable energy to solve non-electrification issues in the remote areas. For example, the first such project, the "Brightness Project Program," was launched in 1997 by the state, and Trinasolar was involved.

In addition, international organisations such as the World Bank and the United Nations collaborated with the Chinese government to initiate several flagship solar energy projects in China (Kirkegaard et al. 2010). Only a few solar PV firms existed in 1990s. Transnational entrepreneurs stimulated the creation of born global solar PV firms and consequently rapid development, due to the wide spread of international knowledge about the global market.

Tim, the founder of a privately owned PV solar firm, shared his reasons for choosing to enter the PV solar industry in 2006

We are a private-owned family business specialising in mechanical equipment. We entered [the] solar sector mainly because of two reasons: (1) solar is an emerging industry with a promising future as demonstrated by Suntech and the global market, [and] (2) we are able to find qualified people. Suntech alike the Huangpu military college [Chinese version of West Point] in the PV solar industry offers [a] talent pool that we can recruit from.

Transnational entrepreneurs not only spread international knowledge about the global market but also generated a positive spillover effect on domestic firms, encouraging them to develop into global firms. In summary, transnational entrepreneurs and their international knowledge play a vital role in technology industries' global expansion and make increasingly important contributions to economic growth and development.

The third important dimension in the development of born global firms is social capital (Coviello, 2006; Presutti, Boari, & Fraticelli, 2007). Although compared with domestic solar firms, transnational entrepreneurs may not have the local social capital to acquire resources, their international social capital can be leveraged (Liu, Woywode, & Xing, 2012). When there is almost no market demand, government plays an important role in cultivating a new high-tech industry (Spencer, Murtha, & Lenway, 2005). In the solar PV industry, even though no market demand existed in the early stage, transnational entrepreneurs convinced the local government to provide it with crucial resources. The case of CSI is a typical manifestation of how transnational entrepreneurs leverage government policy to develop born global firms. During the same time frame as Suntech, Mr. Qu, the founder and CEO of CSI, led his solar energy team from Canada back to China in 2001. Although CSI was registered in Ontario, Canada, the production site was located in Suzhou City, Jiangsu Province. Mr. Qu shared his strategy for receiving governmental support:

A solar company needs a large production site and infrastructure. When we decided to come back, we looked for the place that could offer good conditions. Finally, we chose Suzhou due to the infrastructure and investment atmosphere. The local government favours [foreign direct investment (FDI)], and we told them that we are a foreign firm and there was huge market potential for solar energy in the future. The government support helped us a lot, because we don't have guanxi at our disposal.

Stories and narratives are leveraged by transnational entrepreneurs as effective tools to acquire resources and endorsement (Martens, Jennings, & Jennings, 2007; Zott & Huy, 2007). Prospective market potential invites entrepreneurs and important stakeholders to collectively make sense of new technology and surrounding opportunities. Our analysis indicated that the government support helped compensate for the lack of social capital for transnational entrepreneurs in developing born global firms. We extend the line of argument of social capital for born global development (Zhou, Barnes, & Lu, 2010) by noting that transnational entrepreneurs can leverage their international connections in the development of born global firms.

Born global responses to institutional complexity

Our analysis indicated that transnational entrepreneurs' response to institutional complexity can facilitate the rapid growth of the born global to maturity. We found that entrepreneurs were able to circumvent institutional complexity to their advantage.

The takeoff of the Chinese solar PV industry was driven by global demand. European countries had great need for solar energy as a direct result of policy incentives, such as the feed-in tariff in Germany. New installations of solar PV reached a global record of 7.2 gigawatts in 2009; Germany alone had 3.8 gigawatts of new capacity, which accounted for more than half of the global market (Kirkegaard et al., 2010). The founder of a solar equipment trading company explains:

The Chinese solar PV sector is like "two heads outside," which are upstream and downstream. The upstream head outside is the ingot materials that manufacturers

need to produce cell and panel. The downstream head outside of China is the demand. The Chinese players essentially play the role as manufacturer of cells and panels for the global solar energy market.

This global market demand as a key driver for born global firms' rapid growth was manifested in the development trajectory of the international sales of the four companies we studied. As shown in Table 3, the international market constituted the majority of total revenue for all four.

Insert Table 3 About Here

Given the importance of the global market demand, born global firms encounter international distributors when they embark the internationalisation journey. Tom, senior manager of a major solar company, elaborated the driver for growth,

“We sell our products outside of China primarily to distributors, such as solar distributors, engineering and design firms and other energy product distributors. In 2006, SolarWorld AG was the only customer whose purchases accounted for 10.0% or more of our total net revenues for the year.”

Our analysis shows that solar energy firms work with a relatively small number of distributors that have particular experience in a given geographic or applications market segment. Therefore, dealing with international distributors effectively characterises the nature of rapid growth. Collaborative partnership with distributors requests the process of trust building and mutual understanding between cooperation partners (Cavusgil et al., 2004). Networking capability facilitates identification and exploitation of appropriate distributors. In so doing, born global firm international market performance can be significantly affected.

Transnational entrepreneurs can leverage their international experience in identifying and strengthening distributors. William, marketing director of pan-European market, shared,

“We proactively expand our distribution channels by selectively adding distributors. In summary, we believe that our relationships with our distributors enable us to, firstly leverage the marketing and distribution and after-sales service capabilities of other companies, secondly explore opportunities for additional product development, last but not least more easily, quickly and cost-effectively enter new geographic markets, and attract new customers.”

This shows the importance of collaborative partnership with distributors accelerated the born global firms' growth. Our analysis extends the findings of born global firms as an appropriate and novel context to advance entrepreneurial marketing research (Mort et al., 2012). In particular, our study highlights the central role played by entrepreneur in driving born global growth. Comparatively, transnational entrepreneurs are better equipped with the

international experience and knowledge to networking with distributors. Our results resonate with a recent study that emphasised the international experience of its key decision-maker in the internationalisation of SMEs (Child & Hsieh, 2014). Following Almor's (2011, p. 203) definition of mature companies as "companies that started out as born global companies, and are currently traded on international stock exchanges," we used overseas IPOs as an indicator of the maturity of born global firms. Transnational entrepreneurs' understanding of institutional contexts facilitates born global maturity by addressing global markets while following the market function. Mr. Qu, CEO of CSI, shared his thoughts:

To compete in the global marketplace, we have to follow the global "rules of the game." Our international experience and understanding on the global market helps us. For instance, during our IPO, we choose Nasdaq instead of [the New York Stock Exchange (NYSE)] because we [felt] that our high-tech profile and growth potential fit Nasdaq better.

Our analysis of primary data based on 32 interviews largely support Mr. Qu's statement: To a great extent, the transnational entrepreneur determines the rapid maturation of born global firms, specifically, those with overseas IPOs. Interestingly, there was an isomorphic effect among born global solar firms with respect to IPOs issued in overseas stock exchanges. Suntech's IPO at the NYSE in December 2005 signified the first Chinese solar energy firm that went public in a leading overseas stock exchange. This landmark event stimulated other solar PV firms to initiate overseas IPOs. Moreover, a positive legitimacy spillover effect among born global firms can be observed in the response to the global capital market sentiment. Table 4 notes the time and place of other solar PV firms' IPOs.

Insert Table 4 About Here

The comparative analysis in Table 4 highlights the variations among born global solar PV firms. Transnational entrepreneurs possess technological knowledge, international experience, and international social capital. In comparison, domestic entrepreneurs are relatively lacking in terms of advanced technological knowledge and international experience. Therefore, recruiting talented employees from transnational entrepreneur-led born global firms could help domestic entrepreneur-led born global firms compensate. Such employee mobility and resource interaction affects the development and growth of born global firms.

In responding to institutional complexity, transnational entrepreneurs' cognitive capacity to comprehend global demand and market function facilitates the rapid growth and maturity of born global firms. According to the two aspects of institutional complexity, building overseas distributors network require the entrepreneurs of born global firms to leverage the international experience to achieve foreign market familiarity (Schwens & Kabst, 2011). Furthermore, the individual experience (Jones & Casulli, 2014) of transnational entrepreneurs is largely attributed to the rapid growth of born global firms by collaborating with distributors.

Our findings lend support to a previous study that compares international new ventures, exporters, and domestic firms and concludes that managerial cognition affects a new venture's speed of internationalisation (Acedo & Jones, 2007). From foreign IPO perspective, Suntech's early born global overseas IPO generated a positive legitimacy spillover effect on subsequent overseas IPOs. Hereby, the transnational entrepreneurs pave the way by setting up a growth model that can be emulated by follow-up domestic entrepreneurs in pursuing rapid growth path. Therefore, we argue understanding and responding to institutional complexity such as the global market demand for export and the capital market, drives the rapid growth of born global firms. Adhering to the global market rules highlights the importance of born global firms responding to institutional complexity.

5. Discussion

A multilevel model for born global firms' growth to maturity

Figure 1 presents our multilevel model, which shows the influences of institutional complexity, collaborative entry mode, and the transnational entrepreneur on a born global firm's growth. We have adapted the analysis framework for the growth of maturing born global firms that are jointly influenced by institutional complexity and the transnational entrepreneurs' responses to competing institutional demands. From a process perspective, born global firms are founded by transnational entrepreneurs who have technological knowledge and the goal of commercialising the technology. If the market potential exists, transnational entrepreneurs can navigate through institutional complexity to take advantage of it. Given the nature of born global, born global firms largely rely on distributors to reach out the global market. This growth pattern can be named as growth by collaborative entry mode.

Insert Figure 1

When the global market demand emerges, established born global firms can quickly seize the looming market opportunity by leveraging transnational entrepreneurs' international experience. In nurturing the rapid maturation of born global firms, the international social capital of transnational entrepreneurs plays a crucial role in speeding this process through collaborative partnership. Market function takes over as the major determinant during the growth phase. The global market function and market demand become the major determinants as the born global firm reaches maturity. During the growth process, collaborative entry mode plays a crucial role to speed up the born global firms' growth to maturity. As illustrated in Figure 1, collaborative partnership helps transnational entrepreneurs comprehend the institutional complexity from partners, such as distributors. The collaborative entry mode underpins the growth process of born global firms' inception through to maturity. The IPOs in overseas stock exchanges illustrate that the transnational entrepreneurs fully comprehended the market dynamics and "rules of the game" in the global market. Consequently, overseas IPOs can accelerate the rapid growth path of born global

firms. Our model lends support to the study on the emergence of information and communication technology industry sectors in emerging economies, which notes that overseas entrepreneurs play an important role in the expansion phase of the industry after indigenous entrepreneurs and policy makers had laid its groundwork (Kenney et al., 2013).

Our model describes the challenges born global firms face and emphasises the importance of managing institutional complexity as maturing born global firms enter the rapid growth path. Transnational entrepreneurs, as bicultural individuals with complex cognitive capacity (Zahra, Korri, & Yu, 2005), are able to accommodate the sophisticated institutional contexts—specifically, the crucial areas of global market demand. More important, the process model underscores the dynamic responses of transnational entrepreneurs to institutional complexity. When operating in the global market, the global “rules of the game” have important bearing on the growth path of born global firms. When entering the maturity phase, born global firms participate in the worldwide capital market. Overseas IPOs are a manifestation of the maturity of born globals. In essence, the dynamic development trajectory of born global firms requires that transnational entrepreneurs be able to discern the differences and leverage the institutional complexity accordingly. Therefore, our model elucidates the multilevel interactions, namely, the institutional-level influences on an organisational-level born global firm’s development through individual-level transnational entrepreneurs.

Theoretical implications

Our findings contribute to the increasing body of research on how born global firms grow and mature (e.g., Almor 2011) by (1) taking a process perspective from born global growth to maturity, and (2) examining the role of the individual entrepreneur in the growth via collaborative entry mode and responses to institutional complexity of the born global. Our findings reveal that the transnational entrepreneur’s ability to navigate and leverage institutional complexity is a key factor in determining the growth and maturity of born global firms. Our research also closely examines individual entrepreneurs (Yeung, 2002) and their role, knowledge, network, and cognitive ability. Our research contributes to transnational entrepreneurship by articulating the biculturalism and cognitive ability of transnational entrepreneurs that enables them to circumvent constraints and overcome institutional complexity. Our findings suggest that highlighting entrepreneurs when examining the born global phenomenon can engender a nuanced, contextualised understanding of the growth and maturity of born global firms.

Our research contributes to the literature stream on collaborative entry mode by focusing on the born-global firms’ growth and the influence of collaborative entry mode on growth. Building upon the most recent collaborative entry mode studies, our study extends this research stream by investigating the born-global entrepreneurial context and how collaborative entry mode can be conducive in reducing the resource constraints of born-global firms. Our findings lend support to a recent study on collaborative partnership for SMEs from advanced economies venturing into emerging economies (Stokes et al., 2015). Importantly, our study on the role of transnational entrepreneurs in navigating through the institutional complexity for accelerating firms’ growth adds useful theoretical articulation

and empirical support from a behavioral perspective. Importantly, our qualitative research aims to generate theoretical generalizability (Tsang, 2014) that can shed some light on future scholarly investigation by delivering theory building endeavour. Theoretical generalization carries the explanatory power of being across the empirical and theoretical levels (Tsang & Williams, 2012).

In addition, our research makes a contribution to broader literature on institutional complexity by empirically examining individual responses and strategies for coping with multiple institutional logics. Our findings add to understanding of the notion of “institutional logics as strategic resources” (Durand, Szostak, Jourdan, & Thornton, 2013). Most institutional logic literature discusses organisational responses (Greenwood et al., 2011); very few studies empirically investigate the individual’s response. Therefore, our research is among the first to identify the role of the transnational entrepreneur’s response to institutional logics in the context of the born global phenomenon. Moreover, we provide empirical evidence that the transnational entrepreneur can manage institutional complexity in born global development. Our findings emphasise the joint influences of individual and institutional level factors in enabling the growth of born global firms as they mature.

Recent research has begun to emphasise the importance of multicultural employees and their contribution to organisations (Fitzsimmons, 2013). Our study extends this line of reasoning by offering empirical evidence and a contextualised understanding of multiculturalism in examining transnational entrepreneurs and born global development. By examining the individual entrepreneur’s role and the responses of the transnational entrepreneur to institutional complexity, we extend prior work on born global growth and provide a framework within which future researchers can extend the body of knowledge on born global growth. Our study reveals the importance of transnational entrepreneurs in managing the institutional complexity by leveraging their bicultural advantages and complex cognitive capabilities.

Managerial implications

This study has several implications with respect to international business and policy making. Transnational entrepreneurs who found born global firms in the high-tech sector have become an emerging force in global competition against multinational enterprises (Isenberg, 2008). These entrepreneurs’ global network, industry knowledge, and international experience enable them to move technology and know-how across geographical boundaries (Drori et al., 2009). In capitalising on the knowledge-intensive, high-tech market globally, transnational entrepreneurs become disruptive forces that leverage emerging economies’ advantages, beyond cost leadership. Therefore, we recommend that both incumbent and entrepreneurial firms in developed economies collaborate with transnational entrepreneurs in various business areas. As our findings indicate, transnational entrepreneurs are prepared to utilise collaborative partnerships to accelerate born global firms’ growth. Bearing in mind that transnational entrepreneurs follow the global rules of the game, industry firms may be able to cooperate on product and marketing development, and professional service firms can offer services to expand born global firms further.

Regarding policy recommendations, in the aftermath of the 2008 economic crisis, the worst depression since the 1930s, governments have begun to directly interfere in the economic sphere, whether reluctantly or intentionally. Profiting from such interaction requires some flexibility in the political arena. It is a daunting challenge to navigate the cross-sector partnerships (Koschmann, Kuhn, & Pfarrer, 2012). Transnational entrepreneurs' skill in doing so, particularly in interaction with government, highlights how an entrepreneurship policy might be nurtured amid the migration of institutional logic from FDI driven to talent oriented. The entrepreneurial policy in attracting returnee talent to found entrepreneurial ventures and born global firms delivered initial success in managing global talent (Wang & Liu, 2015). Our study can shed some light on effective policy making and implementation for other countries to initiate entrepreneurship policy and cultivate new high-tech industries that eventually could change the global competitive landscape.

Limitation and further research directions

As with any study, our study has several limitations. First, it is an explorative study whose purpose is to answer the "how" question. Thus, generalising our findings must be approached with caution. Second, our empirical setting is born global firms in China, a transition economy with continuing change and influx from an institutional perspective. Researchers could further validate our findings in other contexts, both emerging and developed economies, following the comparative international entrepreneurship approach (Terjesen, Hessels, & Li, 2013). Third, though we believe the explanatory power of our multilevel model, which captures cross-level effects and joint influences, is strong, another multilevel modelling approach (Shepherd, 2011) might be used to test our framework. As for future research directions, we encourage scholars to empirically test our conceptual model. Future researchers might operationalize our model via empirical research by measuring the degree of institutional complexity and influence of collaborative entry mode on born global firms' growth.

We took a process perspective by examining the growth and maturity of born globals through collaboration; our focus on the role of transnational entrepreneurs highlighted entrepreneurs' sensitivity to institutional context along the growth trajectory. By focusing on the relationship between contexts and entrepreneurship (Autio, Kenney, Mustar, Siegel, & Wright, 2014), our conceptualisation might be further advanced if entrepreneurial behaviours from a strategic perspective were further integrated, in line with recent encouragement that strategic agility (Weber & Tarba, 2014) might offer the impetus in the pursuit of a high growth pathway for born-global firm. Taking our study as a departure point, we encourage scholarly inquiry to pay close attention to micro-processes, which could further advance both academic scholarship and management practice and facilitate a nuanced, contextualised understanding of the complexity of the born global phenomenon.

Conclusion

This article addresses how transnational entrepreneurs grow born global firms to maturity. We illustrate transnational entrepreneurs' responses to institutional complexity. Our study underpins the idea that coping with institutional complexity is important for born global firms along a process perspective. In our framework of growth development for maturing born global firms, the dynamic process is triggered by the interaction between transnational entrepreneurs and institutional complexity. We thus highlight the importance of transnational entrepreneurs who grow born global firms by navigating and leveraging institutional complexity. The case studies and narrative evidence of born global solar PV firms support our conceptualisation and argument.

Our study contributes to the understanding of the growth and development of born global firms in several ways. First, we shed light on the important role of transnational entrepreneurs throughout the growth and development stages of born global firms via collaborative entry mode. In particular, our findings support the importance of the transnational entrepreneur in growing born global firms and offer a nuanced understanding of the influences of institutional complexity and transnational entrepreneurs' responses to them. Second, we provide insights into the different roles of, as well as the interplay between, transnational entrepreneurs and institutional complexity—namely, transnational entrepreneurs navigating through and leveraging institutional complexity to develop born global firms.

We hope this study inspires scholars to further investigate this line of inquiry on transnational entrepreneurs and born global firms. In particular, our tentative multilevel model is an attempt to elucidate the interplay across multiple levels and serves as a departure point for further theoretical refinement and empirical analysis. Furthermore, transnational entrepreneurs' technological knowledge, know-how, and international experience offers strong collaboration opportunities with both new ventures and incumbent firms in today's fast-changing, hypercompetitive, and interconnected world.

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APPENDIX

Table 1:
Founding conditions and growth development of four case companies

<i>Case</i>	<i>Company name</i>	<u><i>Founding conditions</i></u>				<u><i>Growth</i></u>
		<i>Founding year</i>	<i>Organizational type</i>	<i>Country of transnational entrepreneur</i>	<i>Production location</i>	<i>Sales¹⁾</i>
1	Suntech	2001	Private	Australia	Wuxi	\$ 2.5 bn
2	CSI	2001	Private	Canadian	Suzhou	\$ 1.3 bn
3	Trinasolar	1997	Private		Changzhou	\$ 1.5 bn
4	Solarfun	2004	Private		Qidong	\$ 1 bn

Note:

- 1) Total sales in the twelve months 2010 Dec -2011 Dec

Table 2: An overview of interview informants

<i>Informants</i>	<i>China</i>	<i>EU PVSEC, Germany</i>
Solar energy firm	11	9
<i>Privately-owned</i>	(8)	(6)
<i>State-owned</i>	(3)	(3)
Energy research institute	2	1
Energy association	2	2
Professional service firm	4	1

Table 3:
International sales of total revenues (%)

	2004	2005	2006	2007	2008	2009	2010	2011
Suntech	92.2%	75.0%	78.3%	98.1%	90.3%	95.5%	94.7%	88.2%
CSI	98.9%	97.2%	79.4%	97.8%	96.4%	95.9%	97.0%	93.2%
Trinasolar	91.9%	96.9%	90.7%	97.9%	96.3%	97.1%	96.2%	92.9%
Solarfun	n/a	79.8%	94.3%	91.6%	93.4%	95.3%	92.1%	90.7%

Note: Author's analysis based on firm's annual reports

Table 4:**Comparative analysis on entrepreneur and institutional complexity's influences on born global development**

<i>Case</i>	<i>Company name</i>	<u><i>Entrepreneur¹⁾</i></u>			<u><i>Institutional complexity</i></u>		<u><i>Born global maturity</i></u>	
		<i>Technology knowledge</i>	<i>International experience</i>	<i>Social capital</i>	<i>Policy and regulation</i>	<i>Market²⁾</i>	<i>IPO time</i>	<i>IPO place</i>
1	Suntech	Transnational	Australia	International	Gov. invest	First overseas IPO	2005 Dec	NYSE
2	CSI	Transnational	Canadian	International	FDI case	First Nasdaq IPO	2006 Nov	Nasdaq
3	Trinasolar	Local scientists	Lack	Local	Gov. project	Follow-up IPO	2006 Dec	NYSE
4	Solarfun	Spin-over	Lack	Local/ international	-	Follow-up IPO	2006 Dec	Nasdaq

Note:

1) Case 1 and case 2 are transnational, whereas case 3 and case 4 are domestic

2) Global market demand and market function

Fig. 1: A multilevel model of maturing born-global growth



