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DOCTORAL DISSERTATION

Three essays on firm internationalization: Digitalization, institutions, and family management

Author:

Chao Zhang

Supervisors:

Joan-Lluís Capelleras

(Universitat Autònoma de Barcelona)

Victor Martin-Sanchez

(University of Southern Denmark)

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There is no doubt that this section is one of the most challenging parts of the dissertation to write. It isn't very easy for me to look back at what happened in the last 4 years emotionally. I may need hundreds of pages to thank all the people who have been around me in this long Ph.D. marathon and who have, in any form, contributed to my life and work.

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Lastly, words should turn to my family, particularly my parents. I was born in a low-income family in the countryside in a non-known city, Yuncheng, from Shanxi Provenience. My grandparents were farmers and suffered a lot during the social revolution. Since I can remember, they have constantly reminded me and pushed me to study harder to escape the rural area and find a job in the city. My parents are not well-educated, but they are pretty open-minded. In their early 20s, they moved to Xi'an, one of China's biggest and most developed cities, for a living. They are doing small business, but this small only refers to "subsistence" for nearly 30 years. They had an adamant time starting the wholesale business because they lacked money.

Regarding that, their siblings sold all the grains to support them. My parents are very traditional in China in working, diligent and hardworking. They've never been to other places for traveling since I was born in 1995 until now, 27 years have passed. All they do and expect is to provide

a better life and study environment for my younger sister and me. We two are the focus of their entire life. When I was 22, I told them I wanted to study abroad. Initially, they disagreed because I was already enrolled in a master's program in China. Also, most people in China think it is not worth spending a lot of money studying outside if you've already registered at a well-known Chinese university. However, finally, they approved that after learning about my determination and funded my study in Barcelona. Undoubtedly, without their support, I could not accomplish such outstanding achievements. I am grateful to have such helpful, kind, and supportive parents. If reincarnation exists, let's switch the role and please let me be your "parents" taking care of both of you.

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爱我想爱的人，做我喜欢做的事

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[1] This chapter has been published and can be cited as follows. Capelleras, J. L., Martin-Sanchez, V., & Zhang, C. (2023). Does social desirability of entrepreneurship matter for early-stage entrepreneurs' internationalization? The moderating role of economic freedom. *BRQ Business Research Quarterly*, 23409444221144462. https://doi.org/10.1177/23409444221144462 (IF: 4.204; ABS/AJG: 2).

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CHAPTER I: GENERAL INTRODUCTION OF THE THESIS

1.1 Problem statement

Over the last decades, scholars have been investigating internationalization[2] processes as they are essential to understand how firms expand their operations beyond their domestic market achieving new revenue streams and ultimately higher growth prospects (Rialp & Knight, 2005; Rialp et al., 2005; Rialp et al., 2019). As defined by Reuber et al. (2018), it also reflects "the discovery, enactment, evaluation, and exploitation of opportunities" across national borders, describing possibilities for cross-border profit-seeking behavior of firms. The benefits of internationalization include access to new customers, new technologies, and new resources and the possibility to spread risk and diversify operations (Griffith et al., 2008; Knight & Liesch, 2016). Therefore, it has become increasingly crucial in today's economy, as firms seek to compete globally and take full advantage of emerging opportunities in new and growing markets (Paul & Sánchez-Morcillo, 2019; Paul & Rosado-Serrano, 2019). As such, internationalization is important for firms to remain competitive and grow in the global marketplace.

A large significant body of studies on internationalization is classified into subjects and theories (Dabic et al., 2020). Regarding subjects, there are many sub-topics of studies in this research field, ranging from entry modes (Brouthers & Nakos, 2004; Kuivalainen et al., 2007), strategies or resources used to internationalize (Lu & Beamish, 2001; Cerchione et al., 2016), to innovation-related internationalization model (Welch & Luostarinen, 1988; Luo & Bu, 2016) studies. However, the areas mentioned above have often used a heterogeneity of concepts and knowledge bases to develop their discussion despite strong similarities in the explored phenomena (García-Lillo et al., 2017).

Turning to the adopted theoretical perspectives to explain the variations in internationalization, firm international endeavors have traditionally been explained by transaction cost arguments or the process- or stage-based Uppsala model, moving from the country perspective to the microeconomic one over time (Audretsch & Guenther, 2023). Dabic et al. (2020) also identified a dominance of six critical theories in explaining variations of isnternationalization in a review paper from the Uppsala model to the resource-based theory (RBV). However, some existing theoretical perspectives still need to fully explain international endeavors due to the

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[2] It involves various activities, from exporting and licensing to joint ventures, mergers and acquisitions, and foreign direct investment (Melin, 1992; Welch & Luostarinen, 1988).

development of firm internationalization in recent eras. For instance, the established Uppsala model does not necessarily capture the constraints and opportunities in contemporary globalized markets and firms' competitive scenery (Audretsch & Guenther, 2023). The Uppsala model indicates a gradual and incremental process of acquiring and integrating knowledge and experience to develop the necessary capabilities to become increasingly active internationally. More specifically, this stepwise process assumes that firms need to obtain experience in the home market before starting export activities, establishing sales subsidiaries, and opening production plants abroad. Furthermore, firms start with geographically and culturally close markets before becoming active in more distant markets (Ribau et al., 2018). However, it has also been shown that many firms, such as Uber and Airbnb, do not follow incremental steps but have operated globally since their inception (Kuivalainen et al., 2007; Oviatt & McDougall, 2005). Hence, it is suggested to advance the development of theoretical perspectives on explaining firm internationalization to adapt to the new trends.

Moreover, despite the extensive information on internationalization over the past few decades in the literature, from the subject to theoretical perspective, the related literature is still vast, somewhat fragmented, and dispersed (Child et al., 2022; Clark & Pidduck, 2023; Monaghan et al., 2020). This is because extant research has always been reflected through various frameworks, theories, and basic assumptions that have changed over time (Bayfield et al., 2009; Ietto-Gillies, 2012). Not only has the internationalization of business activity evolved over a relatively long time, but scholars' interpretations have also changed (Ribau et al., 2015; 2018). We have yet to learn much about firm internationalization from a holistic perspective. Mainly, how do firms decide to internationalize? What type of factors influences the extent of internationalization? Furthermore, does a firm tend to internationalize slowly or focus on a narrow scope of countries? This doctoral dissertation aims to address this gap and attempt to reconcile all the internationalization dimensions, theories, and findings to paint an overall picture of firm internationalization.

1.2 Purpose and research objectives

Based on the preceding considerations, the general purpose of this dissertation is to contribute to the ongoing debate about the antecedents of firm internationalization by analyzing three factors, namely digitalization, institutional environment, and family management, where further theoretical reflection is needed, and the empirical evidence is relatively scarce and inconclusive. Three chapters are developed, targeting the decision to internationalize, the extent of internationalization, and internationalization speed and scope.

Specifically, Chapter II analyzes the decision to internationalize, focusing on how digitalization affects firms' export propensity in emerging markets. As highlighted by Dabic et al. (2020), the bias of prior research is predominately in a high-tech setting, in urban areas, in developed countries, and/or focuses on a single country, as opposed to generating knowledge based on rural areas or developing countries. Furthermore, we include home country corruption as the moderating variable in the analysis to examine how the relationship between digitalization and export propensity evolves. Corruption, as one of the most unique and prominent institutional factors in the emerging market, could not only bring benefits (e.g., reducing formalities and bureaucracy and helping build networks and knowledge) but also downsides (e.g., fear of frequent bribery and uncertainty of undermining the rule of law in the long run). Understanding how corruption affects the relationship between digitalization and export propensity would greatly interest both practice and literature.

Chapter III investigates the extent of internationalization by concentrating on the interactional effects of institutions. We start with a long-neglected area of the interaction effects in the institutional literature and address how the interaction between institutions affects the extent of internationalization. This chapter studies and answers whether economic freedom (i.e., formal institution) helps attenuate the adverse effects of social desirability of entrepreneurship (i.e., informal institution) in the home country among early-stage entrepreneurs.

Chapter IV explores internationalization speed and scope by studying whether family management discourages firm internationalization because of the pursuit of socioemotional wealth and control of the firm. We further introduce collaborative innovation as a moderating variable to examine if collaborating with different types of partners in innovative products and services helps attenuate such expected negative effect of family management on internationalization.

Each chapter is an independent study that relies on autonomous gaps, theories, data, and methodologies. However, all chapters attempt to reveal a holistic picture of the internationalization progress concerning the decision, the extent, and the speed/scope. Accordingly, the specific objectives of the dissertation are as follows:

(1) To investigate the relationship between firms' digitalization and export propensity in emerging markets and the moderating role of home country corruption. (Chapter II)

(3) To examine the effect of social desirability of entrepreneurship in the home country on early-stage entrepreneurs' internationalization and the moderating role of economic freedom (Chapter III).

(2) To study the influence of family management in the internationalization speed and scope, and the moderating role of collaborative innovation (Chapter IV).

1.3 Theoretical Foundations

To achieve our research objectives, we rely on existing theories or perspectives to explain firm internationalization. These theoretical perspectives are institutional theory (Chapter II and Chapter III), resource-based view (Chapter II), and socioemotional wealth perspective (Chapter IV). In the following sections, we briefly explain these three theories.

1.3.1 Institutional Theory

Institutional theory as a theoretical framework provides a proper perspective for understanding the institutional determinants of business activities and their global differences (Carlsson et al., 2013; Hoskisson et al., 2013). Moreover, researchers have long used institutional theory to account for environmental influences on business activities in general and start-up rates and legitimizing strategies in particular (Su et al., 2017). Among them, the connection between entrepreneurship research and institutional theory has been dominant in the studies of institutional theory. One of the first papers explicitly connected entrepreneurship and institutional theory was by Aldrich and Fiol (1994), discussing the critical role of entrepreneurs in creating new industries and alluding to their foolish audacity to act despite their liabilities of newness. However, institutional theory has been prevalently applied to international business research in the last decades considering the effects of institutional environments (El-Namaki, 1988; Hoskisson et al., 2013; Li, 2018; Muralidharan & Pathak, 2017; Verheul et al., 2002).

In general terms, institutions define in which individual intentionality is created and developed (North, 1990). According to North (1990), institutions are "rules of the game in a society," classified into formal and informal rules. Formal institutions refer to regulations, contracts, procedures, and agreements. Nevertheless, informal rules represent a society's culture, values, and social norms. North (2005) also recommended that formal institutions intend to reduce transaction costs based on the regulations. However, informal rules exist to decline the uncertainty caused by the decisions making of all individuals in a given society. One

conclusion could also be explained as formal institutions can change quickly, but informal rules change more slowly (Williamson, 2000).

Peng et al. (2008) proposed that institutions significantly affect a firm's strategy and performance by considering the institutional environment. Well-developed institutions enable firms to conduct business more efficiently using the market, and underdeveloped institutions create higher transaction costs and make the business exchange less efficient (Wright et al., 2005). Firms are perceived as passive and reactive actors, aligning their strategies and international operations with their heterogeneous institutional contexts through multiple embedders (Meyer et al., 2009). Specifically, passive recipients refer to the effect of the institutional environment on international activities. However, firms also actively engage with institutional actors to transform the institutional conditions in the home and host countries (Cantwell et al., 2010; Doh et al., 2012). Amid that, firms do not only exploit, adjust, and adapt to the existing institutional environment in the process of internationalization but also imitate, shape, and transpose institutional changes (Chidlow et al., 2021).

1.3.2 Resource-Based View (RBV)

The RBV was first proposed by Wernerfelt (1984) as an alternative to the dominant structure approach of M. Porter. The underlying theoretical foundations of the RBV rest on the differences in the firm's performance derived from resources "having intrinsically different levels of efficiency" (Peteraf & Barney, 2003). More specifically, sustainable competitive advantage is the critical focus of RBV and is often defined as relative profitability. Resources are defined as "…those (tangible and intangible) assets which are tied semi-permanently to the firm…" (Wernerfelt, 1984, p.172), and they are the primary source of a firm's competitive advantage. Barney (1991) also denoted that the characteristics of resources are (1) valuable; (2) scarce/rare; (3) hard-to-copy; (4) non-substitutable. Therefore, these attributes are why firms with such resources continuously outperform their competitors. In short, RBV provides a good efficiency-based explanation of the differences in performance among firms from the same industry according to the firm's heterogeneous resources and capabilities, consequently determining international business operations.

In internationalization, resources, and their related advantages are essential for any firm (Tallman & Fladmoe-Lindquist, 2002). Gaur et al. (2014) argued that the way firms rely on internationalization is enabled by their critical resources to overcome the liability of foreignness and newness. These essential resources can be described as cheap labor, network,

access to the market, international experience, and dominated market share in the home market, which do not need to be owned by the firm itself but may likewise be accessed by the use of digital technologies and collaborating with partners. Therefore, the willingness for international expansion and its success will depend on how well firms can develop unique resources and capabilities (Yiu et al., 2007; Gaur et al., 2014). In particular, firms' digitalization will also be required to transform home-country resources (e.g., monopolistic advantages) into sustainable and inimitable competitive in overseas markets (Lu et al., 2010; Krammer et al., 2018).

1.3.3 Socioemotional wealth perspective (SEW)

SEW is not new in family firm research, and it is described as an adequate endowment (Berrone et al., 2012) that family members derive from the business. Debicki et al. (2016) defined SEW as the array of non-financial benefits specifically associated with the well-being and affective needs of family members derived from operating a business enterprise, consisting of potential benefits such as the ability to exercise authority and make unorthodox decisions, the preservation of the sentimental value of the firm for the family members and the family dynasty, and the accumulation and conservation of the family firm's social capital.

With various benefits available to family business owners and managers, Berrone et al. (2012) developed a multi-dimensional construct for SEW including 5 categories with a FIBER model: (1) F-Family control and influence; (2) I-Family members'identification with the firm; (3) B-Building social ties; (4) E-Emotional attachment; and (5) R-Renewal of family bonds to the firm through dynastic succession. Therefore, SEW is universally regarded as a benefit beyond its financial returns (Gomez-Mejia et al., 2010; Jones et al., 2008).

The intersection between family business internationalization and SEW has attracted attention in recent years. Gomez-Mejia et al. (2010) introduced the SEW perspective in family firm internationalization, which has gained prominence over the past few years. Based on the findings above, Pukall and Calabro (2014) thus proposed an integrative theoretical model to overcome the deficiencies of integrating the SEW perspective with the revised internationalization Uppsala model. They observed inconclusiveness after conducting a narrative review of 72 related documents. They argued that the proposed framework might help understand the behaviors of family firms for internationalization, precisely their attitudes towards risk and the role of knowledge and networks.

The SEW is the most relevant approach linked to the internationalization of family firms because these topics are highly connected. Family firms are committed to preserving SEW, helping explain some of their behaviors during the internationalization process related to risk-taking attitude. SEW also posits that aversion to losing the family's legacy in the business and the goal of preserving family control can explain the international behaviors of family firms (Alayo et al., 2021). Hence, the use of SEW perspective to explain the international behavior of family firms has increased in recent years and made greater sense in the family firm internationalization (e.g., Alessandri et al., 2018; Kraus et al., 2017).

1.4 Structure of the thesis and empirical foundations

Accordingly, as previously stated, this dissertation aims to contribute to the ongoing debate and advance the understanding of internationalization, including macro and meso levels which are essential to explain firm internationalization decisions and processes (Child et al., 2022). Specifically, we present three studies that describe the curvilinear relationship between digitalization and export propensity (Chapter II), the interplay between different institutions in international entrepreneurship (Chapter III), and the relationship between family management and internationalization speed and scope (Chapter IV), respectively. The details are shown below.

Chapter II focuses on the interior features to examine the effects of digitalization and export propensity in emerging economies, entitled "The Curvilinear Relationship between Digitalization and Export Propensity: The Role of Home Country Corruption in Emerging Economies." Scholars argue that digitalization could facilitate internationalization for access to resources and markets for firms in emerging economies based on the resource-based view. Others posit that high levels of digitalization may also discourages the export propensity due to the inadequate digital infrastructure, mismatch of human capitals, and increased global competition (Ghobakhloo, 2018; Ucbasaran et al., 2008). However, most related studies have started from the direct linear effects, neglecting the dynamism of digitalization (Bruneel et al., 2018; Schueffel et al., 2011).

Furthermore, institutions matter significantly in the relationship between digitalization and internationalization, particularly in emerging markets. This might be because emerging markets are often associated with unstable and incomplete institutional contexts, which greatly influence the effects of digitalization; for example, as one of the most prominent and costly features in emerging markets, corruption explicitly and implicitly impacts international

endeavors. How corruption shapes firms' international behavior and its role in the relationship between digitization and internationalization in emerging markets remains of great interest to the literature.

Therefore, although the topic is timely and relevant, the role of digitalization in international expansion still needs to be conclusive, particularly for emerging economy enterprises (EEEs). Starting from dynamic intertwined views, we develop theoretical explanations for curvilinear relationships between digitalization and EEEs' export propensity across 73 emerging economies and 30,518 observations from 2006 to 2020 based on the World Bank Enterprise Survey (WBES) database. Furthermore, we also consider the moderating role of home country corruption in this curvilinear relationship. Our findings further support the inverted U-shaped relationship between digitalization and export propensity, and corruption also steepens such a curvilinear relationship, contributing to the RBV and institutional theory.

Chapter III, entitled "Does Social Desirability of Entrepreneurship Matter for Early-Stage Entrepreneurs' Internationalization? The Moderating Role of Economic Freedom," begins by examining macro-level factors and deals with the second objective of this dissertation, focusing on the interplay between institutions and early-stage entrepreneurs' internationalization. Institutions have already been proven to significantly influence international behaviors and play an essential role in internationalization progress, referring to the rule of the game (Eden, 2010; North, 1990). Firms often face a different set of institutional environments than their counterparts. Hence, many existing studies concentrate on the effects of institutional environments on internationalization (North, 1990; Aparicio et al., 2021; Dau-Cazurra, 2014). Nevertheless, current related literature has tended to separate the effects of different types of institutions (e.g., formal and informal institutions) on internationalization, paying more attention to the sole effects and neglecting the interaction effects. Therefore, it is necessary to address this gap to provide a more accurate overall picture of the noted interplay effects on internationalization. For instance, what if individuals with higher entrepreneurial intentions are in an unfavorable entrepreneurial contextual environment (i.e., informal institution)? Would they be pushed out of international opportunities? Could home country economic freedom (i.e., formal institution) help alleviate such adverse effects? Therefore, the interaction effects between institutions remain sparse and interesting to scholars.

Hence, based on an institutional perspective, this chapter examines the influence of the social desirability of entrepreneurship on early-stage entrepreneurs' internationalization and the moderating role of the home country's economic freedom. Using the Global Entrepreneurship

Monitor (GEM) database, we found that the domestic social desirability of entrepreneurship negatively influences early-stage entrepreneurs' internationalization and that economic freedom moderates this relationship. In other words, economic freedom could attenuate the harmful effects of the social desirability of entrepreneurship on international expansion, which is counterintuitive.

Chapter IV, entitled "Collaborative Innovation: A Solution to the Dilemma of Family Firm Internationalization," considers the meso-level aspects and deals with the third objective centering on family management and internationalization speed and scope. Since family firms tend to protect socioemotional and thus prioritize the affective endowment of family members over the financial goals (Berrone et al., 2010; Debicki et al., 2016), there would be a dilemma between economic profit and non-economic goals of protecting SEW for firms with family management. How family management impacts firm internationalization speed and scope will be of great interest. Furthermore, it would be interesting to investigate what would happen if collaborating with different types of external partners (e.g., universities, suppliers, customers, competitors) in innovating products. Would collaborative innovation help facilitate family firm internationalization speed and scope? This topic is stimulating to family firm and international business research.

Besides, Arregle et al. (2021) synthesized family firm internationalization studies and found that the internationalization scale has been widely investigated, accounting for 39% of studies in their reviewed paper. Nevertheless, scope and speed have only taken around 8% and 4%, respectively, suggesting they have long been unnoticed in the family firm internationalization literature. Some studies have regarded internationalization speed as the time to start international expansion. This does not seem very objective because internationalization is a multifaceted strategy process that occurs over time rather than consisting of a single set of decisions or discrete events (Welch & Paavilainen-Mäntymäki, 2014). Moreover, Metsola et al. (2020) also noted the missing information on "temporal evolving outcomes" referring to internationalization speed and scope.

Therefore, we examine the effects of family management concerning firm internationalization: internationalization speed and scope. In addition, we also test the moderating role of collaborative innovation on the above relationships, confirming whether external knowledge resources help solve the dilemma of family business internationalization. We use a Survey on the Business Strategies (ESEE) database for manufacturing firms in Spain, covering product

prices, governance ownership, R&D expenditures, markets, and accounting information. Our final dataset comprises 2866 firms and 16290 firm-year observations across all Spanish autonomy regions.

As a result, family management significantly influences firms' internationalization processes: negative on speed but positive on scope, which breaks our general understanding of family business internationalization (i.e., family firm discourages internationalization generally). Firms with more family management tend to slow their internationalization speed but increase the scope. Additionally, collaborating with multiple partners in innovative products and processes does not always help facilitate family firm internationalization speed and scope. Specifically, involving various collaborative partners would not help attenuate the negative effects of family management on speed. However, collaborative innovation intensity matters on scope, strengthening the family management's positive effects on internationalization scope. However, the number of collaborative type partners (i.e., diversity) presents different moderating effects.

Finally, a conclusion section is included after the three papers are presented. The objective of this section is to put all the pieces together and extract the main results from the different papers included in this dissertation. These results' main theoretical, managerial, and practical implications are detailed and further developed. Furthermore, we also discuss the limitations of this dissertation and propose some possible research topics. These topics constitute the future research agenda to advance the understanding of the internationalization of companies.

Table 1.1 summarizes the structure and main contents of this Ph.D. dissertation, showing the correspondences between objectives, theoretical backgrounds, methodology, and results of the three papers.

Table 1. 1: Structure and contents of the thesis

	Focus	Objective	Main Theoretical Background	Database	Sample	Methodology	Main findings
Introduction	Summary of the main purposes, motivations, theoretical backgrounds, structure of the dissertation and empirical foundations.						
Chapter II	Decision to internationalize	Curvilinear relationship between digitalization and export propensity; moderating role of home country corruption	RBV Institutional Theory	WBES WGI WDI	30518 observations from 73 emerging economies covering 2006-2020	Multilevel logistic regression	Inverted U-shaped relationship between digitalization and export propensity exists. Home country corruption steepens the curvilinear relationship.
Chapter III[3]	The extent of internationalization	Social desirability of entrepreneurship and early-stage entrepreneurs' internationalization; moderating role of economic freedom	Institutional Theory	GEM HF WDI	45454 early-stage entrepreneurs in 48 countries for 2005-2016	Multilevel random-effect ordered logistic regression	Social desirability of entrepreneurship negatively affects early-stage entrepreneurs' internationalization. Economic freedom positively moderates the above-mentioned relationship.
Chapter IV	Internationalization speed and scope	Family management and internationalization speed and scope; moderating role of collaborative innovation	SEW	ESEE	2866 firms and 16290 firm-year observations in Spanish Manufacturing industry covering 2002-2016	Random-effect panel regression	Family management negatively influences on internationalization speed yet positively affects scope. Collaborative innovation (diversity and intensity) does not present moderating role on the relationship between family management and speed. Only collaborative innovation intensity positively moderates the relationship between family management and scope yet diversity does not perform similarly.
Conclusions	Stylized summary of the main findings, theoretical and practical implications, limitations and future research agenda.						

Note: WBES: World Bank Enterprise Survey; WGI: Worldwide Governance Indicators; WDI: World Development Indicators; GEM: Global Entrepreneurship Monitor; HF: Heritage Foundation of Economic Freedom; ESEE: Survey on Business Strategies.

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CHAPTER II: THE CURVILINEAR RELATIONSHIP BETWEEN DIGITALIZATION AND EXPORT PROPENSITY: THE ROLE OF HOME COUNTRY CORRUPTION IN EMERGING ECONOMIES

2.1 Introduction

Digitalization and its advances have been proved to transform international business operations and reshape the evolution of the business world (Jean & Kim, 2020; Parviainen et al., 2017; Monaghan et al., 2020; Verhoef et al., 2019). Moreover, advanced digital technologies have also been identified as enablers of internationalization. (Reuber & Fischer, 2011; Hennart, 2019). Technology that integrates information and communication in the workplace are beneficial for faster transport and the development of local and global networks (Brieger et al., 2022), allowing firms identify and explore new opportunities, achieving efficiency and effective planning, enhancing problem-solving skills, and fostering decision-making process. Therefore, digitalization contributes to efficient local adaption and more client interaction (Autio, 2017; Coviello et al., 2017).

Extant literature has focused on the role of digital transformation in various industries (Baraldi & Nadin, 2006; Hesmondhalgh & Meier, 2018), in new venture internationalization (Brieger et al., 2022; Jean & Kim, 2020;) and in international experience (Dillon et al., 2020). There is also an increasing interest in examining the essence of digitalization on internationalization (Pergelova et al., 2019) and risks associated with internationalization (Kim & Cavusgil, 2020). However, the current understanding of specific influential mechanisms of digitalization on internationalization remains underdeveloped. This is because most current studies have investigated the direct linear effect of digitalization on international expansion and proved powerful enabling effects of digitalization on internationalization such as the role of internet and website (Jean & Kim, 2020), digital platform (Ardito et al., 2021), and information and communication technology (Luo & Bu, 2016).

On the contrary and surprisingly, some scholars recently proposed the effects of too much digitalization on the international expansion (Bergamaschi et al., 2020; Hadjikhani & Lindh, 2020), particularly for firms in emerging economies. They argue that high levels of digitalization may require robust country's digital infrastructure, higher requirements of digital trained workers, and abundant international experience for global competition in the internationalization, which emerging economies might hardly provide and ultimately discourage internationalization in the long run. Therefore, calls on the dynamic intertwined

perspective studying the relationship between digitalization and internationalization are growing (Bergamaschi et al., 2020).

This study aims to advance the understanding of digitalization-internationalization dynamic linkage. By the notion of digitalization, we follow Luo and Bu (2016) which regards it as the means to gain access to knowledge, narrow the gap with market leaders in the global competition, and exploit opportunities to leapfrog. Specifically, it represents the use of digital infrastructure (e.g., email and website) as mediums for selling products and services creating value for customers and stakeholders in line with the definitions of previous studies (Autio, 2017; Baskerville et al., 2020; Brieger et al., 2022; Laudon & Laudon, 2015). The costs associated with internationalization have been a significant barrier to entry for emerging economy enterprises (EEEs). Today, EEEs can internationalize at a comparatively lower cost through websites or email to sell products and services (Autio et al., 2018) although too much dependence may also take adverse effects. We, therefore, argue EEEs who use digitalization for daily activities would go through an inverted U-shaped impact to internationalize their ventures. We also contend that using email and websites as a resource for EEEs makes it easier to reach foreign customers and is also limited by inadequate emerging markets' digital infrastructure, mismatch of human capital and stiff global competition when at the over-digitalization stage.

As the focus on home country characteristics helps to better comprehend the context where EEEs' digital activities induce decisions to internationalize (Brieger et al., 2022), we also go in depth regarding the boundary conditions of the relationship between digitalization and internationalization. One the one hand, typically firms are often better able to benefit from the home country institutional environment and may even take full advantage of home country resources for their internationalization (Adomako et al., 2019; Khanna & Palepu, 2010). On the other hand, their international endeavors could also be destroyed because of unfavorable institutional environment. Against this backdrop, we investigate the moderating role of home country corruption, which is prominent in most developing and emerging countries (Petrou & Thanos, 2014; Wang et al., 2018). Particularly, scholars are questioning whether bribery paid by firms is entirely unethical behavior that increases operational costs or simply unavoidable "grease", necessarily relating to export permission and facilitating internationalization (Fuentelsaz et al., 2020; Marano et al., 2016). It remains inconclusive. As a double-edged sword, how this unethical practice matter for the relationship between digitalization and internationalization remains limited.

Above all, to fill in the above research gaps and combine resource-based view (RBV) of EEEs, this study investigates the interplay between digitalization and internationalization based on a dynamic intertwined perspective. Specifically, we argue that digitalization may perform a curvilinear relationship with export propensity. Our main research question thus is how EEEs' digitalization fosters export propensity? Apart from the above, we further test the moderating role of home country corruption based on the institution-based view (IBV) which exerts significant mixed influence in international expansion in the emerging markets (Belitski et al., 2016). According to The World Economic Forum (2019), corruption, theft, bribery, and other illicit financial flows cost emerging economies US$ 1.26 trillion annually, recommending that the inherent difficulties arise in combating corruption when nations do not possess robust systems and policies to deal with that. At the same time, such rent-seeking stems from the corruption of government officials, which is less likely to happen in developed countries and potentially increases transaction costs and uncertainty for firms (Adomako et al., 2021). As such, corruption is considered a solid constraint to growth and development that many emerging countries are not doing enough to tackle (Adomako et al., 2021), while some argue corruption effectively drives growth by greasing the wheels (Hanousek & Kochanova, 2016). An institutional void and immaturity at the home base (e.g., corruption) can also lead to firms' opportunistic behavior and keeping opaqueness (Li et al., 2021). Given the mixed findings, how corruption influences the relationship between digitalization and international expansion remains of great interests.

To test these hypotheses, we combine secondary data from World Bank Enterprise Survey (WBES) with data from World Development Indicator (WDI) and Worldwide Governance Indicators (WGI) database. We apply multilevel modeling on a sample of 30518 firm-level observations and 73 emerging economies covering 2006 to 2020. For the sake of completeness, we also examine the relationship between digitalization and post-entry performance (i.e., export intensity) as well as the moderating role of corruption. In line with our theorizing, our results present that there is an inverted U-shaped relationship between digitalization and export propensity. EEEs using digitalization to sell their products and services gain benefits at the acceptable level of digitalization yet over-digitalization could decrease their willingness to export. Furthermore, home country corruption steepens the curvilinear relationship.

Our multi-level study makes three key contributions to existing research. First, we contribute a better understanding of digitalization by exploring its curvilinear effect on EEEs' export propensity, responding to the call of Bergamaschi et al. (2020). Academic research on the link

between digitalization and international expansion remains very limited and has been largely based on the enterprises in advanced economies (Jean et al., 2020). Our multi-country fills in this gap and subsequently provides new insights on how digital technologies shape international expansion in emerging economies. Second, we shed light on the boundary conditions of home country characteristic (i.e., corruption) that either flattens or steepens the curvilinear relationship, answering the call for more research to better understand the context of EEEs' internationalization (e.g., Autio, 2017). Third, our study emphasizes the role of home country institutional environment at the country level and digitalization at the firm-level from a practical perspective, inducing greater interest of EEEs and policymakers.

The remainder of this paper is organized as follows. The following section develops the literature review that leads to our hypotheses. Then, we describe our methodology and results. Finally, a discussion of main ideas, limitations, and future research lines are concluded.

2.2 Literature review and hypotheses development

2.2.1 Digitalization in emerging market

Extant studies on internationalization have been primarily focused on firms from developed countries (Sousa et al., 2008). Therefore, evidence on emerging market is scarce regarding the contexts. Furthermore, Hoskisson et al. (2000) advised emerging markets are moving to a market-friendly environment steadily with a relatively fast economic growth rate. The rapid development of economies, the explosion in consumer demand surging foreign direct investment inflows, and intense competition with counterparts lead to the dynamism of emerging market, which cause great uncertainty to the firms (Peng et al., 2008). Despite the above-mentioned advantages of emerging markets, weak institutions, inefficient legal framework, and its enforcement and information asymmetry fail to ensure a relatively efficient and effective market, to some extent even undermine the domestic market (Meyer et al., 2009; Khanna & Palepu, 1997). Therefore, international expansion potentially provides an escape route from these constraints and further allow EEEs to capitalize on their factor-cost advantages compared to firms from advanced markets (Cuervo-Cazurra et al., 2015; Luiz et al., 2017). Moreover, internationalization (e.g., exporting) not only allows EEEs access external markets, but also to diversify their revenue pipelines and reduce asymmetry risk (Li et al., 2013). Emerging economies present a particular context for exporting activities in which both institutional environment and firm capabilities vary between emerging markets and advanced markets.

To realize a better internationalization outcome, EEEs are highly forced to depend on their embeddedness in the organizational or inter-organizational network that accelerates collaboration and reciprocity (Luo & Bu, 2016). Therefore, EEEs face more challenges compared to their counterparts from advanced economies and rely on "intangible resourcefulness" and need interdependence when competing in the international markets and thus leading to greater information processing requirements (Keupp & Gassmann, 2009). Digitalization might be the means to increase EEEs' embeddedness and attain the intangible resource, benefiting the procedure of production, marketing, sales, and distribution and obtaining competitive advantages in international market competition (Lee & Falahat, 2019; Chen & Kamal, 2016; Laplume et al., 2016). Enhancing information process capacities afforded by digitalization thus may be especially crucial.

As a result, we theorize the export propensity by combining resource-based (RBV) and institution-based views (IBV). First, we use RBV to explain the effects of digitalization on export propensity, which depends on how well firms can develop unique resources and capabilities through digital technologies. A vital foundation of the RBV is that differences in resource endowments can generate a competitive advantage and leverage the firm performance (Gerschewski et al., 2015). Enterprises in emerging markets suffer from limited access to resources and consequently need to carefully evaluate the benefits and costs of their investments (Rosin et al., 2020). Therefore, effectively managing resource allocation through a strategic orientation, for example, the use of digital technologies, is essential for their survival (Crespo et al., 2023). Research has shown that firms can strategically implement digital technologies to expand and leverage resources within their processes (Ladeira et al., 2019; Rosin et al., 2020). Consequently, we contend that EEEs might be able to foster competitive and sustainable advantages (e.g., low-labor costs and monopolistic advantages) by exploring the benefits of promoting digital technologies.

Second, we also draw upon IBV and take into account it in the relationship between digitalization and export propensity. According to IBV, firm behavior and strategy are highly depending on institutional environments (Peng et al., 2008). As noted earlier, institutional environments in emerging economies are not robust. To this end, we identify one attribute of the institutions within the EEEs home country that merit consideration with respect to export propensity: corruption. Despite corruption that features emerging economies as beset by less efficient regulation and frequent bribery that fails to make a successful market and provide a place for power rent, it is a double-edged sword with both existing positive and negative points

(Lee & Falahat, 2019; Chen & Kamal, 2016). It is hence stimulating to investigate how corruption matters in the relationship between digitalization and export propensity. Research framework is following below.

Figure 2. 1: Multilevel research framework
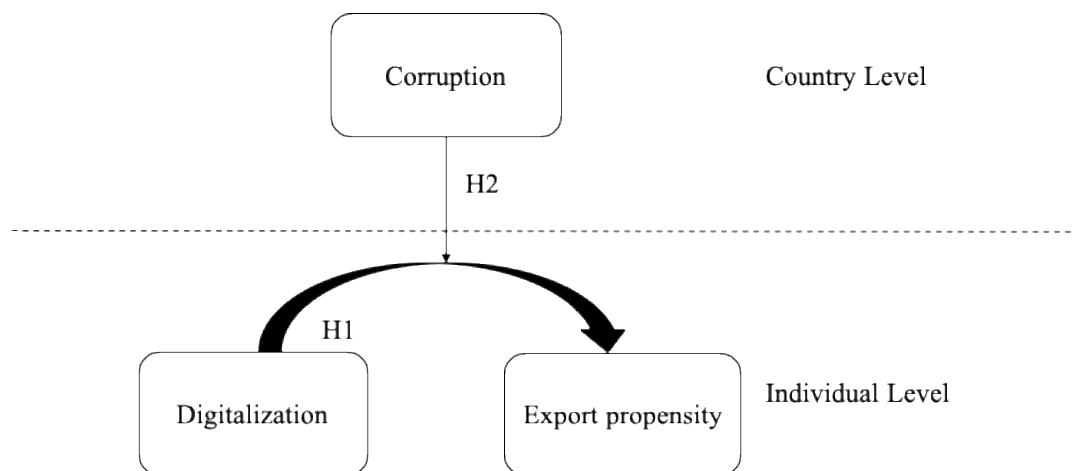
2.2.2 Digitalization and export propensity

The interplay between digitalization and business internationalization has started since Lovelock and Yep (1996), who emphasized information technology as a driver of industry globalization. Subsequently, it has become an increasingly exciting area in boosting internationalization, as various digital technologies are growing and applying in business practices.

As well, scholars have already confirmed the positive effects of digitalization on firms' internationalization (Biggiero, 2006; Zucchella et al., 2007; Luo & Bu, 2016; Jean & Kim, 2020; Puthusserry et al., 2020; Hagsten & Kotnik, 2016). Additionally, Charalabidis et al. (2015) reported that digitalization helps shape organization structures and processes and then allows firms penetrate new foreign market. In addition, Jean and Kim (2020) found the similar mechanism of digital platform and website facilitating firms' internationalization. Contrary to the above, studies of digitalization's potential risks remain sparse, far fewer in the number of related literature. Consequently, Bergamaschi et al. (2020) proposed that more attention should be put on the drawbacks of digitalization during the business internationalization process.

There is a real-life example of Jumia[4], an online marketplace in Nigeria. In its early stages, Jumia faced significant challenges that hindered its growth and export propensity. Limited internet penetration and digital payment infrastructure hindered the ability of Jumia to connect with customers, let alone international ones. Consequently, much of their operations were local. As Jumia embraced more digital technologies, they started to see a significant increase in their reach and operations. They developed their own logistic company, Jumia Logistic, and payment platform, JumiaPay, to overcome infrastructural challenges, allowing Jumia to reach more customers, not just within the countries it operates but also starting to attract foreign customers, indirectly increasing their export propensity. However, with further digitalization associated with the firm daily operational activities, Jumia started facing more complex issues. High operational costs due to expensive digital infrastructure (e.g., digital payment system), limited human talent capitals, and increasing competition from global players posed significant challenges which might overshadow the benefits and ultimately reduce their export propensity. Contrastingly, a similar marketplace in an established economy, like Amazon in the U.S., would have more resources and support system to cope with high levels of digitalization. The presence and affordability of advanced digital infrastructure, better access to skilled talent, and well-established logistics networks would facilitate a company like Amazon to keep scaling its operations internationally, unlike Jumia, who faced diminishing returns at high levels of digitalization.

Above all, our study responds to the previous call and investigates the relationship between digitalization and internationalization based on a dynamic perspective instead of a static cause-effect view. According to Welch and Luostarinen (1988), internationalization is defined as the process of business activities across home country borders with an increasing degree in operations and consists of discovery, enactment, evaluation, and exploitation of opportunities, divided in decision-making and developing process. Specifically, our study only focuses on the first stage, which describes as influence of digitalization on firms' decision whether to export in the emerging economies.

Starting the point of EEEs' nature shortcomings (i.e., smallness, less advanced technology affordances, resources, experience, training, and knowledge limitation), it would be harder for such firms to compete with well-established firms in their domestic market, not to mention start exporting. However, digitalization provide means for those firms seeking for overseas

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[4] https://www.jumia.com.ng/

markets. Increasing the degree of digitalization from low to intermediate levels allows EEEs to enhance their willingness to export by reducing information asymmetry and leveraging potential competencies of digitalization.

First of all, studies have shown that digitalization helps firms identify opportunities and reach a worldwide market (Johanson & Vahlne, 2009; Ojala et al., 2018) to develop niche market. As well, the broad market reach offered by digitalization provides timely insights from many users across countries. This is because digital processes sustain direct engagements, and then relationships with customers are direct and of significant size and scope. That deepens a timely opportunity recognition and further helps EEEs expand decisions (Autio, 2017; Amankwah-Amoah et al., 2019).

Second, digitalization also has come to create a network for firms to directly interact with stakeholders, which is richer and broader than a single buyer-seller relationship and facilitates the efficiency of communication (Johanson & Vahlne, 2009; Monaghan et al., 2020). Legner et al.'s (2017) evidence confirmed firms are fast and direct to share innovation, build resources quickly and construct complementary assets that amplify the synergistic strengths of decreasing digital technologies barriers. Additionally, a relaxed international business environment favors for EEEs to access all kinds of resources and to take advantage of their capabilities for early and rapid internationalization under the foundation of digital technology changes (e.g., digital platform, social media, crowdsourcing, and crowdfunding systems), which all facilitate EEEs' willingness to go international (Pagani & Pardo, 2017).

However, as the degree of digitalization increases beyond a threshold, its benefits in terms of rising EEEs' export propensity are likely to diminish and further hinder their willingness to start exportation. First, with the increase in digitalization, inadequate country-level digital infrastructure in the emerging economies, such as broadband construction and penetration and power shortages, significantly limits EEEs' ability to fully benefit from digitalization, suggesting it would impact an EEE capacity to utilize digital tools effectively and efficiently, which can hamper and constrain EEEs from integrating and leveraging digital technologies to enhance their competitiveness in the global market (Ghobakhloo, 2018).

Second, the requirement of human capitals who are well trained tech-savvy is growing more crucially as digitalization increases for leveraging digital technologies effectively. Therefore, there might be an issue of the mismatch between the use of advanced technologies and human capital among EEEs (Nath et al., 2010; Ucbasaran et al., 2008). Access to skilled labor capable

of utilizing digital technologies is often a challenge in emerging markets. For example, World Economic Forum (2021) stated that in some African countries, less than 2% of the workforce is trained in digital skills. Thus, limited availability of such type of workforce can result in inefficient use of digital tools and subsequently impact the EEEs' international attractiveness at a high level of digitalization.

Third, emerging economies often have to compete with established firms from advanced economies, which are usually equipped with advanced technologies and have more resources at their disposal (Hortaçsu et al., 2009; Kahiya, 2018). Moreover, the Global Competitiveness Report (2020) noted that emerging economies often face a disadvantage in terms of business dynamism and innovation capability when competing with firms from developed economies. This stiff global competition can ultimately turn the potential benefits of digitalization into a burden, leading to reduced export propensity.

As a result, considering these arguments, we propose that digitalization has a curvilinear relationship with EEEs' export propensity in the emerging market. Digitalization helps facilitate EEEs to become exporters at the beginning, however once beyond the cutoff values, the positive effects would decrease. Consequently, our first hypothesis is shown below.

H1: Digitalization has an inverted U-shaped relationship with EEEs' export propensity.

2.2.3 The moderating role of home country corruption

In order to advance the understanding of the effectiveness of digitalization on the extent to EEEs' export propensity, we utilized the institution-based view (IBV) to investigate the contingency role of home country corruption. It is commonly known that "institutions matter" in constructing firms' behaviors and business internationalization (Elango & Dhandapani, 2020; Peng et al., 2009). Institutions influence the resource allocation in a country (Amankwah-Ahmoah et al., 2019; Baumol, 1990). Mangers select their value creation mechanisms based on their perceptions of the institutional environment where they do the business. Particularly in a corrupt institutional context, rent seeking becomes more prevalent, enabling government officials to affect firms' business activities through various implicit policies, rules, and regulations occurring pervasively in emerging market.

Two conflicting arguments of corruption exist in the literature. Anokhin and Schulze (2009) advised that corruption can be regarded as a virtual tax, which discourages economic activities. The reason could be firms may suffer from the higher costs of a more corrupt environment (Estrin et al., 2013). In contrast, firms have possibilities to obtain unique competitive

advantages through bribes to government officials to access more resources and bypass the obstacles, regarded as the grease of the economy (Méon & Sekkat, 2005). Next, we discuss further in details the moderating role of corruption on export propensity.

We propose that the inverted U-shaped relationship between digitalization and export propensity is steeper in strong corruption contexts than those with weak corruption. That is, corruption may strengthen positive effects of low-to-intermediate digitalization, yet it may also intensify the downsides of high levels of digitalization.

In countries where corruption is prevalent, businesses often have to navigate complex, opaque regulatory systems that can impede their operations, including their digitalization efforts and their ability to compete in international markets. A corruption environment may produce a playfield for EEEs to be able to navigate regulatory obstacles or expedite processes through informal means, which can facilitate its initial foray and the international market. Therefore, we argue that high corruption enhances positive effects of digitalization on export propensity at lower levels of digitalization for following reasons. (Chowdhury & Audretsch, 2020; Méon & Sekkat, 2005). First, at the country level, corruption often fosters the creation of intricate informal networks and political connections. In such environments, EEEs that are able to "play the game" could potentially gain an advantage at the early stages of digitalization. They might receive faster approvals, better access to resources, or more favorable regulations, all of which can support their initial digitalization efforts on the entry into international markets (Rose-Ackerman & Palifka et al., 2016). Second, high corruption at the country level often leads to market distortions, with resources, opportunities, and benefits disproportionately concentrated among some entities. In such cases, EEEs can navigate the corrupt system could experience an accelerated digitalization process at the lower level, thereby facilitating the export propensity (Méon & Weill, 2010; Zhuang et al., 2010). Therefore, at the lower levels of digitalization, the above political connections and informal networks and market distortion could potentially result in a more pronounced positive relationship between digitalization and export propensity.

However, these do not imply that corruption is beneficial in the long run as digitalization increases, and it is important to note that these short-term gains come with long-term costs. While it might appear to facilitate business operations at lower level of digitalization, it also exacerbates the problems associated with higher levels of digitalization. First, as digitalization increases, so does the requirement for robust and sound institutional quality. However, high levels of corruption at the country level often undermine the rule of law and breed a lack of transparency in society, leading to greater uncertainty in the business environment (Treisman,

2000; Belitski et al., 2016). This uncertainty and unstable business environment can potentially reduce the effectiveness of digitalization efforts in increasing export propensity in the long run with high levels of digitalization.

Second, the costs of corruption could rise as well with at the high digitalization levels (Aidis et al., 2012; Belitski et al., 2016). EEEs might face escalating demands for bribes, become overly reliant on illicit practices, and fail to address underlying operational inefficiencies, all of which can hinder their ability to compete effectively in international markets (Baker et al., 2005; Tonoyan et al., 2010; Wang et al., 2018). Additionally, increasing digitalization can also lead to higher visibility, making the EEEs a bigger target for corrupt officials. Third, country-level corruption can also influence a country's digital infrastructure and human capital tool. For instance, corruption may lead to misallocation of resources away from public goods like education and infrastructure, including digital infrastructure (Gyimah-Brempong, 2002), which might significantly influence the EEEs' ability to leverage digital tools as digitalization increases. Therefore, at high levels of digitalization stage, the negative influence of corruption could become more prominent.

While corruption might offer an immediate advantage at the low-to-intermediate level of digitalization, it fails to address underlying issues. As firms continue to advance their digitalization efforts, these unresolved problems can become more pronounced, leading to diminishing returns and a potential decline in export propensity at higher levels of digitalization. Specifically, we argue that the downsides stemming from home country corruption are less pronounced or offset at the low-to-intermediate digitalization stage but become essential in the high levels of digitalization stage due to variations in the acceptance of uncertainty and associated costs. Hence, a corruption environment can also amplify the downturn in the inverted U-shape relationship between digitalization and export propensity. We propose that corruption may also exacerbate the potentially detrimental effects of high levels of digitalization on export propensity, steepening the downslope of the inverted U-shaped relationship between digitalization and export propensity.

The above arguments lead to the following hypothesis.

H2: Corruption moderates the inverted U-shaped digitalization-export propensity relationship in such a way that the inverted U-shaped effects become steeper when EEEs locate in contexts with strong corruption than those in contexts with weak corruption.

2.3 Methods

2.3.1 Data collection

We collected data mainly from the World Bank's Enterprise Surveys (hereafter WBES), which have been conducted since the 1990s by various World Bank units. The WBES provides detailed firm-level information in a worldwide scope, especially in emerging markets. Moreover, the topics in the WBES cover a wide array of infrastructure, trade, finance, innovation, regulations, perceptions about obstacles to doing business, etc., through face-to-face interviews with top managers and owners. The Sampling methodology for implementing Enterprise Surveys is stratified random sampling, which increases estimates' precision and lowers standard errors. Furthermore, standardized questionnaires and rigorous interview protocols also ensure consistency and comparability of the data from different countries.

Due to the missing information on the countries from WBES, our analysis is based on the pooled cross-sectional dataset comprising 30518 firm-level observations covering 2006 to 2020 and 73 emerging economies, distributed among 6 regions (i.e., Africa, East Asia and Pacific, Eastern European and Central Asia, Latin America and the Caribbean, Middle East, and South Asia) globally where 4284 are exporters after cleaning the observations with missing data (for further details in Table 2.1). Besides, 5.42% of samples left are from Nigeria the most; 0.18% are from Montenegro, the least. The other countries are distributed steadily from around 1% to 4% of the total samples.).

Table 2. 1: Sample distribution

Regions	Countries	Frequency	Percent	Cumulative (%)	Regions	Countries	Frequency	Percent	Cumulative (%)
Africa	Angola	351	1.13	1.13		Estonia	179	0.58	45.06
	Botswana	333	1.07	2.20		Georgia	208	0.67	45.73
	Burundi	260	0.84	3.04		Hungary	192	0.62	46.34
	Congo, Democratic Republic	304	0.98	4.01		Kazakhstan	322	1.04	47.38
	Côte d'Ivoire	431	1.39	5.40		Kosovo	150	0.48	47.86
	Eswatini	286	0.92	6.32		Kyrgyz Republic	147	0.47	48.34
	Gambia	154	0.50	6.82		Latvia	179	0.58	48.91
	Ghana	442	1.42	8.24	Eastern European and Central Asia	Lithuania	179	0.58	49.49
	Guinea	201	0.65	8.88		Moldova	246	0.79	50.28
	Guinea-Bissau	109	0.35	9.23		Montenegro	55	0.18	50.46
	Kenya	648	2.08	11.32		North Macedonia	228	0.73	51.19
	Madagascar	372	1.20	12.52		Poland	168	0.54	51.73
	Mali	475	1.53	14.04		Romania	225	0.72	52.45
	Mauritania	226	0.73	14.77		Russia	540	1.74	54.19
	Mauritius	293	0.94	15.71		Serbia	269	0.87	55.05
	Mozambique	419	1.35	17.06		Tajikistan	172	0.55	56.61
	Namibia	321	1.03	18.09		Turkey	853	2.74	59.36
	Nigeria	1685	5.42	23.51		Ukraine	503	1.62	60.97
	Rwanda	201	0.65	24.16		Argentina	856	2.75	64.56
	Senegal	459	1.48	25.64		Bolivia	497	1.60	66.16
	South Africa	935	3.01	28.64		Brazil	924	2.97	69.13
	Tanzania	370	1.19	29.83		Chile	849	2.73	71.86
	Uganda	453	1.46	31.29		Colombia	927	2.98	74.84
	Zambia	479	1.54	32.83		Ecuador	554	1.78	76.63
	Indonesia	93	0.30	33.13	Latin America and the Caribbean	El Salvador	662	2.13	78.75
East Asia and Pacific	Lao PDR	354	1.14	34.27		Guatemala	488	1.57	80.32
	Mongolia	206	0.66	34.93		Honduras	412	1.33	81.65
	Philippines	147	0.47	35.40		Mexico	1242	3.99	85.64
	Vietnam	98	0.32	35.72		Nicaragua	425	1.37	87.01
	Albania	202	0.65	36.37		Panama	528	1.70	88.71
	Armenia	208	0.67	37.04		Paraguay	429	1.38	90.09
Eastern European and Central Asia	Azerbaijan	208	0.67	37.71		Peru	562	1.81	91.90
	Belarus	166	0.53	38.24		Uruguay	457	1.47	93.37
	Bosnia and Herzegovina	156	0.50	38.74	Middle East	Iraq	450	1.45	94.81
	Bulgaria	1135	3.65	42.39		Afghanistan	166	0.53	95.35
	Croatia	509	1.64	44.03	South Asia	Bangladesh	1446	4.65	100.00
	Czech Republic	140	0.45	44.48					

2.3.2 Variable measures

Dependent variables. Table 2.2 summarizes the operationalization of the variables in our analysis. Our study operationalizes export propensity by the decision whether to be an exporter or not. Similar to previous research (Ganotakis & Love, 2012; Estrin et al., 2008), the export propensity is developed by a dummy variable equal to 1 for exporters and 0 otherwise.

Independent variable. To measure the independent variable i.e., firms' digitalization, there is no common method to measure firms' digitalization in the related literature. The most frequent metrics for its assessment relate to marketing, sales, and support (Vadana et al., 2019). For example, Ardito et al. (2021) measured it through a digital orientation proxy, which counts the areas where digital technologies have been adopted (i.e., advertising, selling, purchasing, distribution, operation, etc.). Even though this type of measure reflects the scope of use for digitalization on various business activities, that still lacks the connection with the extent to firms' digitalization. Besides, Hagsten and Kotnik (2016) refined it as a four-construct measurement that contains online presence, online transactions, digital infrastructure, and digital training for employees. However, the measure on the integration of digital expenditures and digital capabilities remains scarce.

Therefore, following Luo and Bu's (2016) measure method, we adopted a composite index consisting of digital capabilities and digital expenditures to measure digitalization. As a result, firms' digitalization index can be expressed by the following formula:

$$Firm's\ Digitalization\ Index_{it} = (\log \frac{CO_{it}}{N_{it}})e^{CA_{it}}$$

where CO_{it} represents the total annual digital expenditure such as in ICT services and digital training for employees in t year. In addition, CO_{it} has uniformly converted into U.S. dollars according to official exchange rate in the last day of t year. N_{it} represents the number of permanent, full-time employees of firm i in t year as employees are likely to be trained for increasing their own digital capabilities regularly. Taking into account digital expenditure also helps us fully understand the firm's attitudes towards digital technology and their investment in this digital area. In order to make digital expenditure more comparable across countries and industries and combine later digital capability, we took the logarithm form of the ratio between annual digital expenditure and number of employees. Moreover, CA_{it} represents digital capability which involves the use of digital infrastructure such as email or website for selling

products or services to customers. Specifically, we code 2 if firms both use both email and website, 1 if the firm only uses one of them, and 0 if the firm uses neither.

The above measure firms' digitalization first developed a highly composite index that incorporates digital capabilities and digital expenditures, making contributions in measuring degree of digitalization. Second, digital expenditure (i.e., amount in \$) and digital capability (i.e., 0-2 scale) are significantly inconsistent and asymmetric in scale. We used a logarithm function to transform digital expenditure and an exponential function to transform digital capability to combine them appropriately. $\text{Log}\left(\frac{CO_{it}}{N_{it}}\right)$ normalizes the variabilities of digital expenditure and reduces its scale to an appropriate level comparable to the scale of exponentially transformed digital capability.

Moderating variable. Corruption originates from Worldwide Governance Indicators (hereafter WGI), which describes the country-level institutional environments through a set of 6 indicators covering the process by which governments are selected, monitored, and replaced, the capabilities of governments effectively implement, and the respect of civil rights (Kaufmann et al., 2009). Based on the WGI original dataset, we reverse the already established scale to capture corruption, which finally ranges between -2.5 and 2.5 with higher grades indicating strong corruption and vice versa.

Control variables. The selection of control variables has to be driven by prior studies. Individual- and country-level features are both controlled. Regarding the individual level and accounting for firm heterogeneity, we include firm size and age as firms' basic factors are commonly controlled by the related literature newness (Wiklund et al., 2010; Ucbasaran et al., 2013). Size is measured by the logarithm of the number of permanent employees given that larger firms tend to internationalize faster than smaller firms (Bernard et al., 2007), while age is measured by operating years since the EEE was founded (logarithm). Apart from the above, foreign ownership is also controlled because foreign-own companies are known to have better technologies and market networks which can improve export performance (Krammer et al., 2018), measured by the percent of the focal firm owned by foreign capitals, either foreign individuals or organizations. Similarly, we still control for public ownership (i.e., percentage of ownership by the state or government) because of the importance of state-own firms in emerging markets (Hoskisson et al., 2000). Besides, quality of workforce is also introduced as a control measured using EEE managers' subjective ratings on the extent of obstacles posed by inadequately educated workforces (in a scale of 0-4).

Concerning to the country level, we controlled the institutional quality to reduce the potential highly correlated effects which corruption might capture from institutional environments. Institutional quality was proxied through the 5 governance dimensions (e.g., voice and accountability, political stability, government effectiveness, regulatory quality, and rule of law) developed by Kaufmann et al. (2009) for the WGI, as noted earlier. Our research utilized principal component analysis to elaborate a composite score of institutional environment (Garrido et al., 2014), reducing 6 indicators to 1 factor and allowing us to capture institutional quality in a single variable. As a consequence, the higher final score recommends strong institutional quality in the home country. What is more, three other country-level indexes are also controlled, namely GDP annual growth, Internet cover rate, and official exchange rate. We argued that these three controls are associated with the export propensity when EEEs decide whether to export.

Table 2. 2: Variable description

Variables	Definition	Source
Dependent variables		
Export propensity	Dummy variable. The probability to become an exporter. Exporter=1; Non-exporter=0	Enterprise Survey Dataset
Independent variable		
Digitalization index	Current firms' digital index constructed by a formula which integrates annual digital expenditure, digital infrastructure, and number of permanent employees	Enterprise Survey Dataset
Moderating variable		
Corruption	Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests	Worldwide Governance Indicators
Control variables		
Firm size	The size of the firm, measured by the number of permanent employees	
Age	The number of years since the firm was established	
Quality of workforce	Subjective assessments by the EEE managers of the obstacles posed by inadequately-educated workforces, on a five-point scale (0-4)	Enterprise Survey Dataset
Foreign ownership	The percentage share of equity ownership by "private foreign individuals, companies or organizations"	
Public ownership	The percentage share of ownership by the state or government	
Institutional quality	The overall institutional quality in a given country consisting of five dimensions: voice of accountability, political stability, government effectiveness, regulatory quality, and rule of law.	Worldwide Governance Indicators
Internet cover rate	Individuals using the Internet in a given country (% of population)	
GDP annual growth	GDP growth (annual %) in the fiscal year	World Development Indicators
Official currency exchange rate	Official exchange rate (local currency units relative to the U.S. dollar. period average)	

2.3.3 Estimation model

Because of the multilevel nature of our data and dummy dependent variable (export propensity), we use a hierarchical modeling method (i.e., multilevel logistic regression) reporting fixed effects on coefficient estimation and random effects on variance components allowing intercepts vary randomly across countries (Amorós et al., 2019; Autio et al., 2013; Capelleras et al., 2019; Estrin et al., 2013a; 2020). Specifically, the fixed effects in the model represent the relationships between the independent variables and the outcome variable that are consistent across all groups, while the random effects account for variations that are specific to each group. This allows for modeling of both within-group and between-group variability, making multilevel logistic regression suitable for analyzing hierarchical or clustered data, where observations are nested within different groups. It thus provides information about the strength and significance of the relationships between the independent variables and the outcome variable, as well as the amount of variability accounted for by the random effects.

All in all, our dataset is a cross-section pooled time-series, in which firms are hierarchically nested by countries (Aguinis et al., 2013). Multilevel analysis allows us to address unobserved heterogeneity within the context of a cross-country and cross-time dataset (Estrin et al., 2013; 2020). We do not run standard multivariate methods because they would impede us from assuming the independence of observations (Hofmann et al., 2000). In other words, we would be assuming that individuals act homogenously but do not consider how the environment influences their decisions. In this case of institutions and export-oriented activity we observe a similar structure where firms are level 1 and countries level 2 similar to recent research such as Amorós et al. (2019), Autio et al. (2013), and Nguyen-Van and Chang (2020) where they encourage studies consisted of two levels to use this approach.

Hence, we follow Aiken and West (1991)'s method. The equation is shown below.

$$Y_{ij}^* = \beta_0 + \beta_1 X_{ij} + \beta_2 X_{Square_{ij}} + \beta_3 Z_j + \beta_4 (X_{ij} \times Z_j) + \beta_5 \left(X_{Square_{ij}} \times Z_j \right) + \text{Controls} + \varepsilon_{ij}$$

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

$$\begin{cases} Y_{ij} = 1 \ if \ Y_{ij}^* > 0 \\ Y_{ij} = 0 \ if \ Y_{ij}^* = otherwise \end{cases}$$

where X_{ij} is on behalf of the frim i's digitalization in country j, Z_j is the degree of corruption in country j. Besides, Y_{ij}^* represents the probability of firm i located in country j to export and

Y_{ij} for its observed variable. β_0 is the intercept of the multilevel logistic estimation, ε_{ij} is on behalf of the disturbance term with constant variance and random distribution. The predictors were entered into the regression equation in four steps. In the first step, only control variables are entered as null model. In the second step and third step, the linear (X_{ij}) and quadratic ($X_{\text{Square}_{ij}}$) terms of digitalization were successively added to detect linear and quadratic main effects. In order to test the moderating role of corruption on the curvilinear relationship of digitalization with export propensity, the linear interaction between digitalization and corruption ($X_{ij} \times Z_j$) and quadratic-by-linear ($X_{\text{Square}_{ij}} \times Z_j$) terms were introduced in the final step.

2.4 Results

2.4.1 Descriptive statistics

Table 2.3 presents descriptive results for the variables listed above, for the whole sample from 73 countries. The average value of export propensity suggests that 17.4% the firms in the dataset are exporters. We also conducted group mean comparisons using one-way ANOVA to test if average values of export propensity significantly across sampled countries. The result shows that export propensity differs significantly across firms in the entire countries. Furthermore, the average export intensity among truncated sample is 41.95%. Table 2.3 still suggests the average values of corruption 0.42. Digitalization index on average among all the samples is 31.42.

Turning to the controls, the average firm age is 16.69, whereas number of full-time permanent employees is around 83.56. In terms of ownership, the average foreign ownership is observed as 9.11% and public ownership accounts for 0.56% suggesting less public influenced by government. In addition, managers of EEEs regard inadequately educated workforce as a moderate obstacle on average. Regarding the country-level controls, average institutional quality is 0.021 across all the countries and average GDP annual growth is around 4.22%. Average Internet cover rate in the sampled countries is 16.181%. In addition, official currency exchange rate between local currency and USD dollars is around 542.76.

Table 2. 3: Descriptive Statistics

	Observation	Mean	Std. Dev.	Min	Max
(1) Export propensity	30518	0.174	0.379	0	1
(2) Corruption	30518	0.416	0.628	-1.457	1.638
(3) Digitalization index	30518	31.415	25.839	-0.081	1.561
(4) Firm size	30518	83.565	321.199	1	18208
(5) Age	30518	16.692	15.686	1	190
(6) Quality of work	30518	1.446	1.337	0	4
(7) Foreign ownership (%)	30518	9.110	27.198	0	100
(8) Public ownership (%)	30518	0.562	6.195	0	100
(9) Institutional quality	30518	0.021	2.133	-4.876	5.474
(10) GDP annual growth (%)	30518	4.22	4.938	-14.814	18.333
(11) Internet cover rate (%)	30167	16.181	15.740	0.296	72.5
(12) Official currency exchange rate	30518	542.764	1668.789	0.214	17065.083

2.4.2 Regression results

Besides, Table 2.4 describes the correlation coefficients among the above variables, implying there is no higher correlation between independent variables, dependent variables and controls. We still carried out the VIF test to estimate if multicollinearity issues exist. The results of this test reveal there is no potential multicollinearity issue, and the average value is lower 10 (Neter et al., 1990). Moreover, Table 2.5 reports the results of hierarchical regression model for export propensity. Specifically, Model 1 to Model 4 represents the four steps of entered variables mentioned in the prior section. Model 1 only includes control and moderating variables. Model 2 introduces digitalization to test direct linear effects on export propensity. Model 3 tests the quadratic linear effects of digitalization. Model 4 examines the moderating role of corruption. Besides, the fixed effects of year and industry are controlled in all the model by dummy variables.

Table 2. 4: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Export propensity	1.000					
(2) Corruption	-0.113*	1.000				
(3) Digitalization index	0.246*	-0.259*	1.000			
(4) Firm size (log)	0.168*	-0.153*	0.166*	1.000		
(5) Age (log)	0.419*	-0.082*	0.318*	0.311*	1.000	
(6) Quality of work	0.113*	-0.057*	0.157*	0.085*	0.187*	1.000
(7) Foreign ownership	0.151*	-0.044*	0.126*	-0.022*	0.172*	0.015*
(8) Public ownership	0.029*	0.023*	0.034*	0.065*	0.093*	0.018*
(9) Institutional quality	0.054*	-0.722*	0.146*	0.048*	0.055*	0.088*
(10) GDP annual growth (log)	-0.062*	0.098*	-0.036*	-0.038*	-0.056*	-0.035*
(11) Internet cover rate (log)	0.159*	-0.520*	0.281*	0.192*	0.171*	0.201*
(12) Official currency exchange rate (log)	-0.130*	0.254*	0.111*	-0.127*	-0.132*	-0.129*

p<0.05

Table 2.4: Correlation matrix (Continuous)

	(7)	(8)	(9)	(10)	(11)	(12)
(7) Foreign ownership	1.000					
(8) Public ownership	-0.010*	1.000				
(9) Institutional quality	0.007*	-0.013*	1.000			
(10) GDP annual growth (log)	0.061*	0.019*	-0.183*	1.000		
(11) Internet cover rate (log)	-0.062*	0.015*	0.494*	-0.197*	1.000	
(12) Official currency exchange rate (log)	-0.010*	-0.024*	-0.246*	0.134*	-0.410*	1.000

$p<0.05$

According to Model 2 in Table 2.5, the direct linear effect of digitalization on export propensity in emerging economies is positive and significant ($\beta = 2.302, p < 0.01$). However, when we introduce quadratic term of digitalization in Model 3, the results support hypothesis 1 that digitalization has an inverted U-shaped relationship with export propensity, as the main direct effect of digitalization in Model 3 is positive and significant ($\beta = 4.839, p < 0.01$) and squared term of digitalization is negative and significant ($\beta = -2.735, p < 0.01$).

Turning to the moderating role of corruption on the curvilinear relationship between EEEs' digitalization and export propensity, our study also supports hypothesis 2. Model 4 shows a statistically significant and positive coefficient for the linear interaction term between digitalization and corruption ($\beta = 2.091, p < 0.01$) and a statistically significant and negative coefficient for the quadratic interaction term ($\beta = -2.230, p < 0.01$). These results indicated the proposed inverted U-shaped relationship between digitalization and export propensity is moderated by corruption. In particular, the curve is steepened by high level of corruption (Haans et al., 2016).

Table 2. 5: Multilevel logistic regression results (dependent variable: export propensity)

	(1)	(2)	(3)	(4)
Firm size(log)	0.688***	0.612***	0.593***	0.592***
	(0.019)	(0.020)	(0.02)	(0.020)
Age(log)	0.189***	0.148***	0.144***	0.147***
	(0.030)	(0.030)	(0.03)	(0.030)
Foreign ownership	0.075***	0.065***	0.063***	0.062***
	(0.018)	(0.019)	(0.019)	(0.019)
Public ownership	0.009***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)
Quality of workforce	0.003	0.001	0.002	0.003
	(0.004)	(0.004)	(0.004)	(0.004)
Institutional quality	-0.101	-0.087	-0.084	-0.070
	(0.115)	(0.124)	(0.117)	(0.121)
GDP annual growth(log)	0.232	0.278	0.341	0.362
	(0.251)	(0.269)	(0.255)	(0.263)
Internet cover rate (log)	0.336***	0.208*	0.199*	0.197*
	(0.100)	(0.108)	(0.102)	(0.105)
Official exchange rate(log)	-0.056	-0.145***	-0.111***	-0.110**
	(0.042)	(0.045)	(0.043)	(0.044)
Corruption	-0.188	-0.102	-0.127	-0.414
	(0.250)	(0.271)	(0.255)	(0.300)
Digitalization index		2.302***	4.839***	4.606***
		(0.114)	(0.360)	(0.379)
Digitalization index_ square			-2.735***	-2.555***
			(0.366)	(0.378)
Digitalization index*Corruption				2.091***
				(0.666)
Digitalization index_ square * Corruption				-2.230***
				(0.632)
Digitalization: Slope at min			5.284***	5.022***
Digitalization: Slope at max			-3.700***	-3.373***
Turning point within the range			YES	YES
Industry	YES	YES	YES	YES
Year	YES	YES	YES	YES
Intercept	-5.075***	-5.014***	-5.483***	-5.495***
	(0.736)	(0.775)	(0.758)	(0.772)
Country-level variance	0.232***	0.275***	0.241***	0.257***
	(0.064)	(0.076)	(0.067)	(0.072)
Log likelihood	-6275.681	-6064.283	-6036.10	-6029.427
Wald Chi2	2313.47***	2495.23***	2511.75***	2509.89***
Degree of freedom	31	32	33	35
Observations	17265	17265	17265	17265
Groups	35	35	35	35

Note: (1) Standard errors are in parentheses. The asterisks indicate significance at the following levels: *** p<0.01, ** p<0.05, * p<0.1 (2) Fixed effects of Industry and Year are also controlled in all models.

To gain more insights into how corruption moderates the curvilinear relationship between digitalization and export propensity, we plot the moderating relationships in Figure 2.1 (Aiken & West, 1991). We considered one standard deviation below and above the mean to represent the low and high levels of corruption. As demonstrated in Figure 2.2, regardless of the contexts of high or low corruption, the slopes at the minimum and maximum of digitalization are consistent with the results shown in Table 2.5, confirming the existence of an inverted U shape. Besides, the interaction graph indicates that EEEs born in contexts with a high level of corruption exhibit a pronounced inverted U-shaped relationship between the degree of

digitalization and export propensity than those in contexts with a low level of corruption, which is relatively symmetric. This indicates the curvilinear effect of digitalization on export propensity becomes stronger as corruption grows, corroborating the expectations formulated in Hypothesis 2. Notably, a high level of corruption might strengthen the positive effects of digitalization through its greasing role and intensify the adverse effects of high levels of digitalization by the greater uncertainty in the long run, costs of corruption, and misallocation of resources. For firms located in contexts with low corruption, the turning point occurs more gradually compared to contexts with high corruption. This suggests that the positive effects of digitalization last longer in low corruption environments. In other words, the uncertainty and costs of corruption arrives early in the contexts of high corruption compared with that in the low corruption contexts, further putting turning point ahead.

Figure 2. 2*: Interaction graph of corruption in the curvilinear relationship between firms' digitalization and export propensity*
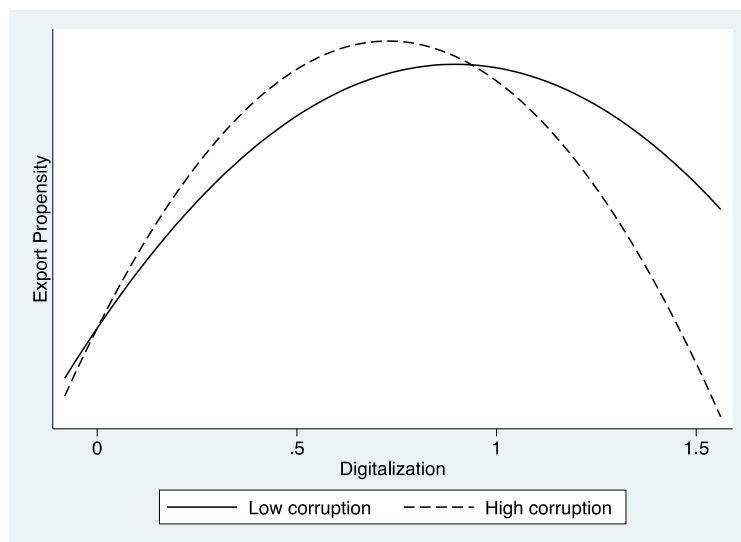
Concerning the control variables, the effects of variables vary in terms of two different levels. Regarding the individual-level controls, firm size and age are all significantly positive to the export propensity, recommending bigger and older EEEs are more willing to internationalize because of strong ability to resist potential risk and abundant experience in line with Krammer et al. (2018). Furthermore, foreign and public ownership perform positive impacts on export propensity, which is in line with the literature (Bernard et al., 2007) whereas quality workforce does not influence exporting willingness aligning findings of Krammer et al. (2018).

As for the effects of other macro-level controls, official exchange rate negatively influences export propensity, recommending that the exchange rate will be the main concern when EEEs decide to export. As exchange rate goes up, the willingness to export decreases. Internet cover rate positively influences EEEs' willingness to go international. In addition, GDP annual growth and institutional quality does not matter the EEEs' decision to internationalize.

2.4.3 Robustness check

As a robustness check, we add a cubic term of digitalization to the estimation equations to test whether the relationship is S-shaped rather than inverted U-shaped. This conduct can help us confirm the observed relationship is indeed quadratic. As expected, our robustness results depict the coefficient of the cubic term is not significant, confirming there is no S-shaped relationship between digitalization and export propensity. We further tested the nature of the inverted U-shaped relationship following a procedure suggested by Haans et al. (2016). To confirm the existence of an inverted U-shaped relationship, it is not sufficient that the coefficient for the quadratic term be significant. Two additional features should occur. First, the slopes at the ends of data range are significant and of the expected sign which are positive slopes at the smallest value of digitalization and negative slopes at the highest value. Second, the turning point should be located in within the data range. At the bottom of Table 2.5, we report the results of the additional analyses of the inverted U-shaped relationship and show the slopes at the extremes of our data range are of the expected sign and significant. The turning point locates exactly within the data range. Fieller method (Fieller, 1954) was used to estimate the confidence interval of the turning point.

On the other hand, the effects of digitalization on willingness to internationalize vary within countries, particularly in the situations of country-level digitalization. To address this, we convert our firm-specific responses for digitalization into country-level averages for the sampled emerging economies. Then, we classified the samples into two groups based on the median of sampled country-level digitalization and rerun the regression separately about two groups (i.e., above the median and the other). This conversion addressed explicitly the heterogeneity within the countries regarding the country-level digitalization (Yi et al., 2013; Krammer et al., 2018). We found that the regression results of two groups are similar to the main regression we did before regarding the curvilinear effects of digitalization on export propensity shown in Table 2.6 (Model 1 and Model 3). However, the moderating effects of corruption might yield different magnitude effects on such curvilinear relationship between

digitalization and export propensity according to the country-level digitalization (Model 2 and Model 4 of Table 2.6).

Table 2. 6: Regression results based on the division of country-level digitalization

	(1) Low Country-level Digitalization	(2) Low Country-level Digitalization	(3) High Country-level Digitalization	(4) High Country-level Digitalization
Firm size(log)	0.525***	0.525***	0.773***	0.776***
	(0.023)	(0.023)	(0.042)	(0.042)
Age(log)	0.155***	0.156***	0.158**	0.160***
	(0.035)	(0.035)	(0.061)	(0.062)
Foreign ownership	0.071***	0.071***	0.023	0.023
	(0.022)	(0.022)	(0.039)	(0.039)
Public ownership	0.006***	0.006***	0.011***	0.011***
	(0.001)	(0.001)	(0.002)	(0.002)
Quality of workforce	-0.001	-0.001	0.012	0.012
	(0.004)	(0.004)	(0.008)	(0.008)
Institutional quality	-0.071	-0.119	-0.014	0.031
	(0.076)	(0.115)	(0.103)	(0.147)
GDP annual growth(log)	0.324	0.347	0.248	0.188
	(0.247)	(0.253)	(0.364)	(0.355)
Internet cover rate (log)	0.192**	0.166	0.221	0.233*
	(0.097)	(0.102)	(0.138)	(0.137)
Official exchange rate(log)	-0.107***	-0.109***	-0.125*	-0.133**
	(0.041)	(0.042)	(0.065)	(0.065)
Digitalization index	2.502***	2.607***	11.781**	4.972
	(0.744)	(0.749)	(5.282)	(5.022)
Digitalization index_ square	-0.895**	-0.998**	-11.862*	14.312
	(0.423)	(0.405)	(7.012)	(19.331)
Corruption		-0.629		-1.523**
		(0.386)		(0.619)
Digitalization index*Corruption		2.392**		32.755***
		(1.085)		(8.509)
Digitalization index_ square * Corruption		-2.382***		-125.914***
		(0.916)		(32.286)
Industry	YES	YES	YES	YES
Year	YES	YES	YES	YES
Intercept	-4.469***	-4.471***	-7.001***	-6.621***
	(0.883)	(0.902)	(1.098)	(1.084)
Country-level variance	0.208***	0.219***	0.333***	0.314***
	(0.061)	(0.064)	(0.127)	(0.120)
Log likelihood	-4349.93	-4344.75	-1626.58	-1621.27
Wald Chi2	1271.18***	1271.60***	715.78***	717.46***
Degree of freedom	30	33	30	33
Observations	9170	9170	8030	8030
Groups	35	35	35	35

Note: (1) Standard errors are in parentheses. The asterisks indicate significance at the following levels: *** p<0.01, ** p<0.05, * p<0.1 (2) Fixed effects of Industry and Year are also controlled in all models.

Additionally, as mentioned in the methods, there is no standard method to measure firms' digitalization in the related literature. However, some scholars argue measurement could start from a digital orientation proxy (Vadana et al., 2019; Ardito et al., 2021). We hence use a more straightforward measure for digitalization to verify the model related to communication, purchasing, delivering, and R&D. In doing so, respondents are required to answer the following questions "Do you use digital technologies for communication?", "Do you use digital

technologies to order purchases for this establishment?", "Do you use digital technologies to deliver services and products to your clients?" and "Do you use digital technologies to do R&D on new products and services?". All the responses are recorded as 0=No and 1=Yes. We then took the mean of the answers from the above questions and re-conduct the regression model shown in Table 2.5. Based on the results deriving from a new measure of digitalization, we didn't confirm the curvilinear effect and moderating role of corruption rather only the direct linear effect of digitalization on export propensity. The valid responses to the above-mentioned questions are limited. Specifically, the number of answers in digital technologies for communications is 1901 across all firm-level observations, and the highest number of responses is for digital technologies used to deliver services and products to clients, which has only 4014 responses. Therefore, due to the significant reduction in observations in the regression model compared to the regression in Table 2.5, the estimates might yield inconsistencies. Moreover, the measure of digitalization proxy doesn't consider the annual expenditures among the samples, which is completely different from our measures shown in Section 2.3.3. Our measures take into account digital expenditures and digital capabilities, implying that various results might occur between two types of measures on digitalization index.

Apart from the alternative measures of digitalization, we further conduct additional tests using alternative measures of corruption to ascertain the robustness of the results. Our measure for the corruption is captured from WGI. Alternatively, we are able to access the other measures in WBES dataset that has explored important obstacles for business performance, including corruption, government effectiveness and political instability. Respondents were asked to select the degree of obstacles for the specific factor (e.g., corruption) ranging from 0-4 subjectively with lowest degree (0) and highest degree (4). Besides, we took the mean of all responses of each country. The results confirm the consistency of our outcomes.

Furthermore, one of the main issues when using survey data for statistical analysis is common method variance (CMV). This always takes place when independent and dependent variables are originated from the same source, potentially leading to spurious correlations that arise from the way that data constructs are measured. We believe that CMV issue is not a serious issue for several reasons. First, WBES does not include any personal information that could identify the respondents, and this strongly reduces the likelihood for managers selecting their socially desirable answers. Then, our dependent variables are not perceptual measures but based on the accounting information. CMV is less likely to appear when objective data is used.

2.4.4 Further analysis

Moreover, Krammer et al. (2018) has identified three prominent attributes of institutional environments within the EEEs home countries that merit consideration in relation to EEEs' export propensity: political instability, competition from the informal sector, and the level of corruption. The focuses of these factors are motivated by the broader literature in comparative institutional theory that characterizes emerging countries as beset by insufficient regulatory and political institutions that fail to ensure market access and provide level playfield (Schneider et al., 2010). We further investigated the other two attributes as our moderating variables. Specifically, we measure informal competition based on the managers' responses to the questions: "To what extent is competition from the informal sector affects business operations" and capture political instability by the extent to is political instability an obstacle to the current operations of this establishment. The scale of responses is the same as the alternative measure of corruption. The results are shown in Table 2.7, and we found informal competitors and political instability are not significantly moderating the curvilinear effects of digitalization on export propensity, suggesting these two home country institutions might not be able to steepen or flatten the curvilinear effects.

Lastly, this study mainly focused on the first internationalization stage (i.e., export propensity), concerning the decision stage. However, we have no information on the effects of digitalization on the second stage of internationalization related to post-entry performance (i.e., export intensity). The growing use of digital technologies means cheaper and greater access, better coordination and higher productivity and lower costs when firms implement international expansion strategy (Jean et al., 2020; Williams et al., 2020), suggesting it would benefit firm international expansion. Moreover, applying these digital technologies have also enabled new ventures to achieve greater responsiveness and agility while adapting quickly to the volatility of international markets (Zahra, 2021). In the phase of implementing internationalization, would these mentioned positive effects stay longer, or is there holding a threshold? Does curvilinear effect exist in the relationship between digitalization and export intensity? This question remains scarce.

Therefore, we further investigated the role of digitalization on the EEEs' export intensity and the moderating role of corruption on the above relationship as a post-hoc analysis shown in Table 2.8. The procedure is the same as what we did in the Table 2.5 but using a Tobit model. Surprisingly, empirical results show digitalization performs a U-shaped effect on export intensity as shown in Model 3 of Table 2.8 ($\beta_{direct\ linear\ term} = -0.309, p < 0.01$;

$\beta_{quadratic\ term} = 0.172, p < 0.05$). This might be because firms face increased competition from other firms that have also adopted digital technologies in the new market, making it more difficult for firms to maintain their level of export intensity, mainly if they cannot differentiate themselves from foreign market competitors. Additionally, as firms invest more resources in digitalization, new costs and challenges are coming out, such as the need to acquire and manage new capabilities and resources, offsetting the benefits of digitalization and reducing firms' ability to export in practice. Once the lowest turning point is passed, as the level of digitalization increases and the adaptation to a new market, the liabilities of newness and foreignness decreases. Hence, benefits of digitalization completely suppress the losses of new costs and challenges in the new markets. Regarding the moderating role of home country corruption, Model 4 of Table 2.8 depicts that there is no either direct linear interaction or curvilinear interaction effects between digitalization and corruption in the emerging economies. That said, home country institution exerts little impact on the moderating role of post-entry performance and probably host country institution matters a lot at the post-entry stage.

Table 2. 7: Regression results of additional moderators

	(1)	(2)
Firm size(log)	0.593***	0.592***
	(0.020)	(0.020)
Age(log)	0.144***	0.145***
	(0.030)	(0.030)
Foreign ownership	0.062***	0.063***
	(0.019)	(0.019)
Public ownership	0.008***	0.008***
	(0.001)	(0.001)
Quality of workforce	0.002	0.003
	(0.004)	(0.004)
Institutional quality[5]	0.011	-0.055
	(0.083)	(0.098)
GDP annual growth(log)	0.398	0.345
	(0.252)	(0.261)
Internet cover rate (log)	0.166*	0.222**
	(0.101)	(0.103)
Official exchange rate(log)	-0.125***	-0.104**
	(0.043)	(0.044)
Digitalization index	3.973**	4.764***
	(1.561)	(0.392)
Digitalization index_ square	-1.549	-2.715***
	(1.647)	(0.414)
Informal competitor	0.350	
	(0.283)	
Digitalization index*Informal competitor	0.468	
	(0.841)	
Digitalization index_ square * Informal competitor	-0.639	
	(0.880)	
Political instability		-0.225
		(0.207)
Digitalization index*Political instability		0.734
		(0.505)
Digitalization index_ square * Political instability		-0.481
		(0.449)
Industry	YES	YES
Year	YES	YES
Intercept	-6.111***	-5.547***
	(0.878)	(0.751)
Country-level variance	0.227***	0.245***
	(0.064)	(0.069)
Log likelihood	-6034.444	-6034.381
Wald Chi2	2514.36***	2511.47***
Degree of freedom	35	35
Observations	17265	17265
Groups	35	35

*Note: (1) Standard errors are in parentheses. The asterisks indicate significance at the following levels: *** p<0.01, ** p<0.05, * p<0.1 (2) The fixed effects of Industry and Year are also controlled in all models.*

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[5] The measure of institutional quality has included corruption in both models. However, Model 2 of Table 2.7 has excluded political instability in the measurement of institutional quality.

Table 2. 8: Regression results on export intensity

	(1)	(2)	(3)	(4)
Firm size(log)	0.023***	0.024***	0.025***	0.025***
	(0.004)	(0.004)	(0.004)	(0.004)
Age(log)	-0.062***	-0.059***	-0.058***	-0.058***
	(0.007)	(0.007)	(0.007)	(0.007)
Foreign ownership	0.000	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)
Public ownership	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Quality of workforce	0.002***	0.002***	0.002***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
Institutional quality	0.011	0.010	0.009	0.008
	(0.007)	(0.007)	(0.007)	(0.008)
GDP annual growth(log)	0.022	0.019	0.017	0.019
	(0.021)	(0.021)	(0.021)	(0.021)
Internet cover rate (log)	0.011	0.019**	0.020**	0.021**
	(0.008)	(0.009)	(0.009)	(0.009)
Official exchange rate(log)	-0.011***	-0.004	-0.006*	-0.006*
	(0.003)	(0.003)	(0.004)	(0.004)
Corruption	0.028	0.020	0.022	0.011
	(0.018)	(0.018)	(0.018)	(0.045)
Digitalization index		-0.143***	-0.309***	-0.322***
		(0.028)	(0.088)	(0.094)
Digitalization index_ square			0.172**	0.183**
			(0.087)	(0.090)
Digitalization index*Corruption				-0.018
				(0.167)
Digitalization index_ square * Corruption				0.045
				(0.145)
Digitalization: Slope at min			-0.337***	-0.212***
Digitalization: Slope at max			0.228*	0.250*
Turning point within the range			YES	YES
Industry	YES	YES	YES	YES
Year	YES	YES	YES	YES
Intercept	0.233***	0.260***	0.292***	0.292***
	(0.054)	(0.054)	(0.057)	(0.058)
Country-level variance	0.097***	0.096***	0.096***	0.096***
	(0.002)	(0.002)	(0.002)	(0.002)
Log likelihood	-849.096	-835.833	-833.865	-833.457
LR chi2	519.91***	546.44***	550.37***	551.19***
Degree of freedom	31	32	33	35
Observations	3376	3376	3376	3376
Pseudo R^2	0.234	0.246	0.248	0.248

Note: (1) Standard errors are in parentheses. The asterisks indicate significance at the following levels:
*** p<0.01, ** p<0.05, * p<0.1 (2)The fixed effects of Industry and Year are also controlled in all models.*

2.5 Discussion and Conclusion

Despite digitalization increasing prominence in both practice and theoretical level, its role in business internationalization is not well understood. Extant literature overemphasizes the positive effects of digitalization on firms' internationalization, starting from a static perspective (Luo & Bu, 2016; Hagsten & Kotnik, 2016; Banalieva & Dhanaraj, 2019; Ojala et al., 2018) rather than a dynamic rapport. In light of the call of Bergamaschi et al. (2020), clarifying the relationship between digitalization and export propensity is of great importance for understanding how firms can benefit from digitalization in terms of international expansion. We further investigate the moderating role of corruption among these relationships. We discuss these contributions in turn.

2.5.1 Theoretical contributions

To our best knowledge, this paper might be the first effort to investigate the curvilinear relationship between digitalization and export propensity based on the large samples of EEEs from 30518 firm-level observations and 73 countries. While numerous researchers have linked digitalization and international expansion, their results on the influence of digitalization on internationalization are inconclusive in the related literature (Bergamaschi et al., 2020).

We contribute to the related literature in two ways. First, the results highlight the dual role of the degree of digitalization in the decision stage of internationalization. Some researchers have found that digitalization facilitates internationalization (Luo & Bu, 2016; Hagsten & Kotnik, 2016; Jean & Kim, 2020), whereas others have warned that high levels of digitalization may elicit higher standards of digital infrastructure and human capital which emerging economies hardly provide and consequently limit the firm going international (Bergamaschi et al., 2020; Ghobakhloo, 2018). Building on extant framework, the present study offers a more balanced theoretical framework for understanding how digitalization affects internationalization. The results reveal an inverted U-shaped effect of digitalization on the decision to internationalization, implying that appropriate degree of digitalization is optimal while higher degree of digitalization is harmful to the EEEs' export willingness. Specifically, an appropriate digitalization level can foster EEE becoming exporters through access to the constrained resources, reaching foreign markets, and helping to build international experience, knowledge, and network (Puthusserry et al., 2020). However, if digitalization within EEEs reaches a relatively higher level, the positive effects of digitalization on export propensity could be curtailed by the inadequate digital infrastructure, the lack of skilled workers, and stiff global

competition in emerging economies, ultimately resulting in diminishing returns until a decline occurs which is consistent with the Hadjikhani and Lindh (2020): the liabilities of digitalization. Therefore, this study helps to explain the hitherto inconsistent research findings on the digitalization-internationalization relationship, responding to the call of Bergamaschi et al. (2020) with respect to a dynamic intertwined perspective of digitalization on internationalization. Furthermore, we also extend and provide the novel RBV explanations of exports by reinforcing the relevance of EEE digitalization for their decision to export (Yi et al., 2013).

Second, by combing IBV, our study contributes to a contingency perspective of home country corruption for the moderating role of the inverted-U-shaped relationship. Specifically, the findings reveal that corruption steepens the inverted-U-shaped relationships between digitalization and export propensity, which helps facilitate the positive effects of digitalization at the low-to-intermediate degree of digitalization stage on the EEEs' export willingness but also exacerbates the negative effect of digitalization at the over-digitalization stage. Incorporating a contingency view into the nonlinear effects of digitalization provides a more precise understanding of how different degree of digitalization affects EEEs' export propensity. Corruption, like many things, has both pros and cons simultaneously, and these pros and cons always seem to coexist (Belitski et al., 2016). At the stage of low-to-intermediate digitalization, also known as the stage of learning knowledge of foreign markets, the benefits of corruption that EEEs can obtain are salient to help firms facilitate the decision to internationalize, which can be explained by the "grease economy." The positive effects of digitalization could be strengthened by high levels of corruption by the creation of intricate informal networks and political connection which EEEs might receive faster approval and more favorable regulations (Belitski et al., 2016; Estrin et al., 2013). Besides, the benefits disproportionately concentrated among some entities in the highly corrupted contexts could also facilitate the positive impacts on export propensity at the stage of low digitalization. However, corruption losses are becoming more evident and significant and eventually exceed its advantages at the high levels of digitalization stage, in which EEEs already have basic information and knowledge on foreign markets and exporting. The costs of corruption with high digitalization (e.g., fear of excessive bribery) and more significant uncertainty caused by undermining the rule of law in the long term augment the harmful effects of high levels of digitalization on export propensity (Adomako et al., 2021; Belitski et al., 2016) and hence decrease the willingness to export. Furthermore, high country-level corruption also weakens the country's digital infrastructure

and human capital due to the misallocation of resources which even steepens the downslope between high levels of digitalization and export propensity. Above all, it is crucial to remember that the advantages of corruption are short-term and unsustainable advantages. They not only contribute to a culture of corruption and lack of trust in emerging economies but also create an unfavorable business environment in the long term. As EEEs increase their level of digitalization, they might find themselves more exposed to the negative impacts of corruption, such as escalating demands for bribes and greater uncertainty. This, in turn, ultimately may reinforce the downturn phase of the inverted U-shaped relationship between digitalization and export propensity at the stage of high levels of digitalization.

In summary, this study extends the literature on the importance of contextual analysis by showing how corruption conditions the digitalization-internationalization relationship.

2.5.2 Practical implications

The findings not only provide managerial advice for EEEs when using digital technologies to go international, but also provide policy suggestions for the local authorities.

First, the primary managerial implication of this study is that EEEs need to balance the benefits of adopting digitalization for export propensity. Using digital technologies for daily operations provides many benefits to EEEs, such as reducing information asymmetries (Lee & Falahat, 2019), improving knowledge integration and sharing within and outside the organization (Alberti-Alhtaybat et al., 2019), and discovering foreign market opportunities and reaching stakeholders (Kim et al., 2018). Therefore, EEEs should fully exploit the advantages of digitalization for internationalization. Nevertheless, EEEs should be aware of the negative effects of high levels of digitalization on internationalization. This is because the present results show that the willingness to internationalize may be weakened through unsound emerging economies' digital infrastructure, mismatch of human capital, and stiff global competition if EEEs are at high levels of digitalization. Thus, appropriately utilizing multiple digital technologies is a challenge for managers during the decision-making process in international expansion.

Second, our findings regarding the moderating role of corruption suggest that the curvilinear relationship is steepened by home country corruption in the emerging markets. The implications for policymakers suggest that the effects of digitalization on export propensity benefit greatly from corruption yet are also damaged by its downsides at different stages of digitalization. Although corruption represents incomplete regulation that may be beneficial for

business internationalization to some extent, the idea behind its role recommends that policymakers make efforts to ease export formalities, provide access to resources and business opportunities created, while exerting enough of its positive functions. Local authorities could create a business environment that reduces bureaucracy, simplifies the permission process, and facilitates transparency in the long term to reduce the uncertainty.

2.5.3 Limitations and future research lines

Although our study provides significant insights regarding the effects of digitalization on export propensity and the moderating role of an institutional factor on its curvilinear relationship, it is still not free of limitations.

This study measure firms' digitalization, mainly focusing on the use of digital technologies in the daily activities to sell products or services to customers and contact stakeholders following the formula developed by Luo and Bu (2016). However, digitalization consists of various technologies such as big data, robotic systems, cloud systems, additive manufacturing, etc. (Strange & Zucchella, 2017). Each effect of digital technology may vary on firms' internationalization because of different functions. For example, big data are becoming more critical on implementing throughout their organization to obtain more profound and well-informed managerial and strategic decisions (Charalabidis et al., 2015). Cloud systems and automation of knowledge are becoming less expensive than before and exponentially improve power and capabilities when going international (Chen & Chen, 2015). In addition, Lee and Falahat (2019) argued that these multidimensional digital technologies allow firms to obtain competitive advantages, improve productivity, and integrate knowledge sharing inside and outside the organization, etc. Therefore, to fully understand the effects of digitalization on business internationalization, future research may incorporate different digital technologies to describe the degree of firms' digitalization and develop better proxies.

Another opportunity for future research arises from the moderating effects of institutions. In this study, we focus on the moderating effects of home country institutions on the relationship between digitalization and export propensity. However, research shows that host country institutions may influence firms' internationalization (Estrin et al., 2013; Autio et al., 2013). Apart from the above, corruption was selected as our moderating variable. While our theoretical arguments and subsequent empirical findings justify this choice, other important and relevant institutions that can be considered in future research.

Further, our study has boundary conditions that open opportunities for future work. First, the constructs for digitalization and internationalization are based on export activity, and firms remain decisions as to whether to internationalize or not. There might be situations in which the firm is digitally born globally in emerging markets, in which the decision to internationalize would be the compulsory choice (Paul & Rosado-Serrano, 2019). Speed and scope might be another issue for future studies. At the same time, other formats of internationalization, for instance, joint ventures and mergers and acquisitions, matter a lot. Second, our institutional settings are built on the foremost recent transitions of emerging markets, accompanied by a relatively fast economic growth rate, the explosion in consumer demand, and surging foreign direct investments. EEEs can exploit the benefits from the room of power rent-seeking, which is greatly impacted by corruption. There might be another concern that when the development of economies and consumer demand in emerging markets are stalled, and there is no power rent-seeking in the emerging markets (more stable and sound regulations), we would need additional empirical tests to determine whether corruption steepens the hypothesized curvilinear effects.

Although we have identified curvilinear relationships between digitalization and export propensity in emerging markets, as well as the moderating influence of corruption, it is unclear whether these findings can be generalized to developed markets. For instance, firms in Japan and India may exhibit divergent digitalization behaviors with regard to internationalization and the impact of corruption. Japan's negative digitalization effects may be less pronounced than those of India due to its long-standing leadership in advanced manufacturing, export competitiveness founded on extensive international experience, high-quality products, efficient supply chains, and cutting-edge technologies, which Indian firms lack. Thus, the negative effects of excessive digitalization may be mitigated by Japan's support system for international expansion, which Indian firms are still limited by. Additionally, as a country with a high level of transparency, sound regulations, and the rule of law, there is less opportunity for rent-seeking by government officials in Japan, which may alter the role of corruption. As a result, future research could investigate these differences by focusing on developed countries.

In conclusion, this study contributes to the extant literature by advancing the understanding of how EEEs can use digitalization to influence their export propensity based on a dynamic perspective in response to the call of Bergamaschi et al. (2020). Moreover, we also investigate how corruption matters for this curvilinear relationship in emerging markets.

CHAPTER III: DOES SOCIAL DESIRABILITY OF ENTREPRENEURSHIP MATTER FOR EARLY-STAGE ENTREPRENEURS' INTERNATIONALIZATION? THE MODERATING ROLE OF ECONOMIC FREEDOM

This chapter has been published and can be cited as follows:

3.1 Introduction

Institutional conditions influence entrepreneurial activity (Batjargal et al., 2013; Bruton et al., 2010; Busenitz et al., 2000; Hitt et al., 2016). However, it is not entirely clear in the literature how institutional diversity influences new firms' capabilities to pursue different types of entrepreneurial activities, including early internationalization (Aparicio et al., 2021; Dau & Cuervo-Cazurra, 2014; Jackson & Deeg, 2008; Wright & Hitt, 2017). In effect, the differing rates of (international) entrepreneurial activity across countries and regions point to the need for more research to understand better the impact of country-level factors, among which institutions are especially important (Eden, 2010; Li, 2013). Our knowledge regarding how the interaction between differing institutions encourages international entrepreneurial activities needs refinement, particularly the interplay between formal and informal factors[6].

We propose and test a model in which both formal and informal institutions influence early-stage entrepreneurs' internationalization. More specifically, first, we examine the direct impact of the social desirability of entrepreneurship, which refers to the commonly held perceptions about the rewards that society bestows on the career choice of entrepreneurship (Busenitz et al., 2000; Koellinger, 2008), on the likelihood of early internationalization. Second, we explore the moderating role of the formal institutional environment of the home country in the form of economic freedom, which can be defined as "the degree to which a market economy is in place, where the central components are voluntary exchange, free competition, and protection of persons and property" (Gwartney et al., 2002, p. 5). For ease of exposition and alignment with

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[6] Formal institutions prescribe the actions and behaviors of people and organizations through written laws and regulations, together with their enforcement measures (North, 1990). Informal institutions are not codified into documented rules but represent enduring systems of shared meanings that reflect a socially constructed reality, which tends to affect cohesion and coordination among individuals (Arregle et al., 2016; Scott, 2013). As such, formal institutions are nested in a broader context represented by informal institutions that are rooted in long-lasting and difficult-to-change cultural traits.

institutional terminology (North, 1990), we regard the social desirability of entrepreneurship as an informal institution enforced by individuals and organizations and economic freedom as a formal rule enforced publicly by the state that can make changes easily, adapting better to the society. Thus, our work investigates how the informal institutional context of the home country, represented by the social desirability of entrepreneurship, affects early-stage entrepreneurs' internationalization and how the formal framework in the form of economic freedom moderates this relationship.

Social desirability [7] refers to the recognition that society accords to individuals' actions (Koellinger, 2008). Although there are entrepreneurs in all countries, they apply their talents according to the specific context in which they operate (Baumol, 1990). As such, the social desirability of entrepreneurship relates to the domestic entrepreneurial climate (Autio et al., 2013; Buckley & Casson, 2021; Estrin et al., 2013; Muralidharan & Pathak, 2017; North, 1990; Scott, 1995). It would be interesting to find out how early-stage entrepreneurs operate in societies in which entrepreneurship is not socially desirable. Are they forced to engage in international activities due to more potential favorable norms outside of the home country? In our model, we argue that the social desirability of entrepreneurship will negatively affect entrepreneurs' international orientation.

Importantly, we also suggest that such a negative effect can be attenuated by the formal institutional context of the home country. We focus on economic freedom, which is a concept related to the efficiency of markets, allowing individuals and new ventures to undertake their activities more effectively (Dau & Cuerzo-Cazurra, 2014; Fuentelsaz et al., 2018; McMullen et al., 2008). The international orientation of early-stage entrepreneurs may change depending on the degree of economic freedom that they encounter. Can higher levels of economic freedom help to overcome the potential adverse effect of social desirability of entrepreneurship? In our framework, we argue that it is essential to account for economic freedom in the home country in these unfavorable contexts since it relates to the quality of government (Holmes et al., 2013; Marano et al., 2016; Wan & Hoskisson, 2003).

Our study makes two main contributions to international entrepreneurship literature. First, we develop a framework to explain how social desirability of entrepreneurship affects the likelihood of engaging in international activities building on ideas of Busenitz et al. (2000) and Reynolds et al. (2004) about the influence of social desirability and the probability of setting

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[7] In this chapter, we discuss "social desirability of entrepreneurship" mainly in the domestic market.

up a business. Here, we suggest that entrepreneurs face different country environments regarding social acceptance of entrepreneurship and that these differences explain why some entrepreneurs are more likely to engage in international activities than others.

Second, we elaborate on the findings of Fuentelsaz et al. (2020) in which they suggest that formal institutions could help to overcome the deficiencies of informal institutions. In this paper, we consider economic freedom as moderator of the relationship between social acceptance of entrepreneurship and early-stage internationalization. In doing so, we respond to a call by Kuckertz et al. (2016) to provide more developmental analysis in view of their non-clear-cut result in the relationship between economic freedom and entrepreneurial efforts. Here, we demonstrate that economic freedom plays a significant moderating role in the link between social desirability and early-stage internationalization. Hence, although domestic social acceptance is a factor that can impede international entrepreneurial action, this effect can be attenuated in countries with high economic freedom.

To test our hypotheses, we employ a multilevel analysis using a large dataset that combines individual- and country-level observations covering 48 countries for the period 2005–2016. The sources of information are the Global Entrepreneurship Monitor, the Heritage Foundation, and the World Development Indicators (WDIs). Our study aims to shed light on the understanding of the likelihood of early internationalization and confirms empirically that individuals' responses to institutional differences are not homogenous across countries.

The remainder of the paper is organized as follows. In the next section, we present the related theoretical literature and develop our hypotheses. Then, we describe the methods. Subsequently, we present the results of our analyses. Finally, we discuss the findings and propose potential future research lines.

3.2 Theoretical background and hypotheses development

3.2.1 Early-stage entrepreneurs and internationalization

In this study, we bridge the literatures on institutions and internationalization. To this end, we start this section with a conceptualization of early-stage entrepreneurs -our key unit of analysis-, and their relationship with their international endeavors. With that, we seek to expand our understanding on how heterogenous institutional configurations of home countries explain the variations of internationalization patterns across countries.

Early-stage entrepreneurs execute new commercial opportunities into the market (Estrin et al., 2016; 2020) aiming to create a viable and sustainable businesses over time (Reynolds et al.,

2004) with the main objective of creating value into a particular territory via productive entrepreneurial projects (Baumol, 1990). These new opportunities do not just occur at the national level (Capelleras et al., 2019) but also are created and exploited across borders with the purpose to generate new business models and better solutions for value creation including factors that range from financial to social and environmental (Zahra et al., 2014). The context in which this (national or international) entrepreneurial activity occurs is characterized by high levels of uncertainty. This is because the entrepreneur must develop efforts towards coordinating the optimal usage of resources while making predictions about the business development not knowing much about the actual economic value of exploiting such business opportunity (Alvarez & Barney, 2005) and how the context influences the economic outcomes derived from their entrepreneurial activity (Aparicio et al., 2021; Gnyawali & Fogel, 1994).

There are two strategic boundaries that early-stage entrepreneurs will encounter from the outset: the way institutional context determines and shapes the type of activities they are planning to develop (Acs et al., 2018; Urbano et al., 2019a; Chowdhury & Audretsch, 2021) and whether they should keep their business operations within the domestic market or going international instead (Estrin et al., 2013b). First, it is widely acknowledged that entrepreneurial activity will be heterogeneous across countries (Batjargal et al., 2013; Sobel, 2008). This is because each country's institutional configurations determine whether individuals will choose entrepreneurship over other alternative occupations and the type of activities such early-stage entrepreneurs will develop (Baumol, 1990; 1993). Furthermore, the institutional conditions including both formal and informal factors (North, 1990) represent a boundary condition in which the entrepreneurs must navigate to create new business opportunities that ultimately will affect national economic outcomes (Bjørnskov & Foss, 2016; Urbano et al., 2019a ; 2019b; Zahra, 2021).

Second, the focus of this paper relies on the idea that entrepreneurs will find themselves in a stronger position in terms of rapid scaling up opportunities whether they foresee the benefits of early internationalization (Schwens et al., 2018) while exploring prospective business opportunities beyond the national borders (Reuber et al., 2018). Early-stage entrepreneurs' willingness to expand their commercial activities abroad is related to the new opportunities created and the possibility to test new business models into new international contexts (Wright et al., 2005). Additionally, expanding entrepreneurial activities beyond the national borders will allow entrepreneurs to expand the uniqueness of their innovative projects which ultimately may end up emerging into new business choices (Capelleras et al., 2018) through the

connection with local partners and the subsequent knowledge exchange activities (e.g., adopting new local technology) that may occur with the interaction (Mthanti & Ojah, 2017). In this study, we consider these two boundaries to develop a framework that explains how the country's institutional framework influences the extent of internationalization by early-stage entrepreneurs.

3.2.2 Institutions and internationalization

The extant literature has already proved that appropriate institutional settings provide supportive conditions for entrepreneurs to identify market opportunities, introduce innovative products or services, and start new business activities (El-Namaki, 1988; Hoskisson et al., 2013; Li, 2018; Muralidharan & Pathak, 2017; Verheul et al., 2002). Entrepreneurs' international activity is also expected to be contingent to the conditions of the home country institutional context (Eden, 2010; Li, 2013). However, prior research has tended to examine separately the effects of formal and informal institutions on international entrepreneurship. While institutional economics has been mainly used to examine formal institutions (Autio & Acs, 2010; Estrin et al, 2013a), informal institutions have been typically investigated by cultural sociology and psychology perspectives (Autio et al, 2013; Muralidharan & Pathak, 2017).

On the one hand, an increasing body of literature has linked formal institutions and international expansions. Factors like the regulatory environment (Adomako et al., 2021; Chowdhury & Audretsch, 2021), economic freedom (Fuentelsaz et al., 2018; Marano et al., 2016), property rights, and financial capital (Bowen & De Clercq, 2008; Estrin et al., 2013b) are some of the key formal institutions concerning firms' internationalization that studies have considered. Chowdhury and Audretsch (2021) demonstrated that administrative regulation significantly influences international expansion, but tax-related regulation does not. Marano et al. (2016) showed that economic freedom coexists in two conflicting perspectives on the relationship between the operation of an international business and its performance. Estrin et al. (2013a) found that weaker property rights and greater availability of financial capital help to facilitate international entrepreneurial activities.

On the other hand, there is a growing interest in the literature in examining the role of informal institutional factors. Culture is an important factor of entrepreneurship when talking about informal institutions (Autio et al., 2013; Luo & Tung, 2007; Stephan & Uhlaner, 2010). Scott (1995) first portrayed cultural–cognitive arrangements as shared beliefs and perceptions in his categories of institutions that help individuals to translate information into practice. Williamson

(2000) developed the idea that informal institutions are nested in and rooted at the social level and are not easy to change and control, particularly pointing out cultural aspects. Regarding their relationship with international expansion, Autio et al. (2013) examined the effects of three dimensions of culture (i.e., institutional collectivism, uncertainty avoidance, and performance orientation) on entry and post-entry growth aspirations. In the same way, Muralidharan and Pathak (2017) studied three informal rules (i.e., social desirability, performance orientation, and self-expression) for international entrepreneurship.

Therefore, previous related literature has tended to separate formal and informal institutional effects on internationalization. Accordingly, there is still a gap concerning the effects of interdependence between the two types of institutions on early-stage entrepreneurs' internationalization. Given that international entrepreneurship occurs at the individual level, at which entrepreneurs are grouped hierarchically by country, informal institutions result from individual-level actions (micro), and formal institutions concern the macro environment. That being said, formal institutions influence the way in which social arrangements and norms operate in practice. Hence, it is necessary to address such a gap to provide a more accurate blueprint of their relationship with internationalization. Our framework suggests that the direct impact of the dominant norms and practices that are prevalent in a given society upon early internationalizing of entrepreneurs will be moderated by the formal institutional framework of the country. The research framework is presented in Figure 3.1.

Figure 3. 1*:* Multilevel research framework
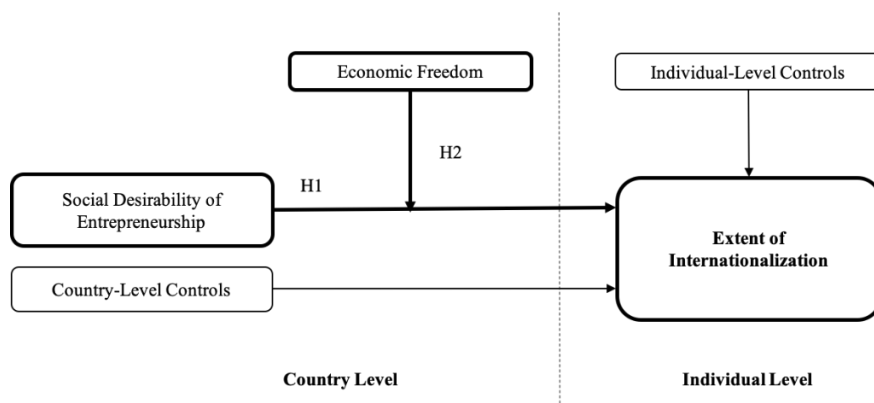
3.2.3 Social desirability of entrepreneurship

Social desirability of entrepreneurship relates to the way society values new projects of their individuals (Koellinger, 2008). Specifically, it is a subjective norm or general held perception about the rewards that societies bestow on the career alternatives of entrepreneurship in a given population (Busenitz et al., 2000; Koellinger, 2008). Furthermore, social desirability typically includes whether entrepreneurship is a desirable career choice, provides higher status and is present in the media (Muralidharan & Pathak, 2017; Stephan & Uhlaner, 2010). Thus, it encompasses societal attitudes toward entrepreneurship that are likely to exert a strong influence on the actual behavior of entrepreneurs. In fact, social desirability has been associated with the inception of new firms and the operation of start-up businesses (Busenitz et al., 2000; Chan & Pattnaik, 2021; Fuentelsaz et al., 2015; Reynolds et al., 2004). A home country society that values entrepreneurial activities as catalysts in sharing risks, increasing income, and decreasing the unemployment rate pays more attention to entrepreneurs' role (Adler & Kwon, 2002; Fukuyama, 2001). Hence, this suggests that an environment in which entrepreneurship is socially desirable might affect the entrepreneurship that individuals pursue.

A home country context with higher social desirability of entrepreneurship encourages entrepreneurial individuals to make full use of their opportunities, enter the domestic market with creative offerings, and further satisfy their internal attribute of the need to succeed in their home country. There is no doubt that a society with high desirability of entrepreneurship encourages entrepreneurial entry (Autio et al., 2013). Moreover, authorities are more likely to expect a positive impact on the subsequent economic development in that specific context. Individuals who are more entrepreneurial start their own business in their home country with the availability of social capital through internal networking opportunities (Adler & Kwon, 2002) and fast information sharing to reduce the degree of asymmetric information (Fukuyama, 2001). Besides, entrepreneurs in such contexts are likely to be rewarded with comprehensive media coverage, leading to the high visibility of their impacts on the home economy. On the other hand, such fertile ground facilitates the availability of capital from domestic financial institutions and cooperation from dispersed stakeholders. Even though higher social desirability of entrepreneurship certainly supports entrepreneurial entry by identifying domestic opportunities, such contexts might dampen the attention that early-stage entrepreneurs pay to exploiting the international markets due to the many apparent advantages and market opportunities in the domestic markets.

Alternatively, contexts with lower social desirability of entrepreneurship may constrain individuals with higher entrepreneurial intentions in the home country. Such home contexts for those types of populations seem to be an uncertain condition. Regarding the environment, such individuals might not start an in-home business because of an unfriendly entrepreneurial environment. In this regard, opportunity-driven individuals with higher entrepreneurial intentions will tend to look at external markets.

The current literature has already investigated whether an uncertain local business environment influences firms' decision to become international (Zahra et al., 1997). Entrepreneurs who struggle from uncertain environments in their home country may seek new markets abroad to achieve their growth aspiration (Dimitratos et al., 2004). Therefore, for early-stage businesses in unfavorable contexts, internationalization may reduce the uncertainty caused by the home country environment. Hence, lower social desirability of entrepreneurship might be a negative factor for domestic start-up businesses but pushes individuals with higher entrepreneurial intentions to look for attractive prospects abroad, where the social–cultural environment may be more favorable (Eshghi, 1992). Such tendencies can partially be explained by the "push" perspective, whereby individuals with higher entrepreneurial intentions are pushed to foreign markets as an external force in a hostile internal entrepreneurial environment (Segal et al., 2005). Consistent with this, individuals with a stronger intention to engage in entrepreneurship may be pushed out to international markets when there is weak legitimacy of entrepreneurship in the home country society.

As such, the lower social desirability of entrepreneurship might be an uncertain or hostile environment for individuals with higher entrepreneurial intentions. An unfavorable domestic environment can create an impetus for internationalization that often stems from necessity such as unfavorable home country environments vs. the need to create profit (Chen et al., 2018). In addition, such contexts do not provide the necessary motivational stimulants for entrepreneurial individuals to satisfy their need for achievement in the domestic markets. We hence propose that lower social desirability of entrepreneurship does not work in helping early-stage firms to expand their business within the domestic market but could push individuals to look for international markets. Accordingly, we posit:

Hypothesis 1. Social desirability of entrepreneurship is negatively associated with the extent of internationalization of early-stage entrepreneurs.

3.2.4 The moderating role of economic freedom

We discussed the relationship between social desirability of entrepreneurship and early-stage entrepreneurs' internationalization in the previous section. However, institutions are often context dependent, and it is not appropriate to analyze them in isolation due to their stickiness (Ang et al., 2014; Boettke et al., 2008; Fuentelsaz et al., 2019). Rather than focusing solely on informal or formal rules, we integrate these institutions and underline their mutual effects on entrepreneurs' international orientation.

Formal institutions are a multidimensional concept that consists of rules for various aspects, such as political, economic, and legislative systems (Pejovich, 1999). These dimensions are related to the availability of financial resources, the nature of the political process, and administration formalities linked with new ventures' inception (Busenitz et al., 2000; Holmes et al., 2013). Better-developed home country formal institutions are found to have a supportive impact on the firms' likelihood of internationalization (Chen et al., 2018). Economic freedom is one key dimension of formal institutions, which is the most relevant factor in the decision-making process (Holmes et al., 2013; Marano et al., 2016). Home country-level economic institutions such as competitive markets play an important role in promoting new business creation and long-run economic growth (Boudreaux et al., 2019a). This is because high-quality of institutional environments (i.e., economic freedom) could reduce transaction costs and lower the regulatory burdens (Boudreaux et al., 2019b).

Economic freedom is then an essential element of any free civil society embedded in mandatory regulations, which include policies, politics, and economic relations and provide a structure and order for business transactions (Su et al., 2017; Welter, 2011; Welter & Smallbone, 2011). Commonly, it is considered as an indicator of the efficiency of business regulation and associated with the fundamental rights of individuals to manage their labor and property freely (The Heritage Foundation, 2021).

In this context, economic freedom could affect the relationship between the informal institutional framework and the early internationalization of new firms. Specifically, we suggest that greater economic freedom is likely to weaken the negative effects of the social desirability of entrepreneurship on international expansion due to a more favorable policy environment in which to start an international business and fewer administrative requirements. Greater economic freedom indicates strong regulation quality, which could form a sound business legal system, optimize administrative formalities, improve business efficiency, and attract more international business entries (Aidis et al., 2012; Dau & Cuerzo-Cazurra, 2014; Fuentelsaz et al., 2018; McMullen et al., 2008). Conversely an institutional context with low

economic freedom would damage opportunity-motivated entrepreneurship in international fields (La Porta et al., 1999; Yang et al., 2020). This is because a higher level of economic freedom allows entrepreneurs to access financial capital easily and provides more room for early-stage entrepreneurs' activities (Aidis et al., 2012; Lee, 2018; Li, 2018).

Additionally, for individuals with high entrepreneurial intentions residing in a home context of high social desirability of entrepreneurship, the mentioned "pushing" power may not be strong enough. They may prefer to start a domestic business instead of an international business to avoid uncertainty and risk. However, what if the home country's regulatory environment favors international activities? That being said, such types of individuals may encounter a home country context with greater economic freedom. Their behaviors may change due to a high degree of free asset liquidity and easy and fast access to foreign financial resources (Dau & Cuervo-Cazurra, 2014; Marano et al., 2016). International expansion will be strengthened with such a favorable regulatory environment, attenuating the negative effects of social desirability. By analogy, it would also be beneficial for such early-stage entrepreneurs in the context of lower social desirability of entrepreneurship to intensify their internationalization due to a favorable regulatory environment. Consistent with this, we hypothesize:

Hypothesis 2. A high degree of economic freedom positively moderates the negative relationship between social desirability of entrepreneurship and the extent of internationalization of early-stage entrepreneurs.

3.3 Methods

3.3.1 Data and sample

To test our hypotheses, we employ a multilevel analysis in which individuals (level 1) are embedded within countries (level 2). The individual-level data were mainly collected from the Adult Population Survey conducted by the Global Entrepreneurship Monitor (GEM). The GEM data is widely used in research for assessing entrepreneurial activities, growth aspirations, and individual attitudes across countries. Furthermore, the GEM project provides adequate heterogeneity in various areas that are crucial to institutional studies since variation is an essential condition (Franke & Richey, 2010; Reynolds et al., 2004). The social desirability of entrepreneurship was thus originated there. Additionally, economic freedom was obtained from the Heritage Foundation (hereafter HF). Besides, we acquired individual demographical characteristics and regional macro-economic indexes from the World Development Indicators (WDIs) (e.g., annual GDP growth and population growth) as control variables. After excluding

all the missing observations and non-valid answers, our final multilevel dataset consisted of 45,454 observations over the years from 2005 to 2016 based on a pooled cross-sectional time series structure that grouped the respondents hierarchically into 48 countries[8]. In this paper our unit of analysis are early-stage entrepreneurs. According to the GEM defintions we focus on those individuals who are running the firm between 3 and 42 months old and therefore have paid wages to employees (Reynolds et al., 2004; Muralidharan & Pathak, 2017). Notably, most companies hold less than 25 % foreign customers over total customers in our study. Among them, developed countries (e.g., Singapore, Belgium, and Portugal) internationalize more than developing countries (e.g., Brazil, Indonesia, and Thailand), as shown in Table 3.1.

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[8] Regarding the selected samples' criteria, there are around 62 countries with five or more years of data. However, those available data are only from GEM APS. Our dataset also includes observations gathered from Heritage Foundation and World Bank's Development Indicators, which unfortunately are not available across all nations in our baseline sample.

Table 3. 1: Sample description across countries

Country	N	Extent of Internationalization[a]	Social Desirability of Entrepreneurship	Economic Freedom
Argentina	705	1.23	0.40	49.19
Australia	477	1.76	0.43	81.15
Austria	67	2.01	-0.43	69.42
Belgium	250	2.16	-1.21	70.21
Brazil	2,615	1.06	1.27	57.66
Canada	327	2.06	0.70	78.95
Chile	3,298	1.67	-0.09	78.06
China	2,603	1.26	1.01	52.24
Colombia	3,465	1.66	0.44	66.41
Denmark	276	1.75	-2.20	76.60
Finland	506	1.52	0.46	73.54
France	201	1.87	-1.44	63.22
Germany	903	1.83	-1.09	71.42
Greece	504	1.79	-1.63	58.16
Hungary	481	1.69	-2.24	66.52
India	622	1.58	-0.58	55.13
Indonesia	2,198	1.09	1.10	57.47
Ireland	475	1.94	0.40	79.42
Italy	190	1.79	-1.24	61.50
Japan	223	1.52	-0.41	72.22
Latvia	515	1.94	-0.36	67.47
Malaysia	504	1.42	0.54	66.44
Mexico	632	1.32	-1.38	66.34
Netherlands	894	1.64	-0.24	74.63
New Zealand	54	1.85	1.06	82.33
Norway	404	1.65	0.29	68.75
Peru	966	1.35	1.12	65.03
Philippines	730	1.26	1.40	58.76
Poland	416	1.83	-0.61	66.53
Portugal	197	2.10	0.07	64.36
Romania	346	2.06	-0.11	65.12
Singapore	326	2.37	0.70	88.31
South Africa	588	1.82	0.49	62.65
Spain	5,722	1.50	-1.27	68.59
Sweden	319	1.71	0.07	71.85
Switzerland	503	1.93	-0.46	80.16
Thailand	1,851	1.13	1.27	63.60
Turkey	1,617	1.62	-0.54	62.26
Uganda	766	1.22	1.38	62.13
United Kingdom	2,823	1.64	-0.58	78.74
United States	563	1.89	0.46	78.87
Vietnam	677	1.26	1.24	51.17

Notes: N is the number of observations. [a] Represents the country level average of the extent of internationalization by early-stage entrepreneurial firms, the average is over the four categories of the dependent variable (1, 2, 3 and 4). All other variables are defined in Table 3.2.

3.3.2 Variables and measurements

Dependent variable. A controversy exists regarding the measurement of the degree of internationalization. Ruzzier et al. (2007) strongly suggested using compound items to portray the extent of internationalization since multilevel item measures could reflect the structure, performance, and attitudinal aspects of internationalization. Conversely, Ramaswamy et al. (1996) worried that aggregating components might hide individual components' effects. Following previous studies (Autio et al., 2013; Li, 2018; Muralidharan & Pathak, 2017), we use the variable extent of internationalization which is a single item defined as the percentage of foreign customers in the total number of customers. The survey asks all early-stage entrepreneurs the following question: What proportion of your customers normally live outside your country? Is it more than 75%, 25% to 75%, less than 25%, or none? Hence, we introduced a dependent variable with four categories: 1=none; 2=less than 25%; 3=25%–75%; and 4=more than 75%.

Independent variable. We adopted one specific dimension based on home country culture traits and the social response to entrepreneurship (North, 1990; Scott, 1995), which was highly correlated with the entrepreneurial atmosphere. The social desirability of entrepreneurship was created as a national aggregate measure that required individuals to respond to statements from the GEM survey: (1) in your country, most people consider a new business as a desirable career choice; (2) in your country, those successful in starting a new business have a high level of status and respect; and (3) in your country, you will often see stories in the public media about successful new businesses. The GEM captured each response in three separate dummies scoring 1 for yes and 0 for no. The study conducted a categorical principal component factor (PCF) analysis of three sub-variables following Muralidharan and Pathak's (2017) method, and, in the end, the results loaded on one single factor. Cronbach's alpha equals 0.75, which reveals relatively high reliability. In addition, the KMO (0.68) and Bartlett test of sphericity (P<0.0) indicated that a principal factor analysis can be conducted without encountering an inter-correlation problem. Besides, the cumulative variance contribution rate of one single factor exceeds 65%. The predicted scores, which could be considered as standardized scores assuming positive and negative values, were used as an aggregate measure of the social desirability of entrepreneurship.

Moderating variable. The index of economic freedom was obtained from the Heritage Foundation; it portrayed 12 parallel sub-indexes grouped into four categories (Fuentelsaz et al.,

2018; Garrido et al., 2014), each of which was allocated three indexes: (1) the rule of law (property rights, government integrity, and judicial effectiveness); (2) the government size (government spending, tax burden, and fiscal health); (3) regulatory efficiency (business freedom, labor freedom, and monetary freedom); and (4) open markets (trade freedom, investment freedom, and financial freedom). Our composite economic free index describes the extent to which individuals' labor and property can be managed freely in a country by grading these sub-indexes on a scale from 0 to 100, with 100 equaling the freest economic environment. A country's overall score is derived by averaging these 12 economic freedoms, with equal weight being given to each of them.

Country and individual control variables. Our paper controlled nine variables divided into two groups, six at the individual level and three at the country level separately. As for the individual-level controls, we followed prior studies (Autio et al., 2013; Li, 2018; Minniti, 2008; Muralidharan & Pathak, 2017; Yang et al., 2020) and controlled the entrepreneurs' age between 18 and 64. We also controlled education and household income since they are both associated with entrepreneurial activities (Arenius & Minniti, 2005). We introduced a four-point scale for education (1=some secondary; 2=secondary degree; 3=post-secondary; 4=graduate experience) and a three-point scale for the household income tier (1=lower 33%; 2=middle 33%; 3=upper 33%), respectively. Additionally, the links with other entrepreneurs and self-efficacy were controlled as dummies. We recoded the answers to the questions on ties with entrepreneurs (Do you know someone who has started a business in the past 2 years?) and self-efficacy (Do you have the knowledge, skill, and experience to start a new business?) as 0 for no and 1 for yes. As for the country-level controls, we controlled the macro country-level variables and retained the annual GDP growth, GDP per capita (log), and population growth (see Table 3.2).

Table 3. 2: Variables description and data sources

Variable	Definition	Source
Dependent variable		
Extent of Internationalization	Categorical variable that measures entrepreneurs' percentage of customers located outside their country, taking the following intensities: 1=none; 2=less than 25%; 3=25%−75%; 4=more than 75%.	GEM
Level 1 variables		
Age	Current age of survey participant in years.	GEM
Gender	Dummy: 1=male; 0=otherwise.	GEM
Educational Attainment	Categorical: 1=some secondary; 2=secondary degree; 3=post-secondary; 4=graduate experience.	GEM
Household income	Categorical: 1=lowest 33rd percentile; 2=middle 33rd percentile; 3=upper 33rd percentile.	GEM
Ties with entrepreneurs	Dummy: 1=personally knows entrepreneurs in the past two years; 0=otherwise.	GEM
Self-efficacy	Dummy: 1= Do you have the knowledge, skill, and experience required to start a new business? 1=yes; 0=no.	GEM
Level 2 variables		
Social Desirability of Entrepreneurship	Extent of the perception of rewards that societies place on the career choice of entrepreneurship (standardized scores).	GEM
Economic Freedom	Index of economic freedom from the Heritage Foundation operationalized as a composite measure of the following equally weighted quantitative and qualitative factors: property rights, government integrity, government spending, tax burden, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom, and financial freedom.	HF
Population Growth (%)	Annual growth rate of GDP at market prices based on constant local currency.	WDI
GDP Growth (%)	Annual percentage growth rate of the GDP at market prices based on constant local currency	WDI
GDP per Capita (Log)	Gross domestic product divided by the population. Log transformation.	WDI

Sources: GEM APS – Global Entrepreneurship Monitor Adult Population Survey (https://www.gemconsortium.org) for the individual-level variables. WDI – World Bank's World Development Indicators (https://data.worldbank.org/products/wdi) and HF – Heritage Foundation for the Index of Economic Freedom (https://www.heritage.org/index/) for the country-level variables.

3.3.3 Empirical strategy

Since this research combines observations both at individual and country levels, we employ multilevel analysis to test our predictions as this technique allows intercepts to vary across countries (e.g., Amorós et al. 2019; Autio et al. 2013; Schøtt & Jensen, 2016; Capelleras, 2018; Estrin et al. 2013; 2020). This empirical strategy also allows us to assume independence of observations, which would not be possible in an ordinary OLS or any other suitable multivariate method (Hofmann et al., 2000). Taking the multilevel configuration and the dependent variable categorical nature into account, we performed a multilevel random-effect ordered logistic regression to estimate how the institutional context affect the extent of internationalization. The configuration of the dataset is of individuals (level 1) nested into countries (level 2) similar to recent research such as Amorós et al. (2019) and Estrin et al. (2020). Random-effect analysis allows regression coefficients to vary across countries, assuming unobserved country-specific effects to be randomly distributed with a mean of zero, to have constant variance, and to be uncorrelated with the predictor covariates (Estrin et al., 2020). The model specification is shown below.

$$Y_{ij}^* = \beta_{0j} + (individual\ and\ country\ level\ controls) + e_{ij} \qquad (1)$$

$$\beta_{0j} = \beta_{00} + \beta_{01}(country\ level\ predictors\ and\ interactions) + U_{0j}\ (2)$$

Y_{ij}^* is the dependent variable that represents the probability of interviewee i in country j having a greater degree of internationalization. β_{00} denotes the mean of constants across countries. Conversely, β_{01} describes the coefficients of the country-level predictors and their interactions, which yield the estimates for the main country-level effects as the "fixed-part estimation." The predicted effects (β_{0j}) in equation (2) are exerted on equation (1)'s intercept. The term U_{0j} consists of the nation-level residuals that are regarded as "random estimation," and e_{ij} represents residuals at the individual level. The analyses were performed in Stata 15.

We adopted three steps to test the direct effects of informal institutions on internationalization and the interaction effect with formal institutions across all the sampled countries. First, we performed an estimation process only with controls and without any predictors and interactions as our basic model (Model 1 of Table 3.4). Second, we introduced the social desirability of entrepreneurship predictor into the null model to estimate the proportion of variance explained

by one main predictor alone (Model 2 of Table 3.4) before adding interactional terms. To estimate the interaction effects, we developed the model of interaction (Model 4 of Table 3.4), including all the predictors, interactions, and multilevel controls. Meanwhile, Model 3 of Table 3.4 examines the direct effects of economic freedom. Therefore, we were able to evaluate the proportion of variance explained by interactions alone when comparing Model 3 and Model 4 in Table 3.4.

3.4 Results

3.4.1 Descriptive statistics

Table 3.1, Table 3.3a, and 3b provide the descriptive statistics. At the individual level shown in Table 3.3a, our respondents are aged from 18 to 64, and 57% of them are male. Furthermore, the interviewees have secondary and above education on average and belong to the middle-income tier and above on average. A total of 65% of the respondents have had connections with other entrepreneurs in the past 12 months, and the overwhelming majority (84%) had received training before they started their business. Regarding the country level (Table 3.3b), on average, the annual increase in the population across all the countries is 0.91%, and the GDP growth is 3.44%.

As depicted in Table 3.1 with the country-level summary information, early-stage entrepreneurs in advanced economic countries on average internationalize more than those in less developed countries. Nevertheless, the maximum value for the extent of internationalization among these countries is lower (Singapore: 2.37; see Table 3.1). With regard to the other countries, this index is far lower than 25% degree of internationalization. Table 3.3a also shows that the average value of internationalization across all the individual respondents is 1.52, indicating no more than 25% internationalization.

Turning to the country-level predictors (see Table 3.1 and Table 3.3b for details), the level of social desirability of entrepreneurship differs between countries, ranging between -2.24 and 1.4, with an average value of 0.06. The statistics software standardized the values of the social desirability of entrepreneurship with the normal distribution. Among our sampled countries, the Philippines represent the home environment with the highest social desirability of entrepreneurship (1.40), and Hungary has the lowest score (-2.24). The average value of economic freedom is 66.23, with scores ranging between 49.19 and 88.31 (see Table 3.1 and Table 3.3b). The standard deviation is 8.87, which also indicates that our sample countries vary

in different institutional contexts. However, generally, contexts in advanced economic countries are usually freer than those in less advanced countries.

3.4.2 Multilevel model results

Tables 3a and 3b also display the correlation matrix, including the individual-level and country-level variables, respectively. There is no higher correlation between multilevel variables since the relationship coefficients are controlled at an acceptable level. Furthermore, significant between-country variance is a precondition for running the hierarchical model. Therefore, we conducted an ANOVA analysis to test the significant between-group variance, using the dependent variable and country group as the predictor. The results show that 12.07% of the total variance can be explained by between-country groups.

Table 3. 3a: Descriptive statistics and correlation matrix – individual level

	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Extent of Internationalization	1.52	0.78	1.00	4.00	1						
Age	37.54	10.97	18.00	64.00	0.02*	1					
Gender	0.57	0.49	0.00	1.00	0.08*	0.01*	1				
Education	2.32	0.93	1.00	4.00	0.14*	0.02*	0.05*	1			
Household Income	2.22	0.80	1.00	3.00	0.08*	0.02*	0.10*	0.23*	1		
Ties with Entrepreneurs	0.65	0.48	0.00	1.00	0.06*	-0.07*	0.07*	0.10*	0.12*	1	
Self-efficacy	0.84	0.36	0.00	1.00	0.05*	0.03*	0.08*	0.08*	0.08*	0.14*	1

* P<0.05. All variables are defined in Table 3.2.

Table 3. 3b: Descriptive statistics and correlation matrix – country level

	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	(5)
Social Desirability of Entrepreneurship	0.06	1.03	-2.24	1.40	1				
Economic Freedom	66.23	8.87	49.19	88.31	-0.39*	1			
Population Growth	0.91	0.70	-2.08	3.44	0.22*	-0.06*	1		
GDP Growth	3.44	3.42	-14.40	25.56	0.37*	-0.34*	0.28*	1	
GDP per Capita (Log)	11.83	2.61	8.22	17.40	0.21*	0.08*	0.14*	0.14*	1

* P<0.05. All variables are defined in Table 3.2.

Table 3.4 presents the hierarchical modeling results. Before evaluating the three hypotheses, a multicollinearity test was conducted. The mean score of the VIF test is around 2, which indicates that all our variables are appropriate for undertaking the regression test. All the

detailed tables included in Table 3.4 report the coefficients and random-effect estimates (variance components).

As for the direct effect, hypothesis 1 is supported by Model 2 of Table 3.4. Specifically, the social desirability of entrepreneurship has a negative and significant ($\beta = -0.0764, P < 0.01$) influence on the internationalization of early-stage firms. Additionally, the variance component decreases from 1.6472 (Model 1 of Table 3.4) to 1.2988 (Model 2 Table 3.4), suggesting that the social desirability of entrepreneurship explains a significant 21.15% (((1.6472 − 1.2988)/1.6472) $\times 100 = 21.15\%$) of the remaining variance after taking all the controls into account. Meanwhile, Model 3 of Table 3.4 reveals a positive and significant direct effect of economic freedom on early-stage entrepreneurs' internationalization ($\beta = 0.0440, P < 0.01$).

The interaction term between economic freedom and the social desirability of entrepreneurship (Model 4 of Table 3.4) is positive and significant ($\beta = 0.0183, P < 0.10$). In countries with greater economic freedom, the interrelationship suggests that the negative relationship between the social desirability of entrepreneurship and the extent of internationalization could be attenuated. Moreover, we also plotted the moderating role of economic freedom on the hypothesized relationship as shown in Figure 3.2. The linear slope of low economic freedom is steeper than that of high economic freedom, suggesting high economic freedom alleviates the negative effect caused by the social desirability of entrepreneurship on the extent of internationalization. Hence, hypothesis 2 is supported. Furthermore, the variance component decreases from 0.7779 (Model 3) to 0.6706 (Model 4), suggesting that the additional interaction terms collectively explain a significant 13.88% (((0.7779 − 0.6706)/0.7779) $\times 100 = 13.79\%$) of the remaining variance after accounting for all the multilevel controls

Figure 3. 2: Interaction between the social desirability of entrepreneurship and economic freedom
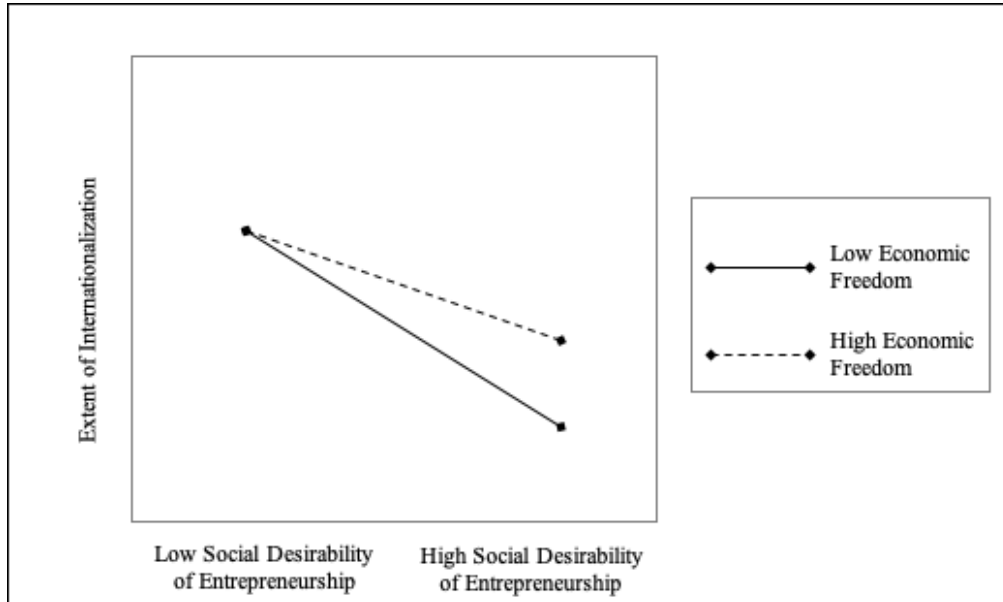
We find several control variables to be statistically significant. As per the country-level variables, the annual population growth and GDP growth are positive and significant across the four models (e.g., Autio et al., 2013; Fuentelsaz et al., 2019, 2020; Gimenez-Jimenez et al., 2020; Reynolds et al., 2004). However, the sign and significance of the GDP per capita vary across the models. Regarding the individual-level control variables, male entrepreneurs prefer to expand to markets outside of their home country. Experienced entrepreneurs with a higher income are likely to expand internationally, and previous experience and knowledge help to facilitate this. Additionally, having ties with other entrepreneurs in the region seems to be an advantage among early-stage entrepreneurs. Finally, young early-stage entrepreneurs are more likely to start a business that is international from inception.

Table 3. 4: Multilevel hierarchical regression results

Dep. var.: Extent of internationalization	Model 1	Model 2	Model 3	Model 4
Individual-level variables				
Age	-0.0376***	-0.0376***	-0.0376***	-0.0372***
	(0.0062)	(0.0062)	(0.0062)	(0.0062)
Age Square	0.0004***	0.0004***	0.0004***	0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Gender	0.1851***	0.1856***	0.1848***	0.1869***
	(0.0210)	(0.0210)	(0.0210)	(0.0210)
Education	0.1225***	0.1221***	0.1204***	0.1221***
	(0.0118)	(0.0118)	(0.0118)	(0.0118)
Household Income	0.1569***	0.1561***	0.1529***	0.1438***
	(0.0136)	(0.0136)	(0.0136)	(0.0136)
Ties with Entrepreneurs	0.2266***	0.2263***	0.2281***	0.2260***
	(0.0223)	(0.0223)	(0.0223)	(0.0224)
Self-efficacy	0.0729**	0.0739**	0.0723**	0.0746**
	(0.0302)	(0.0302)	(0.0302)	(0.0302)
Country-level variables				
Population Growth	0.3557***	0.3899***	0.3490***	0.3424***
	(0.0282)	(0.0293)	(0.0297)	(0.0296)
GDP Growth	0.0086**	0.0101**	0.0128***	0.0113***
	(0.0041)	(0.0041)	(0.0041)	(0.0041)
GDP per Capita (Log)	0.2590***	0.1654**	0.0199	-0.0292
	(0.0974)	(0.0837)	(0.0610)	(0.0538)
Social Desirability of Entrepreneurship (H1)		-0.0764***	-0.0470**	-1.2310***
		(0.0179)	(0.0181)	(0.1187)
Economic Freedom			0.0440***	0.0375***
			(0.0055)	(0.0055)
Interaction term				
Social Desirability of Entrepreneurship*Economic Freedom (H2)				0.0183***
				(0.0018)
Country-Level Variance	1.6472	1.2988	0.7779	0.6706
	(0.4668)	(0.3405)	(0.1812)	(0.1466)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Number of Observations	45,454	45,454	45,454	45,454
Number of Countries	48	48	48	48
Wald–Chi Square	826.44***	845.73***	906.48***	1003.24***
Log-likelihood	-39108.54	-39099.52	-39069.11	-39017.80
Degrees of Freedom	10	11	12	13

Note: Standard errors are given in brackets. * $p<0.10$, ** $p<0.05$, *** $p<0.001$; two-tailed significance.

3.4.3 Robustness check

As mentioned in previous sections, economic freedom is a highly composite index consisting of four pillars—government size, the rule of law, regulatory efficiency, and open markets—with 12 sub-indexes (The Heritage Foundation, 2021). To test the reliability of our models, we investigated whether the moderating effect of each pillar is consistent with the composite index. Table 3.5 replicates the estimations and offers additional evidence on the moderating effects of the four pillars on economic freedom. Given that multicollinearity problems may arise when introducing new categories, we conducted a VIF test step by step, and the results are accepted to be less than 10. It is also vital to notice that the same control variables as in the previous table were introduced. The relevant controls remained statistically significant and maintained their sign. Accordingly, we focused on the moderating effect of each pillar.

Models 2 to 5 in Table 3.5 describe the moderating role of each category, respectively. Like our previous economic freedom results in Table 3.4, each category's direct effect is positive and significant. The interactions with the rule of law (Model 3 of Table 3.5, $\beta = 0.0080, p < 0.01$), regulatory efficiency (Model 4 of Table 3.5, $\beta = 0.0118, p < 0.01$), and open markets (Model 4 of Table 3.5, $\beta = 0.0127, p < 0.01$) produce positive moderating effects that are significantly in line with the moderating effect of composite economic freedom in Table 3.4.

However, the interaction with government size behaves in the opposite way (Model 2 of Table 3.5), showing a negative and significant moderating effect ($\beta = -0.0049, p < 0.01$). This echoes the findings in the past literature showing that the proxies which approach the government size show a negative correlation to other dimensions of economic freedom (Garrido et al., 2014). Moreover, according to the view of explanatory power, Model 2 with government size interactions, could only provide limited explanatory power due to its higher country-level variance (1.2568) compared with the other interaction models in Table 3.5, lower than 1. The remaining three categories jointly contribute to most moderating effects of economic freedom with a higher level of explanatory power. In conclusion, the overall and aggregated moderating impacts of sub-categories exert a positive and significant effect on the relationship between the social desirability of entrepreneurship and internationalization.

In addition to the above, one of the empirical concerns with the large cross-country datasets is that countries with more observations may dominate the results. Following the previous studies utilizing the GEM dataset (e.g., Autio et al., 2013), we excluded Spanish observations, which account for more than 12% of all the samples. We re-ran all the regressions and found that

there is no statistically significant difference after dropping many observations from one particular country.

Table 3. 5: Robustness analysis

Dep. var.: Extent of internationalization	Model 1	Model 2	Model 3	Model 4	Model 5
Individual-level variables					
Age	-0.0376***	-0.0374***	-0.0370***	-0.0380***	-0.0365***
	(0.0062)	(0.0062)	(0.0062)	(0.0062)	(0.0062)
Age Square	0.0004***	0.0004***	0.0004***	0.0004***	0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Gender	0.1851***	0.1856***	0.1887***	0.1845***	0.1867***
	(0.0210)	(0.0210)	(0.0210)	(0.0210)	(0.0210)
Education	0.1225***	0.1227***	0.1248***	0.1187***	0.1238***
	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)
Household Income	0.1569***	0.1555***	0.1464***	0.1516***	0.1466***
	(0.0136)	(0.0136)	(0.0136)	(0.0136)	(0.0136)
Ties with Entrepreneurs	0.2266***	0.2272***	0.2250***	0.2254***	0.2248***
	(0.0223)	(0.0224)	(0.0224)	(0.0224)	(0.0224)
Self-efficacy	0.0729**	0.0727**	0.0766**	0.0765**	0.0722**
	(0.0302)	(0.0302)	(0.0302)	(0.0302)	(0.0302)
Country-level variables					
Population Growth	0.3557***	0.3223***	0.3464***	0.3861***	0.3166***
	(0.0282)	(0.0322)	(0.0304)	(0.0292)	(0.0303)
GDP Growth	0.0086**	0.0102**	0.0108***	0.0092**	0.0108**
	(0.0041)	(0.0041)	(0.0042)	(0.0041)	(0.0042)
GDP per Capita (Log)	0.2590***	0.1078	0.0421	0.0415	-0.0495
	(0.0974)	(0.0769)	(0.0572)	(0.0637)	(0.0548)
Social Desirability of Entrepreneurship		0.2509***	-0.4942***	-0.8988***	-0.8752***
		(0.0819)	(0.0506)	(0.1084)	(0.0802)
Government Size		0.0083***			
		(0.0030)			
Rule of Law			0.0115***		
			(0.0039)		
Regulatory Efficiency				0.0118***	
				(0.0015)	
Open Markets					0.0127***
					(0.0012)
Interaction terms					
Social Desirability of Entrepreneurship*Government Size		-0.0049***			
		(0.0012)			
Social Desirability of Entrepreneurship*Rule of Law			0.0080***		
			(0.0009)		
Social Desirability of Entrepreneurship*Regulatory Efficiency				0.0118***	
				(0.0015)	
Social Desirability of Entrepreneurship*Open Markets					0.0127***
					(0.0012)
Country-Level Variance	1.6472	1.2568	0.7140	0.8451	0.7239
	(0.4668)	(0.3112)	(0.1685)	(0.2002)	(0.1554)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Number of Observations	45,454	45,454	45,454	45,454	45,454
Number of Groups	48	48	48	48	48
Wald–Chi Square	826.44***	870.04***	936.14***	955.62***	984.25***
Log-likelihood	-39108.54	-39086.85	-39054.22	-39042.47	-39025.33
Degrees of Freedom	10	13	13	13	13

Note: Standard errors are given in brackets. * p<0.10, ** p<0.05, *** p<0.001; two-tailed significance.

3.5 Discussion

3.5.1 Key findings

Our study aimed to examine how the informal institutional environment influences early-stage entrepreneurs' internationalization and how the formal institutional framework affects such relationship. Two main findings emerge. We first show that the international orientation of early-stage entrepreneurs varies significantly depending on the country's social legitimacy of entrepreneurship, but we also demonstrate that the formal institutional setting in the form of economic freedom plays a moderating role in this link.

The first main finding concerns the direct effects of social desirability of entrepreneurship on internationalization. Generally, this factor tends to support new business creation (Busenitz et al., 2000; Fritsch & Wyrwich, 2018; Reynolds et al., 2004). However, our empirical evidence shows the opposite relationship with the extent of internationalization. We found that high social acceptance of entrepreneurship in the home country does not necessarily encourage entrepreneurs to pursue international expansion. In other words, early-stage entrepreneurs in an environment with low social desirability of entrepreneurship are more likely to facilitate internationalization.

This can be interpreted as indicating that individuals with higher entrepreneurial intentions will be pushed out to international markets in an unfavorable informal context (Muralidharan & Pathak, 2017; Segal et al., 2005). The "push power" may be strong enough to encourage such types of individuals to engage in international activities (Zahra et al., 2005). In other words, a non-favorable informal institutional environment will prevent individuals their need for achievement. Consistent with this, opportunity driven early-stage entrepreneurs (i.e., those individuals with higher entrepreneurial intentions) will seek further commercial opportunities beyond their national borders.

Another interpretation of this finding suggests that, in home country environments with high social desirability of entrepreneurship, individuals would opt proactively to stay in the domestic markets due to a favorable informal environment. The reason might be that the home country environment could provide easy access to various domestic resources, obtain local media coverage, and avoid foreign market uncertainty. In fact, higher levels of social legitimacy are typically associated with a less risky environment for entrepreneurship (Etzioni, 1987). In such contexts, early-stage entrepreneurs will find support from various ties and the local community (Busenitz et al., 2000; Reynolds et al., 2004). This may favor the access to

resources of early-stage entrepreneurs, which would increase their confidence in navigating the challenges they expect to face in managing their new firm. This will also make it more feasible for ambitious entrepreneurs to seek to grow their firms in the local markets (Autio et al., 2013).

Therefore, this study contributes to extant knowledge by showing that contexts with strong entrepreneurial cultures do not necessarily encourage the pursuit of international growth by early-stage entrepreneurs. Specifically, we have shown that home contexts with high social desirability of entrepreneurship help to facilitate domestic entrepreneurial initiatives but may hinder their international orientation. This finding also adds to our knowledge about the domestic environment factors influencing the degree of internationalization. While prior work has indicated that the economic and political context in the home country affect firm internationalization (Marano et al., 2016), we show that domestic cultural norms might also influence the extent of internationalization.

The second key finding contributes to the knowledge about the interdependence between the two types of institutions, which remains unclear in the related literature. Past studies have shown that favorable formal institutions can positively and directly influence international entrepreneurship explicitly (Fuentelsaz et al., 2019, 2020; Marano et al., 2016; Peng et al., 2008, 2009). Our results confirm this direct positive effect. However, the novelty of this study is the examination of the moderating role of economic freedom in the relationship between the informal institutional context and the extent of internationalization of early-stage entrepreneurs. The interaction results indicate that, in countries with a freer economic context, the negative relationship between social desirability and internationalization can be attenuated. The implication here is that a high degree of economic freedom counteracts the negative effect of social desirability on internationalization. Moreover, the additional robustness tests provide more nuanced evidence that most pillars of economic freedom (i.e., the rule of law, regulatory efficiency, and open markets) produce positive moderation effects in line with our main results.

These can be interpreted as showing that favorable public policies help to promote international expansion, even if entrepreneurs reside in a hostile environment. In this sense, higher transparency, and security to operate in the markets, better access to relevant information, and the freedom to manage the business effectively, will provide resources that not only enable entrepreneurial behavior (Autio et al., 2013; Baumol, 2010; Fuentelsaz et al., 2018) but also favor the entrepreneurs' international orientation, particularly in countries with higher desirability of entrepreneurship. Besides, economic freedom also represents reduction of regulations, especially deregulation on the international activities (Dau & Cuerzo-Cazurra,

2014), which could mitigate the entry barriers to new markets and reduce the limitations of the activities that entrepreneurs can perform (Tirole, 1988). Hence, deregulation provides new opportunities for individuals with higher entrepreneurial intentions to create new business abroad while facilitating the access to additional foreign resources, even in contexts having higher levels of domestic social desirability of entrepreneurship.

Overall, starting with the view that formal institutions function as extrinsic elements to accelerate internationalization, this study attempted to establish whether a high degree of economic freedom could help to ameliorate the deficiencies of informal rules (Evald et al., 2011; Fuentelsaz et al., 2019). Our results reveal that high-level economic freedom represents more favorable factors of the home country institutional environment, helping to counteract the negative effects of informal rules.

3.5.2 Policy and managerial implications

Our findings offer implications for policy and practice. The results suggest that policymakers wishing to favor international activities of early-stage entrepreneurs in the long-term may need to improve attitudes towards international business in the society. The inclusion of international entrepreneurship courses at different educational levels and raising the international market awareness might constitute one possible way to develop the international entrepreneurial spirit. Besides, developing specific training programs aimed at convincing more individuals to consider international entrepreneurial careers (Muralidharan & Pathak, 2017) and presenting successful international entrepreneurs as positive role models in the media can play an important role to convey that early internationalization is a desirable option for those interested in an entrepreneurship career.

This research also indicates that policymakers could ameliorate the negative influence of informal norms in the pursuit of internationalization by fostering and improving the level of economic freedom that works on behalf of the regulation quality and administration efficiency. Consequently, increasing the level of economic freedom makes it easier for early-stage entrepreneurs to internationalize. However, although increasing the level of economic freedom, especially in countries where the rules of the game tend to be less clear, is an implication from a public policy perspective, it is also necessary to be aware of the inter-relationship between formal and informal institutions. Hence, they should not be managed in isolation (Fuentelsaz et al., 2019) but instead jointly integrated within public policies.

Furthermore, our findings provide some guidance for early-stage entrepreneurs seeking to pursue international opportunities. Entrepreneurs should be aware of domestic environments that constrain their internationalization efforts. As such, entrepreneurs that seek to internationalize should appreciate what domestic institutional factors can hinder their international activities and then be able to advocate for an appropriate institutional environment in their home country that reduces the uncertainty surrounding their domestic operations and give them the opportunity to expand in foreign markets.

Relatedly, our findings suggest that early-stage entrepreneurs' approach to international activities might need not only to develop capabilities to successfully exploit opportunities in foreign markets but also learn to navigate around home market constraints related to informal institutions (i.e., social desirability of entrepreneurship) and to take advantage of a formal institutional framework consistent with the pillars of economic freedom, mostly rule of law, regulatory efficiency, and open markets.

3.5.3 Limitations and future research

Our study is not free of limitations, which nonetheless open opportunities for relevant future research. One limitation is the relatively simple measure of internationalization based on the proportion of customers in foreign markets, despite most of existing studies in this area have employed this common measure to capture internationalization of early-stage entrepreneurs (Autio et al., 2013; Li, 2018; Muralidharan & Pathak, 2017). Therefore, there is a need for future research to address this issue and find a richer data to better capture internationalization.

Another limitation has to do with the cross-section nature of GEM data, which may affect the ability to address causality between institutional factors and the extent of internationalization. Future studies should use longitudinal data to deal with this issue. Repeating the analysis with an even larger number of countries would also be desirable, especially as developed economies are somewhat overrepresented in our sample. However, we have included diverse countries with differing economic and social backgrounds across all continents as well as run appropriate robustness checks.

Given the purpose of the study, the analysis is focused on home country variables to predict the likelihood of engaging in early internationalization. In fact, some studies suggest that home country institutions have traditionally been considered more important to the internationalization of early-stage entrepreneurs than host country institutions (Zhang et al., 2016; Yang et al., 2020). However, the next logical step for further research would be to

examine how social acceptance of entrepreneurship and economic freedom in the host country affect international entrepreneurial activity.

Lastly, the entrepreneurs' decision to internationalize might also be based on the costs associated to the internationalization process (Chetty & Campbell-Hunt, 2004; Pogrebnyakov, 2017). Nevertheless, here we have focused on the export-oriented activity of early-stage entrepreneurs, which does not usually involve a substantial resource commitment to a foreign market (Lu & Beamish, 2006) and, thus, is a relatively easy and fast way to engage in international activities (Bolívar-Ramos et al., 2020; Filipescu et al., 2013). Additionally, case study research could be used to investigate less explored factors at different levels of analysis that may shape early-stage entrepreneurs' ability to engage in internationalization activities, including the role of managerial cognition (Marano et al., 2016).

3.6 Conclusion

Early-stage entrepreneurs' internationalization is an important phenomenon that help us understanding how business opportunities emerge across countries. Our research seeks to better understand the boundaries that the institutional context set on those seeking international efforts. The findings reveal that in a context of high social desirability of entrepreneurship entrepreneurs do not necessarily look for business opportunities abroad. Yet, it will be the level of economic freedom in their home country that will positively moderate that relationship. Thus, from a broader perspective, this paper will not just help scholars to advance research on international entrepreneurship but also to develop a more nuanced understanding on how regulative institutional dimensions may compensate the impact of the heterogenous effect of entrepreneurial culture to the extent of early-stage entrepreneurs' internationalization outcomes across countries.

CHAPTER IV: COLLABORATIVE INNOVATION: A SOLUTION TO THE DILEMMA OF FAMILY FIRM INTERNATIONALIZATION?

4.1 Introduction

Family firms dominate the business landscape and play a significant role in leading economic growth worldwide. Therefore, it is not surprising that prominence of family enterprises has captured the interests of a variety of disciplines (Arregle et al., 2021; Pukall & Calabro, 2014), including international business scholars. There is a contradictory phenomenon in family firm internationalization (Debellis et al., 2021). That is, family firms tend to face tensions between the desire to preserve the family values, controls, and traditions by remaining rooted in their local region (Bird & Wennberg, 2014; Gomez-Mejia et al., 2010) and the need to explore and exploit the benefits of global expansion (Arregle et al., 2017, 2021). Therefore, financial wealth and socioemotional wealth (SEW) are combined and balanced when family firms encounter a dilemma of potential economic gains and losses named "mixed gamble" (Alessandri et al., 2018; Gomez-Mejia et al., 2018). Recently, a prevalent view in family firm internationalization is that family management discourages internationalization because of preservation of the SEW and pursuit of noneconomic goals has become a more widely accepted consensus (Hennart et al., 2019).

Some scholars posit that external knowledge might play a significant role in overcoming the limitations mentioned above of internationalization (Alayo et al., 2021; Casprini et al., 2020; Debellis et al., 2021; Fang et al., 2018). Collaborative projects with different partners (e.g., suppliers, competitors, customers, research units) can create valuable resources, for example, knowledge-based resources that are difficult to imitate, leading to a sustainable competitive advantage and thereby enhancing family firm internationalization (Debellis et al., 2021; Singh & Gaur, 2013). International business research has also proved that firms benefit from R&D resources and information flows in international expansion by access to new markets and external knowledge and expertise (Aiello et al., 2021), sharing of resources and risks in the development of innovative products (Feranita et al., 2017), and improvement of innovation capabilities (Ahmad et al., 2021). Altogether, whether such competitive advantages derived from collaborative innovation could alleviate the downside of family firm internationalization remains unclear.

Internationalization is a multifaceted process that occurs over time rather than consisting of a single set of decisions or discrete events (Welch & Paavilainen-Mäntymäki, 2014). The above

definition can be translated as a cumulative, evolutionary, partly dependent on history, but still open-ended, progressive, and a long-term process with temporal factors (Hurmerinta, et al., 2016). Metsola et al. (2020) claimed that majority of studies have adopted a static and deterministic variance-based approach focusing on family firm internationalization as a strategic decision, yet neglecting the "temporal evolving outcomes." Debellis et al. (2021) recommended the necessity to provide "process-based" explanations, such as how family firm internationalization unfolds over time, highlighting the importance of "time." Therefore, in this study we start from the post-entry period and focus on the family firm internationalization evolving over time according to process theorizing, for example, internationalization speed and scope.

Above all, following the previous arguments, our study hypothesizes that family management inhibits internationalization speed and scope based on SEW perspectives, examining whether the findings on speed or scope align with the consensus. Furthermore, we introduce collaborative innovation as external knowledge resources to test whether such competitive advantages in technology, product, and process improvement obtained from the collaboration with external partners could alleviate the limitations on family firm internationalization.

We tested our hypotheses on a large longitudinal dataset covering 1999 to 2016 obtained from the *Survey on the Business Strategies (ESEE)*, focusing on the Spanish manufacturing sector, consisting of 2866 firms and 16,290 firm-year observations. Family firm internationalization refers to Spanish manufacturing firms' export activities. The hypotheses were also examined by the random effect panel regression.

This research makes several contributions to the literature. First, it broadens our understanding of the effects of family management on internationalization speed and scope, echoing previous studies on speed and scope (Arregle et al., 2021). It shows that the effects of family management vary depending on the scope and speed. Moreover, it also helps explain the choice of scope and speed strategies because of limited resources when family firms go international. Therefore, our empirical evidence found that family management discourages internationalization speed and instead facilitates scope. Consistent with this, firms with more family management prefer to start an international business in multiple countries rather than expanding it in some specific countries. Second, our research also advances the understanding of the role of external knowledge resources in family firm internationalization, responding to the need for information about collaborative innovation (Alayo et al., 2021, Casprini et al., 2020; Debellis et al., 2021; Feranita et al., 2017). More precisely and surprisingly, collaborative

innovation intensity strengthens the positive effects of family management on internationalization scope yet diversity does not work. Moreover, all dimensions of collaborative innovation may not alleviate the adverse effects on speed. Therefore, collaborative innovation may not always be a solution to solve the "paradox" of family firm internationalization.

In the remainder of the article, we review the literature on the influence of family management and collaborative innovation on internationalization speed and scope. We then develop the hypotheses, describe our methods, and discuss the implications and limitations and future research directions of this study.

4.2 Literature review and hypotheses development

4.2.1 Family business internationalization

Research on family firm internationalization is reported primarily in family business studies and niche conversations, as highlighted in the literature review paper by Pukall and Calabro (2014) reviewing 72 articles. However, interest in FF internationalization has spanned boundaries of the niche and transcended the family business field to the border IB research domain in 2013–2020 (Debellis et al., 2021). Although some steps have been pushed out, the interface between the family business and internationalization has flourished in a fragmented way, both empirically and theoretically. In this regard, Arregle (2021) synthesized family firm internationalization studies that address each of seven core IB themes according to 220 conceptual and empirical studies over the past 30 years: (1) scale of family firm internationalization; (2) scope of family firm internationalization; (3) entry mode choice; (4) location choice; (5) internationalization process (6) pace, speed, and rhythm of internationalization; (7) internationalization performance. Therefore, the mixed findings vary concerning the above themes. Among the seven core themes, 39% focus on the scale, only 8% on scope, and 4% on speed, pace, and rhythm of internationalization. As a result, little information is on family firm internationalization speed and scope, suggesting fruitful opportunities on speed and scope for further exploration and extension.

In recent years, a unique view among family firm internationalization scholars has become prominent though some scholars discover inconsistence findings, i.e., family management discourages firm internationalization (Debellis et al., 2021; Arregle et al., 2021; Fang et al., 2018; Hennart et al., 2019; Alayo et al., 2021; Hsieh et al., 2019). This is because going international requires more specialized managers and more resources than staying local. Firms

that lack such experiential knowledge, for example, country-specific knowledge, are unable to sell abroad successfully unless they can hire outside managers with international experiences. However, the fact is that family firms are unwilling to recruit non-family managers and dilute their control of the firm and financial return in order to protect the SEW (Kontinen & Ojala, 2010; Pukall & Calabro, 2014).

In addition to the managers with international experience, substantial additional capital is thought to be required, as Arregle et al. (2012) recommended extensive financial resources aims to overcome the "liability of foreignness" stemming from doing business in unknown markets. Similarly, Graves and Thomas (2008) have argued the necessity of external financial resources for international growth. Therefore, our study complements the information on family firm internationalization on speed and scope, testing whether family management inhibits speed or scope in line with general views of family firm internationalization. Research framework is presented in Figure 4.1. More detailed information is discussed below.

Figure 4. 1: Research framework
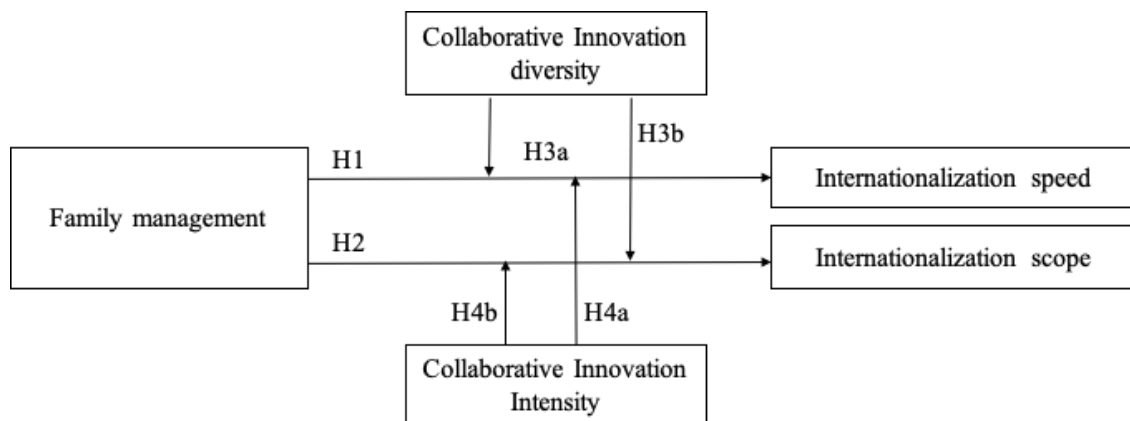
4.2.2 Family management and internationalization speed

Studies have already begun to explore internationalization earliness, speed, rhythm, and timing in the last decades (Arregle et al., 2021; Crispini et al., 2020; Freixanet et al., 2020; Hsieh, 2019). It is often assumed that family firms internationalize slowly and follow a stepwise pattern of international expansion (Graves & Thomas, 2008). However, Lin (2012) showed that family firms increase the pace of internationalization but throws off its rhythm (i.e., internationalization becomes more irregular), and Kontinen and Ojala (2010) proposed higher levels of family involvement correspond with a greater pace of internationalization. Therefore, Arregle et al. (2021) argued in one literature review that temporal patterns of family firm

internationalization rely on characteristics of the family firm, such as management generations and successor attributes.

Stemming from SEW perspectives, we follow the general assumption of family business internationalization and propose that the internationalization process with more family management would be slower than in less management firms. This is because of the dominance of SEW preservation in the internationalization process. The SEW perspective emphasizes the role of noneconomic goals and explains how family owners and managers are connected to their businesses. Remarkably, firms with more family management tend to prioritize noneconomic outcomes when there is a conflict between economic and noneconomic outcomes (Gomez-Mejia et al., 2007). The main three aspects related to the dominant influence of SEW preservation are explained as follows.

First, preserving the family firm's SEW requires a clear orientation to avoid putting SEW at risk. Moreover, the main objective of the family business is to transfer its legacy and management to the next generation, avoiding any potential risk. As Souder (2016) stated, decision-makers tend to take fewer risks when things go well. Typically, internationalization comes with costs, especially when entering unknown and uncertain markets (Johanson & Vahlne, 1977). Failure in the new market expansion may be attributed to poor management and the family manager's passive involvement in social, psychological, and emotional costs. Therefore, a slower international expansion allows family managers to legitimize their decisions by trial and error when testing their role as stewards (Jaskiewicz et al., 2015). Risk aversion by family management hence encourages a slow internationalization process.

Second, only a small number of family firms are public; they want to avoid losing ownership control to large capital providers and refuse to take on high debt levels from banks or other financial companies (Cruz et al., 2021; Souder et al., 2016). However, rapid internationalization requires a high level of financial resources. Consequently, firms with more family management that wish to maintain control tend to have fewer financial resources to dedicate to their internationalization (Pukall & Calabro, 2014), which may slow down the process. The owning family's effort to maintain the greatest possible financial autonomy and avoid new entry from capital partnerships reflects their desire for financial control. Therefore, the scarcity of financial resources leads to slow decision-making about the internationalization process and subsequent lower internationalization speed.

Third, as Pukall and Calabro (2014) proposed in their literature summary, most family firm internationalization follows a stage model, demonstrating a gradually incremental decision over time, which is salient in firms with more family management. These studies suggest that firms with more family management internationalize slower but, in the long run, reach out to the same degree as non-family management firms. This might be because family managers find fewer financial incentives for rapid internationalization but receive more compensation from dividends depending on the firm's long-term value. Hence, long-term orientation encourages slow decisions and prefers to internationalize gradually (Moreno-Menéndez et al.,2021).

Lastly, solid home country social capital strengthens the imprint of the founder on strategy across generations of leadership and management in the firm, which can deter changes in internationalization decisions (Suman, 2017). For example, the founder of family firms tends to keep the business local to protect SEW because of strong social capital for business growth. His successors will probably continue such a conservative strategy and is unlikely to change the founder's internationalization strategy for the business.

Above all, risk aversion, fear of loss of control, and long-term orientation are the consequences of the family firm's desire to preserve their SEW, emphasizing noneconomic goals ahead of financial performance. We, therefore, propose our Hypothesis 1, shown below.

H1: Firms with higher presence of family management internationalize slower.

4.2.3 Family management and internationalization scope

The relationship between family management and geographical diversification is complex and characterized by both positive and negative influences, like the above relationship between family management and speed. For example, Alessandri et al. (2018) concluded that family involvement is positively associated with greater market scope, while Arregle et al. (2017) and others (Avrichir et al., 2016; Bauweraerts & Vandernoot, 2019) discussed that family firms reduced scope of internationalization. In addition, Zahra (2003) found contradictory empirical evidence between ownership and management on international scope based on stewardship theory; ownership positively affected the scope, but family management affected it negatively.

We argue that family management limits firms' international scope for three reasons. However, parts of explanations in internationalization speed may also apply in the explanation for limited scope.

First, increasing international scope creates higher resource demands, which increases the risk of SEW losses (Xu et al., 2020). Second, family-managed business may face challenges in

understanding and adapting to cultural differences in foreign markets, for example the western firms must understand "Guanxi" when they run business in China (Chung et al., 2015). This culture differences can lead to difficulties in establishing relationships with customers and suppliers, as well as in designing products and services that meet local needs. Firms with more family management might also struggle to navigate in legal and regulatory frameworks across countries (Bornhausen, 2022). Third, Zellweger et al. (2012) used data from Switzerland and found family-managed businesses tend to expand into nearby markets rather than distant ones, which is partly owing to the challenges of managing operations across long distance. De Massis et al. (2013) also posited that geographical distance is one of the main factors hindering family businesses' ability to successfully expand into foreign markets by conducting a systematic literature review. Therefore, businesses with more family management are more conservative and might struggle to manage operations across different time zones and geographical locations, leading to communication and coordination difficulties. This can result in delays and increased costs, as well as difficulties in maintaining relationships with customers and suppliers.

Fourth, family leaders prioritize a higher trust network and collaborative intensity because they are motivated to take advantage of their business ties to facilitate internationalization (Cesinger et al., 2016). However, personal networks tend to be limited and regionally bound, leading to a restricted international scope, or constrained to a particular region (Jimenez et al., 2019; Tsang, 2020). Last, international diversity requires significant international experiences for management and access to additional capabilities and resources. Family businesses may have limited experience in operating in foreign markets, which can increase the risk of making costly mistakes (Salvato et al., 2019). Besides, Stadler et al. (2018) found that solid family social capital can hinder international scope by dampening the range of available managerial capabilities in a family firm, causing a mismatch between the pool of competencies available in family managers' social networks and increasing diversity needed for geographical expansion, which fosters liabilities of newness and foreignness.

In sum, we suggest that internationalization scope is more constrained under the influence of family management. Hypothesis 2 is presented below.

H2: Firms with higher presence of family management tend to have a narrower scope towards internationalization.

4.2.4 Moderating role of collaborative innovation

Innovation is an information- and knowledge-intensive process that generates knowledge-based resources for family firm internationalization by positive externalities on the foreign market expansion (Fang et al., 2018). To be more specific, innovation is regarded as a means to growing family business internationally and an end to transforming the knowledge-based resources gathered from international cooperation into new products and processes (Del Giudice et al., 2010). Particularly, firms can benefit from using both internal and external sources of ideas, knowledge, and resources to drive innovation and subsequently fostering internationalization, regarded as open innovation. The original definition of open innovation stressed that "valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well" (Chesbrough, 2003), concerning all the means that can be used by a firm to gain access to the technology. As one of the specific types of open innovation, collaborative innovation is one of the key mechanisms for achieving open innovation that leverages the strengths of different organizations to jointly develop new ideas, products or services, focusing on a way for firms to create a new technology (Bigliardi et al., 2021). By collaborating with external partners, organizations can access new perspectives, expertise, and resources that can help drive the product and process improvement. Collaboration can also help to bridge gaps between different organizations or departments within an organization, facilitating the exchange of knowledge and ideas.

Therefore, some existing studies have already posited that collaborative innovation projects might influence the internationalization process and overall decisions on international scope and speed (Casprini et al., 2020; Calabro et al., 2016). Furthermore, Feranita et al. (2017) defined collaborative innovation as involving exchanging and sharing resources, for example, financial capital, information, knowledge, and technology, with external parties. It also includes alliances, joint ventures, technology exchange, and formal agreements encompassing a broad spectrum of external parties such as customers, suppliers, competitors, universities, and research institutions. The authors also reviewed related literature and classified collaborative innovation of family firm into three categories: strategic view (accessing resources needed), transactional view (curbing possible opportunistic behaviors by collaborating partners), and relational view (social exchange relations between partnering firms).

We argue firms managed by family members tend to utilize knowledge-based resources derived from collaboration with other partners for internationalization purposes as the level of those resources increases (Fang et al., 2018), although they are less willing to internationalize

in general, as mentioned previously. We attempt to explain this phenomenon from the three distinctive views.

First, our strategic review posits collaborations are used by family firms as a means of strategically accessing the resources needed, leading to knowledge transfer and focusing on how family firms recombine external sources of resources to achieve competitive advantages (Alayo et al., 2021). Therefore, when family firms develop tangible or intangible firm-specific assets that can help them acquire a sustainable competitive advantage, collaborative innovation could also support and strengthen such competitive advantage through collaborative projects with different partners. In addition, co-development of the above specific assets with outsiders using external resources leads to time gains and lower innovation costs, also helping family firms decrease risks of product or process improvement failure compared with the development by the focal firm alone, subsequently encouraging desire for internationalization (Aiello et al., 2021).

Second, the transactional view on collaborations concentrates on assessing the different modes of governance structure in curbing possible opportunistic behaviors by partner organizations that may have a negative effect on the intended innovation goal based on the transaction economies' costs and game theory (Feranita et al., 2017). In achieving competitive advantage goals through collaborations, family firms might have more than one single collaboration formed for different innovation projects. Obviously, managing collaborations is becoming much more complex and more than just a matter of curbing opportunism but also includes increased costs in managing the collaborations, consequently leading to negative effects on financial performance (Kale & Singh, 2009). However, when family firms expand their portfolio of collaborations with international partners, the liabilities of "foreignness" can be overcome with the accumulation of experience even though financial performance may initially decrease (Lavie & Miller, 2008). This research thus points to the importance of foreign partners. Therefore, in the transactional view, we see how family firms curb hazards and opportunism in collaborative innovation because of the asymmetry of information and control of resources, ultimately increasing the internationalization process by reducing liabilities of "foreignness."

Third, the relational view of collaborative innovation argues that relationship between focal firms and partners involves the continuous exchange of tangible and intangible resources within the embedded network over a specified period of time (Uzzi, 1997). Once a collaborative relationship is formed, family firms engage in a process that involves the

exchange of resources, such as financial capital, ideas, knowledge, and technology to co-develop a new product. Then trust and familiarity among partners are subsequently built through collaborative ties. Firms become more willing to share knowledge, and the gap in knowledge about international market asymmetry becomes smaller, facilitating the achievement of potential joint internationalization goals in collaborative innovation (Kim & Song, 2007; Fernhaber & Li, 2013). Therefore, according to the three views of collaborative innovation, studies on family firm internationalization show a substantial degree of consensus that the involvement of external actors can alleviate some constraints and positively moderate the primary relationships between family management and internationalization speed and scope.

As a result, we expect external sources of innovation such as collaborative innovation can be critical to addressing this dilemma in the family firm internationalization process. Hence, we focus on the critical role of collaboration innovation in explaining how to decrease constraints and the harmful effects of family management on internationalization speed or scope. Further, collaborative innovation is a multidimensional concept consisting of breadth and depth (Feranita et al., 2017; Aiello et al., 2021). Therefore, we divide the collaborative innovation into breadth (i.e., diversity) and depth (i.e., intensity) to examine collaborative innovation's moderating role, respectively, in drawing a complete picture of these firms' internationalization.

Specifically, collaborative innovation diversity refers to the collaborating with different types of partners (e.g., universities, customers, suppliers) in the process of development of innovative products and services and upgrade of technology (Greer & Lei, 2012). By working with collaborators who have knowledge and connections in different markets, firms can expand their internationalization scope and accelerate their speed of entry because collaborating with partners from diverse backgrounds and regions can provide firms with access to new markets that they may not have been able to enter on their own (Kafouros et al., 2020). Then, diverse partners can provide firms with access to a wider range of expertise and knowledge, helping firms to better understand and adapt to local markets and increasing the speed and scope of their internationalization efforts. Next, the creation of innovative ideas and products derived from working with different partners that can be adapted to multiple markets also accelerates the speed and increasing the scope of internationalization (Ferraris et al., 2021). By leveraging the different perspectives and expertise of diverse partners, family-managed firms can create new and innovative products that meet the needs of different markets. Last, reputation is enhanced while collaborating with diverse partners by demonstrating its commitment to

diversity and inclusivity, which might increase the attractiveness of the firm to international partners and customers and facilitate entry into new markets, alleviating the limitations of family firm internationalization. We hence developed our hypotheses H3 as below.

H3a: Collaborative innovation diversity positively moderates the relationship between family management on internationalization speed: collaborating with more types of partners in the innovative products and services helps attenuate the negative effects of family management on speed.

H3b: Collaborative innovation diversity positively moderates the relationship between family management on internationalization scope: collaborating with more types of partners in the innovative products and services helps attenuate the negative effects of family management on scope.

Collaborative innovation intensity refers to the depth of collaboration in the innovation projects, consisting of degree of collaboration between collaborators and including the frequency and intensity of interactions, joint activities, and resource-sharing (Aiello et al., 2019; Kobarg et al., 2019). As mentioned earlier, family-managed firms may face cultural barriers when entering new markets due to their limited exposure to external cultures. The deeper in the collaborative innovation projects, the better for firms to overcome these barriers by collaborating with partners who have a better understanding of the local culture and can provide guidance on cultural norms and practices (Bornhausen, 2022). In addition, strong collaborative innovation intensity strengthens the ties and involvement of external partners in the collective innovation projects, helping family-managed firms diversify their risks in the development of innovative products and services particularly in the internationalization process (Munoz-Bullon & Sanchez-Bueno, 2011). Further, a high level of collaborative innovation intensity also helps family-managed firm improve their innovation capabilities by deeply exposing to different perspectives, knowledge, and expertise (Ahmad et al., 2021). This can facilitate the procedures of developing new products and services that are more adapted to different markets, accelerating their internationalization speed and scope and offsetting the negative impacts of family management. Hence, we proposed our hypotheses H4 as below.

H4a: Collaborative innovation intensity positively moderates the relationship between family management on internationalization speed: the depth of collaborating with a variety type of partners in the innovative products and services helps attenuate the negative effects of family management on speed.

H4b: Collaborative innovation intensity positively moderates the relationship between family management on internationalization scope: the depth of collaborating with a variety type of partners in the innovative products and services helps attenuate the negative effects of family management on scope.

4.3 Methods

4.3.1 Sample and design

To test our hypotheses, we drew on a representative sample of Spanish firms from the database *Survey on the Business Strategies (ESEE)*, started in 1990 and founded by the Spanish Ministry of Industry and the *Fund for Supporting the Solvency of Strategic Companies (SEPI)*. The *ESEE* is an annual survey designed to gather firm-level data from manufacturing firms located in Spain, covering various firms' strategy decisions that imply extraordinary changes in the firms' life cycle, such as mergers, absorptions, splitting, adjustment plans for employees, and segregation of assets. Moreover, the *ESEE's* reference population is composed of firms with 10 or more employees, randomly sampled by manufacturing and size strata. The sampling procedure adopts exhaustiveness and random sampling criteria to ensure representativeness through a stratified, proportional, and systematic sampling with a random seed. Specifically, two categories in the original dataset were established as one with firms with more than 200 employees and the other with 10 to 200 workers.

We selected this database for the following reasons. (1) Prior studies related to family business internationalization and innovation literature have used this database as an empirical results source because it can provide much information on a firm's strategic decisions, supporting further future research (Moreno-Menéndez et al., 2021; Dieguez-Soto et al., 2018, 2019; Munoz-Bullon et al., 2018). (2) The quality of the survey data was also ensured. The data contents were subsequently validated because of the high level of participation, a high response rate, and the representativeness of the population (Dorling & Simpson, 1998). Furthermore, it is challenging to develop a precise consensus definition of the family firm because of dispersed related literature. However, the typical features of the family firm are seen as an organization controlled or influenced and usually managed by multiple family members, often spanning several generations (Gomez-Mejia et al., 2007; McConaughy et al., 1998).

Some studies consider a family firm one that owns a fraction of the company or has family members serving on the board of directors. One of the comprehensive classifications adopted

by prior studies is meeting two criteria simultaneously: (1) an individual or a family group owning at least 5% of the shares during the whole period, and (2) at least one member of the owning family being on the board of directors (Cruz et al., 2019; Garcés-Galdeano et al., 2016). Moreover, there are studies considering management by multiple members of the same family over time, counting as family firms only those in which several family members are acting as owners or managers of the business. Therefore, Arregle et al. (2021) identified the family firm as having family influence or control with emotional attachment. Because of the non-availability of ownership information in our dataset, we cannot identify the family firm precisely by ownership structure following the previous arguments. However, the number of family members/relatives holding management positions can be accessed. Therefore, our study views firms with family management as a family firm for subsequently testing hypotheses.

Our final dataset covers the period from 1999 to 2016 after removing all observations with missing information and outliers. We obtained unbalanced panel data on 2866 firms and 16,290 firm-year observations across Spanish regions[9] (see Table 4.1). Among them, firms located in Cataluña account for the most firm-year observations (21.98%) and Baleares the least (1.15%). More than 50% of sampled companies come from Cataluña, Valencia, Andalucía, and Madrid, aligning with the leading regions in Spain's economic contribution. Firms located in Navarra internationalize faster than the other regions. As for the scope, firms in Cantabria tend to internationalize in the multiple countries (2.412) which is the most but firms in Extremadura are the least (1.540). Firms in Murcia prefer to deploy more family managers, averagely at least one family member is appointed as manager, but Cantabria is the opposite. Furthermore, the collaborative innovation diversity among Cantabria's firms is the most (1.253) yet Canarias is the least (0.235). Moreover, the collaborative intensity in the procedures of product and process improvement in Galicia (0.368) is the most but Canarias is the least where firms spent less in the external R&D (0.004). In addition, all the firms in the sample are manufacturing firms and represent 20 sub-industries (See Table 4.2). The most firms deal in fabricated metal products (11.27%) and the least in the computer, electronics, and optical equipment (1.45%).

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[9] The Spanish territory is divided into 19 autonomous communities and cities which are the second-level territorial and administrative divisions NUTS 2 under EUROSTAT classifications.

Table 4. 1: Sample distribution across regions

	N	Internationalization speed	Internationalization scope	Family Management	Collaborative diversity	Collaborative intensity
Andalucia	1110	0.010	2.023	0.847	0.398	0.173
Aragon	603	0.014	2.194	0.618	0.808	0.181
Asturias	428	0.011	2.121	0.553	0.832	0.148
Baleares	188	0.005	1.793	0.893	0.096	0.025
Canarias	238	0.004	1.538	0.506	0.235	0.004
Cantabria	221	0.017	2.412	0.380	1.253	0.294
Castilla-La Mancha	795	0.009	1.958	0.848	0.496	0.120
Castilla-Leon	910	0.015	2.122	0.659	0.715	0.324
Cataluña	3580	0.014	2.137	0.701	0.815	0.291
Valenciana	2168	0.014	2.045	0.893	0.506	0.168
Extremadura	213	0.008	1.54	0.716	0.507	0.085
Galicia	852	0.013	1.951	0.723	0.675	0.368
Madrid	2712	0.010	1.902	0.76	0.538	0.301
Murcia	424	0.015	1.976	1.021	0.575	0.039
Navarra	445	0.021	2.013	0.472	0.883	0.195
Pais Vasco	1212	0.020	2.147	0.420	0.989	0.416
La Rioja	191	0.013	2.11	0.665	0.408	0.179

Note: Definitions of variables are shown in Table 4.3

Table 4. 2: Distribution of sub-industries

	Frequency	Percent	Cumulative
Meat products	522	3.20	3.20
Food and tobacco	1674	10.28	13.48
Beverage	292	1.79	15.27
Textiles and clothing	1361	8.35	23.63
Leather, fur and footwear	467	2.87	26.49
Timber	479	2.94	29.44
Paper	594	3.65	33.08
Printing	773	4.75	37.83
Chemicals and pharmaceuticals	1107	6.80	44.62
Plastic and rubber products	917	5.63	50.25
Non-metal mineral products	1087	6.67	56.92
Basic metal products	589	3.62	60.54
Fabricated metal products	1836	11.27	71.81
Machinery and equipment	1186	7.28	79.09
Computer products, electronics and optical	237	1.45	80.55
Electric materials and accessories	882	5.41	85.96
Vehicles and accessories	826	5.07	91.03
Other transport equipment	330	2.03	93.06
Furniture	770	4.73	97.78
Other manufacturing	361	2.22	100.00
Total	16290	100.00	

4.3.2 Variable measurement

Dependent variables

Internationalization speed. Because of the fact that the operationalization of internationalization speed does not have previous theory-driven multidimensional measures, we drew upon the method of Chetty et al. (2014) to develop a measure of internationalization

speed based on the definition used in physics. That is to say, speed is defined and measured as "distance divided by time." Then, we would be able to measure speed by postulating that the "distance" covered is the cumulative magnitude reached by the firm based on some of the vital incremental indicators regarding the internationalization process. In this regard, Hilmersson and Johanson (2016) developed a multidimensional measure of mean speed, namely speed of change in the breadth of international markets, speed of firms' increasing commercial intensity, and speed of change in the firm's commitment to foreign resources considering the foreign assets. Hsieh et al. (2019) subsequently used the first two sub-measures of speed. However, they replaced the speed of change in the firms' commitment of foreign resources to "earliness," accounting for the time taken to make the first international sales since the firm's founding. Among them, foreign assets and earliness are not directly related to the internationalization speed, but they are indirect consequences. Hence, we adopted only one sub-measure of speed (i.e., speed of deepening). We measure the speed of deepening through the ratio of foreign to total sales divided by time. The denominator, time, is measured as the time elapsed from firm inception to the data collection date, in line with how research on firms' internationalization usually measures time starting from inception (Acedo & Jones, 2007; Hilmersson, 2014, 2017; Jorgensen, 2014).

Internationalization scope. This is measured by the number of export areas in a survey year (Patel et al., 2018; Freixanet & Renart, 2020). Respondents have to answer how many countries they are exporting to. The range of all the samples on the number of exporting countries is between 0 and 5.

Independent variables

Family management. We measured family management based on the number of owners or relatives who hold management positions on December 31st in a given year. The range is between 0 to 4.

Moderating variables

Collaborative innovation diversity. To define collaborative innovation, we follow the previous definition and regard it as collaborating with other organizations or individuals in the process of development of innovative products and services and upgrade of technology (Greer & Lei, 2012). To operationalize collaborative innovation diversity, we define diversity as the number of "partner types" that the responding firms collaborated with as indicated on a matrix with the dimensions such as suppliers, clients/customers, competitors, universities/other higher

education institutions following previous studies (Aiello et al., 2021; Kobarg et al., 2019; D'ambrosio et al., 2017), representing the collaborative breadth. The value ranged between 0 and 4 in our study. That is to say, the value of 0 indicates the firm did not collaborate with any external partner, and the value of 4 implies it collaborated with all types of partners. We used the 1-year lagged format.

Collaborative innovation intensity. Kobarg et al. (2019) measured collaborative depth as the number of stages during which the focal firm collaborated with a specific partner type in the process of development of innovative products and services, summed over all potential partner types. The stages are classified into five categories (i.e., idea generation, construction, design and layout, testing and checking, and market introduction). However, Aiello et al. (2021) used such a measure from an expense perspective, implying that external collaborative expenses equal collaborative intensity. Our study operationalized a measure of collaborative innovation intensity following Aiello et al. (2019) because stages may not fully represent the depth of collaborative innovation. Collaborating with different partner types at various stages is another kind of "surface" collaboration, suggesting no depth relationship. Therefore, we measured collaborative innovation intensity as the ratio between expenditures on external R&D collaboration and firms' total annual sales. We also used the 1-year lagged format.

Controls

Several control variables are included in the analysis to account for alternative explanations: *Percentage of family employees, firm size, firm age, foreign shareholding, firm risk, labor productivity, debt ratio, and past international experience*. These controls relate to corporate governance, firm attributes, and firms' strategic actions. Again, all are measured in a 1-year lag.

The *percentage of family employees* is measured by the percentage which owners and relatives represent the company's total personnel in the company on December 31st. *Firm size* is measured by the total personnel employed at the company on December 31st. We used its logged format. *Firm age* is measured by the number of years the firm has been in existence since being founded. Similarly, we used the logged format. *Foreign shareholding* is measured by the percentage of direct and indirect participation of foreign capital in the company's social capital (logged format). Moreover, the *firm risk* is measured by the standard deviation of stockholders' equity for the sampled years. We also used logged *total sales* to measure a firm's performance (Anderson & Reeb, 2004). In addition, *labor productivity* is measured by the

logged value of the production of goods and services and other current income (in thousands of euros), divided by the average total personnel. A firm's strategic actions beyond internationalization are also controlled, such as *debt ratio* (debt/ratio) (Fang et al., 2018). *Previous international sales* are measured as the proportion of international sales to total sales. Variable measures and descriptive statistics are shown in Table 4.3

Table 4. 3: Variable measurements and descriptive statistics

Variable	Definition	Mean	Std. Dev.	Min	Max
Dependent variables					
Internationalization speed	The time it takes to reach a certain degree of the internationalization dimension: speed of deepening (ratio between export intensity and time). Time is measured from firm inception to the survey date.	0.013	0.033	0	1
Internationalization scope	The number of the exporting markets	2.036	1.178	0	5
Independent variable					
Family management	Number of owners or relatives who held management positions on December 31st (t-1).	0.703	0.973	0	4
Moderating variables					
Collaborative innovation diversity	The breadth of collaboration by using information on innovation-related collaboration partners. 0 = did not collaborate with any type of partner; 1, 2, 3, 4 = and the value of 4 if it collaborated with all types of partners (suppliers, clients/customers, competitors, universities/other higher education institutes) (t-1).	0.658	1.075	0	4
Collaborative innovation intensity	The depth of collaboration with external partners. Expenditures of external R&D collaboration divided by firm's annual sales (t-1). (%)	0.247	1.468	0	98.924
Control variables					
Percentage of family employees	Percentage which owners and relatives represent among the company's total personnel in the company on December 31st (t-1).	3.668	6.925	0	100
Firm size	Total personnel employed at the company on December 31st (logarithm & t-1).	4.246	1.474	.693	9.616
Firm age	The number of years the firm has been in existence since its founding (logarithm & t-1).	27.256	20.592	0	172
Foreign shareholding	Percentage of direct or indirect participation of foreign capital in the social capital of the company (logarithm & t-1).	0.869	1.769	0	4.615
Firm risk	The average standard deviation of stockholders' equity for the sampled years (t-1).	0.462	0.365	0	4.076
Labor productivity	Value of the production of goods and services and other current income, in thousands of euros, divided by average total personnel (logarithm & t-1).	6.226	1.28	1.792	10.429
Debt ratio	The ratio between debt over sales (t-1).	1.039	2.746	0.001	259.12
Previous international experience	The proportion of international sales to total sales in time t-1.	0.223	0.282	0	1

4.3.3 Estimation model

In order to control for potential reverse causality between independent and dependent variables, we used longitudinal data and applied a 1-year lag for predictors and other controls so that the direction of causality could be ensured. What is more, ordinary least squares (OLS) regression is unable to control for both periodic and cross-sectional influences due to the nature of longitudinal data. Therefore, we employed random effect panel regression for this analysis suggested by Hausman test (Chi2 $= 114.34$, $p > 0.10$). Though fixed effects were used in similar studies (Fang et al., 2018), random effects models can be more efficient than fixed effects if the unobserved heterogeneity is not completely time-invariant. In this study, we cannot be sure all the unobserved heterogeneity are time-invariant. There might be some time-varying unobserved heterogeneity (e.g., regional export policy) that is not captured by fixed effects, suggesting random effects may provide more precise and efficient estimates and better account for unobserved heterogeneity. In addition, we also conducted correlation analysis and tested the multicollinearity issues for independent variables. The results suggested there is no strong correlation between variables and variance inflation factor (VIF) test also indicated multicollinearity issues are unlikely to occur and were well below the benchmark of 10 as shown in Table 4.4.

Table 4. 4: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	VIF
(1) Internationalization speed	1.000													-
(2) Internationalization scope	0.067*	1.000												-
(3) Family management	-0.109*	-0.012	1.000											1.50
(4) Collaborative innovation diversity	0.136*	0.192*	-0.160*	1.000										1.46
(5) Collaborative innovation intensity	0.032*	0.011	-0.050*	0.205*	1.000									1.05
(6) Percentage of family employees	-0.130*	-0.084*	0.535*	-0.239*	-0.059*	1.000								1.79
(7) Firm size	0.192*	0.197*	-0.284*	0.519*	0.125*	-0.516*	1.000							2.30
(8) Firm age	-0.185*	0.109*	-0.037*	0.190*	0.074*	-0.118*	0.301*	1.000						1.13
(9) Foreign shareholding	0.168*	0.107*	-0.316*	0.275*	0.043*	-0.254*	0.472*	0.154*	1.000					1.41
(10) Firm risk	0.044*	-0.040*	-0.009	-0.006	0.025*	0.027*	-0.006	-0.087*	0.033*	1.000				1.02
(11) Labor productivity	0.094*	0.153*	-0.223*	0.213*	0.047*	-0.257*	0.362*	0.048*	0.274*	0.049*	1.000			1.21
(12) Debt ratio	0.003	-0.018*	-0.004	0.010	0.051*	0.021*	-0.013	0.029*	-0.011	0.042*	-0.083*	1.000		1.01
(13) Previous international experience	0.449*	0.188*	-0.145*	0.351*	0.077*	-0.240*	0.420*	0.157*	0.303*	-0.034*	0.102*	0.005	1.000	1.29

p<0.05

4.4 Results

4.4.1 Main regression results

Prior to testing our hypotheses, we conducted an ANOVA analysis to test the significant between-regions variance, using the dependent variable and regional group as the predictor. The results show that 1.3% of the total variance can be explained by between-region groups, suggesting more remaining variance can be explained within the regions. To test our hypotheses, we hence conducted regressions of family management's effects and its interaction effects with collaborative innovation on internationalization speed and scope, as presented in Tables 4.5 and 4.6. Each table consists of four models: Model 1 is the regression without predictors and moderating variables. Model 2 describes the direct effects of family management on internationalization speed or scope. Model 3 includes the curvilinear effects of family management on internationalization. Model 4 presents moderating effects of collaborative innovation diversity, and Model 5 shows the moderating role of collaborative intensity. More detailed information is shown below.

Regarding the direct role of family management, family management reveals opposite effects on internationalization speed and scope. That is to say, family management has a negative effect on internationalization speed ($\beta = -0.074, p < 0.05,$ Model 2 in Table 4.5), supporting H1 and in line with the previous general results related to family firm internationalization (Arregle et al., 2021). However, family management's effects on internationalization scope are statistically positive ($\beta = 0.030, p < 0.01,$ Model 2 in Table 4.6), not supporting H2. Additionally, since some of the main effects might be zero, we introduce the square term of family management in the regression model and the results (Model 3) in Table 4.5 and 4.6 both show that there is no curvilinear relationship between family management and internationalization speed/scope.

Turning to the moderating role of collaborative innovation, the moderating effects of its two dimensions vary with respect to internationalization speed and scope. In terms of moderating effects of collaborative innovation on internationalization scope, only collaborative innovation intensity positively moderates the relationship between family management and internationalization scope yet collaborative innovation diversity does not perform any moderating role, not supporting H3b but confirming H4b ($\beta = 1.434, p < 0.1,$ Model 5 in Table 4.6). However, the moderating role of collaborative innovation on internationalization speed has not been confirmed (H3a and H4a), either in diversity or

intensity $(\beta = 0.021, p > 0.1, \text{Model 4 in Table 4.5}; \beta = 1.284, p > 0.1, \text{Model 5 in Table 4.5})$. In addition, we plotted the interaction effects between family management and collaborative innovation intensity on internationalization scope, as shown in Figure 3.2. Figure 3.2 reveals the interaction effects between family management and collaborative innovation intensity, suggesting collaborating with more partners strengthens the positive impact of family management in internationalization scope.

Figure 4. 2: Interaction effects between family management and collaborative innovation intensity
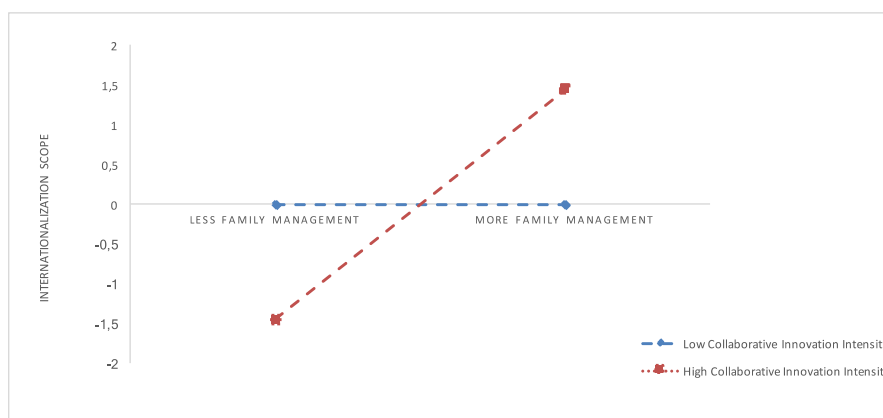
Regarding the controls, different controls yielded various effects on scope and speed, respectively. For example, the percentage of family employees over the total is not significantly related to internationalization speed and scope. However, speed and scope are growing as firm size increases. Firm age shows no influence to scope but detrimental to speed, suggesting firms' longer existence would make firms more conservative to internationalization speed avoiding all risks. Moreover, foreign shareholding is not significantly related to international scope but positively associated with the speed. Firms' preference for risk positively relates to speed. However, preference for risk does not produce any influence on the international scope. In addition, labor productivity is positively associated with internationalization scope but no influence with speed. Last, previous international experience has a positive effect both on speed and scope, while debt ratio does not play a significant role in internationalization.

Table 4. 5: Regression results for internationalization speed

	(1)	(2)	(3)	(4)	(5)
Percentage of family employees	-0.004	0.002	0.003	0.002	0.001
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Firm size	0.144***	0.15***	0.148***	0.161***	0.147***
	(0.03)	(0.03)	(0.03)	(0.032)	(0.03)
Firm age	-0.05***	-0.05***	-0.05***	-0.05***	-0.05***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Foreign shareholding	0.082***	0.075***	0.074***	0.076***	0.076***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Firm risk	0.287***	0.284***	0.283***	0.284***	0.283***
	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)
Labor productivity	0.022	0.019	0.019	0.02	0.019
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Debt ratio	0.006	0.006	0.006	0.006	0.005
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Previous international experience	5.166***	5.169***	5.168***	5.181***	5.172***
	(0.122)	(0.122)	(0.122)	(0.122)	(0.122)
Family management		-0.074**	-0.139*	-0.088**	-0.075**
		(0.031)	(0.08)	(0.035)	(0.031)
Family management_square			0.022		
			(0.024)		
Collaborative innovation diversity				-0.040	
				(0.031)	
Family management * Collaborative innovation diversity				0.021	
				(0.025)	
Collaborative innovation intensity					1.802
					(1.529)
Family management * Collaborative innovation intensity					1.284
					(2.844)
Intercept	0.669***	0.707***	0.730***	0.672***	0.719***
	(0.258)	(0.258)	(0.260)	(0.260)	(0.259)
Industry effects	Yes	Yes	Yes	Yes	Yes
Number of observations	14981	14981	14981	14981	14981
Number of groups	2851	2851	2851	2851	2851
Wald chi	3215.51***	3223.60***	3224.29***	3228.08***	3226.16***
Degree of freedom	27	28	29	30	30

Note: Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

Table 4. 6: Regression results for internationalization scope

	(1)	(2)	(3)	(4)	(5)
Percentage of family employees	0.000	-0.002	-0.001	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm size	0.131***	0.127***	0.127***	0.114***	0.127***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Firm age	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Foreign shareholding	0.006	0.007	0.007	0.007	0.007
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Firm risk	-0.074	-0.073	-0.073	-0.073	-0.072
	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)
Labor productivity	0.054***	0.055***	0.054***	0.054***	0.054***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Debt ratio	-0.005	-0.005	-0.005	-0.005	-0.006
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Previous international experience	0.257***	0.258***	0.257***	0.25***	0.259***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
Family management		0.030***	-0.007	0.037***	0.033***
		(0.009)	(0.024)	(0.010)	(0.009)
Family management_square			0.011		
			(0.007)		
Collaborative innovation diversity				0.047***	
				(0.009)	
Family management * Collaborative innovation diversity				-0.011	
				(0.007)	
Collaborative innovation intensity					0.587
					(0.402)
Family management * Collaborative innovation intensity					1.434*
					(0.762)
Intercept	1.291***	1.284***	1.293***	1.325***	1.286***
	(0.116)	(0.116)	(0.116)	(0.116)	(0.116)
Industry effects	Yes	Yes	14999	Yes	Yes
Number of observations	14999	14999	0.016	14999	14999
Number of groups	2852	2852	2852	2852	2852
Wald chi	460.54***	471.50***	474.36***	501.92***	476.01***
Degree of freedom	27	28	29	30	30

Note: Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

4.4.2 Robustness check

Regarding the robustness check, we first test the heterogenous treatment effect because the effect of family management on internationalization may vary depending on the regional economic development. We therefore classify the Spanish regions into two dimensions by the regional proportion of Spanish GDP per year: high economic development and low economic development. Regions with high economic development refer to GDP proportion over 3.5% averagely in the continuous years and the rest is automatically categorized in low economic development region. We finally obtained 8 regions with high economic development and 9 with the low. Subsequently, we rerun the regression models separately to see if there is significant difference between high economic development and low economic development. The results do not present any significant difference between regions with high and low economic development.

Further, we are able to classify the export area into three categories (i.e., EU, Latin America, OECD (except EU members). Such a classification based on the relevance of Spanish economic activities and geographic regions has an advantage over a specific number of countries and is also stable over time. We coded 0 to indicate firms do not operate in the other countries and 1 equal exporting to one of the areas mentioned above. In doing so, we would have three dummies: exporting to EU, Latin America, OECD (expect EU members). By running the random effects logistic model, we examined the effects of family management on likelihood of being exporters in the related areas respectively and the moderating role of collaborative innovation diversity and intensity as shown in Table 4.7. Similarly, the robustness test confirms the results from last section. Moreover, the effects of family management on the likelihood of being exporters vary across three regions. Family management facilitates firms exporting activities in EU and OECD (except EU members) yet no influence in Latin America area. Concerning to the moderating role of collaborative innovation, we also discovered only collaborative innovation intensity positively moderates the relationship between family management and the likelihood of being exporters in EU region ($\beta = 16.278, p < 0.1$, Model 4 in Table 4.7), which is also in line with weak moderating role as noted earlier.

Table 4. 7: Robustness analysis (dependent variable as dummy among three regions)

	(1) EU	(2) EU	(3) EU	(4) EU	(5) Latin America	(6) Latin America	(7) Latin America	(8) Latin America	(9) OECD*	(10) OECD*	(11) OECD*	(12) OECD*
Percentage of family employees	-0.001	-0.02	-0.019	-0.02	0.002	-0.014	-0.009	-0.013	0.012	-0.002	0.000	-0.003
	(0.011)	(0.013)	(0.013)	(0.013)	(0.023)	(0.027)	(0.027)	(0.027)	(0.012)	(0.015)	(0.015)	(0.015)
Firm size	-0.398**	-0.47**	-0.509**	-0.539***	1.190***	1.142***	1.122***	1.139***	0.668***	0.651***	0.633***	0.589***
	(0.199)	(0.200)	(0.204)	(0.202)	(0.229)	(0.226)	(0.227)	(0.230)	(0.138)	(0.138)	(0.139)	(0.139)
Firm age	0.03***	0.030***	0.031***	0.029***	0.007	0.006	0.007	0.006	0.017***	0.017***	0.017***	0.016***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Foreign shareholding	0.151**	0.166**	0.159**	0.166**	-0.195***	-0.191***	-0.197***	-0.190***	-0.125***	-0.117***	-0.118***	-0.112***
	(0.076)	(0.076)	(0.077)	(0.076)	(0.069)	(0.068)	(0.069)	(0.069)	(0.041)	(0.041)	(0.041)	(0.041)
Firm risk	-0.744**	-0.733**	-0.777**	-0.751**	-1.477***	-1.415***	-1.421***	-1.453***	-0.473*	-0.462*	-0.455*	-0.462*
	(0.339)	(0.338)	(0.348)	(0.343)	(0.502)	(0.484)	(0.487)	(0.495)	(0.26)	(0.260)	(0.259)	(0.260)
Labor productivity	-0.232***	-0.234***	-0.24***	-0.244***	0.304***	0.301***	0.301***	0.302***	0.082*	0.083*	0.081*	0.076*
	(0.061)	(0.061)	(0.061)	(0.061)	(0.063)	(0.062)	(0.062)	(0.063)	(0.043)	(0.043)	(0.043)	(0.043)
Debt ratio	0.029	0.03	0.027	0.006	0.035	0.035	0.033	0.032	0.037	0.038*	0.037	0.026
	(0.035)	(0.043)	(0.049)	(0.024)	(0.023)	(0.023)	(0.023)	(0.024)	(0.023)	(0.023)	(0.023)	(0.021)
Previous international experience	18.466***	18.437***	18.737***	18.609***	5.249***	5.193***	5.252***	5.295***	5.811***	5.814***	5.785***	5.858***
	(0.862)	(0.86)	(0.878)	(0.867)	(0.451)	(0.439)	(0.443)	(0.449)	(0.273)	(0.273)	(0.272)	(0.274)
Family management		0.232***	0.225**	0.217**		0.133	0.048	0.119		0.129*	0.085	0.146**
		(0.089)	(0.095)	(0.09)		(0.104)	(0.122)	(0.105)		(0.067)	(0.077)	(0.068)
Collaborative innovation diversity			0.472***				0.251***				0.097*	
			(0.117)				(0.091)				(0.056)	
Family management * Collaborative innovation diversity			0.019				0.089				0.053	
			(0.09)				(0.075)				(0.050)	
Collaborative innovation intensity				9.444***				1.020				12.785***
				(3.074)				(2.679)				(4.211)
Family management * Collaborative innovation intensity				16.278*				7.328				-0.441
				(8.579)				(7.494)				(5.695)
Intercept	-34.539***	-34.715***	-35.403***	-35.53***	-22.942***	-22.692***	-21.988***	-23.163***	-19.972***	-20.052***	-19.665***	-20.514***
	(1.941)	(1.940)	(1.974)	(1.961)	(2.482)	(2.422)	(2.411)	(2.472)	(1.462)	(1.466)	(1.470)	(1.474)

Log of variance	3.527***	3.520***	3.585***	3.543***	3.954***	3.911***	3.939***	3.945***	2.879***	2.875***	2.864***	2.876***
	(0.074)	(0.074)	(0.074)	(0.074)	(0.081)	(0.080)	(0.079)	(0.080)	(0.070)	(0.070)	(0.070)	(0.070)
rho	0.912	0.911	0.916	0.913	0.941	0.938	0.939	0.940	0.844	0.843	0.842	0.843
Number of Observations	14977	14977	14977	14976	10515	10515	10515	10514	14977	14977	14977	14976
Number of Groups	2849	2849	2849	2849	2593	2593	2593	2593	2849	2849	2849	2849
Wald chi2	1335.60***	1343.66***	1385.09***	1340.15***	339.90***	383.79***	394.02***	352.90***	1340.81***	1344.00***	1344.51***	1334.98***
Degree of freedom	27	28	30	30	27	28	30	30	27	28	30	30
Log likelihood	-2964.061	-2960.965	-2952.254	-2951.07	-2633.918	-2633.061	-2627.409	-2632.45	-4205.52	-4203.66	-4201.04	-4192.77

Note: Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.
Model 1 to 4 are relating to likelihood of firms being exporters in EU. Model 5 to 8 are relating to likelihood of firms being exporters in Latin America. Model 9 to 12 are relating likelihood of firms being exporters in OECD* countries except EU members.

In addition, we further use the dummy for family management (1= with family manager and 0 without family manager) to test the robustness of the results shown in Table 4.8. We confirm that firms with family management is negatively associated with internationalization speed in line with our findings in the Table 4.5. However, surprisingly the effect of family management on scope is not confirmed. Regarding the moderating role of collaborative innovation, collaborating with multiple type of partners in the improvement of product and process procedures helps attenuate the negative effects of family management on speed but the depth of collaborative does not present any influence on the relationship between family management and speed. What is more, we also confirm the positive moderating role of collaborative innovation intensity on the relationship between family management and scope. The primary reason that the difference in the results might be observations and groups in the regression model are reduced. Besides, Table 4.8 mainly discusses about the comparison between family management and non-family management, but the prior tests are arguing the effect of more or less family management on internationalization.

Table 4. 8: Robustness analysis (family management as dummy variable)

Dependent variable	(1) Speed	(2) Speed	(3) Speed	(4) Scope	(5) Scope	(6) Scope
Percentage of family employees	0.001	0.003	0.001	-0.001	-0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)
Firm size	0.133***	0.158***	0.131***	0.129***	0.116***	0.129***
	(0.028)	(0.029)	(0.028)	(0.013)	(0.014)	(0.013)
Firm age	-0.044***	-0.044***	-0.044***	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Foreign shareholding	0.074***	0.076***	0.075***	0.008	0.007	0.008
	(0.018)	(0.018)	(0.018)	(0.008)	(0.008)	(0.008)
Firm risk	0.252***	0.254***	0.25***	-0.087*	-0.087*	-0.086
	(0.086)	(0.086)	(0.086)	(0.052)	(0.052)	(0.052)
Labor productivity	0.023	0.024	0.023	0.054***	0.054***	0.054***
	(0.019)	(0.019)	(0.019)	(0.006)	(0.006)	(0.006)
Debt ratio	0.008	0.009	0.007	-0.006	-0.006	-0.007
	(0.01)	(0.01)	(0.01)	(0.005)	(0.005)	(0.005)
Previous international experience	4.722***	4.748***	4.723***	0.237***	0.229***	0.239***
	(0.11)	(0.11)	(0.11)	(0.046)	(0.046)	(0.046)
Family management_dummy	-0.120**	-0.180***	-0.124**	0.022	0.034	0.028
	(0.06)	(0.066)	(0.06)	(0.021)	(0.023)	(0.021)
Collaborative innovation diversity		-0.095***			0.046***	
		(0.029)			(0.010)	
Family management_dummy * Collaborative innovation diversity		0.1**			-0.020	
		(0.048)			(0.016)	
Collaborative innovation intensity			1.115			0.449
			(1.308)			(0.405)
Family management_dummy * Collaborative innovation intensity			2.302			2.348**
			(3.682)			(1.164)
Intercept	0.535**	0.461*	0.547**	1.288***	1.329***	1.288***
	(0.234)	(0.236)	(0.234)	(0.121)	(0.121)	(0.121)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	12858	12858	12858	12873	12873	12873
Number of groups	2685	2685	2685	2687	2687	2687
Wald chi	3276.77***	3296.38***	3276.87***	437.77***	461.97***	442.26***
Degree of freedom	28	30	30	28	30	30

Note: Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

Subsequently, to identify, *ex post,* the boundary conditions for the theoretical distinction between speed and scope, we rerun the analysis conditioning on those firms that have at least one family manager, which are Table 4.9 (dependent variable: speed) and Table 4.10 (dependent variable: scope). Similar to the previous findings, we confirm the negative influence of family management on speed yet the positive influence of family management on scope is not supported. This might be family firm prefers to adopt a slow internationalization speed due to the preservation of SEW but its influence on the target to multiple export countries seems not to be significantly. More family managers indicate more family controls in the family firm, wherein a strong desire for preservation and conservation international strategy occur. A relatively fast internationalization strategy may bring with greater risk and uncertainty.

Therefore, family firm with more family managers may resist to internationalize faster. However, the numbers of family managers do not influence the scope within the family firm.

Table 4. 9: Robustness analysis: dependent variable - internationalization speed

	(1)	(2)	(3)	(4)	(5)
Percentage of family employees	-0.002	0.003	0.004	0.003	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Firm size	0.158***	0.194***	0.196***	0.196***	0.192***
	(0.035)	(0.036)	(0.036)	(0.037)	(0.036)
Firm age	-0.021***	-0.021***	-0.021***	-0.021***	-0.021***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Foreign shareholding	0.171***	0.167***	0.166***	0.167***	0.168***
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Firm risk	0.202**	0.202**	0.200**	0.202**	0.200**
	(0.096)	(0.096)	(0.096)	(0.096)	(0.096)
Labor productivity	0.036**	0.035**	0.034**	0.035**	0.035**
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Debt ratio	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Previous international experience	3.438***	3.439***	3.437***	3.442***	3.439***
	(0.127)	(.127)	(0.127)	(0.128)	(0.127)
Family management		-.074***	-0.145***	-0.072***	-0.075***
		(.021)	(0.054)	(0.024)	(0.021)
Family management_square			0.022		
			(0.015)		
Collaborative innovation diversity				-0.006	
				(0.041)	
Family management * Collaborative innovation diversity				-0.003	
				(0.019)	
Collaborative innovation intensity					0.605
					(1.692)
Family management * Collaborative innovation intensity					1.274
					(1.694)
Intercept	-0.203	-0.265	-0.243	-0.274	-0.257
	(0.246)	(0.246)	(0.247)	(0.247)	(0.246)
Industry effects	Yes	Yes	Yes	Yes	Yes
Number of observations	6449	6449	6449	6449	6449
Number of groups	1614	1614	1614	1614	1614
Wald chi	1165.51***	1179.95***	1181.57***	1180.09***	1180.40***
Degree of freedom	27	28	29	30	30

Note: All models are regressed by those firms at least have one family manager. Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

Table 4. 10: Robustness analysis: dependent variable - internationalization scope

	(1)	(2)	(3)	(4)	(5)
Percentage of family employees	0.000	-0.001	0.000	-0.001	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm size	0.133***	0.124***	0.126***	0.119***	0.122***
	(0.021)	(0.022)	(0.022)	(0.022)	(0.022)
Firm age	-0.001*	-0.002*	-0.001*	-0.002*	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Foreign shareholding	-0.018	-0.017	-0.018	-0.017	-0.017
	(0.020)	(0.020)	(0.020)	(0.02)	(0.020)
Firm risk	-0.013	-0.013	-0.014	-0.013	-0.014
	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)
Labor productivity	0.048***	0.048***	0.048***	0.048***	0.048***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Debt ratio	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Previous international experience	0.494***	0.495***	0.494***	0.489***	0.497***
	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)
Family management		0.016	-0.009	0.019	0.020*
		(0.011)	(0.028)	(0.013)	(0.011)
Family management_square			0.008		
			(0.008)		
Collaborative innovation diversity				0.033	
				(0.022)	
Family management * Collaborative innovation diversity				-0.007	
				(0.010)	
Collaborative innovation intensity					2.360***
					(0.876)
Family management * Collaborative innovation intensity					-1.963**
					(.885)
Intercept	1.387***	1.403***	1.409***	1.419***	1.408***
	(0.153)	(0.153)	(0.154)	(0.154)	(0.153)
Industry effects	Yes	Yes	Yes	Yes	Yes
Number of observations	6452	6452	6452	6452	6452
Number of groups	1616	1616	1616	1616	1616
Wald chi	204.43***	206.35***	207.21***	209.14***	214.58***
Degree of freedom	27	28	29	30	30

Note: All models are regressed by those firms at least have one family manager. Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

Besides, we also use another alternative measure of family management: the percentage of family owners and relatives over total personnel to examine the robustness. The results are inconsistent with the previous findings, and the coefficients are not statistically significant shown in Table 4.11. The results derived from Table 4.11 do not support the negative role of family management on speed (Model 1 to 3) nor the positive on scope (Model 4 to 6). It might be family members holding the management position could essentially perform the influence on internationalization rather than the family employees over the total personnel. Moreover, it explicitly reveals the importance of family management position which exerts profound impact on firms' strategical decision, resource allocation, and network building.

Table 4. 11: Robustness analysis: independent variable - percentage of family owners and relatives over total personnel

	(1) Speed	(2) Speed	(3) Speed	(4) Scope	(5) Scope	(6) Scope
Firm size	0.144***	0.150***	0.141***	0.131***	0.120***	0.130***
	(0.030)	(0.032)	(0.030)	(0.013)	(0.013)	(0.013)
Firm age	-0.050***	-0.050***	-0.05***	0.000	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Foreign shareholding	0.082***	0.082***	0.083***	0.006	0.005	0.006
	(0.020)	(0.020)	(0.020)	(0.007)	(0.007)	(0.007)
Firm risk	0.287***	0.286***	0.286***	-0.074	-0.074	-0.074
	(0.093)	(0.093)	(0.093)	(0.049)	(0.049)	(0.049)
Labor productivity	0.022	0.023	0.021	0.054***	0.053***	0.054***
	(0.021)	(0.021)	(0.021)	(0.006)	(0.006)	(0.006)
Debt ratio	0.006	0.006	0.005	-0.005	-0.006	-0.006
	(0.009)	(0.009)	(0.009)	(0.004)	(0.004)	(0.004)
Previous international experience	5.166***	5.179***	5.170***	0.257***	0.248***	0.259***
	(0.122)	(0.122)	(0.122)	(0.043)	(0.043)	(0.043)
Percentage of family employees	-0.004	-0.003	-0.004	0.000	0.000	0.001
	(0.004)	(0.004)	(0.004)	(.001)	(0.001)	(0.001)
Collaborative innovation diversity		-0.022			0.040***	
		(0.030)			(0.009)	
Percentage of family employees * Collaborative innovation diversity		-0.006			0.002	
		(0.007)			(0.002)	
Collaborative innovation intensity			2.156			0.498
			(1.511)			(0.399)
Percentage of family employees * Collaborative innovation intensity			-0.076			-0.234
			(0.557)			(0.147)
Intercept	0.669***	0.639**	0.681***	1.291***	1.33***	1.295***
	(0.258)	(0.260)	(0.258)	(0.116)	(0.116)	(0.116)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	14981	14981	14980	14999	14999	14998
Number of groups	2851	2851	2851	2852	2852	2852
Wald chi	3215.51***	3219.94***	3217.16***	460.54***	488.90***	463.98***
Degree of freedom	27	29	29	27	29	29

Note: Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

4.4.3 Further analysis

Despite the fact that we have investigated the moderating role of collaborative innovation in the speed and scope of family firm internationalization, Laursen and Salter (2006) reported curvilinear influences on innovation performance, which exhibit an inverted U-shape. Hence, it is possible that such a curvilinear influence may also occur in internationalization. Therefore, we reran the analysis to examine the curvilinear relationship between collaborative innovation and internationalization speed/scope, as presented in Table 4.12. Among the four models, contrary to Laursen and Salter (2006), we did not find evidence supporting the curvilinear role of collaborative innovation, whether in terms of diversity or intensity, on internationalization. Similarly, we did not find support for the moderating role of family management on internationalization. It is possible that collaborating with a variety of partners in innovative products and services may not be sufficient to influence the speed and scope of internationalization. Although collaborative innovation performs curvilinear effects on innovation performance (Laursen & Salter, 2006), it does not mean it could conduct a similar role in speed/scope because of the different mechanisms on innovation performance and internationalization. However, all the models in Table 4.12 confirm the previous findings that family management hinders speed but facilitates scope.

Table 4. 12: Further analysis: the curvilinear role of collaborative innovation on internationalization

	(1) Speed	(2) Speed	(3) Scope	(4) Scope
Percentage of family employees	0.002	0.002	-0.002	-0.002
	(0.005)	(0.005)	(0.001)	(0.001)
Firm size	0.160***	0.146***	0.114***	0.126***
	(0.032)	(0.031)	(0.013)	(0.013)
Firm age	-0.050***	-0.050***	0.000	0.000
	(0.002)	(0.002)	(0.001)	(0.001)
Foreign shareholding	0.075***	0.076***	0.007	0.008
	(0.020)	(0.020)	(0.007)	(0.007)
Firm risk	0.284***	0.283***	-0.074	-0.073
	(0.093)	(0.093)	(0.049)	(0.049)
Labor productivity	0.020	0.019	0.054***	0.054***
	(0.021)	(0.021)	(0.006)	(0.006)
Debt ratio	0.006	0.005	-0.005	-0.005
	(0.009)	(0.009)	(0.004)	(0.004)
Previous international experience	5.181***	5.171***	0.251***	0.258***
	(0.122)	(0.122)	(0.043)	(0.043)
Collaborative innovation diversity	-0.019		0.028	
	(0.084)		(0.024)	
Collaborative innovation diversity_square	-0.007		0.006	
	(0.026)		(0.007)	
Family management	-0.079**	-0.076**	0.037***	0.032***
	(0.036)	(0.032)	(0.011)	(0.009)
Collaborative innovation diversity*Family management	-0.072		-0.006	
	(0.076)		(0.021)	
Collaborative innovation diversity_sqaure*Family management	0.033		-0.002	
	(0.025)		(0.007)	
Collaborative innovation intensity		2.906		1.093
		(2.872)		(0.790)
Collaborative innovation intensity_square		-1.705		-0.772
		(4.079)		(1.095)
Collaborative innovation intensity*Family management		2.661		-1.096
		(4.195)		(1.137)
Collaborative innovation intensity_square * Family management		-17.05		-4.773
		(27.453)		(7.193)
Intercept	0.672***	0.725***	1.325***	1.288***
	(0.26)	(0.259)	(0.116)	(0.116)
Industry effects	Yes	Yes	Yes	Yes
Number of observations	14981	14980	14999	14998
Number of groups	2851	2851	2852	2852
Wald chi	3230.38***	3224.20***	502.59***	476.82***
Degree of freedom	32	32	32	32

Note: Standard errors in parentheses; two-tailed $p < 0.01$***; $p < 0.05$**; $p < 0.10$*. Industry effects are also controlled. Coefficients and standard errors reported to three decimal places.

4.5 Discussion

4.5.1 Key findings

Our study contends that family management affects internationalization scope and speed, examining whether its effects on scope or speed align with a standard premise, i.e., firms with

family management discourage internationalization, and further responds to studies on scope and speed (Arregle et al., 2021). Our results help reconcile some mixed findings in past research by providing a better understanding of the influence of family management on internationalization (Arregle et al., 2012; Alayo et al., 2021). Moreover, we respond to the calls for more research on external innovation and internationalization in the family firm literature (Alayo et al., 2021; Casprini et al., 2020; Debellis et al., 2021) that have been largely ignored in family firm internationalization literature. Therefore, our findings make several contributions to the family business internationalization and knowledge-based literature.

First, our first finding shows that the effects of family management differ in internationalization speed and scope, with negative effects on speed but positive on scope, contributing to the theoretical understanding of family firm internationalization. Combining the SEW perspective, the former effects of family management on internationalization speed are in line with general assumptions, which are that family management inhibits internationalization because of the preservation of socioemotional wealth (Gomez-Mejia et al., 2007, 2010), resource constraints shaped by their governance structures and size (Segaro, 2012), and pursuit of non-economic goals (Gomez-Mejia et al., 2018). However, the latter effects of family management on scope do not align with our hypothesis and the general standard premise in terms of internationalization. We found evidence that firms with family management tend to internationalize in a multiple market in line with some related research (Lin et al., 2012; Alessandri et al., 2018). This can be explained by two factors. (1) Arregle et al. (2021) have argued that family management always relates to distinctive social capital, and an international network derived from family management is one of their most important assets. Such a trustworthy network could compensate for the lack of international experience and help them expand in a broad geographical scope (Hennart et al., 2019). (2) Internationalization helps reduce fluctuations in revenue by spreading risks over several regions (Lin et al., 2012). Mainly, firms with family management tend to be risk-averse to safeguard the family firm's existence and to pass the business to the next generations over time (Salvato et al., 2019). Consequently, this positive international expansion in various countries simultaneously disperses uncertainty for family firm internationalization.

Overall, firms with family management prefer to internationalize at a lower speed aligning with the Uppsala model (Johanson & Vahlne, 1977, 2009; Vahlne & Johanson, 2017) but are inclined to operate international business activities in multiple countries based on the family

international networks, suggesting the family firm's risk aversion attitude and conservative strategy.

Our second finding contributes to the literature of interplay between collaborative innovation and family firm internationalization. Precisely, we test the role of collaborative innovation in the relationship between family management and internationalization speed and scope. The standard premise is that external collaborative innovation could help alleviate the downsides of family management originating from SEW preservation or strengthen such positive impacts on internationalization by building competitive advantage (Dyer & Singh, 1998). We make a similar argument when hypothesizing about the moderating role of collaborative innovation diversity and intensity. Surprisingly, our findings indicate that the moderating role of collaborative innovation varies in speed and scope. Specifically, collaborative innovation, either diversity or intensity does not produce significant roles for the negative influence of family management on speed. Regarding scope, collaborative innovation diversity does not conduct any roles in the relationship with scope either. However, collaborative innovation intensity positively moderates the relationship between family management and internationalization scope, partially supporting the positive moderating effects of collaborative innovation. Those findings imply that knowledge resources or competitive advantages obtained through collaboration with external partners do not permanently alleviate SEW worriers, such as slow speed. Nonetheless, the depth of collaborating with different type of external partners (i.e., collaborative innovation intensity) in the development of new product and services is beneficial on internationalization scope, strengthening the positive impact of family management on scope. The benefits of the deeper collaboration can grow exponentially over time as more individuals and organizations contribute to the innovation process by shared knowledge, increased network and resources on facilitating internationalization scope. Overall, the quadratic implications of collaborative innovation suggest that by the strong collaborative innovation intensity, family-managed firms and their collaborators can achieve more than they could do their own, leading to more impactful and transformative innovations and upgrades of technology, with benefits that extend beyond the immediate collaborators.

4.5.2 Policy implications

Concerning the practical implications of our findings, we first suggest that a family-managed firm that intends to internationalize should manage its SEW, giving serious consideration to how to address the concerns of family manager (e.g., risk aversion and loss of control). Second, we further suggest that family mangers should be aware of the role of collaborative innovation

in the development of products and services though it does not function at all time. Full recognition of the competitive advantages offered by collaborative innovation intensity will help relieve the negative impact of family management worriers on SEW, encouraging family firm internationalization scope. Third, local government can play an important role in the encouragement of international business expansion by creating fundamental collaborating network and platform to international expansion when internationalization-orientated policy encourages family business to internationalize. Family firms are the most common business entities worldwide as well as in the domestic markets. They are crucial in generating employment in the private sector and contributing to GDP (Alayo et al., 2021). Therefore, local authorities should pay attention to how to help family firms facilitate internationalization.

4.5.3 Limitations and future research lines

Despite the contributions of this study to the family business internationalization and collaborative innovation literature, it is also essential to note its limitations. First, we used a sample of Spanish manufacturing firms, suggesting that our data may restrict the generalizability of our findings in a global context. It has been widely recognized that the spillover of knowledge resources is also determined by contextual environments (Campbell et al., 2012). Therefore, our findings might be contingent upon the change in the external environment, and future research could shed light on the differences in our model across various countries. Besides, the empirical method for this research was built on the random effects of panel regression. Though we were suggested by the Hausman test for the choice of model, random effects rely on the assumption that the error term is orthogonal to the independent variable, which is the case almost exclusively for experimental data. In contrast, our research data was based on the secondary dataset. Meanwhile, another reason might be the lack of within regional unobserved heterogeneity. We acknowledge it might be a limitation for producing inconsistent estimation to some extent.

Second, we found inconsistent results between the robustness tests and main regressions. Specifically, the regression of firms with at least one family manager yielded different results compared to all firms. While it has been proven that family management discourages the speed of internationalization, its positive effects on scope varied. Future research could endeavor to diversify the research contexts and include more samples for the regression to ascertain whether differences still exist.

Third, internationalization behavior in the family firm can vary depending upon family firm heterogeneities such as top management team, board composition (Anderson & Reeb, 2004), board independence (Klein et al., 2005), leadership styles (Bass, 1990), the relationship between founder and successor, strategic works (Arregle et al., 2007) and a host of other factors. Although we some capture family firm heterogeneities, those contingencies still suggest additional ways in which family management and collaborative innovation perspectives can be applied to study the goals and international expansion.

Last, the measure of internationalization speed and scope could be richer. Our current measure of internationalization speed is based on oversea sales due to the data availability, not reflecting the other aspects of firm international business activities (e.g., strategic actions). For example, if a firm acquires a local company in a new market, it suggests a faster internationalization process than if it starts from scratch. Later work could start from different aspects of internationalization (e.g., resources) to measure speed in a highly composite index. Then of course, the current measure of internationalization scope is also not free of limitation, which only considers the number of export areas in a given year. Future studies could put more efforts on the scope from variety of products/services because the variety of products or services offered by a company in its international operations can also indicate the breadth of its internationalization scope rather only geographical distribution. In addition, the existing understanding of internationalization speed and scope refer to export behavior in this study (Fang et al., 2018). However, internationalization may take other forms (e.g., joint ventures, foreign direct investment). Future work could expand the internationalization speed or scope based on other forms to examine whether the same model gives consistent findings.

4.6 Conclusion

This paper is the first study on the effects of interplay between family management and collaborative innovation on internationalization speed and scope. Although family business internationalization has been often studied, empirical research on internationalization speed and scope is scarce. Moreover, we focus on the complementary role of external knowledge resources for the natural limitations of family firm internationalization; therefore, we contribute to the literature by investigating the effects of family management on internationalization speed and scope. Given the interplay between collaborative innovation diversity and intensity, and family management, a better understanding of their interaction effects is also crucial.

CHAPTER V: GENERAL CONCLUSIONS OF THE THESIS

5.1 Main conclusions

Along with this dissertation, internationalization – the process by which a firm expands its operations and establishes a presence in foreign markets beyond its domestic borders – is a significant driver of economic development and long-term growth for firms (Johanson & Vahlne, 1977; Clark & Pidduck, 2023; Knight & Liesch, 2016). As illustrated by scholars in the field of internationalization (Maitland & Sammartino, 2015; Steinhäuser et al., 2021), three interdependent assessments are essential to understanding internationalization: what drives the decision to internationalize? how to increase the extent of internationalization? how to internationalize (slow vs. fast, or single region vs. multiple countries)? Any research that seeks to understand one of the above without considering the other two will be inherently flawed.

To this end, the main aim of this dissertation has been to shed light on the comprehensive understanding of internationalization from three different aspects (i.e., the decision to internationalize, the extent of internationalization, and internationalization speed and scope) by accounting for multilevel factors – macro and meso. The thesis contains three main chapters: Based on the Resource-Based View (RBV) and institutional theory, Chapter II investigates the effects of digitalization among emerging economy enterprises on export propensity and the moderating role of home country corruption. Chapter III examines the interplay between informal (social desirability of entrepreneurship) and formal (economic freedom) institutions on internationalization from the perspective of institutional theory. Chapter IV investigates the effects of family management on internationalization speed and scope, starting from the paradox of family firm internationalization. We also introduce collaborative innovation as a moderating variable to examine whether involving external partners in technology, product, and process improvement can alleviate the hypothesized adverse effects of family management. Hence, motivated by the need better to understand internationalization dimensions from external to internal determinants, the main findings from each chapter are discussed below.

Chapter II aimed to understand better the relationship between digitalization and export propensity and the moderating role of home country corruption in emerging markets. The results in this chapter indicate that digitalization has an inverted U-shaped relationship with export propensity, suggesting that firms do not always benefit from digitalization; instead, over-digitalization may adversely affect the internationalization decision. Additionally, corruption, as one of the vital environmental factors in emerging markets, steepens such an

inverted U-shaped relationship between digitalization and export propensity, recommending the double-edged sword effects of home country corruption.

Once digitalization has been proven to be linked to the decision to internationalize, Chapter III has focused on the extent of internationalization through macro factors, such as institutional factors. In addition, Chapter IV has examined meso factors (family management) on internationalization speed and scope.

To understand the effects of the interplay between institutions on internationalization, Chapter III has analyzed the interaction effects between informal (i.e., the social desirability of entrepreneurship) and formal institutions (i.e., economic freedom) on the extent of internationalization. We observed that the social desirability of entrepreneurship is negatively associated with early-stage entrepreneurs' internationalization, suggesting that individuals with higher entrepreneurial intentions in an unfavorable domestic entrepreneurial environment would be pushed out to the international market. Furthermore, we have also observed that economic freedom helps alleviate the adverse effects of the social desirability of entrepreneurship on the extent of internationalization. This chapter reveals the interaction effects between institutions, advancing the related literature and responding to the call for interplay between institutions.

Finally, in Chapter IV, the main contribution has focused on two critical issues: (1) the effects of family management on internationalization speed and scope, and (2) the moderating role of collaborative innovation intensity and diversity. First, we found that the effects of family management vary on speed and scope: negative effect on speed but positive on the scope. Family firms tend to internationalize slowly but desire to operate in multiple countries. Second, we did not observe the alleviating role of collaborative innovation, including diversity and intensity, for the harmful effects of family management on speed. However, we discovered that one dimension of collaborative innovation (i.e., intensity) could strengthen the positive effects of family management on the scope, but diversity does not produce similar effects.

Taken together and to our best knowledge, this doctoral thesis is the first study to enhance and advance the current understanding of firm internationalization from different stages (i.e., the decision to internationalize, the extent of internationalization, and internationalization speed and scope) by applying an array of theoretical perspectives (e.g., institutional theory, RBV, and SEW). Specifically, our findings respond to the newly emerged institutionalism escape, suggesting that a hostile institutional environment pushes entrepreneurs out for foreign market

expansion (Muralidharan & Pathak, 2017). Besides, our findings also present the effects of the interplay between institutions on early-stage entrepreneurs' internationalization, indicating that robust formal institutions might alleviate the adverse effects of informal institutions. This study contributes to the literature by showing how the home country's institutional context affects the level of early-stage entrepreneurs' internationalization across countries.

Second, although the effects of digitalization on internationalization have already been explored in the past literature, scant information has been placed on over-digitalization from a dynamic intertwined perspective. Our study first answers the call of Bergamaschi et al. (2020) to investigate the effects of digitalization on export propensity in emerging markets based on the low-to-high development of digitalization, providing new empirical evidence and enriching the related theoretical explanations. In addition, we also considered the home country's corruption, one of the significant home country contexts in emerging economies, in this hypothesized curvilinear relationship. Therefore, this study moves forward the understanding of digitalization and corruption in EEE's willingness to export, combining institutional theory and RBV.

Third, the SEW perspective helps us understand the behaviors of family firm internationalization (Aiello et al., 2021) in which it recommends that firms with family management discourage internationalization because of preserving socioemotional wealth and pursuing non-economic goals. However, our findings challenge the above assumptions and find that firms with family management tend to internationalize slower but export to multiple countries simultaneously. Moreover, we also introduced collaborative innovation to test if involving external partners in technology, process, and product improvement could accentuate the internationalization speed and scope of the family firm. The findings suggest that collaborative innovation might not be a solution to facilitate speed.

5.2 Implications

5.2.1 Theoretical implications

As pointed out in the previous section, this thesis contributes to both the theoretical debate and practical implications. From a theoretical point of view, this dissertation may contribute to the advances of current knowledge of firm internationalization, where there is a space to keep working (e.g., digitalization, institutions, and family management) as some aspects remain underexplored.

Some of the main theoretical implications might be related to the evidence that explains international variations among firm internationalization dimensions. By applying different theoretical perspectives (e.g., institutional theory, RBV, and SEW), this research offers a set of empirical findings (Chapter II, III, and IV) that enables and advances the understanding of the decision to internationalization, the extent of internationalization, and internationalization speed and scope.

For example, this research has emphasized the effects of digitalization on export propensity (Chapter II). As an "intangible" resource, digitalization helps firms foster a competitive advantage in foreign markets (Bergamaschi et al., 2020). Although past studies have already proven the positive effects of digitalization on internationalization, high levels of digitalization may be limited by emerging economies' digital infrastructure, human capital, and global competition. Hence, we draw upon the RBV to explain the effects of digitalization on export propensity based on the dynamic intertwined perspective. The findings have revealed that over-digitalization might decrease EEEs' willingness to export, but a moderate level of digitalization facilitates their willingness. The findings provide new insights into the interplay between digitalization and internationalization, offering up-to-date explanations of digitalization from a dynamic perspective.

Then, the role of institutions has also been shed light on in Chapter II and III in line with the arguments of North (2005) that institutions matter to explain the differences among societies. However, most studies have used institutional theory to explain entrepreneurship behaviors, yet more attention should be paid to firm internationalization. Surprisingly, we found that a weak institutional environment could "push out" individuals with higher entrepreneurial intentions to look for opportunities outside the home country shown in Chapter III, which is commonly recognized as "institutionalism escape" (Muralidharan & Pathak, 2017). Besides, solid formal institutions could also attenuate the adverse effects of informal institutions. Furthermore, we also discovered that corruption could steepen the curvilinear effects of digitalization on EEEs' export propensity in Chapter II, suggesting corruption increases the positive effects of digitalization and augments adverse effects in emerging markets. All of the findings related to institutions advance and contribute to the understanding of institutional theory.

Last, we focus on the decision to internationalize and the extent of internationalization and contribute to studies on internationalization speed and scope (Chapter IV). Previous research has primarily concentrated on the internationalization scale and degree, yet information on

speed and scope is relatively scarce (Alessandri et al., 2018). Relying on the SEW perspective, we attempted to disentangle the paradox of family firm internationalization: preserve socioemotional wealth VS achieve higher internationalization. We found that firms with family management tend to internationalize slower but target multiple countries. In addition, we also introduced collaborative innovation to investigate whether involving external knowledge could solve this paradox and facilitate internationalization. We further studied collaborative innovation from two dimensions: diversity and intensity. The findings suggested that collaborative innovation does not present any role in the family firm's internationalization speed. However, collaborative innovation intensity could boost family firm internationalization scope, suggesting firms should be more aware of the role of depth in collaborating with externalists regarding technology, process, and product improvement. These findings highlight the contingencies of collaborative innovation on family firm internationalization processes, enriching the family business internationalization literature.

5.2.2 Practical implications

From a practical perspective, the main findings derived from this dissertation have important implications for policymakers and firms or entrepreneurs.

First, this dissertation has provided the effects of the institutional environment on internationalization, offering suggestions for policymakers. For example, Chapter II has also evidenced corruption's double sword edge effects on the curvilinear relationship between digitalization and export propensity based on a dynamic perspective. In short, policymakers might make efforts in a favorable institutional environment for international market expansion. Moreover, the high social desirability of entrepreneurship decreases individuals with higher entrepreneurial intentions in looking for opportunities outside (Chapter III). However, a high level of economic freedom could help alleviate such adverse effects of the social desirability of entrepreneurship on internationalization. Policymakers wishing to favor international activities thus need to improve attitudes towards international business in society and attempt to improve economic freedom. Beyond the importance of the establishment of favorable institutional contexts on internationalization (e.g., measures to improve legal and regulatory frameworks), policymakers may put efforts into creating a conducive business environment that encourages firms to expand internationally, for instance, reducing bureaucracy and administrative burden, providing access to finance, and enhancing infrastructure and reducing trade barriers. Chapter III further suggests the essence of introducing an education program is necessary for firm internationalization at different levels and to nurture international market

awareness in the long term. In summary, this doctoral dissertation provides policymakers with valuable insights and evidence to support policies and programs that promote economic growth and development through increased international trade. Using the study findings to develop evidence-based policies, policymakers can advance their understanding of firm internationalization from different dimensions. They can create an enabling environment for firms to expand internationally, increase competitiveness, and contribute to long-term development.

Second, our findings provide suggestions for entrepreneurs or firms to internationalize better. For instance, Chapter III recommends that individuals with higher entrepreneurial intentions be aware of their home country's institutional environment and adjust if they are in unfavorable contexts. Understanding the local culture, legal and regulatory frameworks will help firms make informed decisions about market entry and expansion strategies. In addition, resource allocation and management are significant to firm internationalization. The findings of Chapter II help emerging economy firms' access, allocate, and manage required resources effectively using digital technology. Of course, it also reflects that firms should be aware of the dark side of over-digitalization and try to reduce it. Moreover, Chapter IV indicates the role of collaborative innovation in the family firm internationalization in which firms could develop their collaborative innovation intensity to increase the scope of internationalization. Collaborating with different types of partners (e.g., universities, customers, competitors, suppliers) helps firms identify and assess the risks, develop effective risk management and contingency plans in innovative products and services, and consequently facilitate firm internationalization. Our study provides valuable views and guidance to entrepreneurs and firms looking to expand their business globally, navigate the complex and dynamic international business environment, and maximize the benefits of global expansion while minimizing the risks and challenges.

5.3 Limitations and future research lines

Although we have advanced the understanding of firm internationalization, the studies are flexible.

First, the institutional environment in the host country may also need to be considered. Chapter II and Chapter III both take into account the home country's institutions (e.g., the social desirability of entrepreneurship (Chapter III), economic freedom (Chapter III), and corruption (Chapter II). However, future studies might also examine both formal and informal host

country conditions. For example, Butler et al. (2010) suggested that a lack of operational knowledge, psychic and economic distance, and physical distance can discourage international market entry and reduce success. Moreover, it is also possible that cultural distance or degree of differences between home and host country institutions matters in the decision to internationalize and its post-entry performance. This dissertation is limited to using just home country institutions to predict internationalization regardless of the decision, extent, or how.

Another area for improvement is the issues derived from data. Chapter III is based on the GEM database regardless of developing or developed countries. Chapter IV is built upon the ESEE database only, including Spanish manufacturing firms, yet Chapter II relies on the WBES database, which only consists of emerging markets. The used database of Chapters II and III are cross-sectional datasets, yet the database for Chapter IV is unbalanced panel data. According to Estrin et al. (2013a) and Stenholm et al. (2013), different databases (e.g., GEM, WBES, ESEE) are limited by the availability of each country to provide comparable data. All these databases at a country level do not report information in the same period. Although our research provides a diverse database, this issue must be revised to coherently explain three different internationalization dimensions (i.e., the decision to internationalization, the extent of internationalization, and internationalization speed and scope). Future research could examine these three dimensions based on one sizeable balanced data panel with much information to avoid non-comparability.

Moreover, Chapter II has examined the digitalization of export propensity. However, as the world becomes increasingly digital, cyberattacks are becoming a growing concern for firms looking to expand internationally (Westerlund, 2020). The importance of taking cybersecurity seriously when pursuing digital internationalization cannot be overemphasized, as the Internet – regardless of its enormous potential and many benefits, tends to become a hostile environment. As awareness about online business on the web increases, the number of attempted cyberattacks will likely increase. Given that it is difficult to protect a business from a multitude of malicious cyberattacks fully, future research could explore how cyberattacks might compromise the internationalization efforts of firms and what policies and strategies can be put in place to mitigate the risks. For example, studies could make an effort to investigate the types of cyber threats that firms face when expanding into foreign markets, how these threats influence the firm's ability to operate and expand internationally, and what measures can be taken to prevent the response to cyber incidents.

Besides, Chapter III measures the extent of internationalization through the proportion of oversea customers. Chapters II and IV focus on export-oriented activities to measure internationalization speed/scope and willingness to internationalize (export propensity). While our measure provides a holistic picture of the internationalization process: decision (whether to internationalize or not), how (slow/fast internationalizing and scope), and success (the extent of internationalization), this dissertation is limited in offering diverse views of other internationalization activities, for example, foreign direct investment and joint venture (Muralidharan & Pathak, 2017). Therefore, future research could make efforts to measure related internationalization dimensions based on other relevant activities.

Lastly, this doctoral thesis examines the antecedents of firm internationalization: decision, extent, or speed/scope. However, the phenomenon has recently changed, with a global foreign direct investment (hereafter FDI) showing a consistent decline since 2016 (i.e., from $1.97 trillion in 2016 to $1.54 trillion in 2019; UNCTAD) and cross-border trade flow showing a drop of around 10-30% in global goods trade in 2020 (The Economist, 2020). Two main strategies (e.g., de-internationalization and halting of new initiatives in internationalization) are adopted to respond to the significant slide of foreign markets. Among them, de-internationalization has practical, far-reaching implications for firms either in FDI or export overseas if those firms create value relying on international activities. This phenomenon has been more salient since the outbreak of COVID-19 (Tang et al., 2021; Kafouros et al., 2022). For instance, most low-to-intermediate manufacturing industries were concentrated in China before COVID-19. However, the pandemic suddenly stopped logistic services and the supply of commodities, leading to a shortage of materials in other parts of the world. Therefore, authorities realized this shortcoming, and some even proposed "manufacturing back home." In this case, Japan first set up a "back fund" for its multinational companies to move out of China and return home, avoiding the shortage of raw material supply. Hence, these adopted measures suggest a similar conceptual underpinning (i.e., a reduced degree of internationalization).

Consequently, this salient occurrence has triggered growing attention from scholars. Extending the studies in the "de-internationalization" era would be interesting. For example, would institutions work similarly in the de-internationalization period? How should firms respond to the de-internationalization regarding their international activities? In short, it is essential to synthesize the literature through an integrative survey to provide an overall understanding of conclusions and identify consensuses, controversies, and caveats. Most importantly, findings

in de-internationalization could also contribute to the policymakers and become guidelines for firms and entrepreneurs.

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