

What explains the degree of internationalization of early-stage entrepreneurial firms? A multilevel study on the joint effects of entrepreneurial self-efficacy, opportunity-motivated entrepreneurship, and home-country institutions

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ABSTRACT

Integrating recent theories of entrepreneurship with new institutional economics, we develop a multilevel model to deepen our knowledge of how micro-level entrepreneurs' personality and motivational antecedents interact with macro-level home-country institutions in determining internationalization by early-stage entrepreneurial firms. Data were collected from Global Entrepreneurship Monitor Adult Population Survey, GEM National Expert Survey, and the World Economic Outlook Database for the year of 2014. The results show that the personality trait of entrepreneurial self-efficacy contributes positively to the degree of internationalization via mobilizing opportunity-motivated entrepreneurship and that home-country formal institutions strengthen the above relationship of such young entrepreneurial firms.

1. Introduction

The internationalization of early-stage entrepreneurial firms has become a distinct sub-field at the intersection of international business (IB) and international entrepreneurship (IE) research over the past two decades (Oviatt & McDougall, 1994; Zander, McDougall-Covin, & Rose, 2015). However, the question of what drives the internationalization actions of such firms is still a current topic. Recent developments suggest that, to understand the phenomenon, scholars need to pay more attention to the interactions between micro- (i.e., individual) and macro-level (i.e., contextual) antecedents (Zahra & George, 2002; Zhang, Ma, Wang, Li, & Huo, 2016). Particularly, the interactions between the entrepreneurs' characteristics and the institutional environment proposed by Shane (2003) and Frese (2009) has been highlighted as the key to a multilevel approach (Davidsson, 2015; De Clercq, Sapienza, Yavuz, & Zhou, 2012). However, notwithstanding the increasing awareness of the potential interactions between micro- and macro-level antecedents, determining the joint effects of cross-level factors on early-stage entrepreneurial firms' internationalization remains challenging (Zahra, Korri, & Yu, 2005).

This paper tackles this challenge by investigating how the multiple

interactions between the micro- and macro-level contexts shape the internationalization degree of early-stage entrepreneurial firms. Specifically, building on Shane (2003) individual–opportunity nexus model and Frese (2009) action theory of entrepreneurship, we develop a conceptual framework to examine whether and how entrepreneurial self-efficacy (ESE)—a key personality trait and psychological resource (Rauch, 2014; Shane, Locke, & Collins, 2003)—affects the internationalization degree of early-stage entrepreneurial firms as mediated by opportunity-motivated entrepreneurship. Further, our framework uses new institutional economics (NIE) to investigate how country-level formal institutions provide boundaries for the relationships between ESE, opportunity-motivated entrepreneurship, and internationalization degree of early-stage entrepreneurial firms.

As a micro-level antecedent, ESE has recently attracted significant attention and plays a particularly important role in entrepreneurship (Hannibal, Evers, & Servais, 2016; Schmutzler, Andonova, & Diaz-Serrano, 2019). Self-efficacy refers to the belief in one's capability to motivate, exercise control over the events, and execute the behaviors necessary to produce specific, certain level performance (Bandura, 1997). In the context of entrepreneurship, self-efficacy refers to individual entrepreneurs' beliefs in their capabilities to start and run new

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businesses (McGee, Peterson, Mueller, & Sequeira, 2009; Newman, Obschonka, Schwarz, Cohen, & Nielsen, 2019). While entrepreneurship research has extensively studied the impact of ESE on entrepreneurship (Fitzsimmons & Douglas, 2011), how the personality of individual entrepreneurs affects entrepreneurial firm internationalization has received much less attention in IB literature.

In parallel, entrepreneurship is being progressively understood as a motivational consequence (Frese & Gielnik, 2014; Shane & Venkataraman, 2000). As motivational factors have attracted increasing attention in entrepreneurship research (Carsrud & Brännback, 2011; Hessels, Van Gelderen, & Thurik, 2008; Hisrich, Langan-Fox, & Grant, 2007; Shane et al., 2003), the recent psychological approaches towards entrepreneurship (Frese & Gielnik, 2014) suggest motivational factors are the consequences of entrepreneurs' personality or cognitive traits (e.g., self-efficacy) and important antecedents of entrepreneurial actions. Based on the premise that human action is the result of the integration between cognition and motivation (Locke, 2000), this psychological approach assumes individuals' personality traits affect their actions indirectly by mobilizing their motivations (Shane et al., 2003). We thus propose that the theoretical development of entrepreneurial firms' internationalization determinants requires the consideration of both the personality traits of entrepreneurs and what motivates them to make decisions. Specifically, as a first research objective, we examine whether and how ESE affects the internationalization degree of early-stage entrepreneurial firms by mobilizing opportunity-motivated entrepreneurship.

Entrepreneurship is not merely the outcome of human action, but external environmental factors also play a role in this context (Shane et al., 2003). In addition to micro-level antecedents, substantial empirical research, both on entrepreneurship and IB, suggests that the macro-level institutional environment can facilitate entrepreneurial behaviors (Boudreaux, Nikolaev, & Klein, 2019; Davidsson & Wiklund, 1997; Wu & Chen, 2014). The role of institutions in shaping firm internationalization behaviors is not new to the broad IB field. However, regarding entrepreneurial firms' internationalization, with the exception of a few recent studies (e.g., Chen, Saarenketo, & Puumalainen, 2018), the focus has been on the impact of host-country institutions, thus neglecting the impact of home-country institutions. Moreover, in both entrepreneurship and IB literature, how entrepreneurs' home-country institutions interact with their personality traits in influencing firm internationalization remains understudied. This is an important literature gap because IE is a multilevel phenomenon, in which country institutions play a critical role in regulating the extent to which entrepreneurs can exercise their knowledge on IB opportunities while exploiting personal capabilities and resources (McMullen & Shepherd, 2006). In the context of the internationalization of early-stage entrepreneurial firms, it is reasonable to expect home-country institutions to be more important to firm internationalization than host-country institutions, which will only become important as firms continue to grow internationally (Zhang et al., 2016). The second purpose of this study is thus examining how macro-level home-country institutions may facilitate or impede the relationships between ESE, opportunity-motivated entrepreneurship, and entrepreneurial internationalization.

By addressing the above two objectives, we contribute to both IB and IE literature. We test our model and hypotheses using a multilevel design on a unique sample of early-stage entrepreneurship Monitor-Adult Population Survey (GEM-APS), International Monetary Fund (IMF), and World Economic Outlook Database.

2. Theoretical background

This section provides an overview of the current research on entrepreneurial firms' internationalization and introduces the two recent theoretical developments in the entrepreneurship field as building blocks for our conceptual model.

2.1. Current research on entrepreneurial firms' internationalization

Among the major themes in IE research, internationalization by early-stage young entrepreneurial firms or entrepreneurial internationalization is the most salient (Jones, Coviello, & Tang, 2011). Entrepreneurial internationalization refers to the process of discovering, evaluating, and exploiting business opportunities across domestic borders (Oviatt & McDougall, 1994, 2005b). At the core of the research on entrepreneurial internationalization is the internationalization of new venture firms (Shane & Venkataraman, 2000). Since McDougall (1989) early work on international new ventures (INVs), there appeared a substantial body of research on entrepreneurial internationalization, with several review articles having provided overviews of the research progress in this area. Some reviews focus on specific aspects of entrepreneurial internationalization. Schwens et al. (2018) presented a meta-analysis of the research on the internationalization-performance relationship within the context of INVs. Other researchers have attempted to provide comprehensive reviews for the entire domain. For example, Coombs, Sadrieh, and Annavarjula (2009) and Keupp and Gassmann (2009) summarized the state of research in entrepreneurial internationalization and critiqued the field as fragmented and lacking consistent and unifying theoretical integration and paradigms.

In a recent review of 323 articles, Jones et al. (2011) concluded that, as a young research domain, entrepreneurial internationalization is increasing its coherence in several thematic areas, including five broad sub-themes: venture types (e.g., INVs, born globals, global start-ups), internationalization patterns and processes, role of networks and social capital in the process of entrepreneurial internationalization, organizational issues in entrepreneurial internationalization, and entrepreneurship. The final and the newest sub-theme of entrepreneurship is also the least studied and focuses on how individual entrepreneurs discover and exploit opportunities in an international context.

The lack of studies on the role of entrepreneurship in IE research was initially identified by Zahra et al. (2005), the authors pointing out the research opportunities of examining how entrepreneurs' personal characteristics help them recognize and exploit international market opportunities. Since then, there has been theoretical development on how entrepreneurs' characteristics impact their firms' internationalization decisions. For example, Oviatt and McDougall (2005a) recognized entrepreneurs' thinking styles as a possible driver of entrepreneurial firms' internationalization and further theorized the impact of entrepreneurial actors' perceptions on the speed of internationalization. Di Gregorio, Musteen, and Thomas (2008) theorized the role of entrepreneurs' alertness and experience in INV creation.

There have also been published empirical studies on how entrepreneurs' characteristics affect individuals' engagement in opportunity identification and exploitation across national borders since the study of Zahra et al. (2005). For example, Ruzzier, Antoncic, Hisrich, and Konecnik (2007) studied how entrepreneurs' international orientation and risk perceptions affect their firms' internationalization decisions, while Evangelista (2005) and Harms and Schiele (2012) examined how entrepreneurs' experiences contribute to INV creation. Using an in-depth case study, Karra, Phillips, and Tracey (2008) identified the entrepreneurial capabilities that are particularly important for successful INV creation. Chhotray, Sivertsson, and Tell (2018) showed that the entrepreneurial leadership styles that empower employees can also advance the internationalization of born global companies. Despite the progress in understanding the impact of entrepreneurs' individual factors that facilitate entrepreneurial firms' internationalization, compared to studies in other field and sub-fields in IE, relatively few studies focus primarily on entrepreneurship (Jones et al., 2011).

More recently, a small but growing number of studies were devoted to multilevel research. For example, Weerawardena, Mort, Salunke, Knight, and Liesch (2015) showed that both founders' international vision and firms' learning capabilities drive internationalization. Using

Table 1
Selected studies of research on entrepreneurial internationalization since 2005 (in chronological order).

| Study | Study Type | Entrepreneurs' characteristics | Organization Variables | Institution Variables | Dependent Variables/ Research Objectives | Sample |
|---------------------------|-------------------------|---|--|--|--|--|
| Chen et al., 2018 | Survey | | Organizational goal orientation | Home country formal institutional development | Likelihood of foreign expansion | GEM survey of 24,483 individuals from 54 countries |
| Li, 2018 | Survey | Entrepreneurial spirit, innovative competence | Technological resource | Home country institutional development | Performance of internationalization | GEM survey of 144,066 individuals from 56 countries |
| Manolopoulos et al., 2018 | Survey | | Organizational resource SME resources | Home country's government corruption Export bureaucracy Export regulations | Export performance | Survey of 150 SMEs in Greece |
| Fathallah et al., 2018 | Case study | Entrepreneurial spirit, motivation | | Hyper turbulent home country | Speed of internationalization | Historical and longitudinal comparative case studies for nine emerging market multinational companies over 12 years |
| Chhotray et al., 2018 | Case study & interviews | Entrepreneurs' leadership Managerial vision | Decision-making Information sharing structure Responsibility | | Development of born global company | Two case studies with eight interviews. Both companies are from Sweden |
| Lee et al., 2015 | Survey | Managers' time with home country government officials | | Home country's government corruption Foreign ownership | Export intensity of new ventures in transition economies | World Bank's Survey data of 719 venture companies from 25 countries |
| Weerawardena et al., 2015 | Case study + Survey | Entrepreneurs' international vision | Learning capabilities | | Earliness, scope, and extent of internationalization | Study 1: In-depth interviews with founding managers of 14 early internationalizing firms in Australia Study 2: Survey of 1046 Australian exporting firms |
| Wu & Chen, 2014 | Survey | | | Institutional development in the home market Institutional instability in the home market Government ownership | Likelihood of foreign expansion | 921 Chinese firms in the period of 1996 – 2000 |
| Di Gregorio et al., 2008 | Theoretical paper | Entrepreneurs' experience Entrepreneurial alertness | Organizational resource | | Development of international new venture | |
| Oviatt & McDougall, 2005a | Theoretical paper | Entrepreneurial actor perceptions | Technology Network relationships | Home country's competition Foreign market knowledge | Speed of internationalization | |
| Zahra et al., 2005 | Theoretical paper | Entrepreneurial cognition | | Home & host country geography contexts | International opportunity recognition and exploitation | |

World Bank survey data on 719 ventures in transition economies, Lee, Yin, Lee, Weng, and Peng (2015) showed the interactive impact of managers' time as home-country government officials and home-country government corruption on the export intensity of new ventures. Chen et al. (2018) and Manolopoulos, Chatzopoulou, and Kottaridi (2018) examined the impacts of the interaction between organizational and institutional variables on the likelihood of foreign expansion and export performance. Fathallah, Branzei, and Schaan (2018) investigated the impact of entrepreneurial spirit/motivation and hyper-turbulent home-country environment on firms' internationalization speed. Li (2018) developed and tested a multilevel model for examining how entrepreneurs' innovative competences interact with organizational and institutional variables in influencing internationalization speed.

Table 1 summarizes the theoretical, empirical, and multi-level studies in this research area since Zahra et al.'s 2005 review. First, we found that a diverse set of IE-related dependent variables has been studied, such as likelihood of expansion, export performance, and speed of internationalization. Surprisingly, an important and commonly studied dependent variable in IB research, the internationalization degree, has not been adequately analyzed in the context of early-stage entrepreneurial firms (Li, 2018). Second, despite the several studies on how entrepreneurs' characteristics affect their firms' IB engagement, Table 1 concurs with two recent review articles that identify a lack of research on how entrepreneurs' personality and cognitive characteristics contribute to their firms' internationalization behaviors (García-Lillo, Claver-Cortés, Úbeda-García, & Marco-Lajara, 2017; Jones et al., 2011). In other words, Zahra et al.'s 2005 call for determining if and how entrepreneurs' personality and motivational antecedents explain IE remains unanswered. Third, in the context of the internationalization of early-stage entrepreneurial firms, home-country institutional developments play increasingly critical roles in entrepreneurial firms' internationalization (Manolopoulos et al., 2018). In parallel, an increasing number of research publications on entrepreneurial internationalization use a multilevel model approach based on surveys, case studies, and interviews (see Table 1). However, the multilevel approach is still rarely used to determine how institutional contexts may strengthen or impede the effect of entrepreneurs' individual characteristics on internationalization activities (Su, Zhai, & Karlsson, 2017). For example, Table 1 shows that, since 2005, among the studies that have included a component of home-country institution development in analyzing the internationalization of entrepreneurial firms, few have adopted a multilevel approach to examine the interaction between individual- and institutional-level factors in firms' internationalization behaviors.

In addressing these literature gaps, this study examines whether and how entrepreneurs' self-efficacy and entrepreneurial motivation jointly explain the internationalization degree of early-stage entrepreneurial firms and how home-country institutions may encourage or hinder such individual factors to be leveraged for their firms' internationalization.

2.2. The action theory of entrepreneurship

To address the literature's lack of a cognitive perspective on the influence of entrepreneurs' personality and motivational antecedents for entrepreneurial firms' internationalization, we use a recently developed psychological approach to entrepreneurship, namely the action theory of entrepreneurship (Frese & Gielnik, 2014; Frese, 2009), to build the theoretical foundation of our framework. The action theory of entrepreneurship sees all entrepreneurship (including IE) as implying actions and it asserts that all actions need to be studied from a psychological perspective (Frese, 2009). Further, entrepreneurs are conceptualized as active agents in the market, who try to proactively identify and exploit opportunities. Criticizing the previous research that dismissed studies on personality traits (Low & MacMillan, 1988) and supported by recent meta-analytical evidence on the impact of personalities on entrepreneurship (Rauch & Frese, 2007; Zhao & Seibert,

2006), action theory revives the research on entrepreneurs' personality effects as a starting point of understanding how people's perceptions, cognitions, and motivations affect their reactions to business opportunities.

Specifically, the theory's framework considers a sequence of causal relationships, hypothesized as the path through which entrepreneurs' personality traits lead to entrepreneurial acts. Specifically, entrepreneurs' personality traits do not directly affect the success of entrepreneurial actions (e.g., the internationalization degree of entrepreneurial firms in this study); rather, they exercise their influence indirectly through the mediation of motivational antecedents and action characteristics (Frese & Gielnik, 2014). Action characteristics are not actions per se, but ways of performing an action that would lead to entrepreneurial success (Frese & Gielnik, 2014). For example, information searching, planning, feedback processing, social networking, and entrepreneurial orientation are action characteristics between motivational antecedents and entrepreneurial success. The framework thus stipulates a one-way sequential path from personalities to motivations to action characteristics and, ultimately, to entrepreneurial actions and success (Frese & Gielnik, 2014).

Frese and Gielnik (2014) listed personality traits such as the need for achievement, stress tolerance, risk taking, and generalized self-efficacy. They also identified passion, positive/negative affect, and specialized self-efficacy as motivational/affective antecedents to entrepreneurship. However, the literature on self-efficacy often distinguishes between generalized and specific self-efficacy (Chen, Gully, & Eden, 2001). Typically, the literature regards generalized self-efficacy as a personality trait and specific self-efficacy as a motivational state (Frese, 2009). Specific self-efficacy represents an individual evaluation of the capability to perform a certain task within a specific domain (Bandura, 1988). However, as entrepreneurship is a highly complex job and covers a wide-ranging task areas such as accounting, marketing, sales, financing, supply, and logistics management, when building a self-efficacy construct with regard to entrepreneurship, it is necessary to be more general than specific (Frese & Gielnik, 2014). Therefore, we consider ESE as a general personality trait rather than the specific self-efficacy associated with a narrowly defined task.

While action theory has offered a conceptual method for studying how individuals' psychological and cognitive characteristics can help them identify, evaluate, and eventually act on opportunities, Frese and Gielnik (2014) acknowledged it is still a working theory and does not give sufficient consideration to the role of external environment in shaping the relationship between individuals and opportunities. As such, the individual–opportunity nexus model (Davidsson, 2015; Shane, 2003) complements action theory by broadening the theory's narrow focus on individual personality and motivational antecedents to entrepreneurial acts to study person–environment interaction, as called for by Frese and Gielnik (2014).

2.3. Individual–opportunity nexus

Unlike action theory's focus on individual personality and motivational antecedents to entrepreneurship, the individual–opportunity nexus model attaches significant importance to institutional environments as the ground on which the individual–opportunity interaction takes place and argues the phenomenon of entrepreneurship rests at the nexus between individuals and external opportunity sources to the entrepreneurs (Davidsson, 2015; Shane, 2003). Whether an individual can successfully exercise entrepreneurship is based upon the ability to identify opportunities in the external environment. More importantly, the reason why only some individuals are capable of exploring and exploiting new opportunities is the result of the interactions between personal factors such as entrepreneurs' psychological/cognitive resources and environmental factors such as industrial/institutional environments (Shane & Venkataraman, 2000; Shane, 2003). Therefore, the individual–opportunity nexus model studies the relationships

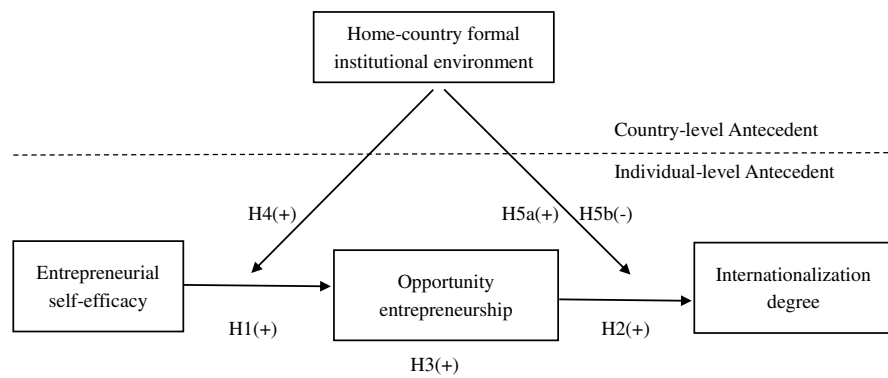


Fig. 1. Conceptual Model.

between entrepreneurs and opportunities by a dynamic view of entrepreneurship, that is, an individual involved in a continuous interaction with sources of opportunity in an external environment, thus complementing action theory's focus on the impact of entrepreneurs' inherent personality traits or characteristics on entrepreneurial actions.

The importance of the external environment for the interactions between entrepreneurs and opportunities under the individual–opportunity nexus model means that the use of institutional analysis could help advance the model by identifying how institutional environments generate entrepreneurial opportunities and how they affect entrepreneurs' abilities to evaluate and act on opportunities. In a recent review on the use of institutional theory in entrepreneurship research, Su et al. (2017) found that most studies have primarily adopted institutional perspectives to explain entrepreneurial firms' founding rates in different countries and that our knowledge of how institutions influence such firms' internationalization is still inadequate. The authors thus call for an integration of institutional theory with the individual–opportunity nexus model to determine how entrepreneurial opportunities are discovered and exploited while considering both individual and environmental factors (Su et al., 2017). In sum, although extant empirical studies on how environmental factors shape individuals' opportunity identification and exploitation based on the individual–opportunity nexus perspective are emerging (Alvarez, Young, & Woolley, 2015; Short, Ketchen, Shook, & Ireland, 2010), theoretical and empirical works based on a cross-level approach and that consider the interplay between individual and institutional factors are still rare.

In the next section, we build upon action theory and the individual–opportunity nexus model to develop our research hypotheses on how ESE may contribute to early-stage entrepreneurial firms' internationalization via opportunity-motivated entrepreneurship. We then extend our conceptual model by including NIE to examine how the differences among countries' formal institutions may influence the leverage of ESE and opportunity-motivated entrepreneurship on internationalization behaviors.

3. Conceptual model and hypotheses development

3.1. Effect of ESE on entrepreneurial firms' internationalization: the mediation mechanism of opportunity-motivated entrepreneurship

The entrepreneurial process, whether within or across national borders, occurs because people pursue opportunities (Shane et al., 2003). Drawing upon the individual–opportunity nexus model and the action theory of entrepreneurship, we develop a conceptual model that examines how the variations in entrepreneurs' personality and motivational attributes affect the degree to which they will act on IB opportunities, manifested by the internationalization degree of newly created firms. There are many personality dimensions correlated with entrepreneurship; however, in a recent meta-analytic review of psychology literature on entrepreneurship, Frese and Gielnik (2014) found

self-efficacy to be correlated more highly with entrepreneurship than other psychological constructs, such as the Big Five personality dimensions. Therefore, we focus on ESE.

Theoretically, entrepreneurs' personal belief in their capabilities of starting and running a new business will show a positive impact on their entrepreneurial actions, including those across national borders. Empirically, ESE has a positive effect on entrepreneurship (Newman et al., 2019). However, it is less clear through what mechanisms do entrepreneurs' personality traits or psychological resources, such as ESE, affect entrepreneurial actions (Shane, 2003). Moreover, ESE might be a potential antecedent to entrepreneurial actions within and across national borders. Therefore, the extent to which its potential for entrepreneurial internationalization is likely to become reality is contingent upon how strongly entrepreneurs are motivated to pursue international over domestic business opportunities. Following action theory (Frese, 2009), we focus on the indirect effects of ESE on entrepreneurial firms' internationalization via opportunity-motivated entrepreneurship. We first develop a hypothesis concerning the effects of ESE on entrepreneurial motivations and then examine the influence of entrepreneurial motivation on entrepreneurial internationalization. Finally, we discuss the role of opportunity-motivated entrepreneurship as a key mediator in the ESE–entrepreneurial internationalization relationship. Fig. 1 illustrates our conceptual model and hypotheses.

Entrepreneurship literature commonly distinguishes between opportunity- and necessity-motivated entrepreneurship (Nikolaev, Boudreaux, & Palich, 2018; Reynolds et al., 2005). On one hand, opportunity-motivated entrepreneurship implies individuals start businesses because of some motivation “pull,” such as income and wealth, recognition, or independence. These motives are related to the need for independence and achievement. On the other hand, necessity-motivated entrepreneurship refers to individuals who are “pushed” into self-employment because of the lack of attractive alternatives (Hessels et al., 2008). Simply, one is motivated by choice and the other by necessity. Whereas opportunity-motivated entrepreneurs may be motivated by the need to succeed through exploiting an opportunity for economic gain and/or other high-satisfaction achievements, such as social status, necessity-motivated entrepreneurs are driven by survival-oriented motivations and are more concerned with avoiding failure (Reynolds et al., 2005). Most previous research on the motivation–entrepreneurship link has focused on the direct effects of entrepreneurial motivations on entrepreneurial outcomes (Carsrud & Brännback, 2011). Following Frese and Gielnik (2014) suggestion, we move beyond this direct relationship to examine the potential mediation role of entrepreneurial motivations on the relationship between ESE and entrepreneurial internationalization.

Drawing upon the action theory of entrepreneurship, we argue ESE has an important bearing on entrepreneurial motivations. However, it can lead to both opportunity- and necessity-driven entrepreneurship. We thus argue that, when an individual's ESE is high, they are highly confident about their capabilities and resources to develop and exploit a

business opportunity. As a results, such individuals are more likely to conduct extensive research and plan for their business venture (Helfat & Lieberman, 2002). They are also more likely to make an optimistic assessment of the likelihood of success and, hence, commit their psychological and physical resources to exploit opportunities. Therefore, we suggest that individuals with a high ESE degree are more likely to be opportunity-motivated entrepreneurs.

By contrast, if individuals have a low ESE, it means they have relatively low confidence in their skills, capabilities, and resources for discovering and exploiting high-risk, albeit potentially high-reward, business opportunities. They are also likely to spend less time researching, planning, and evaluating high-growth and high-risk opportunities. Instead, their primary objective is to seek income-generating opportunities that can meet their immediate need to escape poverty or an uncomfortable situation in their current employment (Cromie & Hayes, 1991). Obviously, such opportunities are often less risky and require a lower level of self-efficiency to discover and exploit.

Recent research on entrepreneurship in subsistence marketplaces in India shows ESE can predict entrepreneurial motivation among low-income women in India (Venugopal, Viswanathan, & Jung, 2015). However, such motivation is necessity-driven, essentially when seeking self-employment when there is no better alternative (Kolvereid & Isaksen, 2006). This is fundamentally different from opportunity-motivated entrepreneurship, which is created by a strong desire for achievement, wealth, status, and success, rather than survival. Thus, we propose that the higher the ESE degree is, the more likely entrepreneurs will be to engage in opportunity-motivated than necessity-driven entrepreneurship.

Hypothesis 1. The higher the level of entrepreneurial self-efficacy is, the more likely individuals will engage in opportunity-motivated entrepreneurship.

Second, whether entrepreneurship is motivated by choice (opportunity) or necessity affects the degree to which entrepreneurial firms pursue internationalization. Specifically, opportunity-motivated entrepreneurship is more likely to result in a high internationalization degree. Opportunity-motivated entrepreneurs usually have higher growth aspirations than necessity-motivated ones (Fuentelsaz, González, Maicas, & Montero, 2015), meaning the former tend to use their psychological and physical resources, skills, and capabilities to discover and develop opportunities that have a higher growth potential and can bring them higher status and achievement in addition to higher economic returns. For opportunity-motivated entrepreneurs, early IB engagement brings more satisfaction than taking advantage of only domestic opportunities.

By contrast, necessity-motivated entrepreneurs focus on meeting theirs and their families' financial needs. Business opportunities that are close to them, less risky, and have more immediate financial reward are more valuable to them than those with high-growth potential and high risks. Such opportunities are more likely to be found within national borders and near where necessity-motivated entrepreneurs and their families live. Previous research on subsistence entrepreneurship shows that necessity-driven entrepreneurs are mostly from among the low-income population (Venugopal et al., 2015) and have the goal of being self-employed when there is no better alternative (Kolvereid & Isaksen, 2006). For necessity-motivated entrepreneurs, the focus is on local rather than international opportunities.

In entrepreneurship literature, the constructs of opportunity- and necessity-motivated entrepreneurship were regarded as entrepreneurial motivations (Amorós, Ciravegna, Mandakovic, & Stenholm, 2019; Boudreaux et al., 2019) and actions (Rey-Martí, Porcar, & Mas-Tur, 2015; Williams, 2009; Williams & Williams, 2014). We give the construct a double meaning by our application of the action theory of entrepreneurship: as a motivational attribute and a type of action characteristic. Frese and Gielnik (2014) suggested a loose model that researchers can adjust to suit their specific areas of inquiry based on

additional or modified variables. Therefore, given the ambidexterity nature of opportunity-/necessity-motivated entrepreneurship, we take the view that opportunity-motivated entrepreneurship may have a particularly strong influence on entrepreneurial firms' internationalization degree because it possesses the features of both a motivational antecedent and an action characteristic, which impact entrepreneurial outcome and success (Frese & Gielnik, 2014).

Hypothesis 2. Opportunity-motivated entrepreneurship is positively related to the internationalization degree of early-stage entrepreneurial firms.

In sum, based on H1 and H2, we propose a mediation effect of opportunity-motivated entrepreneurship. That is, a high ESE level leads to a higher propensity to engage in opportunity-motivated entrepreneurship. Early-stage entrepreneurial firms driven by opportunity-motivated entrepreneurship will in turn internationalize more intensively when they have high-growth aspirations (Boudreaux et al., 2019), as well as a stronger capability to internationalize. Therefore, we expect that opportunity-motivated entrepreneurship will serve as a mediator between ESE and the internationalization degree of early-stage entrepreneurial firms.

Hypothesis 3. Opportunity-motivated entrepreneurship positively mediates the relationship between entrepreneurial self-efficacy and the internationalization degree of early-stage entrepreneurial firms.

3.2. Moderating role of the home-country institutional environment

The previous section identified ESE as an important personality trait, critical to opportunity-motivated entrepreneurship, which in turn relates positively to the internationalization degree of early-stage entrepreneurial firms. Next, we examine how the home-country institutional environment may provide a boundary for these relationships. Specifically, we use NIE to develop a multilevel model that examines how home-country institutions interact with individual-level factors in ESE and opportunity-motivated entrepreneurship for driving entrepreneurial internationalization.

We use NIE to focus on formal institutions, defined as the formal rules and regulations that govern a country's economic exchanges (North, 1990; Williamson, 1985). Specifically, it refers to level-2 institutions according to Williamson (2000) four levels of institutional analysis. Informal social-cultural-cognitive institutions, as discussed in institutional sociology (DiMaggio, 1994; Scott, 1995), are not included in our discussion. Being at the top level of Williamson's framework, these informal institutions have mainly spontaneous origins and display significant inertia in terms of evolution and change (Williamson, 2000). However, NIE is mainly concerned with formal institutions, which are shaped by informal social-cultural constraints in the very long run but are more open to design and change based on deliberate choice by the different branches and levels of government in the short to medium term (Williamson, 2000). Williamson (2000) approach to NIE has been employed increasingly in entrepreneurship studies (Boudreaux et al., 2019; Bylund & McCaffrey, 2017), but not yet been in IB research on firm internationalization. As such, disaggregating institutions into different levels with a focus on formal institutions allows us to identify the effects and offer insights with direct implications for both practitioners and policy makers. It also enables us to focus on the recent conversations on the relationships between personality traits, entrepreneurship, and economic institutions in entrepreneurship research (Boudreaux et al., 2019) and include them into an IB context, thus contributing to the cross-fertilization of the two fields that constitute the foundation of research on entrepreneurial firms' internationalization.

We first examine the moderating effect of home-country formal institutions on the impact of ESE on opportunity-motivated entrepreneurship. Previously, we have established that entrepreneurs with strong ESE engage in entrepreneurial activities because they are

motivated by choice instead of necessity, that is, by business (local or international) opportunities rather than the need for survival. Here, we further conjecture that the degree to which ESE will promote opportunity-motivated entrepreneurship is likely to be affected by the formal institutions surrounding entrepreneurs at home. According to NIE, a country's formal institutions shape its economic behavior by regulating resource allocation, shaping incentive structures, and affecting transaction costs for economic exchanges (North, 1990; Williamson, 1985). As part of economic behavior, the entrepreneurial behavior of identifying, evaluating, and pursuing business opportunities is significantly affected by the institutional environment within which entrepreneurs reside.

First, government institutions can help nurture opportunity-motivated entrepreneurship by providing factor inputs and regulatory resources. For example, recent IB studies showed that the Chinese government's provision of lost-cost regulatory resources, such as land and tax subsidies (Zhang et al., 2016), and cheap credit (Kling & Weitzel, 2011) are crucial for Chinese entrepreneurial firms' creation of business opportunities both at home and abroad. From a psychological perspective, the availability and accessibility of such resources from formal institutions may be perceived differently by entrepreneurs. Entrepreneurs possessing strong self-efficacy are more likely to have a positive assessment of the availability and accessibility of institutional resources and are more capable of taking advantage of them in creating and developing business opportunities. In other words, with strong supportive institutional environment, the positive impact of ESE on opportunity-motivated entrepreneurship is likely greater.

Second, NIE predicts that the degree to which ESE leads to opportunity-motivated entrepreneurship depends on the quality of institutions, which dictates the costs of contractual arrangements for business exchanges. If a country's legal and court systems are strong and efficient, the costs associated with creating a new business venture, running a business, and exiting a business will be low. Other contracting costs, such as the costs of negotiation and re-negotiation, of dispute resolution, and of litigation are also favorable to business activities. Such an institutional environment is conducive to all entrepreneurship types by reducing transaction costs in all phases of business venturing, but is more attractive to entrepreneurs with strong self-efficacy that pursue opportunity-motivated entrepreneurship. As previously discussed, entrepreneurs possessing strong self-efficacy are more likely to pursue high-growth opportunities and attach a higher value to a low-cost and efficient institutional environment with fewer uncertainties in relation to laws and regulations and better protection of property rights and contract enforcement (Boudreaux et al., 2019). Therefore, a strong institutional environment that offers low transaction costs for contractual arrangements will strengthen the positive impact of ESE on the motivation to engage in opportunity-motivated entrepreneurship. We thus posit:

Hypothesis 4. The home-country formal institutional environment moderates the relationship between entrepreneurial self-efficacy and entrepreneurial motivation so that the stronger the formal institutional environment is, the greater the positive impacts of entrepreneurial self-efficacy on opportunity-motivated entrepreneurship are.

The previous section also established that strong opportunity-motivated entrepreneurship can promote entrepreneurial internationalization. However, whether such motivations will translate into actions to pursue IB opportunities is further influenced by the formal institutional environment in entrepreneurs' home countries. On one hand, from a NIE perspective, a critical function of institutions is reducing uncertainty for economic exchanges (North, 1990). Particularly, home-country institutional structures affect the level of uncertainty entrepreneurial firms face for both domestic and international business expansions (Cuervo-Cazurra, Luo, Ramamurti, & Ang, 2018; Zhang et al., 2016). That is, a stable and predictable domestic institutional environment will reduce the perceived uncertainties for business

activities (Manolova, Eunni, & Gyoshev, 2008). However, this function of home-country institutions can promote and enhance both domestic and international business entrepreneurial activities (Zhang et al., 2016). The uncertainty-reduction effect of a strong home-country institutional environment will motivate opportunity-motivated entrepreneurs to seek out local, as well as international opportunities. The low transaction costs of setting up a new business and contracting with business partners, for example, provide incentives for such entrepreneurs to seek business opportunities wherever they are. Additionally, for opportunity-motivated entrepreneurs, starting a business is a desirable choice that will facilitate not only income and wealth creation, but also self-esteem and personal achievement (Tominc & Rebernik, 2007). With well-developed home-country institutions, this desire may be stronger and perceived as easier to realize; hence, we may observe the stronger role of home-country institutions in strengthening the positive effects of opportunity-motivated entrepreneurship on firm internationalization.

For necessity-motivated entrepreneurs, the uncertainty-reduction effect of home-country institutions tends to favor business activities at home than abroad. These entrepreneurs are pushed to start businesses as a substitute for employment and are less conducive to the planning and forethought needed to launch substantively new enterprises (Penrose, 1959). A strong home-country institutional environment often means better institutional support to start businesses at home. They are more likely to be satisfied with such an institutional environment for supporting their families and themselves. In other words, necessity-motivated entrepreneurs are likely more sensitive to the immediate domestic business opportunities created by favorable home-country institutional conditions than IB opportunities. Therefore, we are more likely to observe a stronger role of home-country institutions for necessity-motivated entrepreneurship to have a greater impact on firms' domestic entrepreneurial activities rather than international expansion.

Hypothesis 5a. The home-country formal institutional environment moderates the relationship between entrepreneurial motivations and the internationalization degree of early-stage entrepreneurial firms so that a stronger the formal institutional environment leads to a more positive impact of opportunity-motivated entrepreneurship (as opposed to necessity-motivated entrepreneurship) on the internationalization degree.

Additionally, based on the institutional-escape view (Cuervo-Cazurra et al., 2018; Deng & Zhang, 2018; Stoian & Mohr, 2016; Sun, Peng, Lee, & Tan, 2015) in recent IB research, we develop a competing logic on the possible different moderating role of home-country institutions for the opportunity-motivated entrepreneurship–internationalization relationship. The central argument is that emerging market firms are motivated to venture overseas, especially onto developed markets, to escape a low-quality and high-cost home-country institutional environment characterized by uncertainty, unpredictability, and complexity. We extend this view into IE research and argue that entrepreneurs with strong self-efficacy may be more motivated to seek IB opportunities when facing a weak and low-quality home-country institutional environment. For example, persistent institutional voids, such as the lack of access to financing opportunities and professional intermediaries, can significantly raise the costs to do business at home (Stoian & Mohr, 2016). Inefficiency in administrative procedures can pose a challenge for entrepreneurial firms to accurately assess or reasonably predict business opportunities (Deng & Zhang, 2018). Further, arbitrary and constantly changing policies related to taxes and subsidies, political interference, and an inefficient or corrupt court system can all contribute to increasing business costs at home (Tang, 2011). Therefore, entrepreneurs with strong self-efficacy may look for alternative business opportunities. For example, recent empirical studies found that low-quality home institutions to be the main drivers of Chinese entrepreneurial SMEs' internationalization (Deng & Zhang, 2018; Zhang et al., 2016).

It is possible that necessity-driven entrepreneurs can also be

influenced by an unfavorable home-country institutional environment to start businesses in foreign countries. However, necessity-driven entrepreneurial activity is by definition initiated as a last resort, when individuals feel compelled to start their own business because other work options are absent (McMullen, Bagby, & Palich, 2008). A better overseas institutional environment often provides not only better business opportunities, but also better work opportunities and conditions, which means that necessity-motivated entrepreneurs may re-enter the workforce instead of starting a business when moving to an institutionally superior foreign country. Even if it is difficult to find satisfactory work in another country, necessity-motivated entrepreneurs are more likely to be satisfied with the immediate business opportunities they find in the foreign market instead of pursuing further IB opportunities.

By contrast, opportunity-motivated entrepreneurs are more likely to take a proactive approach in response to home-country institutional hardship, that is, although the main reason for going abroad is also to escape the home-country institutional environment, they are more likely to seek IB opportunities as they grow internationally. In sum, although both opportunity- and necessity-motivated entrepreneurs may engage in escape-based internationalization, the push for such internationalization may result in IB expansion by opportunity-motivated entrepreneurs rather than necessity-motivated entrepreneurs.

Hypothesis 5b. The home-country formal institutional environment moderates the relationship between entrepreneurial motivations and the internationalization degree of early-stage entrepreneurial firms so that the weaker the formal institutional environment is, the greater the positive impact of opportunity-motivated entrepreneurship (as opposed to necessity-motivated entrepreneurship) is on the internationalization degree.

4. Methods

4.1. Sample and design

To test the hypotheses, we used a multilevel design, in which individual entrepreneurs (level 1) were nested within countries (level 2). Individual-level data were collected from the 2014 GEM-APS, the latest publicly available GEM data. We collected national-level data from the 2014 GEM-NES and the World Economic Outlook Database. The GEM-APS survey was conducted using a geographically stratified sampling procedure. Respondents and households aged between 18 and 64 were identified for face-to-face interviews. The initial sample includes 201,841 individuals from 70 countries. The GEM survey further defines identifies early-stage entrepreneurs as those individuals engaged in starting a new business/venture (i.e., the first three months of a business) and new venture/business owners involved in running businesses up to 3.5 years old. The resulting sample consists of 24,176 early-stage entrepreneurs from 70 countries.

4.2. Dependent variable

Degree of internationalization is the dependent variable. Table 2 provides the definition and measures of all variables. Table 3 shows the measurement items for the home-country institutional environment. In the GEM survey, the internationalization degree was measured by the percentage of sales generated in foreign countries to total sales (Muralidharan & Pathak, 2017). Specifically, the GEM survey asked early-stage entrepreneurs “What proportion of your customers will normally live outside your country?”. GEM places the individual-level responses into four categories (0 = no export; 1 = greater than 0 and less than 25 %; 2 = 25 % and less than 75 %; and 3 = 75 % and up to 100 %).

4.3. Independent variables

4.3.1. Entrepreneurial self-efficacy

Previous studies measured self-efficacy by questioning subjects regarding self-assessments of entrepreneurial ability in starting a new business (Liñán, Santos, & Fernández, 2011; Wennberg, Pathak, & Autio, 2013). Following this approach, entrepreneurial self-efficacy was measured dichotomously, creating a binary variable (0 = no; 1 = yes) as the response to the following question: “Do you have the knowledge, skill and experience required to start a new business?”

4.3.2. Entrepreneurial motivations

The GEM data categorized entrepreneurial motives into solo opportunity, solo necessity, and a mixture of opportunity and necessity motives. To avoid the complexity of entrepreneurs being driven by a mixed motives, this paper only distinguishes between solo opportunity-motivated entrepreneurs and solo necessity-motivated entrepreneurs (Williams, 2009). We created a binary variable, *entrepreneurial motive*, coded 1 for an opportunity-motivated entrepreneur and 0 for a necessity-driven entrepreneur.

4.3.3. Home-country institutional environment

Following prior research, we measured the formal institution as the response to seven GEM-NES questions that assess government policies, support programs, and regulations (Lim, Oh, & De Clercq, 2016). We performed a principal component analysis to aggregate these items into an index.¹ Table 3 provides the results of our analysis using varimax-rotation with Kaiser normalization. The rotated factor matrix generated a single-factor solution, with acceptable results (KMO = 0.831; $p < 0.001$; cut point 0.60).

4.4. Control variables

We controlled for a variety of variables at both the micro and macro levels, including gender, age, household income, education, firm size, and economic development. Given the greater propensity of men towards internationalization compared to women (De Carolis & Saporito, 2006), this study controlled for gender (female = 1, male = 2). Both age and household income (Arenius & Minniti, 2005) have been found to be associated with entrepreneurial firms' internationalization degree. The control variables of entrepreneurs' age and socioeconomic status as represented by the household-income tier (1 = lower income tier; 2 = middle income tier; 3 = upper income tier) were also included. Additionally, as empirical research implies the existence of an inverted U-shaped relationship between age and entrepreneurial activities (Gohmann, 2010; Urbano & Alvarez, 2014), we included age-squared variables to verify the non-linear relationship. Education has often been regarded as a proxy for human capital and ambition in regard to internationalization (Bates, 1990). As such, the respondents were asked to indicate their highest education qualification. Their responses were harmonized into a four-category variable: “primary or below,” “secondary,” “post-secondary,” and “graduate.” Consistent with prior research (Wößmann, 2003), we employed a proxy measure to eliminate the effects associated with different education levels. As prior studies suggest that large firms have more resources to spend on international expansion (Barkema & Vermeulen, 1998), we controlled for firm size. At the macro level, previous research has identified a positive relationship between the level of international expansion and economic

¹ If p_i represents the i^{th} principal component, for explaining the w_i proportion of variation in the data, index I is calculated as the weighted average of the principal components, where the proportions of variation are the weights. $I = \sum_i w_i p_i$, where $i = 1, 2, \dots, 8$. We used all components to calculate the index. This allowed us to capture 100% of the variation in the data. For details, see Krishnakumar and Nagar (2008).

Table 2
Description of model variables.

| Measure | Definition | Possible value | Source |
|-------------------------------------|--|---|---------|
| <i>Dependent Variable</i> | | | |
| Internationalization degree | What proportion of your customers will normally live outside your country?" GEM puts the individual-level responses into five categories | 0 - no export 1 - greater than 0 and less than 25 2 - 25 % and less than 75 % 3 - 75 % and less than 100 % | GEM-APS |
| <i>Independent Variable</i> | | | |
| Entrepreneurial self-efficacy | Do you have the knowledge, skill and experience required to start a new business | 0 - no 1 - yes | GEM-APS |
| Entrepreneurial motives | Individual's motivation to become an entrepreneur | 0 - necessity-driven 1 - opportunity-driven | GEM-APS |
| Formal institution | Formal institution is measured as the response to seven questions that assess government policies, support programs, and regulations | | GEM-NES |
| <i>Instrument Variable</i> | | | |
| Tiers with entrepreneurs | Do you know someone personally who started a business in the past 2 years? | 0 - no 1 - yes | GEM-APS |
| Technological skills | Were the technologies or procedures available more than a year ago? | | GEM-APS |
| Technological skills | Were the technologies or procedures available | 1- no new technology (more than 5 years) 2- new technology (one to 5 years) 3- very latest technology (newer than one year) | GEM-APS |
| Entrepreneurship choice | In my country, most people consider starting a new business a desirable career choice | 0 - no 1 - yes | GEM-APS |
| Entrepreneurship status and respect | In my country, those successful at starting a new business have a high level of status and respect | 0 - no 1 - yes | GEM-APS |
| <i>Control Variable</i> | | | |
| Gender | What is your gender? | 1 - female 2 - male | GEM-APS |
| Age/Age-squared | What is your current age (in years)? | | GEM-APS |
| Education | What is the highest qualification you have achieved? | 1 - primary or below 2 - secondary 3 - post-secondary 4 - graduate experience | GEM-APS |
| Firm size | Not counting the owners, how many people are currently working for this business? | | GEM-APS |
| GDP per capita | Gross domestic product (GDP) at purchasing power parity (PPP) per capita | | IMF |

development of home countries as measured by the income per capita (Carree, van Stel, Thurik, & Wennekers, 2002). We thus included the gross domestic product (GDP) at purchasing power parity (PPP) per capita as a control variable. Data on a country's GDP per capita were obtained from the IMF and World Economic Outlook Database (Urbano & Alvarez, 2014).

4.5. Common method variance

Because most variables were self-reported, common method variance (CMV) is a potential concern (Podsakoff, MacKenzie, Lee, &

Podsakoff, 2003). To address it, we adopted the following steps (Chang, Van Witteloostuijn, & Eden, 2010; Fuller, Simmering, Atinc, Atinc, & Babin, 2016; Shirokova, Osiyevskyy, & Bogatyreva, 2016). First, according to Chang et al. (2010), the best way to reduce or avoid potential CMV is to use other sources of information for some key measures. We thus combined multiple data sources (e.g., GEM-APS, GEM-NES, IMF, World Economic Outlook Database) for the variables that are determinants of internationalization. Second, our theoretical model included cross-level moderation and mediation relationships, which helped reduce CMV concerns since complex relationships are "in all likelihood, not part of the respondents' theory in use" (Chang et al.,

Table 3
Measurement items for home-country institutional environment.

| Item Description | Source | Factor loading |
|---|---------|----------------|
| Formal Institution (Cronbach's Alpha = 0.896; CR = 0.919; AVE = 0.619) | GEM-NES | |
| In my country, government policies (e.g., public procurement) consistently favor new firms | | 0.615 |
| In my country, the support for new and growing firms is a high priority for policy at the national government level | | 0.788 |
| In my country, the support for new and growing firms is a high priority for policy at the local government level | | 0.744 |
| In my country, new firms can get most of the required permits and licenses in about a week | | 0.790 |
| In my country, the amount of taxes is not a burden for new and growing firms | | 0.868 |
| In my country, taxes and other government regulations are applied to new and growing firms in a predictable and consistent way | | 0.825 |
| In my country, coping with government bureaucracy, regulations, and licensing requirements it is not unduly difficult for new and growing firms | | 0.851 |

CR = composite reliability; AVE = average variance extracted.
KMO = 0.831, Bartlett's $p < .001$. The cut-off point is 0.600.

2010, p. 180). Third, Harman's single factor test was performed to minimize the CMV issue. The results did not reveal a single factor simultaneously affecting all studied constructs. The exploratory principal component analysis extracted nine components that accounted for only 24.20 % of the total variance, being well below the critical threshold of 40 %. Fourth, applying CFA, which links each indicator to a latent common factor (capturing the potential CMV) rather than separate ones (Shirokova et al., 2016), resulted in a major decline in the model's fit. Therefore, CMV is unlikely a concern in our study.

4.6. Measurement invariance

In line with Gunkel, Schlaegel, and Taras (2016) cultural clusters, as the measurement invariance across clusters of countries, is tested using multi-group confirmatory factor analysis (MGCFA). The countries clustered based on cultural values is reported in Appendix A. We constrained the factor loadings to be equal to test for weak invariance. As the metric invariance model was different from the model fit of the baseline model ($\Delta CFI > 0.01$), we extracted and analyzed the modification indices for individual parameters in the constrained model. While we relaxed the equality constraint by allowing the loadings of two items to differ between groups, the results indicate a lack of weak invariance. This can be explained as follows. First, we were constrained by the sample size. From the country clusters table (Appendix A: Table A1), we have a limited sample size across different groups. For instance, we only have five countries in the Latin Europe group and two countries in the Arab cultures group. According to Flora and Curran (2004) and Myers, Ahn, and Jin (2011), the use of MGCFA could be influenced by sample size. Additionally, the number of groups compared in the tests for measurement invariance affects the ability to achieve invariance (Putnick & Bornstein, 2016). Second, our latent formal institution constructs are primarily driven by the existing theory (i.e., NIE) and measured by well-established survey items (Lim et al., 2016). We measured formal institutions as the response to seven questions that assess government policies, support programs, and regulations (Lim et al., 2016). Therefore, we feel that measurement invariance is not a concern for this study.

4.7. Estimation methodology

Because endogeneity is often observed in the relationship between entrepreneurs' characteristics and firm activities (Mudambi & Zahra, 2007) and a simple standard ordinary least squares (OLS) approach can overestimate the explanatory roles of entrepreneurial characteristics (Antonakis, Bendahan, Jacquart, & Lalive, 2010; Landis & Dunlap, 2000), a two-stage least squares (2SLS) regression model was employed to account for potential endogeneity (Antonakis et al., 2010; Hashai, 2011). Particularly, the predicted values for the endogenous variables (i.e., entrepreneurial self-efficacy and opportunity-motivated entrepreneurship) were first calculated. Next, the predicted variables were used as instruments in the regression to verify the hypotheses.

The first-stage regression for self-efficacy uses tiers, with the entrepreneurs and technological skills as instrument variables. For opportunity-motivated entrepreneurship, we use entrepreneurship status respect and entrepreneurship choice as instrument variables. Since entrepreneurs' self-belief increases with the tiers and technological skills and individuals are more likely to be opportunity-driven if they believe starting a new business will help them to achieve a high-level status and respect if they regard starting a new business as a desirable career choice, and both variables fulfill the necessary conditions as valid instruments (Murray, 2006).

The correlation matrix in Table 4 indicates that the correlations between the instruments and the potentially endogenous explanatory variable are highly significant, whereas the relationship between instruments and the dependent variables are not. To assess the strength of these instruments, the first-stage F-statistics are calculated. The results

Table 4
Correlation matrix.

| | Mean | S.D. | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|-------|-------|---------|----------|---------|---------|----------|---------|----------|---------|---------|---------|---------|---------|---------|-------|
| Internationalization (1) | 1.06 | 0.32 | 1.000 | | | | | | | | | | | | | |
| Age (2) | 39.99 | 15.08 | 0.033** | 1.000 | | | | | | | | | | | | |
| Gender (3) | 1.49 | 0.50 | 0.056** | 0.015** | 1.000 | | | | | | | | | | | |
| Income (4) | 2.00 | 0.75 | 0.044** | 0.016** | 0.089** | 1.000 | | | | | | | | | | |
| Education (5) | 2.01 | 1.06 | 0.068** | 0.055** | 0.024** | 0.261** | 1.000 | | | | | | | | | |
| Business Size (6) | 17.90 | 0.03 | 0.007** | 0.004 | 0.004* | -0.006* | 0.003 | 1.000 | | | | | | | | |
| Tiers with Entrepreneurs (7) | 0.66 | 1.60 | 0.002 | 0.006** | 0.005* | -0.005* | -0.017** | 0.000 | 1.000 | | | | | | | |
| Technological Skills (8) | 2.22 | 1.32 | 0.000 | 0.002 | 0.004 | -0.006* | -0.066** | 0.329** | 0.329** | 1.000 | | | | | | |
| Entrepreneurship Status and Respect (9) | 0.64 | 0.55 | 0.002 | 0.014** | -0.001 | 0.010* | 0.072** | 0.002 | 0.311** | 0.057** | 1.000 | | | | | |
| Entrepreneurship Choice (10) | 0.52 | 0.44 | 0.004 | 0.027** | 0.006** | 0.034** | 0.082** | 0.003 | 0.042** | 0.092** | 0.108** | 1.000 | | | | |
| GRP per capital (11) | 3.39 | 2.29 | 0.076** | 0.050** | 0.057** | 0.126** | 0.176** | 0.000 | -0.009** | 0.008** | -0.005* | 0.017** | 1.000 | | | |
| Self-efficacy (12) | 0.36 | 0.48 | 0.086** | -0.076** | 0.054** | 0.052** | 0.013** | 0.005 | 0.029** | 0.071** | 0.069** | 0.093** | 0.055** | 1.000 | | |
| Entrepreneurial Motivation (13) | 0.69 | 0.28 | 0.465** | -0.070** | 0.059** | 0.069** | 0.031** | 0.007** | 0.000 | 0.016** | 0.015** | 0.030** | 0.161** | 0.164** | 1.000 | |
| Formal Institution (14) | 0.00 | 1.00 | 0.018** | 0.041** | 0.009** | 0.015** | 0.070** | 0.001 | -0.002 | 0.007** | 0.002 | 0.014** | 0.018** | 0.107** | 0.060** | 1.000 |

Note: ** $p < 0.01$; * $p < 0.05$.

Table 5
First stage regression analysis results.

| | Model 1 | | Model 2 | |
|---|---------------|---------|------------------------|---------|
| | Self-efficacy | | Entrepreneurial motive | |
| | Coefficient | S.E. | Coefficient | S.E. |
| Fixed effects | | | | |
| Individual-level Control Variables | | | | |
| Age | 0.009*** | (0.001) | 0.086*** | (0.003) |
| Age-squared | −0.001*** | (0.000) | −0.001*** | (0.000) |
| Gender | 0.168*** | (0.010) | 0.414*** | (0.016) |
| Household income | 0.133*** | (0.007) | 0.318*** | (0.016) |
| Education attainment | 0.043*** | (0.005) | 0.266*** | (0.009) |
| Firm size | 0.716 | (0.511) | 0.296 + | (0.155) |
| Tiers with entrepreneurs | 0.788*** | (0.010) | | |
| Technological skills | 0.219*** | (0.016) | | |
| Entrepreneurship status and respect | | | 0.541** | (0.205) |
| Entrepreneurship choice | | | 0.494* | (0.201) |
| Country-level Control Variables | | | | |
| GRP per capital | 0.029*** | (0.002) | 0.241*** | (0.003) |
| Random effects | | | | |
| Residual country-level variance | 0.421 | | 0.393 | |
| Model fit statistics | | | | |
| F-statistics (First stage regression) | 1195*** | | 1132*** | |
| Sargan statistics | 954 | | 527 | |
| Log-likelihood | −118305.9 | | −54101.1 | |
| Akaike information criterion | 236633.8 | | 108224.2 | |
| Bayesian information criterion | 236746.2 | | 108336.5 | |

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

are significant and high for instruments, greater than the required F-statistic of 10, as defined by [Staiger and Stock \(1997\)](#). Additionally, the Sargan test does not reject the null hypothesis that the instruments are uncorrelated with the error term, suggesting the instruments' exogeneity ([David, O'Brien, Yoshikawa, & Delios, 2010](#)). Both regressions control for individual-level demographic variables and macro-level factors. The first-stage regression analysis results are presented in [Table 5](#) (Models 1 and 2).

To test the moderated mediation effect (Hypotheses 4, 5a, and 5b), we follow the procedure of [Muller, Judd, and Yzerbyt \(2005\)](#) and provide the results in [Tables 6 and 7](#).

$$Y = \beta_{0j} + \beta_{1j}Z + \beta_{2j}\hat{X} + \beta_{3j}Mo + \beta_{4j}\hat{X} * Mo + \varepsilon_1 \quad (1)$$

$$Me = \beta_{5j} + \beta_{6j}Z + \beta_{7j}\hat{X} + \beta_{8j}Mo + \beta_{9j}\hat{X} * Mo + \varepsilon_2 \quad (2)$$

$$Y = \beta_{10j} + \beta_{11j}Z + \beta_{12j}\hat{X} + \beta_{13j}Mo + \beta_{14j}\hat{X} * Mo + \beta_{15j}Me + \beta_{16j}Me * Mo + \varepsilon_3 \quad (3)$$

where Z = control variable; \hat{X} = fitted value of endogenous variable; Mo = moderator; Me = mediator

5. Results

5.1. Hypotheses testing

The means, standard deviations, and pairwise correlation coefficients for all studied variables are shown in [Table 4](#). We then conducted a diagnostic test of multicollinearity by examining the variance inflation factors (VIFs) of all variables. All VIFs were below 5. Therefore, multicollinearity is not a concern ([Pfarrer, Pollock, & Rindova, 2010](#)).

Because the study design includes both individual-level responses and country-level measures, hierarchical modeling methods were used for analyzing the data. Performing a hierarchical model requires a significant between-group variance for the dependent variable ([Hofmann, 1997](#)). Therefore, we conducted a Chi-square test using individual-level internationalization as the dependent variable and the country group as a predictor. The results show a significant between-

group variance within the data ($\chi^2(207) = 6.673 \text{ E3}$, $p < 0.001$).

[Tables 6 and 7](#) present the results of the multilevel logistic regression analyses. According to [Hahn and Ang \(2017\)](#); [Aguinis, Cascio, and Ramani \(2017\)](#), and [Aguinis, Ramani, and Alabduljader \(2018\)](#), we acknowledge that the statistical testing of the hypotheses should not be solely based on whether a p-value passes a specific threshold. Additionally, a p-value (or statistical significance) does not represent the effect size of the result. To alleviate this concern, we report standard errors between parenthesis ([Aguinis et al., 2017, 2018](#)). Further, we use effect size estimates ([Aguinis et al., 2010, 2017; Aguinis et al., 2018; Ely, 1999; Hubbard & Meyer, 2013; Lin, Lucas, & Shmueli, 2013](#)), where the effect size provides information about the magnitude and direction of the relationship between two variables. According to [Durlak \(2009\)](#), the odds ratio is an effect size statistic in logistic regression analyses that shows the direction and strength of the independent variables on the probability of having a higher internationalization degree, therefore revealing the size of the effects and substantive significance of the statistical results. Therefore, we present the results of the odds ratio in Appendix A: [Tables A2–A5](#) to demonstrate the effect size of the proposed model. We also performed a Wald Chi-square test and determine the model effects had significant results. As power calculations, we first reported the log-likelihood, AIC, and BIC in each model. Then, we performed the likelihood ratio test to assess the goodness of fit between models. For instance, the results provide evidence against the reduced Model 4 in favor of Model 5, thus indicating a higher explanatory power due to adding the formal institution index as the moderator. In Model 3 ([Table 6](#)), we conducted a random coefficient model (intercept and slope as outcome model) using the level-1 (individual-level) variables as predictors. The results reveal significant variance in intercepts and slopes across countries. Additionally, the results indicate that ESE is positively and significantly related to opportunity-motivated entrepreneurship. Particularly, the odds ratio of entrepreneurs with high self-belief being engaged in opportunity-motivated entrepreneurship increased by a factor of 2.181 ($\beta = 0.780$, $p < 0.001$), suggesting that a higher ESE level leads to a higher probability that individuals engage in opportunity-motivated entrepreneurship. H1 is supported.

Table 6
Multilevel logistic regression analysis results.

| | Model 3 | | Model 4 | | Model 5 | |
|---|------------------------|---------|----------------------|---------|------------------------|---------|
| | Entrepreneurial motive | | Internationalization | | Internationalization | |
| | Coefficient | S.E. | Coefficient | S.E. | Coefficient | S.E. |
| Fixed effects | | | | | | |
| Individual-level Control Variables | | | | | | |
| Age | 0.054*** | (0.004) | 0.042*** | (0.004) | 0.063*** | (0.004) |
| Age-squared | −0.001*** | (0.000) | −0.001*** | (0.000) | −0.001*** | (0.000) |
| Gender | 0.488** | (0.017) | 0.374*** | (0.026) | 0.386*** | (0.023) |
| Household income | 0.012 | (0.012) | 0.055** | (0.019) | 0.057*** | (0.016) |
| Education attainment | 0.136*** | (0.009) | 0.330*** | (0.015) | 0.423*** | (0.013) |
| Firm size | 0.201 | (0.175) | 0.082 | (0.128) | 0.119 | (0.123) |
| Country-level Control Variables | | | | | | |
| GRP per capital | 0.168*** | (0.003) | 0.106*** | (0.009) | 0.172*** | (0.004) |
| Individual-level predictors | | | | | | |
| Self-efficacy (SE) | 0.780*** | (0.009) | | | 0.332*** | (0.012) |
| Entrepreneurial motives | | | 0.922*** | (0.069) | | |
| Country-level predictors | | | | | | |
| Institutional index | | | | | 0.342 | (0.288) |
| Cross-level two-way interaction | | | | | | |
| Self-efficacy*Institutional index | | | | | 0.126*** | (0.028) |
| Entrepreneurial motives*Institutional index | | | | | | |
| Random effects and model fits | | | | | | |
| Residual country-level variance | 0.781 | | 0.772 | | 0.695 | |
| Log-likelihood | −50693.8 | | −39322.2 | | −38154.1 | |
| Akaike information criterion | 101407.6 | | 78668.4 | | 76336.3 | |
| Bayesian information criterion | 101509.7 | | 78791.0 | | 76479.3 | |
| Chi-square | 6830.5*** | | 5576.8*** | | 7153.1*** | |
| Likelihood ratio test | | | | | 2336.1*** (vs model 4) | |

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

In Model 4 (Table 6), compared with necessity-driven entrepreneurs, the odds ratio of opportunity-motivated entrepreneurs going international increases by a factor of 2.514 ($\beta = 0.922$, $p < 0.001$). Therefore, H2 is supported.

The moderated mediation effects are tested in Models 5 (Table 6) and 6 (Table 7). Additionally, we regress ESE and the moderated mediation effects on the internationalization degree in Model 7 (Table 7). The results demonstrate a significant relationship between

Table 7
Multilevel logistic regression analysis results.

| | Model 6 | | Model 7 | |
|---|------------------------|---------|------------------------|---------|
| | Entrepreneurial motive | | Internationalization | |
| | Coefficient | S.E. | Coefficient | S.E. |
| Fixed effects | | | | |
| Individual-level Control Variables | | | | |
| Age | 0.054*** | (0.003) | 0.049*** | (0.004) |
| Age-squared | −0.001*** | (0.000) | −0.001*** | (0.000) |
| Gender | 0.045* | (0.017) | 0.386*** | (0.027) |
| Household income | 0.007 | (0.012) | 0.057** | (0.019) |
| Education attainment | 0.137*** | (0.009) | 0.354*** | (0.015) |
| Firm size | 0.196 | (0.173) | 0.106 | (0.126) |
| Country-level Control Variables | | | | |
| GRP per capital | 0.167*** | (0.003) | 0.122*** | (0.009) |
| Individual-level predictors | | | | |
| Self-efficacy | 0.792*** | (0.010) | 0.219*** | (0.007) |
| Entrepreneurial motives | | | 0.707*** | (0.074) |
| Country-level predictors | | | | |
| Institutional index | 0.529* | (0.248) | 0.328 | (0.539) |
| Cross-level two-way interaction | | | | |
| Self-efficacy*Institutional index | 0.246*** | (0.022) | 0.112** | (0.035) |
| Entrepreneurial motives*Institutional index | | | 0.424* | (0.190) |
| Random effects | | | | |
| Residual country-level variance | 0.807 | | 0.507 | |
| Model Fit Statistics | | | | |
| Log-likelihood | −50633.1 | | −38773.5 | |
| Akaike information criterion | 101290.3 | | 77579.1 | |
| Bayesian information criterion | 101412.9 | | 77742.5 | |
| Chi-square | 6951.8*** | | 6646.3*** | |
| Likelihood-ratio test | 1212.9*** (vs model 3) | | 1097.4*** (vs model 4) | |

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

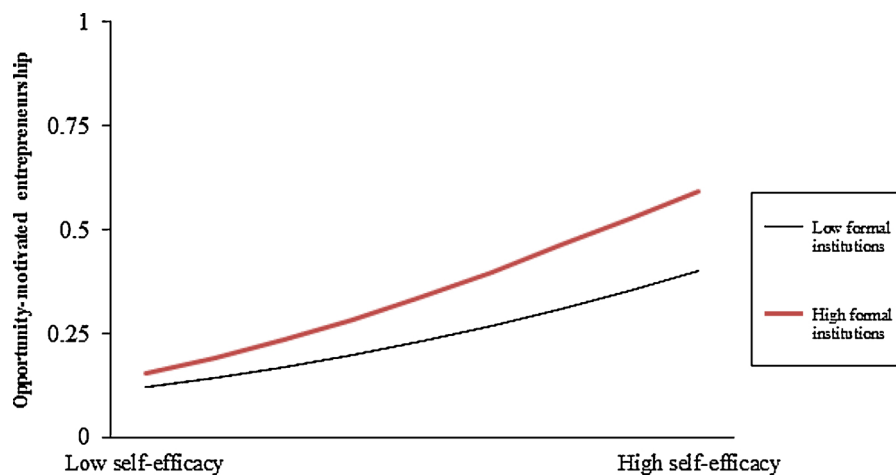


Fig. 2. Moderating effect of home-country formal institutional environment on the relationship between entrepreneurial self-efficacy and opportunity-motivated entrepreneurship.

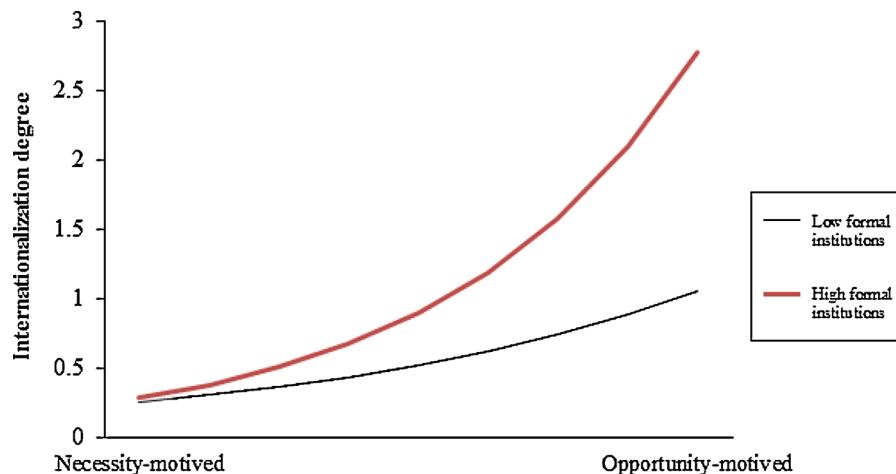


Fig. 3. Moderating effect home-country formal institutional environment on the relationship between opportunity entrepreneurship and the internationalization degree.

ESE and the internationalization degree (Table 6: Model 5, odds ratio = 1.393, $\beta = 0.332$, $p < 0.001$). Model 6 in Table 7 shows that ESE is positively related to the probability of individuals engaging in opportunity-motivated entrepreneurship (odds ratio = 2.207, $\beta = 0.792$, $p < 0.001$). Additionally, the results suggest that a supportive home-country institutional environment positively moderates the relationship between entrepreneurial self-efficacy and entrepreneurial motivation (Table 7: Model 6, odds ratio = 1.278, $\beta = 0.246$, $p < 0.001$). In Model 7 (Table 7), the mediating effect of opportunity-motivated entrepreneurship is positive and significant (odds ratio = 2.027, $\beta = 0.707$, $p < 0.001$) and the effect of ESE is lower with the inclusion of opportunity-motivated entrepreneurship (odds ratio = 1.244, $\beta = 0.219$, $p < 0.001$), indicating opportunity-motivated entrepreneurship partially mediates the main effect of ESE on the internationalization degree. Therefore, H3 is supported.

The results also show that the indirect effect of ESE on the internationalization degree through opportunity-motivated entrepreneurship is contingent on the home-country institutional environment (Table 7: Model 7, odds ratio = 1.528, $\beta = 0.424$, $p < 0.05$). Specifically, a supportive home-country institutional environment enhances the mediating effect of opportunity-motivated entrepreneurship, which further enhances their firms' internationalization degree by 52.80 % in

terms of odds.² Hence, H4 and H5a are supported, while H5b is not supported. Figs. 2 and 3 show the moderating effects. Specifically, Fig. 2 shows the interaction effect of entrepreneurial self-efficacy and formal institutional environment on opportunity-motivated entrepreneurship. Fig. 3 shows the interaction effect of opportunity-motivated entrepreneurship and formal institutional environment on the internationalization degree.

For all control variables, a positive coefficient on age and a negative one on age-squared indicate that the probability of going international increases with the age; however, the relationship peaks at a relatively early age and decreases afterwards. Men appear to be more likely to engage in international expansion than women. This result is consistent with previous studies (Arenius & Minniti, 2005; Langowitz & Minniti, 2007). Education is found to have a positive impact on the internationalization degree. Moreover, the positive impact of the GDP on the internationalization degree is an indicator of the entrepreneurial expectations of further international expansion, which are consistent with the extant research (Bowen & De Clercq, 2008).

² 52.80% = $(1.528 - 1) * 100\%$

Table 8
Robustness check using EFW index.

| | Model 8 | | Model 9 | | Model 10 | |
|---|----------------------|---------|------------------------|---------|----------------------|---------|
| | Internationalization | | Entrepreneurial motive | | Internationalization | |
| | Coefficient | S.E. | Coefficient | S.E. | Coefficient | S.E. |
| Fixed effects | | | | | | |
| Individual-level Control Variables | | | | | | |
| Age | 0.063*** | (0.004) | 0.053*** | (0.003) | 0.041*** | (0.005) |
| Age-squared | −0.001*** | (0.000) | −0.001*** | (0.000) | −0.001*** | (0.000) |
| Gender | 0.381*** | (0.023) | 0.046** | (0.017) | 0.342*** | (0.027) |
| Household income | 0.061* | (0.016) | 0.011 | (0.012) | 0.028 | (0.019) |
| Education attainment | 0.364*** | (0.013) | 0.139*** | (0.009) | 0.269*** | (0.016) |
| Firm size | 0.095 | (0.094) | −0.223 | (0.169) | 0.016 | (0.127) |
| Country-level Control Variables | | | | | | |
| GRP per capital | 0.189*** | (0.004) | 0.167*** | (0.003) | 0.101*** | (0.009) |
| Individual-level predictors | | | | | | |
| Self-efficacy (SE) | 0.185*** | (0.040) | 0.265*** | (0.033) | 0.120*** | (0.025) |
| Entrepreneurial start-up | | | | | 0.199*** | (0.049) |
| Country-level predictors | | | | | | |
| Economic freedom index | 0.023 | (0.027) | 0.370*** | (0.082) | 0.031 | (0.078) |
| Cross-level two-way interaction | | | | | | |
| Self-efficacy*Economic freedom index | 0.027*** | (0.006) | 0.093*** | (0.005) | 0.011** | (0.004) |
| Entrepreneurial Start-up*Economic freedom index | | | | | 1.045*** | (0.081) |
| Random effects and model fits | | | | | | |
| Residual country-level variance | 0.976 | | 0.905 | | 0.867 | |
| Log-likelihood | −38014.7 | | −50567.9 | | −38760.8 | |
| Akaike Information Criterion | 76057.5 | | 101159.9 | | 77553.6 | |
| Bayesian information criterion | 76200.5 | | 101282.5 | | 77717.0 | |

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

5.2. Robustness tests

We conducted a robustness check for our findings using a secondary measurement for institutional variables from the Economic Freedom of the World (EFW) index. The index refers to the measures of institutional quality for five major dimensions, namely government size, legal structure and property rights protection, sound money access, free international trade, and regulation of credit (Nyström, 2008). Each component in the index ranges from 0 to 10, where 0 represents low institutional quality and 10 indicates its highest level. During 1970–2000, this index was published every five years and annually since 2000. To match the GEM survey, the EFW 2014 index was interpolated. The results are presented in Table 8 (Models 8–10) and do not systematically differ from our estimates in Tables 6 and 7.

6. Discussion and conclusions

6.1. Findings

It has long been recognized that entrepreneurs' engagement in IB opportunity discovery and exploitation is a joint result of individual and environmental factors (Shane & Venkataraman, 2000; Shane, 2003), as well as cross-level interactions between the two (Autio & Acs, 2010). However, scholars have only recently started to examine this research question using different construct/variable levels (see Table 1 for a review). Motivated by the dearth of multilevel studies, this paper aims to address this literature gap by developing a multilevel theoretical framework and adopting a mixed effects methodology to examine 1) how individual-level personality and motivational antecedents (level 1) affect early-stage entrepreneurial firms' internationalization degree and 2) how home-country institutional context (level 2) moderate the influence of entrepreneurs' personality and motivational attributes on their firms' internationalization degrees.

Addressing these two specific objectives led to a number of important findings. First, the results confirmed the role of opportunity-motivated entrepreneurship in mediating the relationship between ESE and the internationalization degree of early-stage entrepreneurial firms.

Specifically, the potential influence of ESE on entrepreneurial internationalization can be realized if entrepreneurs are sufficiently motivated and act upon opportunity rather than necessity. Our study thus portrays a relatively more comprehensive picture of the personality trait–entrepreneurial motivation–IE action relationship.

Second, home-country formal institutions explain the boundary conditions of the main effects at the individual level. Specifically, the level of home-country institutional development positively moderates the relationship between ESE and opportunity-motivated entrepreneurship and home-country institutions strengthen the positive effect of opportunity-motivated entrepreneurship on the internationalization degree of early-stage entrepreneurial firms. The findings thus reveal the critical role of the home-country institutional environment in individual entrepreneurs using their psychological and motivational resources for driving their firms' internationalization.

6.2. Theoretical contributions

Our findings contribute to the IB and IE literature in a number of ways. First, to the best of our knowledge, this paper represents the first attempt to use the action theory of entrepreneurship (Frese & Gielnik, 2014; Frese, 2009) to examine IE actions as the result of the motivational and cognitive factors of individual entrepreneurs and study how the interaction between the two shapes the internationalization degree of early-stage entrepreneurial firms. Specifically, we test the idea of a sequential path of influence from ESE to opportunity-motivated entrepreneurship to entrepreneurial firms' internationalization actions. Our results support action theory's basic premise that the effect of entrepreneurs' personalities on entrepreneurial action and success is likely mediated by their motivational state (Frese & Gielnik, 2014). Further, while the recent literature demonstrates the effect of ESE on entrepreneurship (Newman et al., 2019), we answer the call to extend this research stream to IE (Hannibal et al., 2016) by showing its indirect effect on entrepreneurial firms' internationalization through opportunity-motivated entrepreneurship.

Second, in IE research, there exists an unanswered call for a psychological/cognitive perspective to study the impact of entrepreneurs'

personal characteristics on their firms' abilities to create and capture opportunities in international markets (Zahra et al., 2005). Other studies have pointed out the need to assess the impact of potential contextual contingencies under the individual–opportunity nexus (Frese & Gielnik, 2014; Frese, 2009). There is also a growing need to contextualize IE by considering multilevel antecedents (Davidsson, 2015; Jones et al., 2011; Knight & Liesch, 2016). Similarly, the integration of macro- and micro-level factors in entrepreneurship research is required (Bamberger, 2008; Frese, 2009; Kiss, Danis, & Cavusgil, 2012; Welter, 2011). By synthesizing the key concepts and ideas of the action theory of entrepreneurship, individual–opportunity nexus model, and NIE into a multilevel perspective, we were able to combine a micro-psychological approach with a macro-institutional analysis to examine what drives entrepreneurial internationalization and overcome the micro–macro divide by addressing these past (unanswered) and recent calls in the literature.

Third, our study contributes to a better understanding of the role of home-country institutions in the internationalization of early-stage entrepreneurial firm. Prior entrepreneurship research has paid little attention to the impact of the home-country institutional environment on the personality–entrepreneurship relationship (Frese & Gielnik, 2014; Frese, 2009) and IB researchers have implicitly assumed that entrepreneurs benefit equally from home-country institutions during internationalization (Zhang et al., 2016). By contrast, we did not assume universal and automatic ESE benefits on international expansion, but rather recognized the potential mediation effect of opportunity-motivated entrepreneurship, as well as the moderating role of home-country institutions. Specifically, our theoretical arguments and empirical findings suggest home-country institutions can channel individual entrepreneurs' self-efficacy to increase the entrepreneurship by opportunity (instead of necessity), which can in turn lead to a higher internationalization degree for early-stage entrepreneurial firms. Moreover, by reducing the transaction costs associated with the formal institutional structures governing business activities, home-country institutions play a significant and positive role in enabling opportunity-motivated entrepreneurs to better explore and exploit overseas business opportunities. Therefore, we not only address the long-overdue call of examining whether individual entrepreneurs' personality and motivational factors matter for IE (Zahra et al., 2005), but also provide additional insights on how personality and motivational antecedents depend on the home-country institutional context.

Finally, the institutional escape view that the weaker the home-country institutions are the greater is the positive impact of opportunity-motivated entrepreneurship on entrepreneurial internationalization is not supported by our results, indicating such a view may be rather valid for explaining the internationalization of firms from emerging economies, which is the context for which this perspective originally developed (Cuervo-Cazurra et al., 2018; Deng & Zhang, 2018; Stoian & Mohr, 2016).

6.3. Managerial relevance

Our findings have implications for early-stage entrepreneurs interested in expanding onto overseas markets. We show that, while ESE and opportunity-motivated entrepreneurship are key individual-level factors for promoting early-stage entrepreneurial firms' engagement in IB, the strength of the positive effect is significantly influenced by the level of institutional development in entrepreneurs' home countries. This means that entrepreneurs' psychological resources and opportunity-driven motivations may be important but not sufficient to achieve success in international expansion. A careful consideration of how the

home-country institutional environment might facilitate or impede entrepreneurs' abilities to use their psychological and motivational resources should be part of the decision whether to engage in internationalization.

Second, the entrepreneurs with high self-efficacy have a stronger ability to solicit home-based institutional support for seeking IB opportunities through opportunity-based entrepreneurship. This suggests that the entrepreneurs interested in expanding overseas should not only rely on the support of the institutions typically suggested by IB studies (Zhang et al., 2016), but should also participate in entrepreneurship-training programs to cultivate personal initiatives, confidence, and skills (Economist, 2017), since such activities can help them better utilize institutional stimuli to develop stronger self-belief for identifying and exploiting IB opportunities.

Our findings also have public policy implications for governments aiming to promote the IB engagement of home-country firms. First, previous research shows that opportunity-motivated entrepreneurship benefits from better home-country institutions and the larger the population involved in opportunity-motivated entrepreneurship (as opposed to necessity-motivated entrepreneurship) is, the higher the level of economic development of a country (Acs & Varga, 2005). Similarly, as opposed to necessity-motivated entrepreneurship, Acs, Desai, and Hessels (2008) found opportunity-motivated entrepreneurship to be more important to a country's macro-economic performance and productivity indicators, such as per capita GDP, percentage of exports over GDP, and expenditure on R&D and education. Our findings corroborate earlier studies by confirming the importance of home-country institutions for the development of opportunity-motivated entrepreneurship, which has the additional benefit of promoting IB engagement by entrepreneurial firms.

Second, the positive interactions among ESE, opportunity-motivated entrepreneurship, and home-country institutions suggest that, to promote home-country entrepreneurial firms' IE activities, a better institutional development at home requires both a psychological and a business approach for shaping the propensity and intensity of these firms' IB engagement. Therefore, policy makers should recognize that, to stimulate the IB engagement of their countries' firms, the development and improvement of the macro-level institutional environment, while important, may not be sufficient (Stephan & Uhlaner, 2010). An effective government approach should include not only supportive institutions designed to reduce transaction costs at the macro-level, but also entrepreneurship-training programs inspired by psychological research and designed to help entrepreneurs take individual-level initiatives (Economist, 2017).

6.4. Limitations and future research

This study has some limitations that provide opportunities for future research. First, because we analyzed early-stage entrepreneurial firms' internationalization, it was appropriate to focus on the impact of home-country institutions; however, host country institutions will play a greater role as these firms continue to grow internationally and this is why we call for future research to examine how ESE and opportunity-motivated entrepreneurship interact with both home- and host-country institutions as they continue to internationalize. Second, as some studies question the appropriateness of using a single item (Sarstedt, Diamantopoulos, & Salzberger, 2016), future research could use multidimensional measures of self-efficacy. Because we treat ESE as general rather than specific self-efficacy, it is appropriate to apply unidimensional and binary measures from the GEM survey. Third, the internationalization measure in the GEM survey captures international sales

only. While this might be appropriate for studying early-stage entrepreneurial firms' internationalization because exporting is often their primary mode of IB engagement (Zhang et al., 2016), future research could expand this paper's theoretical logic to examine the joint impact of entrepreneurs' personalities, motivations, and external institutions on other aspects of entrepreneurial firms' IE activities, such as foreign production, international sourcing, and geographical dispersion. Such research would require an NIE analysis extended to the third-level of Williamson's (2000) hierarchy of institutions, namely the governance of entrepreneurial firms' IB activities.

Finally, while examining the joint effects of ESE, opportunity-motivated entrepreneurship, and home-country institutions on the internationalization degree of early-stage entrepreneurial firms constitutes an important contribution to both IB and IE literatures, future research can further study their impact on international firm performance. Although internationalization may provide entrepreneurial firms with growth opportunities and access to knowledge in foreign markets, it also generates additional costs and uncertainties (Contractor, Kumar, & Kundu, 2007). How internationalization affects firm performance has long been recognized as an important topic in IB (Hitt, Tihanyi, Miller, & Connelly, 2006; Lu & Beamish, 2001), but the relationship between the two remains unclear (Li, 2007; Schwens et al., 2018), especially in the context of entrepreneurial firms' internationalization. Similarly, although our study identified the positive impact of ESE on the internationalization degree through opportunity-motivated entrepreneurship, ESE may not necessarily contribute to enhanced firm performance. For example, Hmieleski and Baron (2008) suggest that, in dynamic environments, the effects of ESE on firm performance are positive when combined with moderate optimism. However, the relationship becomes negative in the presence of high optimism. More recently, Morgan, Sui, and Baum (2018) argued that an extremely high ESE level may induce overconfidence, which will in turn become a mechanism to reduce the

international performance of SMEs. We thus call for future research to examine this potential downside of ESE on entrepreneurial firms' international performance.

6.5. Conclusions

By integrating the action theory of entrepreneurship, the individual–opportunity nexus model, and NIE, this study developed a multilevel framework to examine the joint effects of ESE, opportunity-motivated entrepreneurship, and home-country institutions on the internationalization degree of early-stage entrepreneurial firms. Using data from multiple sources, namely GEM–APS, GEM–NES, the IMF, and the World Economic Outlook Database, we tested our hypotheses using a large cross-country sample of early-stage entrepreneurs, and found that opportunity-motivated entrepreneurship serves as a mediator between ESE and the internationalization degree of early-stage entrepreneurial firms. Moreover, the results show home-country formal institutions moderate both the relationship between ESE and opportunity-motivated entrepreneurship and the relationship between opportunity-motivated entrepreneurship and entrepreneurial firms' internationalization. Our study thus makes a number of theoretical contributions to both IB and IE research and has both practical and policy implications.

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Declarations of interest

None.

Appendix A

Table A1
Country clusters.

| | | | |
|--------------------------|-----------------------|------------------------|----------------------|
| Arab Cultures | China | IRAN | El Salvador |
| Qatar | Japan | Malaysia | Guatemala |
| Turkey | Singapore | Philippines | Mexico |
| Sub-Sahara Africa | Taiwan, China | Suriname | Panama |
| Angola | Viet Nam | Thailand | Peru |
| Barbados | Eastern Europe | Germanic Europe | Puerto Rico |
| Belize | Bosnia & Herzegovina | Austria | Uruguay |
| Botswana | Croatia | Belgium | Latin Europe |
| Burkina Faso | Georgia | Germany | France |
| Cameroon | Greece | Luxembourg | Italy |
| Jamaica | Hungary | Netherlands | Portugal |
| South Africa | Kazakhstan | Switzerland | Romania |
| Uganda | Kosovo | Latin America | Spain |
| Anglo Cultures | Poland | Argentina | Nordic Europe |
| Australia | Russia | Bolivia | Denmark |
| Canada | Slovakia | Brazil | Estonia |
| Ireland | Slovenia | Chile | Finland |
| UK | Southern Asia | Colombia | Lithuania |
| USA | India | Costa Rica | Norway |
| Confucian Asia | Indonesia | Ecuador | Sweden |

Table A2

First stage regression analysis results in odds ratio.

| | Model 1 | | Model 2 | |
|---|---------------|---------|------------------------|---------|
| | Self-efficacy | | Entrepreneurial motive | |
| | Odds ratio | S.E. | Odds ratio | S.E. |
| Fixed effects | | | | |
| Individual-level Control Variables | | | | |
| Age | 1.009*** | (0.001) | 1.089*** | (0.003) |
| Age-squared | 0.999*** | (0.000) | 0.999*** | (0.000) |
| Gender | 1.182*** | (0.010) | 1.512*** | (0.016) |
| Household income | 1.142*** | (0.007) | 1.374*** | (0.016) |
| Education attainment | 1.043*** | (0.005) | 1.304*** | (0.009) |
| Firm size | 2.046 | (0.511) | 1.344 + | (0.155) |
| Tiers with entrepreneurs | 2.198*** | (0.010) | | |
| Technological skills | 1.244*** | (0.016) | | |
| Entrepreneurship status and respect | | | 1.717** | (0.205) |
| Entrepreneurship choice | | | 1.638* | (0.201) |
| Country-level Control Variables | | | | |
| GRP per capital | 1.029*** | (0.002) | 1.272*** | (0.003) |
| Random effects | | | | |
| Residual country-level variance | 0.421 | | 0.393 | |
| Model fit statistics | | | | |
| F-statistics (First stage regression) | 1195*** | | 1132*** | |
| Sargan statistics | 954 | | 527 | |
| Log-likelihood | −118305.9 | | −54101.1 | |
| Akaike information criterion | 236633.8 | | 108224.2 | |
| Bayesian information criterion | 236746.2 | | 108336.5 | |

Note: *** p < 0.001; ** p < 0.01; * p < 0.05; + p < 0.1.

ORs above 1 represent a positive relationship; ORs below 1 represent a negative relationship.

Table A3

Multilevel logistic regression analysis results in odds ratio.

| | Model 3 | | Model 4 | | Model 5 | |
|---|------------------------|---------|----------------------|---------|------------------------|---------|
| | Entrepreneurial motive | | Internationalization | | Internationalization | |
| | Odds ratio | S.E. | Odds ratio | S.E. | Odds ratio | S.E. |
| Fixed effects | | | | | | |
| Individual-level Control Variables | | | | | | |
| Age | 1.055*** | (0.004) | 1.042*** | (0.004) | 1.065*** | (0.004) |
| Age-squared | 0.999*** | (0.000) | 0.999*** | (0.000) | 0.999*** | (0.000) |
| Gender | 1.629** | (0.017) | 1.453*** | (0.026) | 1.471*** | (0.023) |
| Household income | 1.012 | (0.012) | 1.056** | (0.019) | 1.058*** | (0.016) |
| Education attainment | 1.145*** | (0.009) | 1.390*** | (0.015) | 1.526*** | (0.013) |
| Firm size | 1.222 | (0.175) | 1.085 | (0.128) | 1.126 | (0.123) |
| Country-level Control Variables | | | | | | |
| GRP per capital | 1.182*** | (0.003) | 1.111*** | (0.009) | 1.187*** | (0.004) |
| Individual-level predictors | | | | | | |
| Self-efficacy (SE) | 2.181*** | (0.009) | | | 1.393*** | (0.012) |
| Entrepreneurial motives | | | 2.514*** | (0.069) | | |
| Country-level predictors | | | | | | |
| Institutional index | | | | | 1.407 | (0.288) |
| Cross-level two-way interaction | | | | | | |
| Self-efficacy*Institutional index | | | | | 1.134*** | (0.028) |
| Entrepreneurial motives*Institutional index | | | | | | |
| Random effects and model fits | | | | | | |
| Residual country-level variance | 0.781 | | 0.772 | | 0.695 | |
| Log-likelihood | −50693.8 | | −39322.2 | | −38154.1 | |
| Akaike information criterion | 101407.6 | | 78668.4 | | 76336.3 | |
| Bayesian information criterion | 101509.7 | | 78791.0 | | 76479.3 | |
| Chi-square | 6830.5*** | | 5576.8*** | | 7153.1*** | |
| Likelihood ratio test | | | | | 2336.1*** (vs model 4) | |

Note: *** p < 0.001; ** p < 0.01; * p < 0.05; + p < 0.1.

ORs above 1 represent a positive relationship; ORs below 1 represent a negative relationship.

Table A4
Multilevel logistic regression analysis results in odds ratio.

| | Model 6 | | Model 7 | |
|---|------------------------|---------|------------------------|---------|
| | Entrepreneurial motive | | Internationalization | |
| | Odds ratio | S.E. | Odds ratio | S.E. |
| Fixed effects | | | | |
| Individual-level Control Variables | | | | |
| Age | 1.055*** | (0.003) | 1.050*** | (0.004) |
| Age-squared | 0.999*** | (0.000) | 0.999*** | (0.000) |
| Gender | 1.046* | (0.017) | 1.471*** | (0.027) |
| Household income | 1.007 | (0.012) | 1.058** | (0.019) |
| Education attainment | 1.146*** | (0.009) | 1.424*** | (0.015) |
| Firm size | 1.216 | (0.173) | 1.111 | (0.126) |
| Country-level Control Variables | | | | |
| GRP per capital | 1.181*** | (0.003) | 1.129*** | (0.009) |
| Individual-level predictors | | | | |
| Self-efficacy | 2.207*** | (0.010) | 1.244*** | (0.007) |
| Entrepreneurial motives | | | 2.027*** | (0.074) |
| Country-level predictors | | | | |
| Institutional index | 1.697* | (0.248) | 1.388 | (0.539) |
| Cross-level two-way interaction | | | | |
| Self-efficacy*Institutional index | 1.278*** | (0.022) | 1.118** | (0.035) |
| Entrepreneurial motives*Institutional index | | | 1.528* | (0.190) |
| Random effects | | | | |
| Residual country-level variance | 0.807 | | 0.507 | |
| Model Fit Statistics | | | | |
| Log-likelihood | -50633.1 | | -38773.5 | |
| Akaike information criterion | 101290.3 | | 77579.1 | |
| Bayesian information criterion | 101412.9 | | 77742.5 | |
| Chi-square | 6951.8*** | | 6646.3*** | |
| Likelihood-ratio test | 1212.9*** (vs model 3) | | 1097.4*** (vs model 4) | |

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

ORs above 1 represent a positive relationship; ORs below 1 represent a negative relationship.

Table A5
Robustness check using EFW index in odds ratio.

| | Model 8 | | Model 9 | | Model 10 | |
|---|----------------------|---------|------------------------|---------|----------------------|---------|
| | Internationalization | | Entrepreneurial motive | | Internationalization | |
| | Odds ratio | S.E. | Odds ratio | S.E. | Odds ratio | S.E. |
| Fixed effects | | | | | | |
| Individual-level Control Variables | | | | | | |
| Age | 1.065*** | (0.004) | 1.054*** | (0.003) | 1.041*** | (0.005) |
| Age-squared | 0.999*** | (0.000) | 0.999*** | (0.000) | 0.999*** | (0.000) |
| Gender | 1.463*** | (0.023) | 1.047** | (0.017) | 1.407*** | (0.027) |
| Household income | 1.062* | (0.016) | 1.011 | (0.012) | 1.028 | (0.019) |
| Education attainment | 1.439*** | (0.013) | 1.149*** | (0.009) | 1.308*** | (0.016) |
| Firm size | 1.099 | (0.094) | 0.792 | (0.169) | 1.016 | (0.127) |
| Country-level Control Variables | | | | | | |
| GRP per capital | 1.208*** | (0.004) | 1.181*** | (0.003) | 1.106*** | (0.009) |
| Individual-level predictors | | | | | | |
| Self-efficacy (SE) | 1.203*** | (0.040) | 1.303*** | (0.033) | 1.127*** | (0.025) |
| Entrepreneurial start-up | | | | | 1.220*** | (0.049) |
| Country-level predictors | | | | | | |
| Economic freedom index | 1.023 | (0.027) | 1.447*** | (0.082) | 1.031 | (0.078) |
| Cross-level two-way interaction | | | | | | |
| Self-efficacy*Economic freedom index | 1.027*** | (0.006) | 1.097*** | (0.005) | 1.011** | (0.004) |
| Entrepreneurial Start-up*Economic freedom index | | | | | 2.843*** | (0.081) |
| Random effects and model fits | | | | | | |
| Residual country-level variance | 0.976 | | 0.905 | | 0.867 | |
| Log-likelihood | -38014.7 | | -50567.9 | | -38760.8 | |
| Akaike Information Criterion | 76057.5 | | 101159.9 | | 77553.6 | |
| Bayesian information criterion | 76200.5 | | 101282.5 | | 77717.0 | |

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

ORs above 1 represent a positive relationship; ORs below 1 represent a negative relationship.

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