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# Unveiling the path of Schumpeterian entrepreneurs: Exploring growth aspirations, innovative entrepreneurship, and export orientation

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# Unveiling the path of Schumpeterian entrepreneurs: Exploring growth aspirations, innovative entrepreneurship, and export orientation


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## Preface

Entrepreneurship is a dynamic force that drives innovation, economic growth, and job creation. It catalyses change, bringing new ideas, products, and services to markets. However, the entrepreneurial landscape is complex and influenced by various factors that shape entrepreneurs' aspirations, behaviour, and outcomes. Understanding these factors is crucial for fostering high-impact entrepreneurs and creating an environment that nurtures their growth.

This doctoral thesis presents a comprehensive research study that explores the factors influencing entrepreneurial aspirations for growth, innovative entrepreneurship, and export orientation. Each chapter of this research contributes insights into understanding how these factors shape the entrepreneurial landscape and their implications for entrepreneurs, policymakers, and future entrepreneurship research.

With this research, I expect to contribute to academic literature with a comprehensive analysis exploring how individual and contextual factors shape Schumpeterian entrepreneurs, who represent desirable entrepreneurs to cultivate for their impact on economic growth.

For their invaluable guidance and support throughout the entire research process, I would like to express my deepest gratitude to my supervisors Joan-Lluís Capelleras and Victor-Martin Sanchez. Your expertise, insightful feedback, and encouragement have shaped this work and pushed me to new challenges. I am truly grateful for the countless hours you dedicated to mentoring me and for believing in the potential of this research.

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To all those mentioned and the countless others who have contributed to this work in various ways, I extend my deepest appreciation. Your support has been immeasurable, and I am honoured to have had you by my side throughout this transformative journey.

## Abstract

Drawing upon Schumpeter's influential work, this doctoral thesis explores the realm of Schumpeterian entrepreneurs who embody visionary qualities, embracing growth, innovation, and internationalization as key precepts of their entrepreneurial journeys. Through extensive analysis of multisource datasets encompassing various countries from 2005 to 2020, this research investigates the intricate interplay between individual characteristics, country-level variables, and the entrepreneurial landscape. The findings offer valuable insights for policymakers and researchers, focusing on characterizing high-impact entrepreneurs. This comprehensive study examines several dimensions of entrepreneurial endeavours, including growth aspirations, innovative strategies, and export-oriented mind-sets. Each distinct study chapter contributes specific insights into the characteristics and strategies employed by entrepreneurs to leverage resources and gain a competitive advantage.

The first study explores differences in growth aspirations between novice and habitual entrepreneurs, considering the influence of a country's investment in research and development (R&D). The second study investigates the relationship between gender, financial depth development, and innovative entrepreneurship. Finally, the third study examines how informal investors and a country's rule of law impact new ventures' export orientation.

The research findings demonstrate that entrepreneurial experience positively affects growth aspirations. Portfolio entrepreneurs exhibit higher growth aspirations than novice and serial entrepreneurs. Furthermore, the study highlights that national investment in R&D amplifies these differences in growth aspirations. This indicates that entrepreneurial experience is valuable for assimilating new knowledge within specific contexts, particularly for portfolio entrepreneurs.

In innovative entrepreneurship, female entrepreneurs exhibit a marginally greater propensity for pursuing it than their male counterparts. However, the level of financial institution development in a given context reduces the likelihood of new venture innovation, while market-based financing development fosters it. Nevertheless, less favourable financing conditions for female entrepreneurs can be mitigated in contexts with higher levels of financial development, whether institution-based or market-based.

Regarding informal investors and the rule of law, both factors significantly influence new ventures' export orientation. Countries with more informal investors tend to enhance export-oriented new ventures, although this effect is diminished in countries with stronger rule of

law. The impact of informal investors and the rule of law also varies depending on the entrepreneur's wealth. Informal investors have a more pronounced positive impact on export orientation for entrepreneurs from lower-wealth backgrounds, while a stronger rule of law positively affects export orientation for wealthier entrepreneurs.

These findings emphasise the importance of cultivating environments for the success of Schumpeterian entrepreneurs. Therefore, policies related to this research's findings would imply support for the proliferation of habitual entrepreneurs and informal investors, strengthening a country's investment in R&D, promoting the development of financial markets, and ensuring effective enforcement of the rule of law.

**Keywords** Growth aspirations · Habitual entrepreneurs · Innovative entrepreneurship · Entrepreneurial finance · Export orientation

**JEL Classification** L26 · O32 · O57 · O31 · G24 · O16 · M13 · G32

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# Chapter 1

# 1 Introduction

## 1.1 Problem statement and motivation

As a dynamic and transformative force of economies, entrepreneurship is pivotal in driving productivity, innovation, and economic growth. As a result, academic interest in entrepreneurship in recent years widely increased, positioning it as a relevant field of study in the social sciences due to its significant impact on various aspects of society (Venkataraman & Shane, 2000; Wiklund et al., 2011). This growing interest stems from recognizing that entrepreneurship is crucial in driving transformational societal changes. By understanding entrepreneurs' motivations, behaviours, and outcomes, researchers can provide insights into how entrepreneurial activities can be harnessed to address societal challenges and promote sustainable development (Davidsson et al., 2006).

At the forefront of entrepreneurial studies stands the seminal work of Schumpeter (1934), whose pioneering work has left a lasting impact on the field. Schumpeter's formulation in the early 20th century emphasized the role of entrepreneurs as "creative destructors," willing to seize opportunities in the face of challenges and drive the progress of industries and economies. More than a century later, Schumpeterian entrepreneurs' relevance and enduring importance continue to shape the understanding of entrepreneurial behaviour (Estrin et al., 2022).

Examining Schumpeter's entrepreneurs provides an opportunity to investigate their distinct characteristics and recognize that entrepreneurship involves the risk-taking and proactive pursuit of growth-oriented strategies. This perspective highlights that while entrepreneurship is often associated with differentiation strategies, not all entrepreneurs achieve it in their new ventures (Autio et al., 2014). Hence, the focus is on entrepreneurs who aspire for higher growth, employ innovative strategies, or engage in export-oriented activities to gain a competitive advantage (Alvarez & Barney, 2007).

The analysis of this study begins by focusing on entrepreneurial activities embodied by new ventures, as they represent an early stage of entrepreneurship, in contrast to established firms (Gilbert et al., 2006; Giotopoulos et al., 2017; Nason et al., 2019). Understanding the intrinsic characteristics that drive individuals to aspire for higher growth is one of the key aspects of this research. This understanding is relevant not only for entrepreneurial studies but also for economic growth analysis, as new ventures generate jobs and contribute to the development of economies (Davidsson et al., 2006; Wiklund & Shepherd, 2003). Previous

research in this area has found that the entrepreneurs' strategic decision to grow is the initial reason for pursuing it (Chandler & Hanks, 1994). Moreover, studies have highlighted the significant influence of entrepreneurs' aspirations for growth as a prerequisite for the actual growth of their ventures (Levie & Autio, 2013). Findings consistently indicate a positive correlation between entrepreneurs' growth aspirations and subsequent business growth (Baum et al., 2001; Davidsson et al., 2006; Stam et al., 2009).

Moreover, researchers have acknowledged the heterogeneity of entrepreneurs' aspirations and their impact on actual growth achievements (Gilbert et al., 2006). The factors influencing entrepreneurs' attitudes toward growth operate at multiple levels, including individual-level characteristics, business/firm aspects, and country/context-level factors. Additionally, it is worth noting that much of the existing research in this field has focused on analysing a single country (Autio & Acs, 2010). These two elements highlight the need to provide the existing literature with a better understanding of how individual, firm, and country-level determinants influence entrepreneurial growth aspirations. To achieve this, a broader spectrum of analysis encompassing a larger number of countries is needed.

While aspiring for growth is relevant for these high-impact entrepreneurs, their strategy to attain it is also important, usually by following innovative and/or export-oriented strategies (Estrin et al., 2022, 2019; Hessels et al., 2011; Love & Roper, 2015).

By studying innovative entrepreneurship, researchers can gain insights into how entrepreneurs identify and capitalize on opportunities to introduce novel ideas, products, services, and processes (Baumol, 2010). Understanding innovative entrepreneurs' motivations, strategies, and outcomes can shed light on the factors contributing to their success and the broader implications for economic development. Unlike imitative entrepreneurs, innovative entrepreneurs take risks and seek to create unique combinations within their local markets (Koellinger, 2008; Malerba & McKelvey, 2020). They actively pursue resources and opportunities to transform their ideas into tangible innovations. This form of entrepreneurship is essential for driving long-term economic growth and development (Mayhew et al., 2016).

Innovative entrepreneurship addresses complex challenges and fosters sustainable development (Volkmann et al., 2021). Its study can assist in understanding how entrepreneurs navigate the innovation process, overcome barriers, and create value for society. Furthermore, in a rapidly evolving global economy, where technological advancements and market dynamics are constantly changing, understanding innovative entrepreneurship is vital for individuals, organizations, and policymakers, as it provides insights into how entrepreneurs

adapt to disruptive forces, leverage emerging technologies, and navigate competitive landscapes (Grilli et al., 2023).

As a second strategy to achieve rapid growth, entrepreneurs' incursion beyond their domestic markets excels as a remarkable area of analysis within entrepreneurial studies and international business (Hessels & Van Stel, 2011; Oviatt & McDougall, 2005). This strategic shift towards internationalization offers new ventures the opportunity to expand their customer base and penetrate new markets, fuelling their growth trajectories.

The emergence of new ventures entering international markets from their inception or at an early stage of formation (Buccieri et al., 2022; G. Knight et al., 2004; Phillips McDougall et al., 1994) reflects their ability to overcome challenges associated with their newness and foreignness. This strategic choice requires these ventures to navigate uncharted territories and compete in global markets. However, it is important to recognize that these ventures can have different starting points influenced by individual characteristics and the conditions of their home-based markets (Clercq et al., 2013). Understanding how specific country-level factors can either facilitate or hinder their internationalization efforts is crucial (Chen et al., 2018; Rialp et al., 2005; Romanello & Chiarvesio, 2019). Additionally, exploring the individual differences among these ventures further contributes to the understanding of their internationalization strategies and outcomes. By examining these factors, researchers can gain insights into the complex dynamics that shape the internationalization processes of new ventures and inform policymakers and entrepreneurs on how to enhance their internationalization likelihood. In response to Jiang' (2020) call for a more comprehensive approach, an integrated research approach that considers multiple levels of analysis can offer a broader understanding of the phenomenon of new ventures rapidly expanding into foreign markets.

By integrating multiple levels of analysis, a more nuanced understanding of growth-oriented, innovative, and export-oriented entrepreneurs can be achieved. This comprehensive examination also considers the crucial relationship between entrepreneurial activities and financial resources. Special attention is given to exploring external financing options for new ventures and strengthening entrepreneurial finance literature (Cumming et al., 2019). Each chapter inquiries into the mechanisms that can attenuate potential financing constraints. One such mechanism explores how entrepreneurs can enhance their innovative capacity by accessing external to-firm investment in research and development (R&D) (Burke et al., 2021; Urbano, Turro, et al., 2019). The study investigates the impact of the restrictiveness of R&D investment on new ventures and how this constraint can be alleviated through the spill

over effects generated by national R&D expenditure (Acs & Sanders, 2013). Another aspect of external financing complexity pertains to the configuration of the financial structure within which new ventures operate. Specifically, the analysis examines the financing alternatives available to new ventures that involve direct funding without intermediaries, which align more closely with their specific needs and characteristics. Additionally, the study explores the role of indirect intermediation, which refers to financing options that are more distant from the needs of new ventures. This examination is framed within the context of financial markets and financial institutions' depth development, respectively (Block et al., 2021; Canh & Thanh, 2020; B. Nguyen & Canh, 2021). A third financial area of research transversally covered in this study relates to the availability of resources from informal investors, often referred to as the first pecking order financing alternative (Hellmann et al., 2021). These informal investors, such as family, friends, and fools, represent new ventures' closest external financing option. However, there is a lack of understanding regarding the implications of informal investors' stronger or weaker presence. Therefore, this research specifically examines how a higher proportion of informal investors can facilitate the endeavours of export-oriented entrepreneurs. By focusing on this aspect, the study aims to shed light on the significance of informal investors as a critical resource for new ventures in their pursuit of international market expansion (Kerr et al., 2014; Mason & Harrison, 2002).

The research recognizes the significant impact of both formal and informal institutions on entrepreneurship (Guerrero et al., 2021; North, 1990). One area of investigation focuses on understanding the connection between the enforcement of the rule of law and the chances of success for international new ventures. It is well understood that countries with a strong rule of law framework provide a more stable and predictable legal environments, fostering business activities with confidence (Estrin et al., 2013). Such environments ensure that new ventures have equal opportunities, enforceable contracts, and protected property rights, which are essential for their success (Autio & Acs, 2010; Papageorgiadis et al., 2020). However, it is also evident that the rule of law varies significantly across countries, which can impact entrepreneurs' likelihood of adopting an export-oriented approach. Furthermore, it is unclear how entrepreneurs perceive the level of legal protection and whether it differs based on their household income. Therefore, this research explores the differences in internationalization patterns among entrepreneurs at various levels of the rule of law, considering wealth inequality (Bapuji et al., 2020).

This study also focuses on certain individual characteristics of entrepreneurs. Firstly, it examines the impact of their previous entrepreneurial experience by comparing novice entrepreneurs with habitual entrepreneurs (Ucbasaran, Alsos, et al., 2008; Westhead, Ucbasaran, & Wright, 2005). The aim is to understand whether their growth aspirations differ and what implications this may have. Additionally, the study explores gender differences as another individual determinant. It investigates whether gender can predict an entrepreneur's inclination to be more or less innovative (Brush et al., 2019; Hechavarria et al., 2019). By examining these individual factors, the research seeks insights into how they influence entrepreneurial behaviour and outcomes. Finally, wealth differences are explored as a parameter to evaluate different perceptions of institutional factors among new venture entrepreneurs (Bapuji et al., 2020; Braggion et al., 2018).

This research uncovers insights that can shape the future of entrepreneurial endeavours by exploring the complex dynamics of entrepreneurship and the factors that drive growth, innovation, and internationalization. The findings presented in the subsequent chapters unveil the multifaceted nature of entrepreneurial activities, shedding light on the mechanisms that facilitate or hinder growth, innovation, and international expansion. Approaching a wide variety of countries and different levels of analysis, this research answers to researchers call for a more comprehensive analysis in the field. With each chapter offering unique perspectives and compelling analysis, this doctoral thesis invites the reader to embark on the journey of Schumpeterian entrepreneurs. It covers the intricacies of entrepreneurial behaviour, the power of external financial resources, the influence of institutions, and the impact of individual characteristics.

## 1.2 Main research objectives

The primary objective of this research is to contribute to the existing literature on entrepreneurship by enhancing the understanding of the factors influencing the emergence of Schumpeterian or high-impact entrepreneurs. Recognizing the extensive scope of these factors, this study investigates specific elements related to the entrepreneurs' decision to aspire for higher growth, their strategic takes on innovation, and export orientation. Although it is not feasible to comprehensively cover all aspects related to this line of inquiry due to inherent research limitations, the research aims to shed light on the key objectives outlined below:

- To investigate the direct effect of prior entrepreneurial experience—novice, serial, and portfolio entrepreneurial experience—and the moderating role of national

research and development (R&D) expenditure in shaping entrepreneurial growth aspirations.

- To examine the gendered nature of innovative entrepreneurship and scrutinise the impact of financial depth development on this phenomenon, specifically analysing the direct and indirect effects of financial market and financial institution development.
- To study the role of informal investors and a country's rule of law enforcement in determining new ventures' export orientation while detangling the relation of these factors based on the entrepreneurs' wealth differences.

These objectives are designed to provide a comprehensive understanding of the complex dynamics influencing the emergence of high-impact entrepreneurs and their strategic decisions. By exploring the influence of prior entrepreneurial experience, gender, national R&D expenditure, financial depth development, informal investors, and the rule of law, this research aims to contribute valuable insights that can inform policymakers, entrepreneurs, and researchers in fostering entrepreneurial growth, promoting innovation, and supporting internationalization efforts.

## 1.3 General theoretical framework of the study

Each research objective in this study is underpinned by a specific theoretical framework that provides the foundation for formulating the hypotheses. By aligning each objective with a relevant theoretical framework, this research aims to contribute to the existing body of entrepreneurial literature and deepen the understanding of the phenomena under investigation.

Recent findings in entrepreneurial literature have highlighted the importance of studying entrepreneurs as individuals who shape their ventures based on their surrounding environment (Estrin et al., 2013; Shepherd, 2011). Consequently, investigating entrepreneurial activities necessitates examining these various levels of analysis. This research utilizes different theoretical foundations to explain how specific individual characteristics contribute to the motivation for pursuing high-impact entrepreneurship: aspiring for higher growth, searching for innovativeness, or being export-oriented. Additionally, it integrates them with an understanding of how the context in which entrepreneurs operate can influence their entrepreneurial endeavours.

At the individual level, this research explores the characteristics of entrepreneurs, such as their level of entrepreneurial experience, gender, and wealth. Chapter 2 deepens the understanding of entrepreneurial experience built upon the theoretical framework of human capital theory (Becker, 1964). This theory encompasses two components: general and specific

human capital, which contribute to a firm's future productivity. General human capital refers to skills effective across different contexts, while specific human capital refers to skills specific to a particular context (Ucbasaran, Alsos, et al., 2008; Westhead, Ucbasaran, & Wright, 2005). Furthermore, general human capital is transferable and acquired through formal education, whereas specific human capital is developed through experience (Baptista et al., 2014; Capelleras et al., 2019; Estrin et al., 2016; Unger et al., 2011).

Entrepreneurial experience, a form of specific human capital held by "habitual entrepreneurs" (Parker, 2014; Ucbasaran, Alsos, et al., 2008), can help explain different decision outcomes (Westhead, Ucbasaran, & Wright, 2005), such as why some entrepreneurs aspire for higher growth than others. The effects may vary depending on the type of experience. In this context, it explores first-time or novice entrepreneurs without previous entrepreneurial experience (Lechner et al., 2016). In contrast, habitual entrepreneurs who have actively established entrepreneurial activities (Toft-Kehler et al., 2014) are categorized into two main types: serial and portfolio entrepreneurial experience. Serial entrepreneurs have been involved in multiple businesses sequentially (Parker, 2013; Vaillant & Lafuente, 2019), whereas portfolio entrepreneurs manage multiple ventures simultaneously (S. Carter & Ram, 2003; Parker, 2014).

To further explore entrepreneurs' individual characteristics, chapter 3 examines the potential gendered nature of innovative entrepreneurship. To analyse this phenomenon, it draws on the social feminist theory (N. M. Carter & Williams, 2003; Johnsen & McMahon, 2005), highlighting the significance of gender differences in entrepreneurship. According to this theory, gender differences in entrepreneurship are shaped by social structures, power dynamics, cultural norms, and institutions. It provides insights into the distinct socio-cultural values and norms that influence men and women and acknowledges that both genders possess equally effective traits without one being superior or inferior but somewhat different (N. M. Carter & Williams, 2003; Fischer et al., 1993). Gender, in this context, refers to an individual's possession of masculine or feminine characteristics (Muehlenhard & Peterson, 2011). This perspective recognizes women's societal roles and firm dynamics (Griffiths et al., 2013). The field of entrepreneurship has made significant progress by examining gender differences, reframing them as aspects that require a comprehensive analysis within the entrepreneurial landscape rather than viewing them as deficiencies in women that need to be "fixed" (Ahl & Marlow, 2012; L. Foss et al., 2019).

Chapter 4 emphasizes the relevance of investigating specific characteristics of entrepreneurs in shaping their behaviours. In this context, it expands our understanding of the

role of the entrepreneurs' wealth. Drawing on the theoretical framework of institutional theory (North, 1990), it recognizes the importance of considering wealth disparities as a significant factor in comprehending the outcomes of international new ventures. Wealth differences provide insights into the divergent behaviours exhibited by different actors. These variations can impact their access to resources and overall interpretation of their entrepreneurial ecosystem (Bapuji et al., 2020; Pathak & Muralidharan, 2018).

The research integrates the examination of individual characteristics with specific firm outcomes. In order to uncover the distinctive attributes of Schumpeterian entrepreneurs, three types of new ventures are explored: growth-oriented, innovative, and the ones with rapid internationalization. As such, the study of growth aspirations explored in chapter 2 focuses on understanding the factors and motivations that drive entrepreneurs to aspire for growth in their ventures. It recognizes that not all entrepreneurs have the same aspirations and that their growth goals can vary significantly (Davidsson et al., 2006).

Research in this field suggests that the primary motivation for entrepreneurs to pursue growth is their strategic decision to do so (Chandler & Hanks, 1994). The existing literature can be categorized into two main streams: longitudinal research focusing on actual growth and research exploring entrepreneurial growth aspirations (Tominc & Rebernik, 2007). Previous studies have emphasized the significant influence of an entrepreneur's aspirations on the actual growth attained by their venture (Levie & Autio, 2013). These studies have discovered a positive correlation between an entrepreneur's growth aspirations and subsequent business growth (Baum et al., 2001; Davidsson et al., 2006; Stam et al., 2009).

Also at the firm level, chapter 3 investigates innovative entrepreneurship, recognized as a crucial driver of long-term economic growth and societal well-being (Davidsson et al., 2006; Mayhew et al., 2016). The theoretical foundations of innovative entrepreneurship encompass diverse perspectives and frameworks to understand the dynamics and determinants of entrepreneurial innovation (Baumol, 2010; Darnihamedani et al., 2018; McKelvie et al., 2017). Within these theoretical perspectives, the research adopts a Schumpeterian approach, which portrays entrepreneurs as agents of "creative destruction" (Schumpeter, 1934, 1942), introducing disruptive businesses generating economic growth. In this context, these entrepreneurs are responsible for introducing new products, services, production methods, or business models to their respective markets (Agarwal et al., 2007; Ganbaatar & Douglas, 2019; Malerba & McKelvey, 2020). It is relevant to emphasize that, in line with previous studies, the definition of innovation in this context primarily focuses on the entrepreneurs'

local markets. As a result, the ability to introduce novel combinations distinguishes innovative entrepreneurs from pure imitative entrepreneurs (Hessels et al., 2008; Koellinger, 2008).

Chapter 4 further explores the emergence of international new ventures, representing the third type of Schumpeterian firm explored in this study. Internationalization literature emphasizes that ventures enter international markets to leverage their unique competencies and achieve superior performance through production, technology, products, or services. The Uppsala internationalization model (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975) suggests that firms gradually expand their international activities, starting with limited and low-risk operations in foreign markets. However, an alternative perspective known as the Born Global approach argues that certain firms possess distinctive characteristics that enable them to enter international markets early in their life cycle (Phillips McDougall et al., 1994). These firms are driven by entrepreneurial opportunities, market knowledge, and networks, which help them overcome resource constraints and quickly establish a presence in foreign markets. Much of the research done in this relation has been engaged towards rapid internationalizing firms or born global firms (G. A. Knight & Cavusgil, 2004) under the field of international new venture (INV) studies (Abrahamsson et al., 2019). Since the approach of this research is of Schumpeterian entrepreneurs that internationalize from inception or at an early stage of formation, the theoretical focus will centre on international new ventures (INV), referring to those ventures that generate over 25% of their revenues from foreign customers (Buccieri et al., 2022; G. A. Knight & Cavusgil, 2004; Phillips McDougall et al., 1994).

Finally, some specific elements are explored when exploring the entrepreneurs' interaction with their context. In chapter 2, the study explores the impact of national research and development (R&D) expenditure on entrepreneurial growth aspirations. The attention is centred on endogenous growth models, highlighting the importance of generating knowledge stock for economic activities and innovation (Romer, 1986, 1990). National R&D expenditure is a significant source of knowledge stock, and how it is allocated can influence economic growth. However, these models often overlook entrepreneurs' crucial role in recognizing and transforming knowledge into profitable opportunities. To bridge this gap, the study incorporates the Knowledge Spillover Theory of Entrepreneurship (KSTE) (Acs & Sanders, 2013), which recognizes the interaction between entrepreneurs and the knowledge stock generated within an economy (Acs et al., 2014).

Chapter 3 utilizes the theoretical framework of entrepreneurial finance (Cumming et al., 2019) to enhance our understanding of the relationship between a country's financial

development and innovative entrepreneurship. On the other hand, chapter 4, also guided by the same theoretical framework, examines the significance of informal investors within a country as a factor determining the likelihood of international new ventures' emergence. Entrepreneurial finance focuses on the financial aspects of entrepreneurship, including the acquisition, management, and allocation of financial resources in entrepreneurial ventures. It encompasses various topics such as venture capital, angel investing, crowdfunding, debt financing, and financial decision-making within entrepreneurial firms. Entrepreneurial finance aims to understand how entrepreneurs secure funding for their ventures, evaluate investment opportunities, manage financial risks, and create value through effective financial strategies (Block et al., 2021). This field recognizes entrepreneurs with unique financial challenges and opportunities who often operate in uncertain and dynamic environments (Hirsch & Walz, 2019).

The allocation of financial resources in economies is influenced by various factors, including returns, risks, transaction costs, and asymmetric information (Allen & Santomero, 1997; Brealey, 2001). Chapter 3 understands that entrepreneurs in different contexts seek external financial resources from various sources. However, a country`s financial allocation occur through direct or indirect mechanisms (Svirydzenka, 2016), each having different levels of development. In the case of direct resource allocation, resource seekers directly engage with investors in financial markets (Wurgler, 2000). Financial market development is measured by indicators such as stock market capitalization, stocks traded, and debt securities. Examples of financial markets include stock markets, debt securities, crowdfunding platforms, and peer-to-peer transactions (Block et al., 2021; Estrin et al., 2018; Kleinert et al., 2020). Indirect resource allocation involves intermediaries that match the needs of both sides and act as specialists to manage the inherent risks related so asymmetries of information (Allen & Santomero, 1997). These intermediaries, such as banks, pension funds, mutual funds, and insurance funds, play a crucial role in risk transfer and possess specialized knowledge of financial instruments and markets. The depth of a country's financial institutions is measured by metrics such as bank credit allocations. Overall, both direct and indirect mechanisms contribute to the efficient allocation of financial resources (Svirydzenka, 2016).

Similarly, the entrepreneurial finance theory suggests that informal investors play a crucial role in providing financial resources to early-stage ventures. These investors are more likely to invest in high-risk, high-potential ventures, including those with international growth aspirations (Maula et al., 2005). By providing funding, informal investors enable international

new ventures to overcome financial constraints and pursue their expansion plans. In the context of INV, entrepreneurs can tap into external resources from informal investors to acquire the necessary financial, human, and social capital to support their internationalization efforts. These external resources can help overcome the challenges of internal restrictions and facilitate the acquisition of knowledge, networks, and expertise required for successful international expansion.

Lastly, this research focuses on the role of a country's rule of law enforcement under the theoretical background of institutional theory to explore in chapter 4 its effects on international new ventures. As North (1990) proposed, the institutional theory provides insights into how institutional factors shape the behaviour and performance of businesses within a country and its effects on international trade.

Institutional theory suggests that formal and informal rules, regulations, and norms established by institutions significantly influence the decisions and actions of entrepreneurs. A key institutional factor that affects international new ventures is the rule of law enforcement (Levie & Autio, 2011). The rule of law refers to the existence of a legal framework that ensures fairness, transparency, and predictability in business transactions and protects property rights (Kaufmann et al., 2011). Effective enforcement of the rule of law creates a conducive environment for entrepreneurship by reducing uncertainty, promoting trust, and facilitating economic activities. By integrating the institutional theory into the theoretical background of international new ventures, this research can gain a deeper understanding of how the rule of law enforcement and contextual factors, including wealth differences, shape the behaviour, strategies, and performance of ventures operating in international markets.

## 1.4 Main contributions of the research

The main contribution of this research is to provide a deeper understanding of the Schumpeterian entrepreneurial process by highlighting the significance of motivated entrepreneurs in creating high-impact new ventures (Estrin et al., 2022). The study focuses on disruptive entrepreneurs who make strategic choices that lead to higher growth aspirations, introduce innovation in local markets, or explore new markets outside their home countries. It also bridges the gap between individual and contextual characteristics contributing to the proliferation of Schumpeterian entrepreneurs emerging from diverse countries backgrounds.

The research findings, presented across different chapters, emphasize the following key points:

*Differences in Growth Aspirations*: The study reveals that growth aspirations vary based on an entrepreneur's previous experience. This finding enhances our knowledge about entrepreneurial decision-making, emphasizing the role of entrepreneurial experience in setting realistic goals and making informed decisions. Moreover, the importance of experience in shaping entrepreneurial skills highlights the need for practical and experiential components in entrepreneurial success. The presented evidence in this chapter strongly supports the importance of experience in entrepreneurship, making valuable contributions to existing literature and laying the groundwork for future research in the field, with a particular emphasis on controlling for diverse experiential backgrounds.

Serial entrepreneurs (involved in multiple businesses sequentially) adjust moderating their growth aspirations based on lessons learned from past ventures. In contrast, novice entrepreneurs who are still navigating the complexities of entrepreneurship and have yet to adjust to more realistic growth aspirations. Portfolio entrepreneurs (manage multiple ventures simultaneously) exhibit the highest growth aspirations from the analysis set, by leveraging their existing resources and experience to seize new opportunities more swiftly.

Additionally, the research demonstrates that a country's investment in research and development (R&D) has a moderating effect on growth aspirations on all entrepreneurs. However, because of their propensity for recognizing new knowledge generation as an opportunity for growth, portfolio entrepreneurs have significantly higher growth aspirations in countries with greater R&D expenditure. This finding aligns with the knowledge spill-over theory, suggesting that experienced entrepreneurs are likelier to adopt inventions and leverage knowledge generated in their environment. In contrast, novice entrepreneurs are less inclined to perceive knowledge generation as growth opportunities and might even feel threatened in such contexts. The findings also highlight that an environment characterized by higher levels of national research and development (R&D) can facilitate the emergence of Schumpeterian entrepreneurs.

*Gender and Financial Depth in Innovative Entrepreneurship*: This chapter examines innovative entrepreneurship through a gendered lens. Among the main contributions, the study includes in the innovation discussion the gender role, highlighting the importance of considering diverse entrepreneurial roles and characteristics when studying innovation. Additionally, the study highlights how the presence of various financial mechanisms in a specific context can either promote or hinder innovative behaviour.

The findings indicate that female entrepreneurs are marginally more likely than male entrepreneurs to introduce innovations. This tendency is attributed to feminine traits such as

open communication, collaboration, female entrepreneurial roles, and seeking outside support to overcome adversity. Furthermore, the study highlights the role of financial depth in influencing innovative entrepreneurship. Countries with highly developed financial institutions counter the likelihood of innovation due to the risk aversion and rigidity of these institutions. Conversely, countries with more developed financial markets, offering market-based financing solutions, are more conducive to innovative entrepreneurship. Out of the interaction effect, less favourable financing conditions for female entrepreneurs might be mitigated when they introduce innovations in contexts with higher levels of financial development, whether from financial institutions or market-based alternatives.

*Informal Investors, Rule of Law, and Export Orientation*: The research investigates the relationship between informal investors, the rule of law, and entrepreneurial export orientation. The primary contributions of this chapter lie in examining the trade-off effect between different institutional settings and highlighting how institutional factors can be perceived differently within the same context based on entrepreneurs' wealth. These insights are relevant for analysing the interplay of diverse institutional settings that foster high-impact entrepreneurs.

The findings demonstrate that both informal investors and the level of the rule of law significantly predict new ventures' export orientation. However, an interaction effect of these contextual variables shows that entrepreneurs in countries with weaker rule of law enforcement benefit from a higher proportion of informal investors in promoting international new ventures. In contrast, the presence of informal investors becomes less relevant for them in countries with strong rule of law. Additionally, the impact of informal investors and the rule of law varies depending on the entrepreneur's wealth. Informal investors have a stronger positive impact on export orientation for entrepreneurs from lower-wealth backgrounds, while a stronger rule of law positively affects export orientation for wealthier entrepreneurs.

The research contributes to the entrepreneurial literature by providing empirical evidence and insights into factors influencing Schumpeterian entrepreneurs. These factors include growth aspirations, entrepreneurial experience, R&D expenditure, innovative entrepreneurship, gender dynamics, financial depth, informal investors, the rule of law, and export orientation. The findings enhance the understanding of the complex dynamics within the entrepreneurial ecosystem and have implications for policy and practice in promoting high-impact entrepreneurial activities.

While Schumpeterian entrepreneurs may adopt one or more of the strategies investigated in this study, there is no clear indication of them being strictly bound by a path

dependence on these strategies. For instance, higher growth aspirations do not necessarily correlate with a greater likelihood of introducing innovation into their venture and becoming export-oriented. As discussed in the existing literature on this subject (Estrin et al., 2022), it is possible that entrepreneurs who establish innovative ventures naturally develop higher growth aspirations. This observation emphasises a potential reverse causality among the three strategies under analysis. This implies that Schumpeterian entrepreneurs might engage with any strategies outlined in the study.

This study has also aimed to validate variations in adopting Schumpeterian strategies based on individual characteristics. For instance, female entrepreneurs tend to express notably lower growth aspirations than their male counterparts and show a diminished inclination towards export orientation. However, they exhibit a marginally higher propensity to engage in strategies that drive innovation. Similarly, across each chapter, it has been established that higher levels of education correspond to higher growth aspirations, a greater likelihood of pursuing innovation, and a tendency to engage in export activities. In close connection, habitual entrepreneurs tend to be inclined towards selecting these strategies. Conversely, income levels are significantly and positively linked to higher growth aspirations but negatively associated with innovative entrepreneurship. Similar to the one conducted in chapter 4, a sensitivity analysis revealed no distinct deviations in the moderating effects of contextual variables like national R&D expenditure or a country's financial development concerning entrepreneurs' wealth.

Overall, among all the individual factors examined in this group of entrepreneurs, what stands out as a common trait among Schumpeterian entrepreneurs is their possession of higher levels of human capital acquired through education or entrepreneurial experience (Becker, 1964; Capelleras et al., 2019). This characteristic significantly contributes to their likelihood of engaging in export-oriented activities, embracing innovation, or aspiring for higher growth within their ventures.

## 1.5 Structure of the research

The rest of the doctoral thesis is organized as follows. Chapter 2 submerges the reader into the realm of growth aspirations, exploring the differences between novice and habitual entrepreneurs, and the interrelation with national R&D expenditure in shaping the entrepreneurial landscape. This chapter is organized in different sections, where section 1 provides an introduction to the chapter, section 2 presents the study's theoretical framework, explaining the theoretical approaches on which this chapter rationalizes, particularly to

formulate the hypotheses. In section 3 the data and methodology used are described. Section 4, reports the results and findings. Finally, in section 5, a discussion of the chapter findings, conclusions policy implications, and a space for limitations and future research.

Chapter 3 takes us on an analysis into the intersection of gender, financial depth development, and innovative entrepreneurship. While chapter 4 explores the relationship between informal investors, a country's rule of law, and entrepreneurial export orientation. Both chapters follow similar sections as chapter 2.

Finally, chapter 5 highlights the main findings and implications emerging from chapters 2, 3 and 4. In its structure, it covers different sections including the main conclusions, theoretical and practical implications, and finally limitations and future research lines.
Table 1 summarizes the main characteristics and the structure of the research.

**Table 1 Summary and structure of the research**

| Chapter | Theoretical framework | Dependent Variable | Individual-level Predictor and data source | Country-level Predictor and data source | Sample and Methods | Main results |
|---|---|---|---|---|---|---|
| Chapter 2: Novice, serial and portfolio entrepreneurs: How entrepreneurial experience shapes growth aspirations and absorption of national R&D expenditure | - Growth aspirations (Chandler & Hanks, 1994;Davidsson et al., 2006)<br>- Human Capital (Becker, 1964)<br>- Knowledge Spill over Theory of Entrepreneurship (KSTE)(Acs & Sanders, 2013) | Entrepreneurial growth aspirations (EGA) | - Novice Entrepreneurs (GEM)<br>- Serial Experience (GEM)<br>- Portfolio Experience (GEM) | - National R&D expenditure (WDI) | -117,617 observations<br>-Hierarchical multilevel model | - Portfolio entrepreneurs have higher growth aspirations than novice and serial entrepreneurs. While EGA is slightly higher for novices than serial entrepreneurs.<br>- R&D expenditure strengthens EGA differences between serial and portfolio entrepreneurs explaining their recognition of new knowledge generation as opportunities for growth.<br>- Novice entrepreneurs absorb less R&D expenditure as opportunities to aspiring for higher EGA |
| Chapter 3: Exploring the intersection of gender and financial depth development in innovative entrepreneurship | - Innovative entrepreneurship (Baumol, 2010)<br>- Social feminist theory (N. M. Carter & Williams, 2003; Johnsen & McMahon, 2005)<br>- Entrepreneurial finance (Cumming et al., 2019) | Innovative entrepreneurship (Inn..E.) | Gender (GEM) | - Financial institutions development (IMF)<br>- Financial markets development (IMF) | - 81,545 observations<br>-Multi-level logistic regression | - Female entrepreneurs are more likely than male entrepreneurs to pursue innovative entrepreneurship.<br>- Higher financial institution development reduces the likelihood of innovation, while high market-based financing development fosters innovation.<br>-Less favourable financing conditions for innovative female entrepreneurs might be mitigated in contexts with higher levels of financial development. |
| Chapter 4: New ventures' export orientation: wealth-based impacts of informal investors and the rule of law | -International New Ventures (G. A. Knight & Cavusgil, 2004; Phillips McDougall et al., 1994)<br>- Entrepreneurial finance (Cumming et al., 2019)<br>- Institutional theory (North, 1990) | Export Orientation (EO) | -Sample split based on Wealth inequality (GEM) | - Informal Investors (GEM)<br>- Rule of Law (WGI) | - 78,368 observations<br>- Multi-level logistic regression | -High proportion of informal investors is generally beneficial for export-oriented new ventures, but this effect is reduced in countries with stronger rule of law.<br>- Informal investors have a stronger positive impact on export orientation for entrepreneurs from lower-wealth backgrounds. In contrast, a stronger rule of law positively affects export orientation for wealthier entrepreneurs. |

# Chapter 2

# 2 Novice, serial and portfolio entrepreneurs: How entrepreneurial experience shapes growth aspirations and absorption of national R&D expenditure

## 2.1 Introduction

Entrepreneurial growth aspirations are a crucial determinant of new venture growth, and as such, understanding what drives these aspirations is a relevant area of entrepreneurial research (Baum et al., 2001; Davidsson et al., 2006; Estrin et al., 2022; Hermans et al., 2015; Levie & Autio, 2013). Notably, the growth aspirations of first-time entrepreneurs and experienced entrepreneurs may be influenced differently by their trajectory and the context where they operate (Autio & Acs, 2010; Estrin et al., 2013), such as the level of national R&D investment, which is a key indicator of innovation creation in a country (Amorós et al., 2019; Burke et al., 2021; Van Stel et al., 2019).

This study aims to investigate how prior entrepreneurial experience and national R&D expenditure impact the growth aspirations of entrepreneurs. The research focuses on different individual entrepreneurial experiences: first-time entrepreneurs (novice) (Ucbasaran et al., 2006; Ucbasaran, Alsos, et al., 2008) and habitual entrepreneurs. Novice entrepreneurs have only operated one business, while habitual entrepreneurs have run multiple businesses as serial or portfolio entrepreneurs (Westhead, Ucbasaran, & Wright, 2005). Serial entrepreneurs have sequentially been involved in multiple businesses, whereas portfolio entrepreneurs run multiple ventures in parallel (Capelleras et al., 2019; Parker, 2014; Plehn-Dujowich, 2010). These different experiences prepare entrepreneurs to have higher growth aspirations in distinctive ways.

Furthermore, the moderating effect of national R&D expenditure on the relationship between prior entrepreneurial experience and growth aspirations is examined. The enhancement of growth aspirations among habitual entrepreneurs derived from a country's national R&D expenditure, aims to reveal a link between a country's knowledge generation and entrepreneurship (Kirschning & Mrożewski, 2023).

The study contributes to the literature by providing a more contextualized understanding of the impact of entrepreneurial experience on growth aspirations and the moderating effect of national R&D expenditure. Data from the Global Entrepreneurship Monitor (GEM) and World Development Indicators (WDI) provided a dataset of 117,617 early-stage entrepreneurs from 84 countries between 2005 and 2020. Through the utilization of a hierarchical multilevel

model, the analysis focuses on the influence of various types of entrepreneurial experiences on venture growth aspirations, along with exploring the moderating effect of national R&D expenditure.

The rest of the paper is organized as follows. Section 2, presents the study's theoretical framework, explaining the theoretical approaches on which this study rationalizes, particularly to formulate the hypotheses. Section 3 describes the data and methodology used. Section 4 reports the results and findings. Finally, in Section 5, a discussion on the study's findings and implications are presented for policy and practice, particularly for policymakers interested in promoting entrepreneurship and fostering economic growth. The findings suggest that policymakers should focus on supporting the development of serial and portfolio entrepreneurs, particularly those with experience in technology-based ventures, and invest in R&D to foster knowledge generation and create opportunities for growth-oriented entrepreneurs.

## 2.2 Theory and hypotheses

Entrepreneurial growth aspirations are examined by considering the individual characteristics of the entrepreneur and their interaction with contextual factors. Human capital theory (Becker, 1964) serves as the basis for understanding the role of entrepreneurial experience in shaping growth aspirations, as it represents a crucial component of human capital formation. Additionally, recognizing the influence of the environment on entrepreneurial decision-making (Bruton et al., 2010; Kirschning & Mrożewski, 2023), the research investigates the indirect impact of national R&D expenditure on entrepreneurial growth aspirations.

### 2.2.1 Novice and habitual entrepreneurs' growth aspirations

Human capital theory suggests that education and training are investments in a firm's future productivity (Becker, 1964). Becker distinguished between general and specific human capital. While general human capital refers to skills that are equally effective across contexts, specific human capital refers to skills specific to a particular context (Gimeno et al., 1997; Ucbasaran, Westhead, et al., 2008), mainly developed via experience (Baptista et al., 2014; Capelleras et al., 2019; Estrin et al., 2016; Unger et al., 2011). Exploration of specific entrepreneurial experiences provides a perspective on how habitual entrepreneurs might have an advantage over novice entrepreneurs (Lechner et al., 2016). These experiences possessed by "habitual entrepreneurs" (Birley & Westhead, 1993; Parker, 2014; Ucbasaran et al., 2003)

can also explain why some entrepreneurs focus on higher growth (Grilli et al., 2023). Distinguishing between novice, serial, and portfolio entrepreneurs can provide a clear understanding of how they shape their growth aspirations differently.

As pointed by Jiang (2022), novice entrepreneurs are typically driven by a desire to turn their ideas into successful businesses, and they often have high levels of motivation and enthusiasm. However, their lack of experience and knowledge to navigate the complexities of starting and growing a business (Mannor et al., 2016; Ruiz-Jiménez et al., 2021) can impact their growth aspirations. Novice entrepreneurs are still learning about the business's challenges and are more focused on developing their products or services and establishing a customer base (Westhead, Ucbasaran, Wright, et al., 2005). Additionally, first-time entrepreneurs may face greater uncertainty and risks (Podoynitsyna et al., 2012), which can impact their confidence and willingness to take bold steps to grow their businesses. As a result, they may have limited access to resources (Schjoedt, 2021), mainly relying on internal financing and a smaller network of contacts due to not having built an entrepreneurial track record. Despite these challenges, novice entrepreneurs can set and achieve ambitious growth goals with proper support and mentorship, with the strong commitment to realizing their business idea (St-Jean & Audet, 2012).

On the other hand, habitual entrepreneurship comprises two main categories: serial and portfolio entrepreneurial experience. While serial entrepreneurs have been involved in multiple businesses sequentially, portfolio entrepreneurs run multiple ventures in parallel (Parker, 2014; Plehn-Dujowich, 2010; Westhead, Ucbasaran, & Wright, 2005). Most research has portrayed habitual entrepreneurs as a homogeneous group without accounting for their unique characteristics (Carbonara et al., 2020; Lechner et al., 2016).

Serial entrepreneurship constitutes a significant portion of all entrepreneurial activity (Westhead & Wright, 2015). Serial entrepreneurs draw inferences from lessons learned in their previous ventures, enabling them to assess more accurately those situations they consider similar. This "learning by doing" explains why serial entrepreneurs improve their abilities over time (Corbett, 2005; Dabić et al., 2021), increase their initial skills endowments, and perform better through learning from their previous experience (Parker, 2013). Additionally, serial experience enables entrepreneurs to enhance their managerial and technical skills, cultivate more extensive social networks, and improve their market interpretation, thereby developing venture proposals that are more sophisticated for their subsequent start-ups (Guerrero & Peña-Legazkue, 2019; McGrath & MacMillan, 2000; Ucbasaran, Alsos, et al., 2008; Unger et al., 2011).

Serial entrepreneurs gain knowledge from exiting their previous endeavours (Lafuente et al., 2019), capitalizing on their positive or negative experiences in the search for new opportunities. This alertness allows them to have more spontaneous and radical choices, relying on their enthusiasm, driven mainly by their intuition, without any fear of changing lines of interest. Compared to novice entrepreneurs, this behaviour characterizes them for been more confident and less risk-averse, willing to accept a new learning situation that requires finding new resources and building new social capital related to their new ventures (Lechner et al., 2016). In addition, serial entrepreneurs are likely to have experienced the difficulties involved in growing a business or even faced failures and so may have a more realistic outlook in subsequent ventures (Westhead & Wright, 2015). This previous experience may mitigate the overconfidence often attributed to entrepreneurs (Koellinger et al., 2007) while also encouraging them to pursue an opportunity as a way to "catch up" from the past (Ucbasaran, Alsos, et al., 2008).

A serial entrepreneur familiarized with specific technology or industry will prioritize the timing to exploit the identified opportunity as fast as possible (Fan et al., 2021). In contrast to inexperienced outsiders, serial entrepreneurs leverage their advantage from their industry insights and their business creation understanding (Lahiri & Wadhwa, 2021). Furthermore, their heuristic strategic decisions and mental shortcuts enable them to act in situations where information is not fully available (Ucbasaran, Alsos, et al., 2008), acting with a sense of urgency to exploit the opportunity while also expecting a reward for their advantageous opportunity identification. Accordingly, the following hypothesis is posited:

**Hypothesis 1.** *Serial entrepreneurs have higher growth aspirations than novice entrepreneurs.*

As the owners of multiple enterprises, portfolio entrepreneurs constitute a significant portion of all entrepreneurs. In research analysing their performance in creating jobs and sales revenues, portfolio entrepreneurs have been identified as leading fast-growing businesses (Storey, 2016; Westhead, Ucbasaran, & Wright, 2005); accordingly, they are responsible for substantial value creation (S. Carter & Ram, 2003; Rosa & Scott, 1999). These characteristics can be attributable to their diversification strategy, whereby growth is developed by portfolio entrepreneurs moving their capital among the various enterprises they own, facilitating new product development and business integration (S. Carter & Ram, 2003). Furthermore, compared to other entrepreneurs, their profile is more innovative and export-oriented (Robson et al., 2012), and they can adapt more rapidly to new market conditions (Kibria, 1994). As a

result, following a "path dependence," it becomes easier for them to exploit new opportunities related to their current ventures (Alvarez & Barney, 2007; Gruber, 2010; Kock & Gemünden, 2021). Additionally, portfolio entrepreneurs develop more extensive social networks through their business diversification strategy (S. Carter & Ram, 2003), which might also confer some fiscal benefits and sector advantages (MacMillan, 1986).

In contrast to novice or serial entrepreneurs, portfolio entrepreneurs may likely have higher optimism, as they expect to utilize and leverage resources from their existing business(es) to fund and grow new ventures (Carbonara et al., 2020). They constantly look outside the firm for growth opportunities via innovation, internationalization, or mergers and acquisitions (Rodgers et al., 2022). Their risk exposure is also different from other entrepreneurs by managing the risk across their different businesses (Lechner et al., 2016), making them more risk-averse. The strong ties accumulated from their social capital cultivation will enable them to better administrate their limited time over their different businesses.

These entrepreneurs' reputation as permanent entrepreneurs encourages them to constantly explore new opportunities (Lechner et al., 2016) while being vigilant to profit maximization from their current businesses (Ucbasaran, Westhead, et al., 2008). Hence, while novice and serial entrepreneurs will likely adjust their growth aspirations upon new opportunities, portfolio entrepreneurs will tend to be more ambitious in developing their new firms, understanding the benefits of the synergies they create, and leveraging their existing resources. This expectation is formulated by the following hypothesis:

> **Hypothesis 2.** *Portfolio entrepreneurs have higher growth aspirations than serial and novice entrepreneurs.*

### 2.2.2 Entrepreneurship and a country's knowledge stock generation

In 1956, Solow's economic growth model reflected a per capita view based on capital accumulation. Solow's later model (1957) pointed out that capital accumulation represents only a fraction of total economic growth, with the rest attributed to labour, including technological progress, as a constant. Although this model set the ground for developing the neoclassical theories of economic growth, it partly explained growth as a result of "external forces"; hence, these models are termed exogenous economic growth models. By contrast, endogenous economic growth models internalize these "forces" identified as the ideas and new technology that can be generated in an economy with the support of investment in new

knowledge (Romer, 1986, 1990) and in human capital (Lucas Jr, 1988). A country's most important source of knowledge stock generation is often represented by national R&D expenditure (Van Stel et al., 2019). A key feature of knowledge stock generation is that it enables further knowledge creation, such that one discovery can lead to more discoveries recognized by other entrepreneurs (Parker, 2009).

However, endogenous economic growth models assume that the knowledge stock is automatically transformed into economic activities that foster growth without mentioning the actors that lead and engage in those economic activities. Specifically, their explanations neglect the role of entrepreneurs in recognizing this knowledge and transforming it into profitable economic opportunities (Acs & Sanders, 2013; Audretsch, 1995).

Optimal allocation of economic resources is also essential, as findings show that R&D expenditure has diminishing returns where investment opportunities are progressively exhausted (Medda, 2020; Michelacci, 2002). At the same time, raising the amount of resources dedicated to national R&D expenditure does not necessarily increase economic growth, given that not all entrepreneurs benefit equally from R&D (Estrin et al., 2014). Despite such market failures, countries allocate significant amounts of resources to R&D, funded by private and public institutions that expect to achieve higher economic growth (Audretsch & Caiazza, 2016; Audretsch & Fiedler, 2023). Unlike established firms, which can acquire the necessary resources for their activities, new ventures must often overcome enormous challenges to attain the required resources (Nason et al., 2019). To tackle these limitations, many new ventures adopt external to their firm R&D findings in order to generate innovations (Runst & Thomä, 2022).

Researchers have applied different perspectives to understand how the components of an economy's generated knowledge stock interact with entrepreneurial activity to produce innovation (Acs et al., 2014). A relevant line of inquiry seeks to understand how knowledge stock at the country level spills over to individual firms (Acs et al., 2009; Braunerhjelm et al., 2010; Coe & Helpman, 1995). Englobing the incumbent actors' interconnection, the Knowledge Spillover Theory of Entrepreneurship (KSTE) (Acs et al., 2009) acknowledges the role entrepreneurs play in innovation, balancing it with the relevant role of institutions and knowledge generation; however, the theory hasn't deepened yet on the necessary conditions each of the components must fulfil to facilitate knowledge absorption (Acs et al., 2017; Ghio et al., 2015). A common factor among the different approaches is that innovation emerges from interactive systems, where all the components interact; as a result, the National Systems of Entrepreneurship framework (Acs et al., 2014) raises the urgency to understand better how

entrepreneurs shape their aspirations and behaviour by their context. Considering the complex relations within a system, the study examines a specific stance that can provide a conduit to an entrepreneurial inclination to identify knowledge generation (Kirschning & Mrożewski, 2023) as an opportunity for venture growth. In this sense, it explores how the intensity of knowledge generated in a specific country can strengthen the entrepreneurs' opportunities visualization, depending on their entrepreneurial experience, translating them by their entrepreneurial mind-set as growth possibilities. Increasing this understanding could assist public policy actors in defining policies more in tune with their set of entrepreneurs, maximizing the potential to generate innovation with all the associated positive effects.

### 2.2.3 The moderating role of national R&D expenditure on novice and habitual entrepreneurs

Mainly composed of public expenditure, university research, and private investment, national R&D expenditure effectively represents the innovativeness of the context where entrepreneurs develop their activities (Chung et al., 2022) and ultimately moderate their behaviour (Koo & Lee, 2019). For example, cities promoting knowledge generation in specific fields, such as high technological sectors, will foster the creation of virtuous circles of knowledge transfer and commercial exploitation (Audretsch & Caiazza, 2016). Moreover, evidence suggests that some regions have certain advantages over others in knowledge stock generation and are thus able to successfully attract ambitious entrepreneurs (Audretsch & Lehmann, 2005). Accordingly, the study combines two levels of analysis; at the individual level, evaluates how novice and habitual entrepreneurs shape their growth aspirations based on different levels of national R&D expenditure as the contextual second level of analysis.

While the size and track of established firms facilitate their new knowledge absorption capacity, in most cases, small new ventures still need to scale up and intensify their investment in internal knowledge generation to acquire this advantage (Denicolai et al., 2014). However, a resourceful mechanism to attain this absorbing capacity emerges from the entrepreneur's ability to capture this information from their context (Audretsch & Caiazza, 2016; Mueller et al., 2020; Runst & Thomä, 2022). Therefore, the research posits entrepreneurial experience as the primary enabling individual factor facilitating the recognition of contextual R&D expenditure as an opportunity for growth, as highlighted by previous findings signalling entrepreneurial experience as a factor fostering an individual's capacity to acquire and organize complex information emerging from new knowledge

generation, which in many cases may resemble the one of a field expert information processing (Ucbasaran, Alsos, et al., 2008).

Serial entrepreneurs base their actions on opportunity recognition and rapid exploitation, delineating them with lower levels of risk aversion and taking shorter periods of executing new activities than a novice entrepreneur (Alsos & Kolvereid, 1998). In addition, their ability to quickly adapt to changing contexts allows them to benefit from new knowledge generation, transforming them into business opportunities (Lechner et al., 2016), even when substantial learning is required. In this sense, they capitalize on their accumulated entrepreneurial learning experiences showing successful strategies that facilitate innovation (Vaillant & Lafuente, 2019). Furthermore, contexts with intense R&D investment generate more competitive environments, encouraging serial entrepreneurs' appetite for exploitable opportunities (Cerver-Romero et al., 2020; Westhead, Ucbasaran, & Wright, 2005). Novice entrepreneurs with no previous experience would have lower growth aspirations in countries with higher R&D investment from their unfamiliarity with performing in contexts generating constant change in the form of discoveries. Accordingly, the study proposes the following hypothesis:

> **Hypothesis 3**. *Higher levels of national R&D expenditure enhance entrepreneurial growth aspirations more for serial entrepreneurs than novice entrepreneurs.*

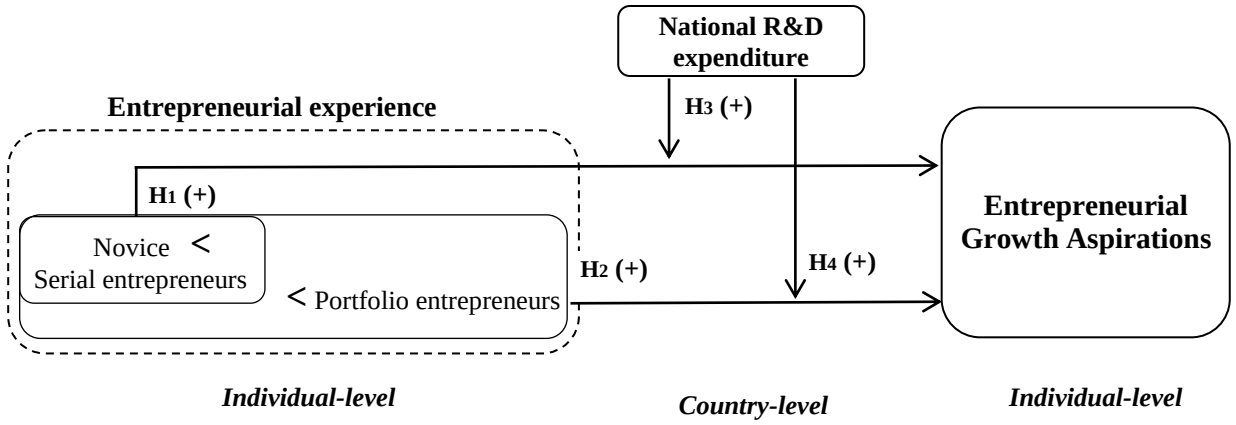
This research formulates that any entrepreneurial experience assists in capitalizing from knowledge generated from national R&D investment. However, it is also tested that the magnitude effect would differ depending on the entrepreneurial experience type. In their quest to constantly expand and grow, portfolio entrepreneurs will draw upon their accumulated strong ties of social capital and expertise in determinate fields to explore new possibilities (Lahiri & Wadhwa, 2021), often being portrayed as a more innovative type of entrepreneur (Carbonara et al., 2020; Westhead, Ucbasaran, & Wright, 2005). In most cases, these entrepreneurs operate among sector-related firms creating synergies and positioning them in a privileged stand within an industry. In addition, their proximity to their various companies enables them to be influenced faster by knowledge spill over flows (Cerver-Romero et al., 2020). Their possibility to mobilize resources provides portfolio entrepreneurs an additional advantage over other entrepreneurs, given that they can use these resources when other R&D investing organizations can only exhaust some of the commercial options from the knowledge they generate (Audretsch & Caiazza, 2016). Subsequently, the learned understanding of the market where they develop their activities allow portfolio entrepreneurs to navigate more

readily than serial or novice entrepreneurs in contexts where new knowledge generation is constantly emerging. The research tests this with the following hypothesis:

> **Hypothesis 4**. *Higher levels of national R&D expenditure enhance entrepreneurial growth aspirations more for portfolio entrepreneurs than serial and novice entrepreneurs.*

Figure 1 summarizes the conceptual model.

**Figure 1 Conceptual framework and hypotheses – EGA**




## 2.3 Data and methodology

### 2.3.1 Data

The research hypotheses are tested using cross-sectional data from the GEM Adult Population Survey (individual level) and the World Development Indicators WDI (country level). The time frame of the information analysed in this study runs from 2005 to 2020. The initial database includes data from 116 countries; after excluding all missing observations and applying filters, the final sample includes data from 84 countries in a wide variety of regions around the world, each with its own particular context.

At the individual level, a filter was introduced to limit the sample to new ventures, meaning those in the total early stage of entrepreneurial activity. Specifically, only ventures where the percentage of the adult population (ages 18-64) indicating they are involved in early-stage entrepreneurial activity (Reynolds et al., 2005). This characteristic is relevant to the study because the growth aspirations of an early-stage entrepreneur may differ from those of an established business (Gilbert et al., 2006; Giotopoulos et al., 2017).

Additional country-level data were also used for the analysis. Besides controlling for inter-country differences in per capita GDP, GDP growth, and population growth (using data sourced from the WDI), the research also includes each country's gross national R&D expenditure as a percentage of GDP as an explanatory variable.

After omitting missing values and non-valid answers, the final sample contains 117,617 observations.

### 2.3.2 Variables

*Dependent variable*

Following previous studies using GEM data to analyse entrepreneurial growth aspirations, EGA is calculated as the difference between the natural logarithms of the expected number of employees in five years' time and the current number of employees (Capelleras et al., 2019; Estrin et al., 2013). Natural logarithms are used to normalize the distribution.

*Individual-level predictors*

*Novice* entrepreneurs are defined as individuals who are currently running the original business they launched and are in the total early stage of entrepreneurial activity. To identify novice entrepreneurs, the research used the question from the Global Entrepreneurship Monitor (GEM) dataset, "are you, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others?" The data was included in the analysis as a predictor variable, using a dummy variable where 1 indicated "yes" and 0 indicated "no." Furthermore, among the respondents who answered "yes," those who also indicated having serial or portfolio experience were categorized as not being novice entrepreneurs.

Habitual entrepreneurship was assessed in terms of the two types of entrepreneurial experience. *Serial Experience* was measured by individuals' answer to the GEM question on whether, in the past 12 months, they had sold, shut down, discontinued, or quit a business that they owned-managed, and if that business continued to exist after their departure (Estrin et al., 2016). Individuals that answered "yes" were interpreted as having serial experience, and thus assigned the value 1; those answering "no" were assigned the value 0.

*Portfolio Experience* was measured using a binary variable that takes the value 1 if, according to GEM data, the entrepreneur is already the owner-manager of another established existing firm, and 0 otherwise (Capelleras et al., 2019).

*Country-level moderator*

Knowledge stock generation was measured by a *country's R&D expenditure* as a percentage of annual GDP (R&D) (Amorós et al., 2019). This data was lagged for one year, since any discovery requires time to develop, although research findings suggest that this time is short, between one to two years (Medda, 2020).

*Cross-level interactions*

The moderating effect of national R&D expenditure was analysed using the interaction of the individual-level predictors and the country-level predictor, as "An interaction between two variables implies that the effect of each variable depends on the value of the other variable" (Rabe-Hesketh & Skrondal, 2008, p. 37). This research presents a two-level model, in which entrepreneurial experiences at the first level could be affected by the second-level variable of the amount of national R&D expenditure. The evaluation explores which interaction has the strongest influence on entrepreneurial growth aspirations.

*Individual-level controls*

The model controls for entrepreneurs' demographic characteristics of *age* and *age squared*, and *gender*, where female equals 1 and male equals 0. As used in entrepreneurial research, some other individual control variables account for data that provides more information about entrepreneurs and their businesses. For the entrepreneur's general human capital, a categorical variable (*education*) represents the highest educational level attained: some secondary education (1), a secondary degree (2), post-secondary education (3), and graduate experience (4). *Investor experience* controls whether the entrepreneur has personally provided funds for a new venture as an informal investor in the past three years ("yes" = 1, "no" = 0). Previous findings show a positive relationship between angel or informal investor experience and growth intentions (Welter 2001). To control for entrepreneurs' optimism and *alertness to opportunities*, using the GEM question that asked respondents if they considered there would be good opportunities to start a business in the next six months: termed alertness to opportunities, this variable was coded as 1 for "yes" or 0 for "no" (Boudreaux et al., 2019; Capelleras et al., 2019; Cassar, 2010). Given the high uncertainty and risk-taking intrinsic to entrepreneurial activities, and control for *fear of failure* as an inhibitor of entrepreneurial activity (Boudreaux et al., 2019; Wennberg et al., 2013), coded as 1 if GEM respondents indicated that fear of failure would prevent them from starting a business, and 0 otherwise. Individual perceived *Self-efficacy* was measured by whether GEM respondents thought they

had the required knowledge, skills, and experience to start a business ("yes" = 1, "no" = 0) (Boudreaux et al., 2019). Respondents' entrepreneurial network was measured by the GEM question of whether they personally know someone who started a business recently *(know entrepreneur*), assigning 1 for "yes" and 0 for "no." The size of the new venture was included in the model to avoid biased estimates (Delmar et al., 2022), measured by the current number of employees. Finally, *household income* was controlled using a dummy variable for each of three categories—low, medium, and high income—measured using each country's information in GEM (Troilo, 2011).

*Country-level controls*

Some variables were introduced to control for differences among countries. One is the national level of development, captured by the logarithmic *GDP per capita* based on purchasing power parity (PPP) in 2011 constant USD (GDP Per Capita PPP). Annual *GDP Growth* was introduced (expressed as the percentage variation from one year to the next) to reflect each country's economic performance cycles, given that economic recessions and crises influence growth aspirations (Koellinger, 2009). The third country-level control variable included is *Population Growth* (also expressed as the percentage variation from one year to the next) to capture information reflecting long-term economic growth (Strulik, 2005).

Finally, time dummies were added to enable controlling for *years* in the sample period while excluding one as a reference category (Hair et al., 2014). *Industry controls* are also included in all the specifications to account for sectoral differences in growth aspirations (Capelleras et al., 2019; Estrin et al., 2013).

All variable definitions and data sources are presented in Table 2.

### 2.3.3 Empirical Model

The model best suited to the characteristics of the hypotheses is the hierarchical multilevel model (Rabe-Hesketh & Skrondal, 2008). This random intercept model is preferred for the analysis because the individual responses of entrepreneurs (represented by i) are nested in clusters of the countries where they live (represented by j). The within dependence of each individual with their country can be analysed by splitting the residuals into two components that are not correlated.

The two-level model is specified as:

*Level 1 Individual-level*

$$EGA_{ij} = \beta_{0j} + \beta_{1j}X1_{ij} + \beta_{2j}X2_{ij} + \beta_{3j}X3_{ij} + \beta_{4j}(X1_{ij} * W_j) + \beta_{5j}(X2_{ij} * W_j) + \beta_{6j}(X3_{ij} * W_j) + \beta_{7j}Z_{ij} + \varepsilon_{ij}$$

*Level 2 Country-level*

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_j + \gamma_{02}V_j + \mu_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}W_j + \gamma_{12}V_j + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \gamma_{21}V_j + \mu_{2j}$$

Where:

- $EGA_{ij}$ are the growth aspirations outcome variable for the $i_{th}$ individual in the $j_{th}$ group.
- $X1_{ij}$, $X2_{ij}$ and $X3_{ij}$ are the level 1 predictors for the $i_{th}$ individual in the $j_{th}$ group. Respectively, "*novice entrepreneurs*", "*serial entrepreneurial experience*" and "*portfolio entrepreneurial experience*".
- $\beta_{0j}$ is the level 1 intercept for the $j_{th}$ group
- $\beta_{1j}$, $\beta_{2j}$ and $\beta_{3j}$ are the level 1 slopes for $X1_{ij}$, $X2_{ij}$ and $X3_{ij}$, respectively, for the $j_{th}$ group
- $\varepsilon_{ij}$ is the level 1 residual for the $i_{th}$ individual in the $j_{th}$ group
- $W_j$ is the level 2 predictor for the $j_{th}$ group, "*national research and development expenditure*"
- $\gamma_{00}$, $\gamma_{01}$, $\gamma_{10}$ and $\gamma_{11}$ are the level 2 regression coefficients for the intercept and slopes, respectively
- $\mu_{0j}$, $\mu_{1j}$ and $\mu_{2j}$ are the level 2 random effects for the intercept and slopes, respectively. They capture the variation intercepts and the variation of the errors of each entrepreneur's growth aspiration and their country's growth mean.
- $\beta_{4j}$, $\beta_{5j}$ and $\beta_{6j}$ are the slopes for the interaction terms ($X1_{ij}$* $W_j$), ($X2_{ij}$* $W_j$), and ($X3_{ij}$* $W_j$), respectively
- $Z_{ij}$ are the control variables for the $i_{th}$ individual in the $j_{th}$ group, and $\beta_{7j}$ are the corresponding level 1 regression coefficients.
- $V_j$ are the level 2 control variables for the $j_{th}$ group, and $\gamma_{02}$, $\gamma_{12}$, and $\gamma_{21}$ are the corresponding level 2 regression coefficients.

## Table 2 Definitions of variables and data sources

| Variable | Definition | Source |
|---|---|---|
| ***Dependent variable*** | | |
| *EGA* | Entrepreneurial growth aspirations, difference between (the natural logarithms of) entrepreneurs' expected number of employees in the next five years and the current number of employees. | GEM |
| ***Individual-level predictors*** | | |
| *Novice Entrepreneurs* | Has the entrepreneur, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others? Dummy: 1 = yes, 0 = no. Individuals who answered "yes" to this question and also indicated being serial or portfolio entrepreneurs were not classified as novice entrepreneurs. | GEM |
| *Serial Experience* | Has the entrepreneur sold, shut down, discontinued, or quit a business that they owned/managed in the past 12 months, and did that business continue to exist after their departure? Dummy: 1 = yes, 0 = no. | GEM |
| *Portfolio Experience* | Does the entrepreneur currently own/manage an existing business that is older than 42 months? Dummy: 1 = yes,0 = no. | GEM |
| ***Country-level predictor*** | | |
| *National R&D expenditure* | Yearly national research and development expenditure, as a percentage of country GDP. | WDI |
| ***Individual-level controls*** | | |
| *Gender* | Dummy: 0 = male, 1 = female | GEM |
| *Age* | Current age of participant in years. | GEM |
| *Education* | Four categories, based on schooling years, "secondary education" = 1, "secondary degree" = 2, "post-secondary education" = 3, and "graduate experience" = 4 | GEM |
| *Investor experience* | In the past three years, has the entrepreneur personally provided funds for a new business? Dummy: 1 = yes, 0 = no. | GEM |
| *Know entrepreneur* | Does the participant know someone who started a business in the past two years? Dummy: 1 = yes, 0 = no. | GEM |
| *Perceived self-efficacy* | Does the participant think they have the knowledge, skills, and experience to start a new business? Dummy: 1 = yes, 0 = no. | GEM |
| *Fear of failure* | Would fear of failure prevent the entrepreneur from starting a business? Dummy: 1 = yes, 0 = no | GEM |
| *Alertness to opportunities* | In the next six months, will there be good opportunities for starting a business? Dummy: 1 = yes, 0 = no. | GEM |
| *Household Income* | Three categories based on the income categories by country. "Low income"; "Middle income"; "High income" A dummy variable corresponds to the category indicated by the entrepreneur. | GEM |
| Venture Size | Logarithm of the current number of employees. | GEM |
| ***Country-level controls*** | | |
| *GDP Per Capita PPP* | Logarithmic GDP per capita based on purchasing power parity in 2017 constant USD. | WDI |
| *GDP Growth* | Annual percentage growth in GDP. | WDI |
| *Population Growth* | Annual population growth, expressed in percentage change. | WDI |

*Sources:* GEM – 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) for the country-level variables.

## 2.4 Results

### 2.4.1 Descriptive results

Table 3 presents all of the study variables' mean and standard deviation and the correlation matrix. It is observed that these estimations agree with previous studies employing the same database (Simmons et al., 2019). Notably, 41% of the entrepreneurs are women, and 59% are men, while the average age is 37. Just 12% of entrepreneurs have previous investors' experience as business angels, meaning that most of the sample has not provided funds for any other new business. About two-thirds of respondents (60%) consider there will be good opportunities for starting a business in the next six months. Similarly, 29% of the entrepreneurs reported that fear of failure would prevent them from starting a business, while 84% considered having the necessary skills to start a business. Regarding household income, 44% of the entrepreneurs are in their respective country's high-income group, 31% are in the middle-income group, and 25% are in the low-income group. Concerning the entrepreneur's general human capital attainment, 9% of the entrepreneurs have attained higher education, 35% report having some post-secondary education, and 56% represent the ones with lower levels of educational attainment.

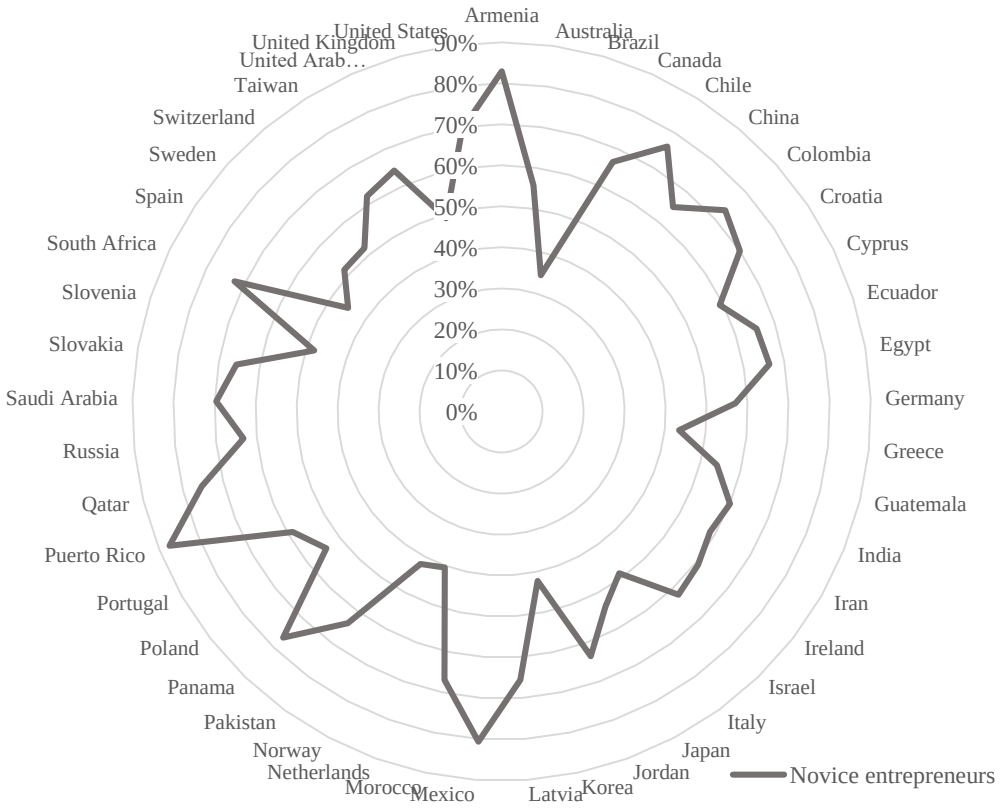
## Table 3 Descriptive statistics and correlation matrix

| VARIABLES | Mean | SD | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) EGA | 1.01 | 1.14 | **1.00** | | | | | | | | | | | | | | | | | | |
| (2) Novice entrepreneurs | 0.58 | 0.49 | **0.28** | **1.00** | | | | | | | | | | | | | | | | | |
| (3) Serial experience | 0.03 | 0.17 | **0.02** | **-0.23** | **1.00** | | | | | | | | | | | | | | | | |
| (4) Portfolio experience | 0.04 | 0.19 | **0.08** | **-0.26** | **-0.04** | **1.00** | | | | | | | | | | | | | | | |
| (5) National R&D expenditure | 1.01 | 0.91 | **-0.09** | **-0.10** | -0.01 | 0.00 | **1.00** | | | | | | | | | | | | | | |
| (6) Industry | 3.18 | 0.97 | **-0.05** | **0.03** | **0.01** | **-0.02** | **-0.02** | **1.00** | | | | | | | | | | | | | |
| (7) Gender | 0.41 | 0.49 | **-0.10** | 0.00 | **-0.02** | **-0.05** | **-0.04** | **0.17** | **1.00** | | | | | | | | | | | | |
| (8) Age | 37.69 | 11.45 | **-0.06** | **-0.09** | **-0.02** | **0.08** | **0.11** | **-0.07** | 0.00 | **1.00** | | | | | | | | | | | |
| (9) Education | 2.20 | 1.06 | **0.12** | **0.04** | -0.01 | **0.01** | **0.20** | 0.01 | **-0.05** | **-0.01** | **1.00** | | | | | | | | | | |
| (10) Income | 2.19 | 0.81 | **0.08** | **-0.01** | 0.00 | **0.06** | 0.00 | **-0.02** | **-0.11** | **0.01** | **0.23** | **1.00** | | | | | | | | | |
| (11) Invest. experience | 0.12 | 0.33 | **0.08** | **0.02** | **0.10** | **0.05** | **-0.03** | **-0.01** | **-0.07** | **-0.02** | **0.04** | **0.08** | **1.00** | | | | | | | | |
| (12) Knows entrepreneur | 0.65 | 0.48 | **0.05** | **0.05** | **0.03** | **0.03** | **0.04** | **0.01** | **-0.06** | **-0.07** | **0.10** | **0.10** | **0.10** | **1.00** | | | | | | | |
| (13) Perceived self-efficacy | 0.84 | 0.37 | **0.05** | **0.04** | **0.02** | **0.04** | **-0.03** | 0.00 | **-0.05** | **0.03** | **0.06** | **0.06** | **0.04** | **0.13** | **1.00** | | | | | | |
| (14) Alertness to opportunities | 0.60 | 0.49 | **0.08** | **0.10** | **0.02** | **0.01** | **-0.03** | **0.03** | **-0.01** | **-0.07** | **-0.02** | **0.04** | **0.05** | **0.15** | **0.13** | **1.00** | | | | | |
| (15) Fear of failure | 0.29 | 0.45 | **-0.04** | **-0.01** | **0.02** | **-0.02** | 0.00 | **0.01** | **0.05** | **0.01** | **-0.02** | **-0.05** | **-0.01** | **-0.03** | **-0.15** | **-0.10** | **1.00** | | | | |
| (16)Venture Size | 0.55 | 0.89 | **-0.32** | **-0.14** | **0.05** | **-0.03** | **0.06** | **-0.06** | **-0.10** | **0.02** | **0.10** | **0.12** | **0.09** | **0.07** | **0.02** | 0.00 | **-0.02** | **1.00** | | | |
| (17) GDP per capita | 26,976 | 16,773 | **0.04** | **-0.04** | **-0.03** | **-0.01** | **0.58** | **-0.02** | **-0.07** | **0.17** | **0.39** | **0.03** | **-0.04** | **-0.02** | 0.00 | **-0.09** | **0.01** | **0.08** | **1.00** | | |
| (18) GDP growth | 2.68 | 3.57 | **-0.02** | **0.02** | **0.01** | **0.01** | **-0.13** | 0.00 | **0.01** | **-0.05** | **-0.10** | 0.00 | **0.02** | **0.00** | **-0.04** | **0.09** | **-0.03** | **0.04** | **-0.28** | **1.00** | |
| (19) Population growth | 0.90 | 0.73 | -0.01 | **0.04** | **0.05** | **0.01** | **-0.21** | **0.03** | 0.01 | **-0.10** | **-0.19** | **-0.03** | **0.06** | **0.04** | **0.02** | **0.13** | **-0.02** | **0.03** | **-0.37** | **0.20** | **1.00** |

*Notes:* Correlation coefficients displayed in bold are significant at 0.1

Regarding the explanatory variables, 58% reported being novice entrepreneurs, 3% have serial experience, and 4% have portfolio experience. These proportions vary from country to country, as presented in Figure 2 and Figure 3. Based on the responses from entrepreneurs, it is observed that certain countries are less encouraging towards first-time entrepreneurs, with lower levels of novice entrepreneurs reported. On the other hand, some countries are more propitious for novice entrepreneurs' emergence, with active involvement from first-time entrepreneurs. For instance, countries such as South Africa, Mexico and Puerto Rico report higher levels of novice entrepreneurs.

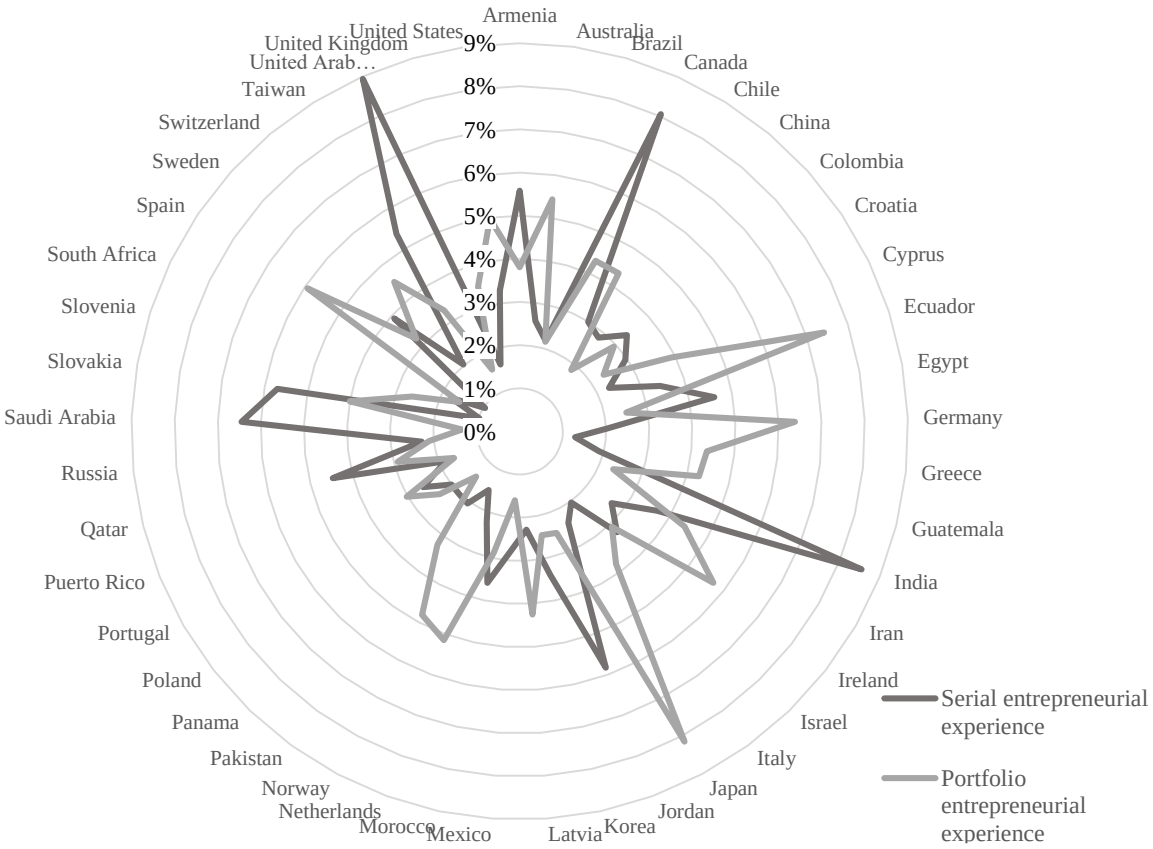
**Figure 2 Proportion of novice entrepreneurs by country**




*Source:* Author`s elaboration using data from the Global Entrepreneurship Monitor Adult Population Survey
* Selected countries, expressed as an average per country from 2005-2020

When examining the differences between experienced entrepreneurs, variations among countries also emerge, as shown in Figure 3. This is the case of India and the United Arab Emirates, which have a higher proportion of serial entrepreneurs than other countries. Contrasting those results, Japan and Germany have more portfolio entrepreneurs than other countries in the research.

**Figure 3 Proportion of portfolio and serial experienced entrepreneurs by country**

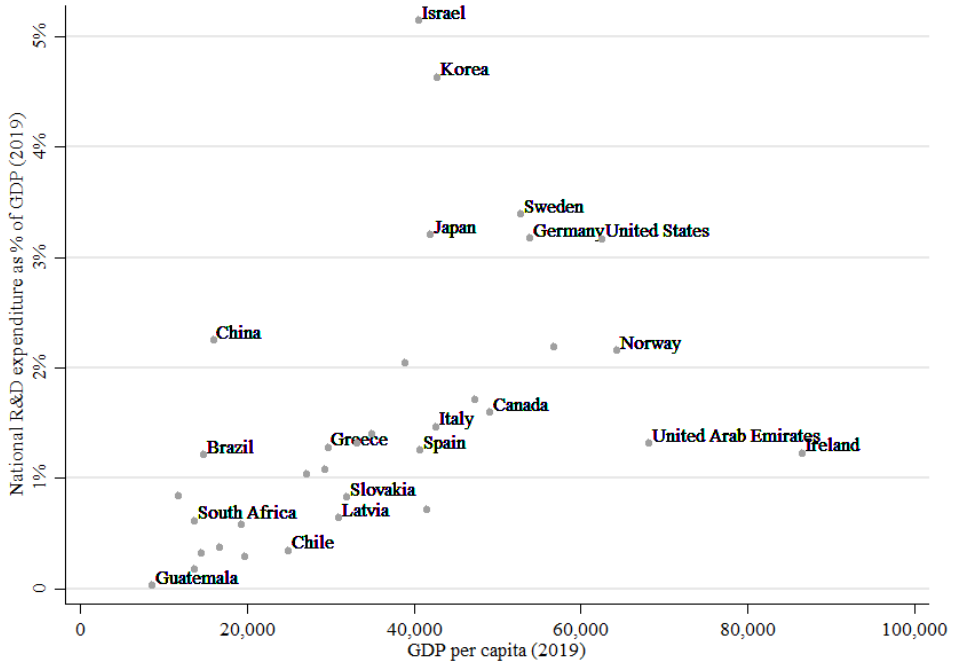



*Source:* Author's elaboration using data from the Global Entrepreneurship Monitor Adult Population Survey
* Selected countries, expressed as an average per country from 2005-2020

At the country level, national R&D expenditure as a percentage of GDP ranges between 0.13% and 5.14%. The magnitude of this investment is closely related to country size, as shown in Table 3 by the strongly positive and significant correlation between a country's investment in R&D and its GDP per capita. This finding indicates that countries with higher GDP per capita invest more in R&D. However, Figure 4 presents how some countries have the highest expenditure in R&D without being the wealthiest ones. The clearest two examples are Israel and South Korea, highlighting that these countries in 2019 invested almost 5% from their GDP in R&D. Contrasting these two countries are Spain and Italy, having similar GDP per capita as Israel and South Korea, but the investment in R&D was only close to 1.5% of their GDP.

In terms of the country-level control variables, per capita GDP presents an annual mean of USD 26,976 where the country with the lowest per capita annual income is USD 1,584 and the country with the highest per capita income is USD 116,284. For the total sample, the average GDP per capita growth was 2.68%, and the average annual population growth was 0.90%.

**Figure 4 (National R&D expenditure as % of GDP) / (GDP per capita) – 2019**




*Source:* Author's elaboration using data from WDI – World Bank's World Development Indicators
*Country labels into selected countries for illustration, information of 2019

The 84 countries considered in the model comprise 35 from Europe, 3 from North America, 6 from Central America, 8 from South America, 21 from Asia, 9 from Africa, and 2 from Oceania.

### 2.4.2 Multilevel model results

Table 4 reports results from the multilevel random intercept models predicting entrepreneurial growth aspirations (EGA).

Model (1) results include all the control variables at both the individual and country levels. These results indicate that *female* entrepreneurs will likely have lower EGA (Entrepreneurial Growth Aspirations). Other factors are negatively associated with entrepreneurs' EGA, including their *age*, *fear of failure* sentiment, and *venture size*. Some control variables positively related to the dependent variable include *investment experience*, *knowing other entrepreneurs*, *self-efficacy*, and *perceived opportunities*. Similarly, *higher education* and *household income* positively relate to higher growth aspirations. Confirming the relevance of human capital attainment in shaping their growth aspirations, entrepreneurs attaining the *highest education* possible have higher growth aspirations than other entrepreneurs. This individual control variable contributes the most to higher growth aspirations. (Capelleras et al., 2019).

## Table 4 Multilevel model results

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| ***Individual-level predictors*** | | | | | | | | |
| Novice entrepreneurs | | 0.405*** | 0.488*** | | 0.380*** | 0.459*** | 0.159*** | 0.169*** |
| | | (0.006) | (0.007) | | (0.009) | (0.010) | (0.010) | (0.010) |
| Serial experience | | 0.375*** | 0.457*** | | 0.302*** | 0.381*** | 0.108*** | 0.119*** |
| | | (0.017) | (0.017) | | (0.025) | (0.025) | (0.027) | (0.027) |
| Portfolio experience | | | 0.698*** | | | 0.554*** | | 0.179*** |
| | | | (0.015) | | | (0.023) | | (0.033) |
| ***Moderator*** | | | | | | | | |
| (R&D) National R&D expenditure | | | | 0.020 | -0.013 | -0.032 | -0.030* | -0.032** |
| | | | | (0.020) | (0.020) | (0.020) | (0.016) | (0.016) |
| ***Cross-level interactions*** | | | | | | | | |
| Novice entrepreneurs*R&D | | | | | 0.023*** | 0.026*** | 0.018** | 0.019** |
| | | | | | (0.007) | (0.007) | (0.007) | (0.008) |
| Serial experience*R&D | | | | | 0.074*** | 0.075*** | 0.035* | 0.037* |
| | | | | | (0.019) | (0.019) | (0.020) | (0.020) |
| Portfolio experience*R&D | | | | | | 0.140*** | | 0.081*** |
| | | | | | | (0.016) | | (0.026) |
| ***Control Variables*** | | | | | | | | |
| Gender | -0.204*** | -0.195*** | -0.183*** | -0.204*** | -0.195*** | -0.183*** | -0.094*** | -0.093*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| Age | -0.011*** | -0.009*** | -0.010*** | -0.011*** | -0.009*** | -0.010*** | -0.001 | -0.001 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Age square | 0.000*** | 0.000*** | 0.000*** | 0.000*** | 0.000*** | 0.000*** | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Secondary education | 0.095*** | 0.086*** | 0.084*** | 0.094*** | 0.086*** | 0.085*** | 0.045*** | 0.045*** |
| | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) |
| Secondary degree | 0.151*** | 0.134*** | 0.131*** | 0.152*** | 0.135*** | 0.132*** | 0.074*** | 0.074*** |
| | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) |
| Post-secondary | 0.262*** | 0.239*** | 0.232*** | 0.262*** | 0.240*** | 0.234*** | 0.130*** | 0.130*** |
| | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) | (0.013) | (0.013) |
| Graduate experience | 0.318*** | 0.291*** | 0.278*** | 0.318*** | 0.292*** | 0.280*** | 0.164*** | 0.163*** |
| | (0.016) | (0.015) | (0.015) | (0.016) | (0.015) | (0.015) | (0.016) | (0.016) |
| Mid Income | 0.048*** | 0.054*** | 0.049*** | 0.048*** | 0.054*** | 0.049*** | 0.053*** | 0.051*** |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| High Income | 0.172*** | 0.181*** | 0.165*** | 0.172*** | 0.182*** | 0.165*** | 0.111*** | 0.107*** |
| | (0.008) | (0.008) | (0.007) | (0.008) | (0.008) | (0.007) | (0.008) | (0.008) |
| Investment experience | 0.237*** | 0.213*** | 0.191*** | 0.237*** | 0.213*** | 0.190*** | 0.111*** | 0.105*** |
| | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.010) | (0.010) |
| Know entrepreneur | 0.052*** | 0.041*** | 0.032*** | 0.052*** | 0.041*** | 0.032*** | 0.063*** | 0.061*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.007) | (0.007) |
| Self-efficacy | 0.097*** | 0.080*** | 0.066*** | 0.097*** | 0.080*** | 0.066*** | 0.079*** | 0.078*** |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.009) | (0.009) |
| Perceived opportunity | 0.128*** | 0.101*** | 0.095*** | 0.128*** | 0.101*** | 0.094*** | 0.104*** | 0.102*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.007) | (0.007) |
| Fear of failure | -0.059*** | -0.059*** | -0.054*** | -0.059*** | -0.059*** | -0.054*** | -0.047*** | -0.046*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.007) | (0.007) |
| Venture Size (ln) | -0.456*** | -0.428*** | -0.415*** | -0.456*** | -0.428*** | -0.415*** | -0.132*** | -0.134*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| GDP PPP(ln) | 0.168*** | 0.130*** | 0.126*** | 0.159*** | 0.130*** | 0.133*** | 0.042* | 0.040* |
| | (0.031) | (0.029) | (0.029) | (0.033) | (0.031) | (0.031) | (0.022) | (0.022) |
| GDP Growth | 0.006*** | 0.005*** | 0.005*** | 0.006*** | 0.005*** | 0.004*** | 0.001 | 0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Population growth | 0.053*** | 0.034*** | 0.010 | 0.054*** | 0.033*** | 0.009 | 0.016* | 0.007 |
| | (0.010) | (0.010) | (0.010) | (0.010) | (0.010) | (0.010) | (0.009) | (0.009) |
| Intercept | -0.786** | -0.607** | -0.568** | -0.712** | -0.587* | -0.602** | -0.022 | 0.001 |
| | (0.307) | (0.289) | (0.287) | (0.326) | (0.304) | (0.300) | (0.212) | (0.212) |
| Years Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| LR vs. linear model | 11,110 | 9,149 | 9,093 | 10,159 | 8,571 | 8,555 | 2,649 | 2,675 |
| Wald Chi-square | 27,103 | 32,148 | 34,773 | 27,103 | 32,177 | 34,884 | 4,384 | 4,545 |
| Prob > chi2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Log-likelihood | 163,147 | 161,133 | 160,111 | 163,147 | 161,121 | 160,068 | 67,734 | 67,659 |
| Akaike crit. (AIC) | 326,372 | 322,348 | 320,306 | 326,373 | 322,331 | 320,229 | 135,557 | 135,411 |
| Degrees of Freedom | 39 | 41 | 42 | 40 | 44 | 46 | 44 | 46 |
| Intraclass corr. coefficient | 0.09 | 0.08 | 0.08 | 0.09 | 0.08 | 0.08 | 0.04 | 0.04 |
| Observations | 117,617 | 117,617 | 117,617 | 117,617 | 117,617 | 117,617 | 60,279 | 60,279 |
| Number of groups | 84 | 84 | 84 | 84 | 84 | 84 | 84 | 84 |

Yes[i], to denote that the model includes Year Fixed Effects and Industry Fixed Effects for the different years, from 2005 to 2020.

*Notes:* Reported values are non-standardized β coefficients. Robust standard errors are given in parentheses. AIC is Akaike's information criterion = $2k - 2$ x (log likelihood), where indicates the degrees of freedom. *$p < 0.10$, **$p < 0.05$, ***$p < 0.001$; two-tailed significance. The spatial controls are included in all the models.

At the country level, *GDP per capita*, *GDP growth* and *population growth* significantly increase the likelihood of having higher growth aspirations. These results are consistent with previous academic findings (Autio & Acs, 2010; Capelleras et al., 2019).

In Model (2), all the control variables are included along with individual-level predictors that determine if the entrepreneur is a *novice* or has *serial entrepreneurial experience*. Both variables are significantly and positively related to EGA, but the coefficient for novice entrepreneurs is higher than that for serial entrepreneurs. Therefore, Hypothesis 1, which suggests that serial entrepreneurs have higher growth aspirations than novice entrepreneurs, is rejected. This means that novice entrepreneurs who are driven by their enthusiasm have marginally higher growth aspirations than serial entrepreneurs who adjust their growth expectations based on past experiences and are more realistic in their current expectations.

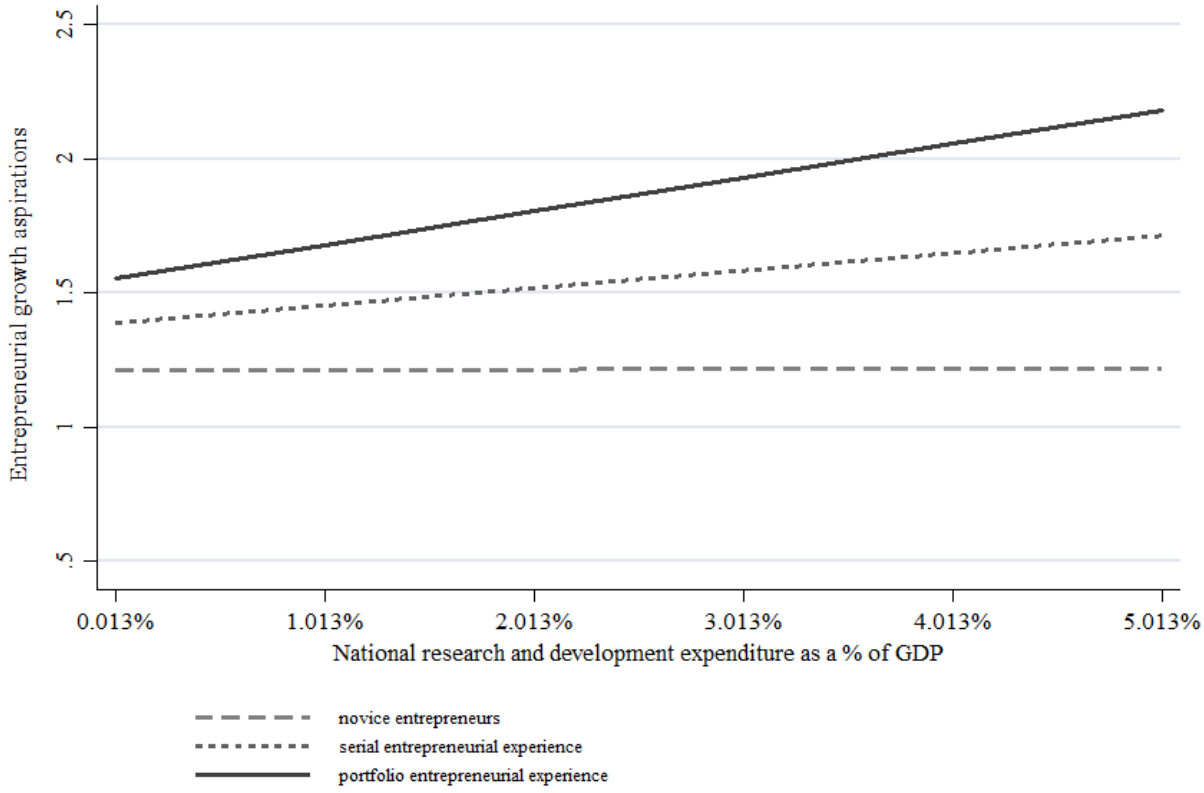
Then Model (3) analyses whether *portfolio entrepreneurs* have higher growth aspirations than serial and novice entrepreneurs, as formulated in Hypothesis 2. The variation outcome of the coefficients confirms this approach. To illustrate this, refer to Figure 5, where portfolio entrepreneurs have higher growth aspirations than serial and novice entrepreneurs, considering a measure of a country with a null investment in R&D. This finding suggests that portfolio entrepreneurs aspire for higher growth, relying on their knowledge attainment, their leveraged access to different resources, and their risk management decision to pursue opportunities that will add value to their investment portfolio.

To study the effect of the country-level moderator variable, *national R&D expenditure* is first explored on its direct effect on growth aspirations in Model (4). Consistent with the correlation matrix findings, national R&D expenditure is negatively and significantly correlated to EGA. However, in the multilevel regression, the coefficient is close to cero and this relation is not significant. To understand better this effect, refer to Figure 5 and the moderating effect formulated in Hypothesis 3 and the results from Model (5). In the study it is found that inexperienced entrepreneurs might perceive countries with higher levels of R&D expenditure as threatening environments since they have not developed an adoptive capacity and might perceive they cannot cope successfully with new technologies and discoveries (Ali et al., 2020; Audretsch, 1995b; Cefis et al., 2021), thus reducing their growth aspirations.

In contrast, serial entrepreneurs increase their growth aspirations when operating in contexts with significant investment in R&D. This confirms Hypothesis 3 and explains the unexpected negative result observed in Model (5) in the relation of national R&D expenditure and EGA. It helps to understand why R&D expenditure negatively influences the correlation matrix, but it is observed that this slight negative effect only affects novice entrepreneurs.

This implies that serial entrepreneurs are better able to take advantage of opportunities arising from new knowledge generation, which has a positive effect on their EGA, particularly when observing portfolio entrepreneurs, as proposed in Hypothesis 4 and presented in Model (6) in Table 4. This suggests that among habitual entrepreneurs, portfolio entrepreneurs benefit more from national R&D expenditure. Moreover, innovative contexts enhance EGA more for portfolio entrepreneurs than for serial and novice entrepreneurs. Figure 5 illustrates the different effects that R&D expenditure has on entrepreneurs depending on their experience level. On the one hand, the moderating effect is negative for novice entrepreneurs, while it enhances growth aspirations for experienced entrepreneurs, particularly for portfolio entrepreneurs.

**Figure 5 Moderating effect of national R&D expenditure on the relationship between entrepreneurial experience and entrepreneurial growth aspirations**




### 2.4.3 Robustness checks

To ensure the robustness of the findings, several checks were performed on the regression model. First, a variance inflation factor (VIF) test to identify multicollinearity between the independent variables. As expected, age and age squared showed a high inflation factor. However, these variables were retained in the model to account for the quadratic effect of age, which is consistent with previous literature (Hessels et al., 2011).

In the first robustness check, an ordinary least squares (OLS) regression was run and compared with the results of those obtained from the hierarchical multilevel model. Although the OLS model does not account for the embeddedness differences at the two levels, the results were consistent with those from the hierarchical model.

In the second check, the robustness of the findings was tested by changing the specification of the R&D variable. Two different proxies were used to measure a country's knowledge generation: the log of the number of researchers and the log of the number of patents. When using the log of the number of researchers and the log of the number of patents as proxies, the results were consistent with those of the initial model.

An additional examination was conducted testing the hypotheses formulation by narrowing the focus to new firm owners-managers who paid salaries for more than three months but less than 42 months. Nascent entrepreneurs who had been engaged in start-up behaviour in the past 12 months but had not yet paid salaries or wages for more than three months were excluded (Reynolds, 2016). This specification helped to identify the effect of entrepreneurial experience on EGA among those new ventures that had passed beyond the initial stage of formation. The findings obtained from the smaller sample size of 60,279 observations from the same 84 countries are presented in Table 4 in Models (7 and 8) and are consistent with those presented in Models (5 and 6), which includes nascent and new firms. These results suggest that differences in shaping entrepreneurial growth aspirations are noticeable since the initial formation stage of the new venture and continue throughout the subsequent stages of the new venture.

Overall, these robustness checks confirm the validity and reliability of the multilevel regression model and enhance the generalizability of the findings.

## 2.5 Discussion

### 2.5.1 Key Findings

In this study, it was examined how previous entrepreneurial experience affects entrepreneurs' growth aspirations and whether the amount of a country's expenditure on research and development (R&D) affects this relationship. The study identified two main findings. First, previous entrepreneurial experience does influence growth aspirations. Novice entrepreneurs are mainly driven by the enthusiasm for their business idea (L. Jiang et al., 2022; Westhead & Wright, 1998), so their growth aspirations may not be fully calibrated to the real growth they can achieve. In contrast, serial entrepreneurs are also eager to put in

motion a recognized opportunity but might have a more realistic understanding of what to expect, so their aspirations are slightly more moderate than novice entrepreneurs (Koellinger et al., 2007; Westhead & Wright, 2015). On the other hand, portfolio entrepreneurs have higher growth aspirations than novice and serial entrepreneurs. This may be because their accumulated resources allow them to confidently leverage and use them to pursue new exploitable opportunities (Carbonara et al., 2020; Lechner et al., 2016).

The content of the study acknowledges previous findings exploring the entrepreneur's human capital formation as a predictor of entrepreneurial growth aspirations (the general component of human capital attainment) (Autio & Acs, 2010; Capelleras et al., 2019), and adds to this knowledge the understanding of how different types of entrepreneurial experience (the specific component of human capital attainment) contribute toward shaping entrepreneurial growth aspirations. Although both types of entrepreneurial experiences—serial and portfolio—accumulate in the entrepreneurs' learning process, they are distinct in shaping their growth aspirations. For example, first-time entrepreneurs are yet to unveil all the complexities of leading a new venture, so they might still have their initial thrill of expecting great growth. However, this enthusiasm might be adjusted for entrepreneurs that experienced some unforeseen complexities involving new ventures, as is the case of serial entrepreneurs, who will slightly adjust their growth aspirations from the lessons learned in the past. On the other side, portfolio entrepreneurs will seek the perceived opportunity more cautiously, also attaining a rapid reaction due to leveraging their existing resources (Fan et al., 2021). Additionally, their risk assessment might affect how they form their growth aspirations, which is expected to evidence a higher risk aversion for portfolio entrepreneurs than for serial and novice entrepreneurs (Lechner et al., 2016). Characteristics such as better risk management, export, and innovation orientation, opting for diversification strategies and business integration, ease of new product development, and more extensive social networks typify portfolio entrepreneurs as growth seekers (Ucbasaran, Alsos, et al., 2008). Also motivated by entrepreneurial growth, serial entrepreneurs are highly driven to exploit new opportunities, overcoming obstacles related to their new endeavours and relying on their experience attained in the past.

The study's second finding concerns how different types of entrepreneurial experiences can enable entrepreneurs to absorb external research and development (R&D) resources, which can enhance the growth of their new ventures. This finding aligns with formulations of the Knowledge Spillover Theory of Entrepreneurship (KSTE) (Acs et al., 2009), which emphasizes the relevant role of entrepreneurs in identifying profitable opportunities by

capitalizing on newly generated knowledge from research and development (R&D) investments. Furthermore, the research explicitly emphasizes the importance of gaining entrepreneurial experience and highlights that the type of experience obtained will impact an individual's ability to get an advantage from discoveries. At a country level, nations dedicating intense resources to research and development will foster an environment of innovation, prone to discovering new technologies and new knowledge generation. Additionally, significant investments in this sector will spill over in different economic areas, evidencing a higher concentration of researchers and specialists, enhancing patenting behaviour, attracting high technological companies, fostering the creation of innovative start-ups, and boosting entrepreneurial activity. A context with these characteristics will ultimately propitiate business expansion opportunities. It has been explored in this research that among all of these factors, habitual entrepreneurs increase their growth aspirations when developing their activities in these innovative contexts. By experiencing first hand a market's reaction to introducing a new business, habitual entrepreneurs acquired an advantage over novice entrepreneurs in staying ahead in the face of new technologies development and change in market trends. This environment will trigger serial entrepreneurs' appetite for exploiting new business opportunities and their understating of the benefits that emerge from an agile reaction in response to opportunity identification. However, among those experienced entrepreneurial attainments, it is portfolio entrepreneurs who might feel motivated to achieve higher growth aspirations in an innovative environment, as observed by the interaction between portfolio experience and national R&D expenditure presented in Figure 5.

The strong ties cultivated with their networks facilitate quicker access to information related to emerging trends and new technologies and simultaneously enhance their possibilities for new partners and resources, given their reputation as permanent entrepreneurs. This advantage also enables them to have more informed decisions and effectively manage potential synergies and expansion opportunities in their businesses. As a result, it is relevant to highlight that attaining portfolio entrepreneurial experience acts as an enabler force to absorb external R&D expenditure.

### 2.5.2 Policy implications

The findings of this study carry significant policy implications, which can be directed towards individual entrepreneurs, firms, and the overall context. The importance of nurturing experienced entrepreneurs has been highlighted, particularly concerning their role in driving aspirations for greater growth in new ventures. Consequently, actively promoting the

expansion of experienced entrepreneurs becomes a desirable national goal and of the interest of policymakers.

Past research has established that a higher likelihood of individuals transitioning from novice to experienced entrepreneurs is linked to factors such as higher levels of education, industry expertise, and managerial experience (Carbonara et al., 2020). These factors result from countries prioritizing strengthening educational systems and implementing policies that foster the growth of skilled talent.

Furthermore, serial and portfolio entrepreneurs have gained valuable insights from their previous experiences, which can significantly inform their current pursuits. In light of this, policymakers could take various measures to acknowledge and support them. For instance, when seeking financing, the prior expertise of these entrepreneurs, particularly portfolio entrepreneurs, could facilitate their ability to secure venture capital or even lead to tailored financial arrangements with institutions. Alternate forms of encouragement towards the emergence of serial and portfolio entrepreneurs could manifest as incentives to benefit their consecutive venture creation. These incentives might encompass favourable adjustments to their tax structures, support for reinvesting profits, or even considerations for profits generated through business divestitures (Westhead, Ucbasaran, Wright, et al., 2005).

Encouraging experienced entrepreneurs' propagation is just part of the actions policymakers can take. As experienced entrepreneurs represent the most agile actors in an environment to take action upon business opportunities recognition, some specific actions in their context would enhance this behaviour. The first and most evident one is promoting conditions that encourage the increase of national R&D expenditure, emerging from private and public sources. To achieve this, governments can allocate increased funding through grants, subsidies, and tax incentives while fostering public-private partnerships to pool resources while prioritizing R&D infrastructure, education, and skilled workforce development. Long-term funding commitments, international collaboration, sector-specific strategies, and robust intellectual property protection further stimulate R&D expenditure (Sterlacchini, 2008). Setting R&D funding targets, raising public awareness, and continuous policy evaluation ensure a comprehensive approach to driving innovation, economic growth, and competitiveness.

Finally, a comprehensive approach to fostering experienced entrepreneurs involves the mentioned measures and also a country's dedication to establishing effective platforms for knowledge transfer and utilization, as highlighted by Audretsch and Caiazza (2016). This goal can be achieved by reinforcing networking systems that facilitate seamless knowledge

exchange and aligning them with institutions that actively promote innovation. These institutions could encompass R&D labs, support for research collaborations, the establishment of additional incubators and accelerators, and incentives for creating research centers within businesses. Additionally, the promotion of entrepreneurial networks can bridge the gap between insights gained by experienced entrepreneurs and those just starting their entrepreneurial journey.

According to the study's findings, specific actions aimed at nurturing experienced entrepreneurs should concentrate on prioritizing education, fostering skilled talent, and acknowledging the advantages of accumulating a pool of experienced entrepreneurs in a given context. Furthermore, strategic initiatives to augment R&D funding allocation and establish efficient channels for knowledge transfer emerge as pivotal areas for policy intervention. Consequently, a supportive environment should cultivate a culture of innovation and collaboration across all participants involved in generating new knowledge, thereby fostering the expansion of an "entrepreneurial society" (Audretsch & Fiedler, 2023).

### 2.5.3 Limitations and further research

This study has limitations that offer opportunities for future research. First, besides entrepreneurial experience, various other individual characteristics also contribute to explaining their growth aspirations, such as industry experience, risk aversion, achievement orientation, innovativeness, motivation, self-efficacy, technology orientation, and export intention (Levie & Autio, 2013). Although this research included many of these factors as control variables, a deeper analysis of them could further enhance understanding of entrepreneurial growth aspirations and fully unveil the relationships between entrepreneurship and the absorption of knowledge stock generation. Informal institutions in the form of sociocultural factors (North, 1990) could also be further explored.

Second, besides national R&D expenditure, there are various alternative measures of knowledge generation, such as the number of annual patents, human capital dedicated to knowledge generation (researchers, scientists, and inventors), the proportion of highly educated population (Iftikhar et al., 2022), refereed scientific publications, and percentage of innovations in high technologies (Zahlan, 2007). However, many countries do not have rigorous methodologies for tracking these alternative measures, so that national R&D expenditure might be more accurate for comparative analysis between countries. The approach is also consistent with previous studies in this field (Van Stel et al., 2019). In future studies, national investment in R&D could be split into its four components: business

enterprises (for-profit, firm-based), government R&D expenditure, higher education R&D, and private non-profit R&D. This could enhance understanding of how different investment sources affect knowledge transfer (Amorós et al., 2019; Coccia, 2010; Martins & Hukampal Singh, 2023).

It should also be noted that investment in R&D is not immediately translated into discoveries ready to adopt in markets; on the contrary, a maturation process is required. Therefore, further developments in this line of investigation could consider the life cycles of R&D projects and the stages in which entrepreneurs are more susceptible to adopting them as business opportunities. Moreover, the research recognizes the significant role of entrepreneurs in identifying opportunities within their ecosystems. However, in the case of many high-tech startups, their founders also acquire new knowledge by actively participating in virtual platforms that go beyond their local geographic scope. This distinction emphasizes the need to explore further the differences between innovative ecosystems and the utilization of digital platforms to expand the understanding of new ventures' innovative absorption (Cuvero et al., 2023).

Finally, the results depend on data availability. In the case of this research, it was attempted to evaluate the differences between novice and habitual entrepreneurs. Following other studies using the same dataset to understand serial and portfolio entrepreneurs (Capelleras et al., 2019; Estrin et al., 2016) while also providing a novel first attempt to compare novice entrepreneurs in contrast to habitual entrepreneurs using GEM data in the analysis. Additionally, most individual-level data are captured by binary variables, limiting the comprehensiveness of the information they provide. However, previous authors in this domain have validated these data as useful for entrepreneurial studies (Acs et al., 2014; C. Álvarez et al., 2014; Coduras & Autio, 2013), and they are frequently used in other social science studies.

### 2.5.4 Conclusion

The findings of this study shed light on the impact of previous entrepreneurial experience on entrepreneurs' growth aspirations and the influence of a country's research and development (R&D) expenditure on this relationship. This work contributes to the entrepreneurial literature by examining the varying perspectives of entrepreneurs regarding their own businesses and the context in which they operate. It specifically explores the differences in perception between first-time entrepreneurs and those with prior entrepreneurial experience as serial or portfolio entrepreneurs. The results indicate that possessing some

entrepreneurial experience helps to better adjust growth aspirations. Notably, portfolio entrepreneurs, leveraging their accumulated resources, exhibit higher growth aspirations than novice or serial entrepreneurs. Moreover, the study emphasizes the importance of entrepreneurial experience in absorbing external knowledge generated from a country's R&D expenditure, thereby enhancing the growth they aspire for their ventures. These findings carry significant policy implications, emphasizing the need to foster supportive ecosystems that cultivate experienced entrepreneurs and accentuate the relevance of a country's investment in R&D to drive economic growth.

# Chapter 3

# 3 Exploring the intersection of gender and financial depth development in innovative entrepreneurship

## 3.1 Introduction

Since portrayed as “creative destructors” by Schumpeter (1942), entrepreneurship and innovation have become intertwined concepts in the prevalent mind-set (Autio et al., 2014; Darnihamedani et al., 2018). Innovative entrepreneurship refers to introducing novelty to markets (Baumol, 2010), such as new products, services, production methods, or business models (Agarwal et al., 2007). Innovative entrepreneurs take risks, make new combinations in their local markets, and access resources to turn their ideas into innovations (Malerba & McKelvey, 2020), differentiating themselves from pure imitative entrepreneurs (Koellinger, 2008). This type of entrepreneurship is crucial for long-term economic growth (Davidsson et al., 2006; Mayhew et al., 2016), but literature exploring this subject is still evolving, and the intersection between innovative and gender entrepreneurship receives less academic attention (Alsos et al., 2013; Strawser et al., 2021).

Innovative entrepreneurs’ ability to reach the necessary resources (Cainelli et al., 2020), including financial resources, is essential to materialize any innovation, and the country’s financial configuration (Canh & Thanh, 2020) is a critical driver in transferring funds and providing financial services to economic activities (Block et al., 2017; Shane, 2003). However, the inherent risk associated with innovative entrepreneurship further increases the complexity of this consideration (Hall, 2002; Kleinert et al., 2020), positioning innovative ventures in a more difficult category to assess when attempting to compete for funding in an economy (Carpenter & Petersen, 2002).

This article aims to investigate if innovative entrepreneurship is a gendered phenomenon (Cowling et al., 2020; Hechavarria et al., 2019; Q. Wu et al., 2021) and explore the effect of higher levels of financial development (Botev et al., 2019) on innovative entrepreneurship, understood by its two interaction channels: direct (financial market development) and indirect (financial institutions development) (Bats & Houben, 2020). This research also aims to study how contextualizing innovative entrepreneurship as a gendered phenomenon can have implications when exploring its interactions with its financial context, according to the depth of development attained by its financial markets and financial institutions (Zhu et al., 2020).

The findings are supported by a multi-level logistic regression, combining the individual-level observations from the Global Entrepreneurship Monitor (GEM), the country-level data from the International Monetary Fund (IMF) and World Bank (World Development Indicators), evaluating a dataset of 81,545 new ventures (that is new firms paying salaries or wages between three and forty-two months). A coverage of 106 different countries considering the years 2005–2020.

The research structure is organized as follows: A theoretical framework develops the understanding of innovative entrepreneurship, entrepreneurial gender roles, a country's financial depth development, and its interactions, which support the hypotheses tested. Then, a more practical section provides the reader with descriptive data analysis and the methodology used. A third section presents the results and findings, while a final section provides some conclusions and a space for discussion.

## 3.2 Theory and hypotheses

This research investigates innovative entrepreneurship, which is considered to be a key driver of long-term economic growth and societal well-being (Davidsson et al., 2006; Mayhew et al., 2016). The theoretical foundations of this research are based on innovative entrepreneurship (Baumol, 2010; Darnihamedani et al., 2018; McKelvie et al., 2017), as well as social feminist theory (N. M. Carter & Williams, 2003; Johnsen & McMahon, 2005), which emphasizes the importance of gender differences in entrepreneurship, and entrepreneurial finance (Cumming et al., 2019).

### 3.2.1 Innovative entrepreneurship

High-impact entrepreneurship analyses individuals who respond to market opportunities by introducing innovative solutions, leading their ventures into higher growth in terms of employment and turnover returns (Acs, 2008; Covin & Wales, 2019). Subsequently, innovative entrepreneurship applies to ventures that create new products, services, production methods, or business models (Agarwal et al., 2007; Ganbaatar & Douglas, 2019; McKelvie et al., 2017). However, only few firms can achieve extraordinary growth (Tracy, 2011), usually by following either innovative, export-oriented strategies (Estrin et al., 2019; Hessels & Van Stel, 2011; Love & Roper, 2015).

Different factors contribute to firms' innovation, mainly categorized as the entrepreneurs' characteristics and environment (Koellinger, 2008; Venkataraman & Shane, 2000). Findings suggest the entrepreneurs' education increases their probability of identifying

opportunities to innovate (Samuelsson & Davidsson, 2009), especially when attained in a specialized technical domain (Kuschel et al., 2020). Others include previous entrepreneurial experience (Lahiri & Wadhwa, 2021; Robson et al., 2012), while their household income and self-confidence (Elliott et al., 2020; Koellinger, 2008) positively affect their innovativeness. Connecting to people through social networks is another enabling resource for innovation (Elliott et al., 2020). Likewise, the firm's characteristics play an essential role in encouraging innovative entrepreneurship, like adopting high technology (Low & Isserman, 2015), employing high-skilled personnel (Feser, 2003), or having a patenting orientation and rapid adaptation to market changes (Low & Isserman, 2015). Similarly, their context provides the channels that enable or discourage innovation, whether from formal or informal institutions (Ali et al., 2020; North, 1990), by promoting the generation of knowledge stock in an environment, producing the appropriate setting for disseminating knowledge spill overs and configuring the conditions for entrepreneurial activity (Aparicio et al., 2016; Bjørnskov & Foss, 2013; Malerba & McKelvey, 2020).

### 3.2.2 Innovative entrepreneurship and gender

Various studies have raised the relevance of better understanding the gender dimension as a critical determinant of individual entrepreneurial performance (Brush et al., 2019; Bullough et al., 2022; Dawson & Henley, 2015; Hechavarria et al., 2019). Evidence suggests that the start-up rate between men and women bends into higher figures for men, and this finding is consistent across different countries, with few exceptions (Kelley et al., 2017). These differences are also related to the start-up motivation reasons (Strawser et al., 2021), where women are more likely than men to mention necessity-based as the cause for starting a business, despite having similar levels of education. In addition, entrepreneurial literature portrays women as motivated to pursue entrepreneurial activities to balance their work/life necessities better (Humbert & Drew, 2010). Although recent findings suggest that motherhood favouring contextual conditions allow women to engage in entrepreneurship as a desired career (Markowska et al., 2022). However, many other findings portray entrepreneurial patterns related to gender, supporting the idea of male entrepreneurs being more assertive and dominant and female entrepreneurs expected to behave by displaying feminine characteristics linked to warm feelings and emotional expressiveness (Balachandra et al., 2019).

So far, entrepreneurial literature has elucidated that female-owned firms tend to be smaller and employ fewer people (Kelley et al., 2017). In addition, their self-efficacy

perceptions tend to be lower than male entrepreneurs (Brush et al., 2004); they also have less entrepreneurial experience and lower levels of personal income and wealth (Marlow & McAdam, 2012). Furthermore, the figures emerging for university spin-offs show female underrepresentation (Crane, 2022); similar results for patent activity (Link & van Hasselt, 2020) and female entrepreneurs face more complex difficulties than male entrepreneurs when seeking financing (Brush et al., 2019). The differences could also be noticeable in sector preferences, where female entrepreneurs mainly concentrate on the service sector (Yacus et al., 2019). The areas chosen are traditionally related to "female roles" in beauty, food, and cloth related (Bates, 2003; Du Rietz & Henrekson, 2000; Hallward-Driemeier, 2011). These services are characterized by having lower labour productivity, partially explaining the income gap difference in entrepreneurship (World Bank, 2011).

Regardless of these diverse outcomes between female and male entrepreneurship, a preceding discussion should approach understanding the nature of these differences. First, many academics posit that gender differentiation analysis is a social construction rather than a biological one (Bettio & Verashchagina, 2008). In this sense, gender would explain an individual's state of possessing masculine or feminine characteristics (Muehlenhard & Peterson, 2011). One of the roots of this argument originates in how cultural values influence what is considered acceptable work for women and their role in society (Griffiths et al., 2013). For example, in contexts characterized for being extremely hostile toward women, females leading a business portray a way of breaking the norms of females' acceptable behaviour (Ogundana et al., 2021; Welter & Smallbone, 2010). In less extreme environments, this social construction is also present, where the percentages of companies led by men represent the majority, while women taking high executive roles are the minority (Henry et al., 2015; Muehlenhard & Peterson, 2011).

Accordingly, the feminist theory (N. M. Carter & Williams, 2003; Johnsen & McMahon, 2005) assists in understanding the inherent differences between men and women. This theory states that none is superior or inferior but somewhat different due to distinct socio-cultural values construction, yet developing equally effective traits (Fischer et al., 1993). Entrepreneurial literature has advanced in exploring that these differential gaps do not represent something that needs to be "fixed" in women but instead calls for a more comprehensive analysis which should include the whole entrepreneurial ecosystem (Ahl & Marlow, 2012; L. Foss et al., 2019).

Exploring innovative entrepreneurship provides an opportunity to include gendered perspectives in the discussion (Cowling et al., 2020). The question to investigate is not only if

female entrepreneurs are more innovative than male entrepreneurs but if differences exist, understand the roots of these differences and the implications. For example, firms whose corporate innovation is led by female Chief Technical Officers predominantly evidence a transformational leadership style which has proven to have a positive effect on the innovative culture of a corporation by encouraging creativity, communication, collaboration, and cooperation (Q. Wu et al., 2021). However, these technical positions tend to be male-dominated, mainly derived from an initial underrepresentation of women emerging from the science, technology, engineering, and mathematics fields (Kuschel et al., 2020). Not surprisingly, these results are a consequence of industry-related masculine structures, where a female in this sector navigate their way to "fit in" (Marlow & McAdam, 2015), in many cases overcoming these challenges by becoming an "honorary man" (L. Martin et al., 2015) and to cope with an specific industry structure (Marlow & McAdam, 2012).

This underrepresentation is also present in innovative entrepreneurial role models. The predominant female role model portrays a hard-working superwoman capable of overcoming all obstacles. This depiction highlights a meritocratic and individualistic view of entrepreneurship (Byrne et al., 2019). This high-achieving role model might inspire and resonate more with a specific, privileged group rather than a broader range of female entrepreneurs, especially those who come from low-skilled and low-paid occupations (Ahl & Nelson, 2015). This role model portrayal might also endure the idea of "fixing" to correct their deficits (Ely & Meyerson, 2000). In this way, many entrepreneurial role models fail to embrace diversity (Welter et al., 2017) and diminish existing gender barriers derived from formal and informal institutions (Byrne et al., 2019).

However, these limitations might provide insight into how some female entrepreneurial features lead to innovative ventures. A clue to this understanding emerges from a study exploring bank lending dynamics after the financial crisis (Cowling et al., 2020). In this case, to attain external credit to finance their venture growth, many female entrepreneurs adapted their finances to show the bank a more conservative profile and be perceived as a safer alternative (Cowling et al., 2020). Their finding suggests that although existing gendered ascriptions limit women's opportunities (Marlow & McAdam, 2015) when they manage to develop innovative ventures, they might be more successful than male entrepreneurs in accessing the required resources and conquering their objectives (Audretsch et al., 2022). For this reason, the focus is on female leaded new ventures since they have survived the initial start-up phase and are manoeuvring their way to continue.

The previous arguments enlighten how female entrepreneurs use their managerial and leadership styles to overcome challenges that might enable innovation (N. Foss et al., 2022; Q. Wu et al., 2021). In this sense, a feminine entrepreneurial leadership style is more oriented toward relations and collaborative decision-making, facilitating more opportunities for innovation to emerge by leveraging knowledge and financial resources from people inside and outside the firm (Devine et al., 2019). Similarly, the ability of female entrepreneurs to balance their private and work life enhances their effectiveness to commit to different roles when needed, facilitating learning-oriented strategies (N. Foss et al., 2022). Lastly, female entrepreneurial role models make evident a perduring overachieving behaviour to counter existing limitations. This persistent type of entrepreneur influences other female entrepreneurs by tracing a path to follow, which encourages overachiever behaviour, despite all circumstances.

Consequently, the aim is to explore how some ventures can differentiate from pure innovative ones, focusing on the entrepreneurs' gender. Often characterized by possessing a transformative leadership style, a managerial orientation to leverage resources, and inspired by high-achieving entrepreneurial role models, it is expected that new ventures led by female entrepreneurs have a higher likelihood of developing some innovation. From these considerations, it is being formulated the following:

> ***Hypothesis 1.*** *Female-led new ventures are more inclined to exhibit innovative entrepreneurship compared to male-led new ventures.*

### 3.2.3 Innovative entrepreneurship and external financing

At the starting point of opportunity recognition, a series of factors and resources should get together where innovative entrepreneurship is being orchestrated (Shane, 2003). Their alignment facilitates the emergence of new products/services, allowing the materialization of innovations. Some include human capital requirements, capital resources to finance innovation, and knowledge generation (Block et al., 2017).

To finance their endeavours, firms can choose from internal and external sources (B. Nguyen & Canh, 2021). Financing theorems propose that internal and external financing alternatives are substitutes for perfect markets (Modigliani & Miller, 1958). However, external financing for new ventures developing innovative entrepreneurship involves a higher analysis complexity due to information asymmetries, and the principles of perfect markets do not apply (Damodaran, 2010). In this sense, entrepreneurs find additional challenges when

seeking external financial resources from their financial system (Brown et al., 2022; De Clercq et al., 2013).

Innovative new firms are often categorized as high-risk ventures because of the uncertain outcomes derived from the innovation process. At the same time, these firms face more obstacles than pure imitative firms when searching for external financial resources to pursue their idea (Kleinert et al., 2020; Schneider & Veugelers, 2010). From the lender's perspective, innovative new ventures often lack collaterals to support the loan, from the fact that their novel developments are reliant on intangible assets and rest on one or very few projects since they are still small (Block et al., 2019; Cainelli et al., 2020; Freel, 2007). Additionally, failure rates in innovation are relatively high. In contrast, the predictive returns on innovation are uncertain (Hall, 2002). Findings show that only a small number of innovative firms succeed in achieving substantial gains, while most have relatively small returns (Coad & Rao, 2008). The challenge in financing innovative new ventures increases with the asymmetry of information by the parties involved (Gompers, 1995; Jensen & Meckling, 1976; O'Sullivan, 2005; Santos & Cincera, 2022; Stiglitz & Weiss, 1981). Most breakthrough innovations require a specialist valuation, similar to the financial intermediation work of venture capitalists (VC) (Gompers & Lerner, 2001; Hogan et al., 2017).

Economies structure their financial resource allocation based on the certainty of the returns, the associated risks, the transaction costs, and the levels of asymmetric information (Allen & Santomero, 1997; Brealey, 2001). The financial transactions can be direct or indirect depending on the interaction closeness between the financial resource seekers and providers.

In a direct resource allocation (Wurgler, 2000), resource seekers (in this case, entrepreneurs with innovative business ideas) meet investors interested in financing their project in a market. This type of interaction is understood as market-based or through financial markets because these are the places that generate all the necessary conditions for resource seekers and investors to meet.

The depth of a country's financial development considers financial structures in size and liquidity (Svirydzenka, 2016). Direct interaction among its participants—market-based—considers data on stock market capitalization to its GDP, stocks traded, international debt securities, and corporative securities. Some examples of financial markets include stock markets and debt securities of financial and non-financial corporations. More recent developments include crowdfunding platforms (Estrin et al., 2018; Kleinert et al., 2020), peer-to-peer transactions, and stock markets specialized in small and riskier firms (Block et al., 2021; Colombelli, 2010) such as junior stock markets (Honjo & Kurihara, 2022).

The second mechanism for financial resource allocation is indirect, where an intermediary matches the necessities of both sides. A country's financial institutions' depth compiles information regarding bank credit allocations in the private sector to their GDP. Other activities developed by financial institutions include pension funds, mutual funds and insurance funds (Svirydzenka, 2016). Economies need these intermediaries because of their specialization. They act as facilitators of risk transfer and for their knowledge of financial instruments and markets (Allen & Santomero, 1997).

The development degree of each type of these financial approaches will vary across countries, some having more dynamism than others (Svirydzenka, 2016). Differences are also evident within countries, usually having more robust development in their financial institutions than in their financial markets (Ball et al., 2008; Zhu et al., 2020).

Research investigating an adequate financing alternative depending on their business life cycle, size, and information availability suggests that innovative new ventures are better suited to be financed by equity, such as the investment done by business angels (Berger & Udell, 1998). The same authors indicate that the natural order of financing firm innovation follows a path of public equity funding, typically subscribed by an initial public offer (IPO) commonly encountered in financial markets. In most cases, the process of financing innovative new ventures aligns with a sequence of steps (Hellmann et al., 2021; Myers & Majluf, 1984), starting with personal savings, support from friends and family, then angel investors, and lastly, an initial public offering (IPO) at an equity market (Cosh et al., 2009). Debt financing, on the other hand, in the form of bank credits or similar, represents a less appropriate source of financing innovative new ventures (Carpenter & Petersen, 2002) due to different reasons, such as moral hazards, the complexity in evaluating the associate risks and the potential gains, the lack of collaterals, and the less flexible configuration in adjusting the financial intermediaries necessities with the firm's, in terms of interest payments and general debt conditions. Despite this, credit is still the most relevant source of financing for small ventures (Kanze et al., 2020). Studies comparing market and credit alternatives as external financial mechanisms confirmed the differences among these approaches and found that market alternatives enhance innovation among specific industries. In contrast, credit-based alternatives constrain them (Ho et al., 2018).

The prevailing number of credits among new ventures allocated by banks (Hirsch & Walz, 2019; Kanze et al., 2020) evidences the banking alternative as the most significant source of external financing for small firms emerging from financial institutions. Alternatively, venture capitalists develop a role as financial intermediaries but only

concentrate on a few industries, cover a small portion of new firms (Davis, 2003) and is very sensitive to economic shocks (Bellavitis et al., 2022). Nevertheless, there are some reasons why banking financing is the preferred alternative; first, because of the assumption that the funds are available (De Bettignies & Brander, 2007) by simply approaching a bank. Additionally, because of the intangible nature of intellectual property rights, innovative firms might not be required to disclose their novel ideas to banks (Alimov, 2019). Moreover, depending on their regulatory system, new ventures might be subject to stricter or more forgiving bankruptcy regimes (Estrin et al., 2017). Finally, by acquiring debt, firms maintain complete control and ownership of their venture (Colombo et al., 2014). However, these apparent advantages come with a cost, the interest rate, which tends to be higher for new and innovative firms than other types of firms (Alimov, 2019).

The downside resulting from banks dominating the institutional financing mechanism manifests in the supply role they have in deciding the firms to receive funding. Especially evident after the global financial crisis of 2008 and noticeable during any economic contraction, the banking regulation requires banks to control their risk exposure. To achieve this, they lower the credit supply to riskier alternatives, such as innovative entrepreneurship (Doerr, 2021). Intentionally or unintentionally, the bank industry designs the entrepreneurial landscape of countries, hampering innovation from small ventures. As a result, it is expected that countries with high levels of financial institutions' depth development to discourage innovative entrepreneurship. Accordingly, it is formulated the following:

> ***Hypothesis 2.*** *New ventures in countries with greater financial institution depth development exhibit lower levels of innovative entrepreneurship.*

Complementary but not substitutable, financial markets and financial institutions provide solutions to allocate financial resources in economies. Financial institutions guarantee the transactional process to the parties involved by complying with established regulations of their sector (World Bank, 2019). Financial markets must also provide an environment that assures the transactions among their participants; to accomplish this, they set participants' rules and requirements to fulfil. However, new ventures often perceive them as very strict, difficult to achieve and costly (Carpentier & Suret, 2012), discouraging their participation in financial markets.

Notwithstanding difficult participation in traditional stock markets, recent financial developments consider second-tier listings; these are financial markets for small and medium enterprises. These alternative markets create better matching financing opportunities for

innovative new ventures (Knyazeva, 2019). In addition, they improve their current financing options and align new ventures with better future financing options (T. Nguyen et al., 2020). Moreover, technological advances have created multiple market-based financing alternatives (Brown et al., 2018). For example, crowdfunding enables a platform with lower costs, facilitates information diffusion (Farrell et al., 2022) and reduces barrier entry related to information. Like this, many more developments could adequately finance the needs of small ventures and match the ones of the investors, for example, business angels syndicates interacting directly with new firms or more binding solutions such as accelerators, combining technical assistance with financing (Cumming et al., 2019).

Innovative entrepreneurs face additional challenges by the assumption of belonging to a riskier type of investment. While it is difficult for new ventures to transition from opaque information release in their early stage to a more transparent one (Hirsch & Walz, 2019), market developments capable of capturing this information would enable more financing opportunities for innovative entrepreneurs. The continuous development of market-based financial solutions will create the conditions for entrepreneurs to find adequate financial conditions that match their innovation needs. Higher levels of financial market development should be associated with generating better alternatives to finance innovative entrepreneurship since they could stimulate better matches between investors and innovative ventures. The research tests this formulation with the following hypothesis:

> ***Hypothesis 3.*** *New ventures in countries with greater financial market depth development exhibit higher levels of innovative entrepreneurship.*

### 3.2.4 The moderating role of financial depth development over innovative female entrepreneurship

In the previous sections gender roles were explored in determining innovative entrepreneurship at the level of the entrepreneurs' characteristics. Then, at the context level, the study explores the role of a country's financial development in facilitating innovative entrepreneurship. Subsequently, this section explores the interaction between these two levels of analysis.

At an individual level, the literature suggests that one of the constraints limiting female entrepreneurs from getting involved in innovative entrepreneurship is their unfavourable position in attaining financing (Dawson & Henley, 2015; Hallward-Driemeier, 2011; Sabharwal & Corley, 2009). Hence the importance of exploring the role of financial

structures (De Clercq et al., 2013; L. Foss et al., 2019) facilitating/hampering innovative entrepreneurship.

Research in this field suggest that entrepreneurship is not gender-neutral (Jennings & Brush, 2013), stating that female entrepreneurs are affected differently by the cultural and institutional environments surrounding them (Griffiths et al., 2013). Consequently, policies fostering gender-neutral objectives might not have the expected results from the inherent differences between male and female entrepreneurs (Aidis & Weeks, 2016). These considerations expand on the underlying assumptions, suggesting that all entrepreneurs have equal access to resources, which is only sometimes true (Isenberg, 2011). Different studies demonstrate that, on average, men initiate a business with an estimated double amount of capital as women (Coleman & Robb, 2012). However, female entrepreneurs are just as willing as men to finance their ventures with debt but receive less favourable conditions (Brush et al., 2019). The differences are even more notorious when attempting to attain financing from venture capital (VC) alternatives (Guzman & Kacperczyk, 2019), portraying VC financing attainment as a more masculine behaviour (Brush et al., 2019; Gupta et al., 2009). These restrictions denote female entrepreneurs' limitations in accessing financial resources (Kanze et al., 2018, 2020).

Previous studies on this topic identify gender differences in access to financing vanish with higher levels of financial development (Muravyev et al., 2009). In the banking industry, technological developments assist in reducing biases toward women and gender discrimination, as exemplified by adopting algorithms along the loan process (Cowling et al., 2020). Furthermore, developments among venture capital investors will expand the number of expert investors. These investors are desirable in an entrepreneurial ecosystem since they are most interested in identifying business opportunities and do not fall easily for gender-stereotyped behaviours (Balachandra et al., 2019). Finally, as highlighted by Chen (2017), financial institutions' development assists in creating more inclusive financing solutions, as in microfinance. Worldwide examples prove that microfinance positively affects female entrepreneurs (Quigley & Patel, 2022).

Therefore, it would be reasonable to consider that countries with higher development in financial institutions would favour female entrepreneurs' conditions and indirectly enhance their innovative entrepreneurship opportunities. This formulation is tested with the following hypothesis:

***Hypothesis 4.*** *A country's financial institution depth development enhances innovative entrepreneurship more for female entrepreneurs than for male entrepreneurs.*

Financial markets set up a place for direct interaction between resource seekers and investors, creating a space to find financial solutions that adjust to each participant's needs. In the case of firms, they benefit from flexible financing terms according to their possibilities, whether they finance through debt or equity (Parra & Winter, 2022). Despite these clear advantages, for most innovative new ventures participating in financial markets is challenging given their lack of transparency, their early stage formation and their hardship to generate enough cash flows (Hirsch & Walz, 2019) to pay interest rates or dividends.

Higher financial market-based development might reduce these asymmetries (Block et al., 2021), which are particularly counter towards female-led innovative new ventures. In addition, creating a market space to include a wider diversity of financial participants would benefit everyone involved instead of creating opportunities only for the usual beneficiaries, such as large firms from specific industries (Canh & Thanh, 2020).

Some ways deeper financial markets could benefit female-led innovative entrepreneurs become noticeable by understanding their entrepreneurial behaviour. For example, female's lower levels of entrepreneurial self-efficacy translate to higher risk aversion behaviours, marked by the preference for equity financing over debt (Block et al., 2019). Similarly, a more profound financial depth could enable financial solutions that allow lower leverage levels in their capital structure (Faccio et al., 2016). In the case of debt financing, long-term debt possibilities in the form of bonds and similar could adjust better to their risk tolerance over short-term debt such as credit (Datta et al., 2021).

The relational mechanisms of female entrepreneurs also provide evidence of financial resource-seeking managerial skills. The best example arises from credits without collateral, based on the reputation of solid social capital knots. Relational managerial styles highlight women's success in crowdfunding alternatives (Prokop & Wang, 2022). Furthermore, their capability of leveraging internal/external resources from the firm could also provide opportunities to get financing from non-traditional origins. For example, markets that enable paths for grants to reach innovative entrepreneurship or promote public support initiatives through financial markets (Harrison et al., 2020).

The relevance of attaining higher market-based depth development resides in channelling all these potential financing solutions that foster fitted financing conditions for

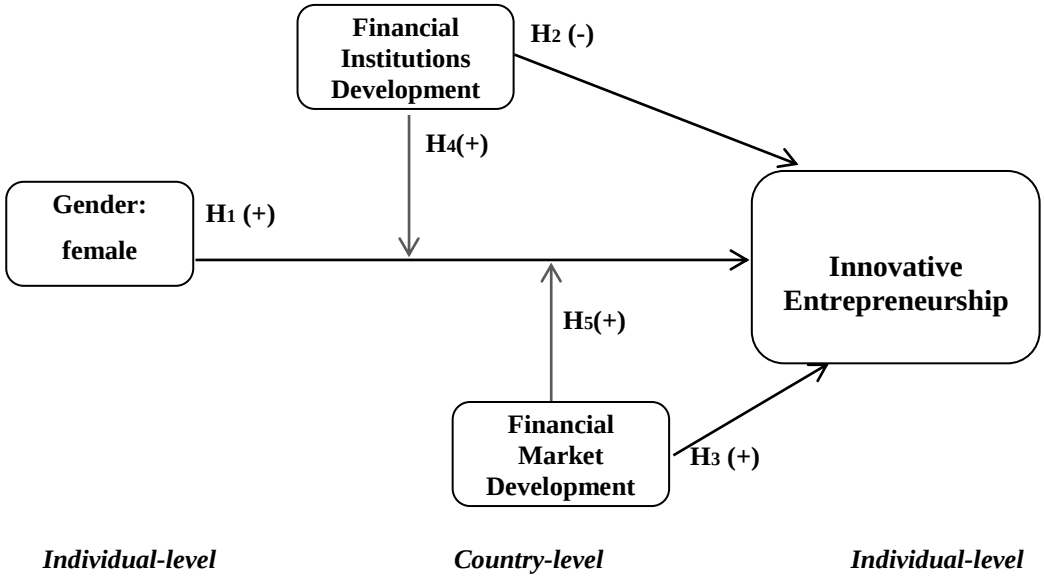
female-led innovative entrepreneurs. As such, more profound market-based financing alternatives enhance female-led innovative new ventures.

Recent developments in market-based financing, such as crowdfunding, provide financing solutions to discouraged borrowers leading riskier firms (Brown et al., 2018). Therefore, it would be reasonable to consider that countries with higher development financial markets would favour female entrepreneurs' conditions and indirectly enhance their innovative entrepreneurship opportunities. This formulation is examined with the following hypothesis:

***Hypothesis 5****. A country's financial market depth development enhances innovative entrepreneurship more for female entrepreneurs than for male entrepreneurs.*

Figure 6 summarizes the conceptual model.

**Figure 6 Conceptual framework and hypotheses – Inn.E.**




## 3.3 Data and methodology

### 3.3.1 Data

Research studying female entrepreneurship has increased thanks to the availability of entrepreneurial comparable sex-disaggregated datasets (Aidis & Weeks, 2016). One of these sources is the Global Entrepreneurship Monitor (GEM) (Reynolds et al., 1999). Innovative entrepreneurship is evaluated with cross-sectional data compiled from GEM's Adult Population Survey (APS). The study comprehends data collected from the year 2005 to the

year 2020. After excluding all the missing observations and the filter for new ventures, the model used to test the hypotheses accounts for 106 countries under examination. These ventures are in an early stage of entrepreneurial activity or young firms where salaries have been paid between three and forty-two months. These firms are relevant since most of a firm's growth obtained from innovative entrepreneurship happens at this early stage (Bradley et al., 2021).

At a country level, two dataset sources assist in analysing the context where entrepreneurs develop their activities. First, the recent compilation of the IMF's time-series information regarding a country's financial development (International Monetary Fund, 2020; Svirydzenka, 2016) offers an insightful dataset reflecting a country's indexed figures on the depth of development of its financial institutions and financial markets. Secondly, data from the World Bank development indicators (The World Bank, 2020) supports the model to control country differences, including per capita GDP, GDP growth, and population growth.

The final model accounts for 81,545 observations after omitting missing values and non-valid answers.

### 3.3.2 Variables

*Dependent variable*

The study explores innovative entrepreneurship using individual-level data from APS GEM, considering the responses to three different questions differentiating between pure imitative entrepreneurs and those who have introduced some innovation (Fuentelsaz et al., 2018; Hessels et al., 2008; Koellinger, 2008). This dummy variable takes zero value for pure imitative new ventures with many competitors. The technologies they use have been available more than a year ago, and none of their customers perceives they provide a new product or service to the market. On the contrary, it takes the value of one for any other combination with some degree of innovation. The combination includes none or few competitors, the use of the latest technology or if their products and services are perceived as new by some or all their customers.

*Individual-level predictor*

Individual data from GEM, taking a sample of new venture entrepreneurs between the ages of eighteen and sixty-four years. Available in the dataset, the gender variable differentiates the entrepreneurs with one if the answer corresponds to a female entrepreneur and zero if the answer is male (Estrin & Mickiewicz, 2011).

*Country-level predictors*

IMF's Financial Development Index (FD) constitutes the source for the country-level predictors considered in this research. This index is generated based on the depth, which is the size and liquidity of the markets (Svirydzenka, 2016). Financial institutions represent an index aggregation from data related to a country's private credit contribution to the GDP and pension funds, mutual funds, and insurances contribution. Financial markets represent an index aggregation from data related to a country's depth in terms of its stock market capitalization, the number of stocks traded, international debt securities, financial and non-financial corporate debt securities (International Monetary Fund, 2020).

Financial institutions and financial markets comprise an aggregate of the depth dimension, constructed as a weighted average index, with continuous variables from zero to one (Svirydzenka, 2016). The information related to financial institutions and financial markets has been extracted from the index elaborated by the International Monetary Fund, which complies with information assessing a country's overall development financial development.

*Cross-level interactions*

The moderating effect of financial institutions and financial markets (country-level predictors), depending on whether the entrepreneur is female or male (individual-level), combines a two-level analysis, exploring the interaction of these variables, implying that the effect of a variable depends on the value of the other (Rabe-Hesketh & Skrondal, 2008).

*Individual-level controls*

At an individual level, some variables were introduced to control for differences among entrepreneurs. First, the entrepreneurs' *age* and *age squared* are considered. According to each country's grouping, the analysis also considered the *household income*, classified into three categories, low, medium and high income. Controlling for the entrepreneurs' general human capital attainment, a categorical variable is considered for the differences between some secondary *education* (one), a secondary degree (two), post-secondary education (three), and graduate experience (four). Achieving a higher education would be related to having more resources to identify innovative opportunities (Samuelsson & Davidsson, 2009). Specific human capital was also taken from GEM, where two types of entrepreneurial experience are assessed. The first one is "*serial entrepreneurial experience*" obtained from the individuals' answers to the GEM question on whether they have sold, shut down, discontinued, or quit a business in the past twelve months that they owned-managed, and if that business continued to exist after their departure (Estrin et al., 2016). If the individuals' response was "yes", it is interpreted as having previous serial experience and thus

assigned the value one; those answering "no" were assigned the value zero. *Portfolio experience* was measured using a binary variable that takes the value one if, according to GEM data, the entrepreneur is already the owner-manager of another established existing firm and zero otherwise (Capelleras et al., 2019).

Financing innovative new ventures imply higher risk exposure given the uncertainty of the outcomes (Hall, 2002). So it is relevant to differentiate if the entrepreneurs have experience acting as informal investors or *business angels.* If the answer was affirmative, it is coded with one, otherwise zero. The question measuring their entrepreneurial network asks if they *know someone* who recently started a business, assigning one for affirmative and zero for negative responses. Their sense of optimism measured with the question of perceived *alertness to opportunities* is included, where it is asked if they consider that there will be good opportunities to start a business in the next six months. Again, an affirmative response is coded with one or zero if negative. The attitudes towards optimism are relevant for innovation, suggesting that optimistic entrepreneurs create more extensive networks and cluster involvement as a facilitating resource. In contrast, pessimistic entrepreneurs work isolated (Alventosa et al., 2016). Their perceived *self-efficacy* was measured by questioning whether they think they have the required knowledge, skill and experience to start a business, decoded as a binary variable (Boudreaux et al., 2019).

Additionally, given that entrepreneurial activities are highly related to uncertainty and risk-taking, the model includes information reporting their *fear of failure* as an inhibitor of entrepreneurial activity (Wennberg et al., 2013), where one stands for a positive response toward fear of failure. Finally, the *size of their new venture* was included in the model, controlling for the number of current employees.

*Country-level controls*

Some variables were introduced to control for differences among countries. One is the national level of development, captured by the logarithmic GDP per capita based on purchasing power parity (PPP) in 2017 constant USD (GDP Per Capita PPP). Annual GDP Growth is introduced (expressed as the percentage variation from one year to the next) to reflect each country's economic performance cycles, given that economic recession is expected to lower entrepreneurial activities (Koellinger, 2009). The third country-level control variable is Population Growth (also expressed as the percentage variation) to capture information reflecting long-term economic growth (Strulik, 2005).

## Table 5 Variables definitions and data sources

| Variable | Definition | Source |
|---|---|---|
| *Dependent Variable* | | |
| Innovative entrepreneurship (Inn.E.) | Dummy variable. Entrepreneurship of pure imitation takes value 0 if there are many competitors offering the same products, none of their customers considers their product new, and the technologies/procedures they use have been available for more than a year ago. Takes the value 1 for any kind of innovation resulting from combining if there are few or no competitors, if they use the latest technology/procedures available or if their product is new to some or all their customers. | GEM |
| *Individual-level predictor* | | |
| Gender | Dummy: 1 =female, 0 = male | GEM |
| *Country-level predictors* | | |
| Financial institutions development | Relative ranking of countries in respect to their financial institutions depth development. Represented as an index aggregation of continuous values from 0 to 1. | IMF |
| Financial markets development | Relative ranking of countries in respect to their financial markets depth development. Represented as an index aggregation of continuous values from 0 to 1. | IMF |
| *Individual-level controls* | | |
| Age | Current age of participants in years | GEM |
| Household Income | Three categories based on the income categories by country. "Low income"; "Middle income"; "High income" A dummy variable corresponds to the category indicated by the entrepreneur." | GEM |
| Education | Four categories, based on schooling years, "secondary education" = 1, "secondary degree" = 2, "post-secondary education" = 3, and "graduate experience" = 4 | GEM |
| Serial Experience | Has the entrepreneur sold, shut down, discontinued, or quit a business that they owned/managed in the past 12 months, and did that business continue to exist after their departure? Dummy: 1 = yes, 0 = no. | GEM |
| Portfolio Experience | If the entrepreneur currently owns/manages an existing business that is older than 42 months = 1, if not = 0 | GEM |
| Investment Experience | In the past three years, has the entrepreneur personally provided funds for a new business? Dummy: 1 = yes, 0 = no. | GEM |
| Knows other entrepreneur | Does the participant know someone who started a business in the past two years? Dummy: 1 = yes, 0 = no. | GEM |
| Perceived Founding Opportunities | In the next six months, there will be good opportunities for starting a business. Dummy: 1 = yes, 0 = no | GEM |
| Self-efficacy | Does the participant think they have the knowledge, skills, and experience to start a new business? Dummy: 1 = yes, 0 = no | GEM |
| Fear of failure | Would fear of failure prevent the entrepreneur from starting a business? Dummy: 1 = yes, 0 = no | GEM |
| Venture Size | Logarithm of the current number of employees | GEM |
| *Country-level controls* | | |
| GDP per capita PPP (ln) | Logarithmic GDP per capita based on purchasing power parity in 2017 constant USD. | WDI |
| GDP growth | Annual percentage growth in GDP. | WDI |
| Population growth | Annual population growth, expressed in percentage change. | WDI |

*Sources:* GEM APS – Global Entrepreneurship Monitor Adult Population Survey (https://www.gemconsortium.org) for the individual-level variables. IMF – International Monetary Fund https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b) for country-level predictors. WDI – World Bank's World Development Indicators (https://data.worldbank.org/products/wdi) for the country-level controls.

Finally, time dummies are added to enable controlling for *years* in the sample period while excluding one as a reference category (Hair et al., 2014). *Industry* controls are also included in all the specifications to account for sectoral differences (Devine et al., 2019; Estrin et al., 2013) (see Table 5).

### 3.3.3 Empirical Model

Innovative entrepreneurship is measured as a binary variable, determined by some entrepreneurs' characteristics at the first level of analysis and contextual variables at a second level, assembling a two-level hierarchical structure. The specification of the hypotheses stated in previous sections could be better analysed by the specification of a multi-level logistic regression, also known as a mixed-effects logistic regression (Rabe-Hesketh & Skrondal, 2008). Studies using a similar methodology present the results as an odds ratio (Guerrero et al., 2021; Mickiewicz et al., 2019). However, given that gender is expressed as a dichotomous variable, it facilitates interpreting the outcome in the form of coefficients.

A multi-level logistic model is selected for the analysis since the entrepreneurs' responses are nested in clusters from the countries where they live. So, in this cross-sectional research, entrepreneurs (represented by i) are nested in a country (j). Each individual's dependence on their country can be analysed by splitting the residual results into two components that are not correlated.

The model for this research is presented in a combined equation at the two levels:

*Level 1 Individual-level*

$$Logit(Pr(InnE_{ij}=1)) = \beta_{0j} + \beta_{1j}X_{ij} + \beta_{3j}(X_{ij}*W_j) + \beta_{4j}Z_{ij} + \varepsilon_{ij}$$

*Level 2 Country-level*

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_j + \gamma_{02}V_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}V_j + \mu_{1j}$$

where:

- $InnE_{ij}$ is the likelihood of exhibiting innovative entrepreneurship for the $i_{th}$ individual in the $j_{th}$ group.
- $X_{ij}$ is the level 1 predictor (*gender*) for the $i_{th}$ individual in the $j_{th}$ group.
- $\beta_{0j}$ is the level 1 intercept for the $j_{th}$ group
- $\beta_{1j}$ is the slope for $X_{ij}$, for the $j_{th}$ group
- $\varepsilon_{ij}$ is the level 1 residual for the $i_{th}$ individual in the $j_{th}$ group

- $W_j$ is the level 2 predictor for the $j_{th}$ group, "*financial depth development*"
- $\gamma_{00}$ is the grand mean intercept
- $\gamma_{01}$ and $\gamma_{10}$ are the level 2 regression coefficients
- $\mu_{0j}$, $\mu_{1j}$ are the level 2 random effects for the intercept and slopes, respectively.
- $\beta_{3j}$ is the slope for the interaction term ($X1_{ij}$* $W_j$ )
- $Z_{ij}$ are the control variables for the $i_{th}$ individual in the $j_{th}$ group, and $\beta_{4j}$ are the corresponding level 1 regression coefficients.
- $V_j$ are the level 2 control variables for the $j_{th}$ group, and $\gamma_{02}$, $\gamma_{11}$ are the corresponding level 2 regression coefficients.

## 3.4 Results

### 3.4.1 Descriptive results

Two descriptive tables are presented, Table 5 containing detailed information about variable definitions and Table 6 showing descriptive statistics and the correlation matrix. The study only includes firms that are no more than three and a half years old and have paid salaries or wages for a period of three to forty-two months. The final sample consists of data from 81,545 entrepreneurs across 106 different countries.

Out of this sample, 60% of *new venture* owners worldwide reported introducing some *innovation*. This high percentage is explained by their perception of the local market, considering factors such as whether their product or service is new to all or some customers, if they have few competitors in their market, or if they use the latest technology.

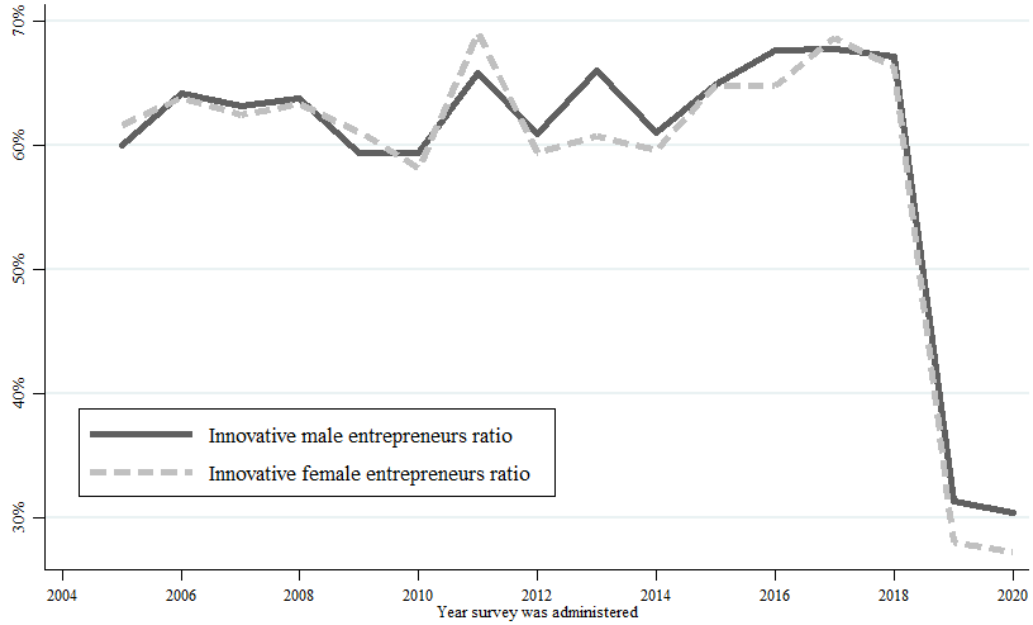
## Table 6 Descriptive statistics and correlation matrix

| VARIABLES | Mean | SD | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) IE | 0.60 | 0.49 | 1.00 | | | | | | | | | | | | | | | | | | | |
| (2) Gender | 0.43 | 0.49 | **-0.01** | 1.00 | | | | | | | | | | | | | | | | | | |
| (3) Year | | | **-0.10** | 0.00 | 1.00 | | | | | | | | | | | | | | | | | |
| (4) Age | 38 | 12 | **-0.01** | 0.00 | **-0.02** | 1.00 | | | | | | | | | | | | | | | | |
| (5) Industry | 3.19 | 0.98 | **0.04** | **0.18** | **0.04** | **-0.07** | 1.00 | | | | | | | | | | | | | | | |
| (6) Household income | 2.16 | 0.81 | **0.02** | **-0.11** | 0.00 | 0.01 | **-0.03** | 1.00 | | | | | | | | | | | | | | |
| (7) Education | 2.06 | 1.13 | **0.06** | **-0.07** | **0.01** | -0.01 | 0.00 | **0.25** | 1.00 | | | | | | | | | | | | | |
| (8) Serial experience | 0.04 | 0.19 | **0.04** | **-0.02** | **0.05** | **-0.02** | **0.01** | 0.01 | 0.00 | 1.00 | | | | | | | | | | | | |
| (9) Portfolio experience | 0.02 | 0.14 | **0.03** | **-0.03** | **-0.02** | **0.04** | **-0.01** | **0.05** | **0.02** | **0.02** | 1.00 | | | | | | | | | | | |
| (10) Invest. experience | 0.12 | 0.33 | **0.05** | **-0.07** | **0.04** | **-0.03** | **-0.01** | **0.09** | **0.05** | **0.14** | **0.06** | 1.00 | | | | | | | | | | |
| (11) Knows entrepreneur | 0.67 | 0.47 | **0.03** | **-0.07** | **0.10** | **-0.08** | **0.03** | **0.12** | **0.13** | **0.04** | **0.03** | **0.11** | 1.00 | | | | | | | | | |
| (12) Perceived opport. | 0.61 | 0.49 | **0.05** | **-0.02** | **0.04** | **-0.07** | **0.03** | **0.04** | **-0.01** | **0.03** | **0.02** | **0.06** | **0.17** | 1.00 | | | | | | | | |
| (13) Self-efficacy | 0.84 | 0.36 | **0.02** | **-0.06** | 0.00 | 0.00 | 0.00 | **0.08** | **0.08** | **0.02** | **0.03** | **0.05** | **0.16** | **0.15** | 1.00 | | | | | | | |
| (14) Fear of failure | 0.29 | 0.45 | **-0.02** | **0.05** | **0.05** | **0.01** | **0.02** | **-0.07** | **-0.03** | **0.04** | **-0.01** | -0.01 | **-0.04** | **-0.09** | **-0.17** | 1.00 | | | | | | |
| (15)Venture Size | 0.90 | 0.98 | **0.08** | **-0.16** | **0.01** | 0.00 | **-0.08** | **0.17** | **0.18** | **0.07** | **0.05** | **0.15** | **0.10** | **0.04** | **0.05** | **-0.02** | 1.00 | | | | | |
| (16) GDP per capita | 24,832 | 18,519 | 0.01 | **-0.09** | **0.01** | **0.18** | **-0.06** | **0.06** | **0.40** | **-0.03** | 0.01 | **-0.04** | -0.01 | **-0.09** | **0.02** | 0.01 | **0.15** | 1.00 | | | | |
| (17) GDP growth | 2.78 | 3.85 | **0.12** | **0.02** | **-0.28** | **-0.06** | **0.02** | **-0.02** | **-0.11** | **0.01** | 0.01 | **0.03** | 0.00 | **0.09** | **-0.05** | **-0.03** | **0.03** | **-0.30** | 1.00 | | | |
| (18) Population growth | 1.17 | 1.11 | **0.02** | 0.01 | **-0.01** | **-0.11** | **0.05** | **-0.05** | **-0.20** | **0.06** | **0.02** | **0.08** | **0.04** | **0.13** | **0.03** | **-0.03** | **0.03** | **-0.38** | **0.19** | 1.00 | | |
| (19) Fin. Inst. Develop. | 0.41 | 0.27 | **0.01** | **-0.03** | **-0.06** | **0.20** | **-0.03** | **0.02** | **0.27** | **-0.04** | **0.01** | **-0.04** | **-0.03** | **-0.07** | 0.00 | 0.00 | -0.01 | **0.67** | **-0.22** | **-0.33** | 1.00 | |
| (20) Fin. Markets Develop. | 0.42 | 0.32 | **0.01** | **-0.04** | **-0.09** | **0.18** | **-0.02** | **0.02** | **0.28** | **-0.03** | **0.02** | **-0.05** | **-0.03** | **-0.08** | 0.01 | **0.02** | **0.05** | **0.70** | **-0.19** | **-0.26** | **0.85** | 1.00 |

Notes: Correlation coefficients displayed in bold are significant at the 0.1 %.

*Gender* is considered an individual predictor for innovative entrepreneurship, with 43% of female entrepreneurs and 57% of male entrepreneurs represented in the sample. This ratio is consistent with previous studies using this data (Simmons et al., 2019). The distribution is similar among innovative entrepreneurs, with 42% female and 58% male. The correlation between gender and innovative entrepreneurship is negative and significant, supporting previous findings that female entrepreneurs are underrepresented in entrepreneurial activity. Without controlling for complementary individual features and traits, being a woman negatively correlates with innovative entrepreneurship, highlighting their disadvantaged position in entrepreneurship. In Figure 7, yearly information on the share of innovative male and female entrepreneurs is observed. The graph portrays this negative relation, remarkably evident during the COVID-19 crisis in 2020, where women entrepreneurs reported a lower likelihood of introducing some innovation. However, it is proposed that some traits among female entrepreneurs, could change this negative relation, which are captured in the model with complementary data on the entrepreneur. A clue of this is evident in the same figure, where the spike in innovative entrepreneurial activities after the financial crisis of 2008 is more pronounced for female entrepreneurs than for male entrepreneurs.

**Figure 7 Innovative entrepreneurship share by gender and year – world average**




*Source:* Author`s elaboration with GEM data.

The entrepreneurs' average age is 38 years. Personally providing funds for a new business, if they know other entrepreneurs, believing in having the skills and knowledge to start a business, and higher levels of education, portfolio and serial experience are positively and significantly related to innovative entrepreneurship. Entrepreneurs with previous experience as informal investors or business angels represent 12 percent of the total, while 67 percent personally know another entrepreneur and 84 percent trust their entrepreneurial self-efficacy. The sentiment of fear of failure is present in 29 percent of the entrepreneurs in the sample. Similarly, only 8 percent have attained higher education, and 29 percent attaining post-secondary education. In comparison, 51 percent have lower education levels with some secondary education or a secondary degree. The figures are lower for previous entrepreneurial experience, with 4 percent for serial entrepreneurial experience and 2 percent for portfolio entrepreneurial experience. Of the total, 43 percent of them locate themselves in the 33 percent upper high-income tile. The entrepreneurs generally share a positive attitude towards good opportunities for starting a new business in the upcoming months, representing 61 percent.

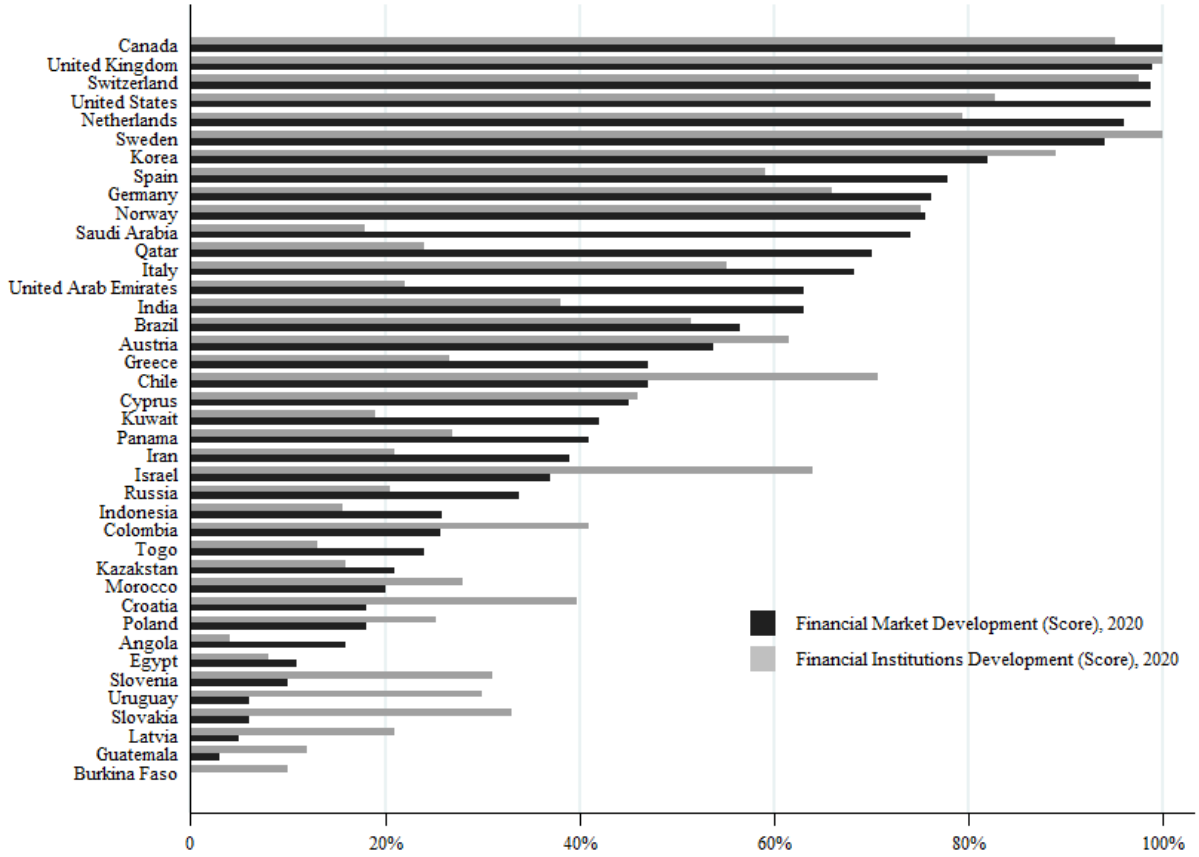
For sectoral preferences, 67 percent of the female entrepreneurs categorize their industry as "consumer-oriented" while for male entrepreneurs, the preference for this sector is only 46 percent.

At a country level, a positive but low correlation between financial markets depth and the introduction of some innovation, and a similar relation for financial institutions depth. From the sample taken understudy, the mean of the variable *financial institutions* is 0.41, while the mean for *financial markets* is 0.42. While the mean for these indicators appears similar, there are significant differences in the development depth among economies, as marked by Figure 8 (International Monetary Fund, 2020). In Figure 8, I present the depth development by region and selected countries of the analysis for the year 2020. It is also being illustrated differences from country to country, some with similar and high development among institutions and markets, such as the case of Switzerland, the United Kingdom, the United States, Sweden, and Canada. However, in other countries, the gap in development is notorious, as is the case of Saudi Arabia and Qatar, where most of their financial development is on the side of their markets. Conversely, Chile, Israel, and Croatia primarily developed their financial institutions.

Regarding country control variables, GDP growth, GDP per capita and population growth are positively and significantly correlated to the dependent variable. Data employed in this study suggests that income differences from country to country are well accounted for.

Having, on average, a GDP per capita of $24,832 (this variable is expressed in the model in logarithms to normalize its distribution). From the total sample, countries grow on average at a rate of 2.78 percent, and 1.17 percent for population growth.

**Figure 8 Institutions and market-based financial development by country, 2020**




*Source:* Authors with data from IMF – International Monetary Fund https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b

### 3.4.2 Multilevel model results

Table 7 reports the mixed-effects logistic regression models predicting innovative entrepreneurship.

Model (1) estimates all the control variables at the individual and country levels. Under this specification, the entrepreneur's age is significant, and its effect is negative, meaning that the older the entrepreneur is, the lower probability of developing innovative entrepreneurship. The entrepreneurs' characteristics are also relevant; having experience as a business angel, a positive perception of their context, and trusting in an individual's self-efficacy are all characteristics that enhance the probabilities of choosing innovative entrepreneurship. Higher human capital attainment is also a desirable characteristic that encourages innovative entrepreneurship; each educational achievement increases the likelihood of introducing innovation, while serial and portfolio entrepreneurial experience are

essential factors for determining innovative entrepreneurship. However, the entrepreneurs' income is significant and negatively related to innovative entrepreneurship, observing that innovation might be a key business strategy among the entrepreneurs with lower income levels. The entrepreneurs' fear of failure is negatively related, associated with reducing innovative entrepreneurship. At the firm level, controlling for firms' size is positively related to a higher likelihood of innovative entrepreneurship. The country-level controls, GDP per capita, GDP growth and population growth are also significant and positively related to predicting innovative entrepreneurship. These findings agree with the theoretical framework presented in previous sections.

Model (2) introduces the predicting variable gender into the analysis. Hypothesis 1 formulates that female entrepreneurs leading new ventures would be more likely to introduce innovative entrepreneurship in their ventures. When testing the model specification on a sample that includes entrepreneurs in 106 countries worldwide, hypothesis 1 cannot be rejected, indicating a higher likelihood of female entrepreneurs introducing innovative entrepreneurship. The preceding discussion on entrepreneurial gender roles highlights equal entrepreneurial effectiveness when assessed by gender. As a result, a female entrepreneurial orientation that commonly involves a transformational leadership style, high communicational skills, constant gender-related challenges, and inspired by high-achieving role models might trace a path that leads them to achieve higher innovation. In addition, these characteristically female traits allow them to leverage knowledge and resources that facilitate innovative entrepreneurship.

Model (3), under this specification, the country-level variable finance institutions' depth development, accompanied by the control variables, are the focus of analysis. The results confirm hypothesis 2; countries with high financial institutions development might discourage innovative entrepreneurship; this relation is strongly negative and significant. Entrepreneurial innovation requires financial investment. Resources obtained as a loan from a bank—the most available source of financing from financial institutions—would hamper innovative initiatives since this is not the most suitable financing mechanism, given the loathsome requirements for credit. Difficulties financing innovative entrepreneurship relate to the application process, higher interest rates, payment inflexibility not according to business cycles, the complexity in assessing the risk related to the innovative idea and many other issues connected to the asymmetry of information involved in this type of financial transaction.

## Table 7 Multilevel logistic random intercept model predicting innovative entrepreneurship

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| ***Individual-level predictor*** | | | | | | | |
| Gender | | 0.048*** | 0.048*** | 0.048*** | -0.010 | -0.014 | -0.009 |
| | | (0.016) | (0.016) | (0.016) | (0.029) | (0.026) | (0.030) |
| ***Moderators*** | | | | | | | |
| Financial Institutions (FI) | | | -0.570*** | | -0.629*** | | -0.895*** |
| | | | (0.181) | | (0.183) | | (0.218) |
| Financial Markets (FM) | | | | 0.434*** | | 0.373*** | 0.610*** |
| | | | | (0.132) | | (0.133) | (0.169) |
| ***Cross-level interactions*** | | | | | | | |
| Gender*FI | | | | | 0.144** | | -0.081 |
| | | | | | (0.059) | | (0.118) |
| Gender*FM | | | | | | 0.153*** | 0.222** |
| | | | | | | (0.049) | (0.098) |
| ***Control Variables*** | | | | | | | |
| Age | -0.021*** | -0.021*** | -0.021*** | -0.021*** | -0.021*** | -0.021*** | -0.021*** |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Age square | 0.000*** | 0.000*** | 0.000*** | 0.000*** | 0.000*** | 0.000*** | 0.000*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Mid Income | -0.068*** | -0.066*** | -0.066*** | -0.066*** | -0.065*** | -0.066*** | -0.066*** |
| | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) |
| High Income | -0.096*** | -0.092*** | -0.093*** | -0.092*** | -0.092*** | -0.091*** | -0.093*** |
| | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) | (0.021) |
| Secondary education | 0.072** | 0.072** | 0.071** | 0.073** | 0.070** | 0.072** | 0.070** |
| | (0.030) | (0.030) | (0.030) | (0.030) | (0.030) | (0.030) | (0.030) |
| Secondary degree | 0.100*** | 0.100*** | 0.099*** | 0.101*** | 0.097*** | 0.099*** | 0.097*** |
| | (0.029) | (0.029) | (0.029) | (0.029) | (0.029) | (0.029) | (0.029) |
| Post-secondary | 0.204*** | 0.204*** | 0.203*** | 0.204*** | 0.201*** | 0.202*** | 0.200*** |
| | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) |
| Graduate experience | 0.347*** | 0.347*** | 0.347*** | 0.347*** | 0.345*** | 0.344*** | 0.345*** |
| | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) | (0.041) |
| Serial experience | 0.288*** | 0.289*** | 0.288*** | 0.289*** | 0.289*** | 0.289*** | 0.287*** |
| | (0.045) | (0.045) | (0.045) | (0.045) | (0.045) | (0.045) | (0.045) |
| Portfolio experience | 0.323*** | 0.325*** | 0.328*** | 0.324*** | 0.329*** | 0.324*** | 0.328*** |
| | (0.056) | (0.056) | (0.056) | (0.056) | (0.056) | (0.056) | (0.056) |
| Investment experience | 0.166*** | 0.169*** | 0.169*** | 0.169*** | 0.169*** | 0.168*** | 0.169*** |
| | (0.025) | (0.025) | (0.025) | (0.025) | (0.025) | (0.025) | (0.025) |
| Know entrepreneur | 0.087*** | 0.089*** | 0.089*** | 0.089*** | 0.089*** | 0.089*** | 0.089*** |
| | (0.017) | (0.017) | (0.017) | (0.017) | (0.017) | (0.017) | (0.017) |
| Perceived opportunity | 0.134*** | 0.134*** | 0.134*** | 0.133*** | 0.134*** | 0.133*** | 0.133*** |
| | (0.017) | (0.017) | (0.017) | (0.017) | (0.017) | (0.017) | (0.017) |
| Self-efficacy | 0.084*** | 0.087*** | 0.088*** | 0.085*** | 0.089*** | 0.086*** | 0.087*** |
| | (0.022) | (0.022) | (0.022) | (0.022) | (0.022) | (0.022) | (0.022) |
| Fear of failure | -0.019 | -0.021 | -0.021 | -0.021 | -0.021 | -0.021 | -0.021 |
| | (0.018) | (0.018) | (0.018) | (0.018) | (0.018) | (0.018) | (0.018) |
| Venture Size (ln) | 0.149*** | 0.152*** | 0.152*** | 0.152*** | 0.152*** | 0.151*** | 0.151*** |
| | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) |
| GDP PPP(ln) | 0.089* | 0.090* | 0.187*** | 0.004 | 0.186*** | 0.003 | 0.105* |
| | (0.046) | (0.046) | (0.057) | (0.053) | (0.057) | (0.053) | (0.059) |
| GDP Growth | 0.006* | 0.006* | 0.006 | 0.007* | 0.006 | 0.007* | 0.005 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Population growth | 0.074*** | 0.074*** | 0.075*** | 0.076*** | 0.074*** | 0.076*** | 0.080*** |
| | (0.018) | (0.018) | (0.019) | (0.018) | (0.019) | (0.018) | (0.019) |
| Intercept | -0.808* | -0.826* | -1.572*** | -0.128 | -1.538*** | -0.091 | -0.842 |
| | (0.458) | (0.458) | (0.534) | (0.505) | (0.534) | (0.504) | (0.549) |
| Years Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| LR vs. linear model | 4,969 | 4,971 | 4,967 | 4,980 | 4,965 | 4,971 | 4,981 |
| Wald Chi-square | 4,391 | 4,398 | 4,407 | 4,408 | 4,413 | 4,418 | 4,446 |
| Prob > chi2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Log-likelihood | 49,194 | 49,190 | 49,184 | 49,184 | 49,181 | 49,179 | 49,164 |
| Akaike crit. (AIC) | 98,466 | 98,459 | 98,451 | 98,451 | 98,447 | 98,443 | 98,417 |
| Degrees of Freedom | 39 | 40 | 41 | 41 | 42 | 42 | 44 |
| Intraclass corr. coefficient | 0.07 | 0.07 | 0.08 | 0.07 | 0.08 | 0.07 | 0.08 |
| Observations | 81,545 | 81,545 | 81,545 | 81,545 | 81,545 | 81,545 | 81,545 |
| Number of groups | 106 | 106 | 106 | 106 | 106 | 106 | 106 |

*Yes$^{i}$, to denote that the model includes different years, from 2005 to 2020.*

Notes: Reported values are non-standardized β coefficients. Robust standard errors are given in parentheses. AIC is Akaike's information criterion = 2k – 2 x (log likelihood), where  indicates the degrees of freedom. *p < 0.10, **p < 0.05, ***p < 0.001; two-tailed significance. The spatial and industry controls are included in all the models.

In the opposite direction, model (4) shows all the control variables and financial markets depth development at the country level. This specification tests hypothesis 3 and fails to reject it. It evaluates if new venture innovation increases in countries with more developed financial markets. The main reason behind the positive effect of developing more evolved financial markets is that this direct intermediation process allows more flexibility in generating financial solutions that match the needs of the financial resource providers and the financial seekers, in this case, innovative new ventures.

Model (5) incorporates the interaction between an entrepreneur's gender and the development of financial institutions in the analysis. Consistent with Model (3), the direct effect of highly developed financial institutions negatively affects innovative entrepreneurship; however, this contextual variable enhances innovative female entrepreneurs. Microfinance illustrates this apparent contradictory situation. In microfinance, different financial institutions allocate financial resources to often marginalized participants, such as low-income female entrepreneurs from emerging economies. Under this alternative, the lack of individual monetary collateral to get a loan is covered by a rotating savings and credit association formed by a group of female entrepreneurs. Forming part of one of these solidarity groups acts as a mechanism of reputation and support in case one of the members fails to pay the credit, the rest of the group members will cover it (Lindvert et al., 2019). This kind of financial development facilitates access to financial resources for a group excluded from most financial institutions' resources.

Model (6) evaluates the interaction between innovative female entrepreneurship and financial market depth development. The results insist on working on further developing financial mechanisms to foster innovation. In this sense, the direct relation is positive, and the interaction is also positive and significant. Therefore, enhancing financial markets should not be distant from the needs of female entrepreneurs. Furthermore, countries that have developed larger financial market structures have reduced the barriers to this predominantly male domain (Brush et al., 2019). This finding supports the findings of Model (4), financial markets development facilitates female access to financial resources, given that it could stimulate the match between investors and innovative ventures.

Model (7) contains all the control variables, the predictive variables explored, and the interactions among them. The results are consistent with the previous models except for the interaction between the development of financial institutions and female entrepreneurs. From this, it can be highlighted that the alternative to enhancing innovative female entrepreneurship is more market development rather than more financial institutions. However, this model is

not the preferred one due to the complementary impact of financial institutions and financial markets. Therefore, it is preferable to analyse the effects separately, as demonstrated in models 5 and 6.

The effects of the statistically significant interaction terms are illustrated in Figure 9 for the moderating effect of financial institutions' depth development on the relationship between gender and innovative entrepreneurship. In Figure 10 for the moderating effect of financial markets depth development on the relationship between gender and innovative entrepreneurship.

**Figure 9 Moderating effect of financial institutions depth development on the relationship between gender and innovative entrepreneurship**

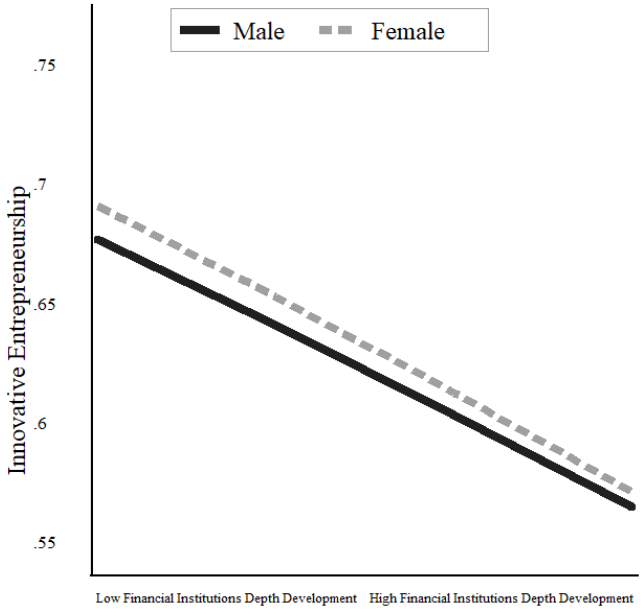
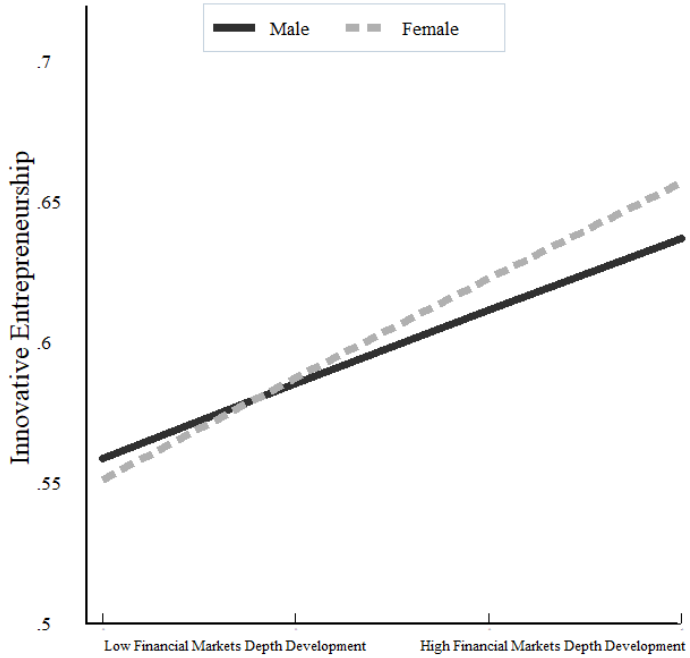



**Figure 10 Moderating effect of financial markets depth development on the relationship between gender and innovative entrepreneurship**



### 3.4.3 Robustness check

Following previous literature, the study measured innovative entrepreneurship by observing three elements indicating some innovation: new products to their market, having few competitors, or using the latest technology (Fuentelsaz et al., 2018; Hessels et al., 2008; Koellinger, 2008). Alternatively, other studies construct this variable using less elements, new product to their market (Darnihamedani et al., 2018) or adopting the latest technology. A sensitivity test was performed with these other constructs. After running the multilevel models, results agree on all hypotheses stated.

To check for the consistency of the results, a model was run without disaggregating the data of financial depth development into the variables "financial institutions" and "financial markets" but instead as a consolidated index indicator of a country's "financial development" (Svirydzenka, 2016). The results show opposite effects of this variable acting as a direct dependent variable and a moderator. This contradictory effect confirms the relevance of analysing financial depth development from the two approaches, "financial institutions" and "financial markets", given that more developed financial institutions are negatively related to innovative entrepreneurship. In contrast, the opposite happens with financial markets. These results have been explained in this research, where high levels of financial institutions' depth development discourage innovative entrepreneurship, while high levels of financial market development enhance the likelihood of innovative entrepreneurship for female entrepreneurs. Therefore, each has a different effect on innovative entrepreneurship, an important finding when analysing a country's financial development. Similarly, it is explored the relationship between financial institutions and financial market development, expressing them as a relational ratio. The regression results show that this ratio is negatively related to innovative entrepreneurship and the moderating effect is also negative, signalling that significant gaps in the depth development of these two mechanisms counter innovative entrepreneurship.

Another test included in the study runs the model on the different components of financial institutions and financial markets captured by the IMF, its development measures (Svirydzenka, 2016) in terms of depth, access, efficiency and an aggregated of the three. The results show the relevance of exploring financial depth development and its relation with new venture innovation over a similar relation with financial access or financial efficiency.

Additionally, a logit model was run to evaluate the consistency of the findings, which are the same for gender, financial institutions and financial markets. However, this type of

modelling does not account for embedded factors entrepreneurs share for developing their activities in a specific country.

## 3.5 Discussion

### 3.5.1 Key Findings

Innovative entrepreneurs are desirable individuals for an economy because of the disruptive breakthroughs they introduce to markets (Acs, 2008; Baumol, 2010; Darnihamedani et al., 2018). Furthermore, innovation is essential because it acts as the engine that fosters long-term economic growth and improvements in a society's welfare (Davidsson et al., 2006; Mayhew et al., 2016).

This study began by including gender in the analysis of innovative entrepreneurship. Then, attending academic remarks for more analysis of gender interaction with their context (Ahl & Marlow, 2012; Marlow & Martinez Dy, 2018) by considering the direct and indirect effects of financial depth development. Results suggest a higher likelihood of introducing some innovation by female entrepreneurs than male entrepreneurs. Furthermore, at the country level, contexts with a higher market depth development encourage innovative entrepreneurship, while deepened financial institutions weaken the likelihood of developing some novelty.

By exploring female-led innovative entrepreneurs, similarities are found with other studies analysing gender roles and innovation. Female entrepreneurs, or as examined in other studies, female technical officers, female managers, and female board directors add a higher likelihood of firms' achieving innovation (Cowling et al., 2020; N. Foss et al., 2022; Q. Wu et al., 2021). Some of the explanations for this situation involve female gender role construction. A transformational leadership style (Q. Wu et al., 2021), common among female entrepreneurs, explains how by inspiring collaborative work and encouraging different perspectives analysis, female entrepreneurs prioritize transformation achievement that, in many cases, facilitates innovation. However, existing literature outstands a universal type of female entrepreneurial role model. This portrayal might serve as a reference to other women entrepreneurs, indicating that the way to overcome existing gender-related obstacles is by trying their best, that successful female entrepreneurs have to be overachievers (Byrne et al., 2019). This depiction might inspire some women entrepreneurs to find ways to differentiate themselves from other businesses to achieve success. As a result, in their way of overcoming obstacles, some female entrepreneurs would define their track toward innovation. Gender-

related constraints might also explain how searching for alternative resources (Devine et al., 2019; N. Foss et al., 2022) enhances their likelihood of discovering new developments to introduce in markets. This mechanism to face adversity might assist them in looking for new methods, products/services, and ways of doing things.

Although the study finds significant differences in the likelihood of introducing innovation between female and male entrepreneurs, these differences are slender but provide a glimpse into how some feminine characteristically behaviours could promote innovation. However, the financial context can substantially affect innovative entrepreneurship, directly and indirectly. The urgency for better-fitted financial alternatives for innovative ventures is highlighted, and the study provides evidence that financial contexts development from its two intermediation mechanisms can provide some answers.

It has been identified in the study that countries with more profound financial institutions configurations hamper innovative entrepreneurship. This does not suggests reducing this sector's participation but channelling the financial resources differently. Acting as risk transfer specialists, they could further specialize in bank credits that adjust better to innovative small firms. A special call is raised to venture capitalists since resources to firms are disproportionally channelled by bank credits and less by venture capital (Davis, 2003). Having more venture capital specialists evaluating riskier business opportunities to fund might impulse innovative new ventures while reducing gender-biased decisions (Balachandra et al., 2019).

On the market-based financing alternatives, it was also identified that further developments could enhance innovative entrepreneurship and reduce gender biases. Some potential solutions arise from bigger and more liquid financial contexts. In those, it is observed that developments such as second-tier listings for small businesses, a boost among financial technologies like crowdfunding (Farrell et al., 2022), and business angels syndicates (Cumming et al., 2019), among other financial solutions could foster innovative entrepreneurship.

### 3.5.2 Policy implications

The implications for further financial development to encourage innovative entrepreneurship and reduce constraints among its participants involve work from all its members. Policymakers' involvement requires their understanding of new venture financing needs, to update or, when required, introduce regulations that foster financial development, whether directly or indirectly. Regulation can have a substantial impact in this endeavour, as

previously discussed. For instance, crowdfunding stands out as a promising avenue for funding innovative new ventures. Nevertheless, it is worth noting that in many countries, the absence of regulatory frameworks hinders the adoption of crowdfunding as a financing solution. Similarly, when it comes to fostering the emergence of more sophisticated investors, some countries may lack the necessary regulatory infrastructure to support their development. Regulation can also assist in developing mechanisms that reduce any bias related to gender.

The study also remarks the importance of having a more congruous development balance between financial institutions and markets. These two complement each other, but when in a context, one of them has a more intense concentration, it might dominate the financial system (Canh & Thanh, 2020), negatively affecting the conditions for some of its participants, as is the case of innovative ventures. Policymakers can also encourage participation in a less developed financial market by setting incentives and reducing entry costs for small firms. They can also create stimulating conditions for investors' interest in small firms.

On the side of the financial specialists, it is relevant to highlight their role in continuously working on engineering financial developments that adjust better to small firms and generate more inclusion among the participants. Moreover, some advances in this field highlight the critical task of new technologies merging with finance (Cumming et al., 2019).

A financial context with more experienced investors is also fundamental. Their expertise is one of the keys to reducing gender biases. Savvier investors are required to opportunely identify innovative business opportunities, enhancing the proliferation of successful and growing firms. Their crucial role in financial development is to demand a wider variety of financing alternatives. Innovative ventures' involvement in more sophisticated financing alternatives than credit banking becomes essential to foster financial markets. Among all participants, small firms play a protagonist role in pushing for better-fitted financing. Playing this role requires that entrepreneurs dedicate significant time from their activities to financing planning. Besides contacting investors, their activities should also include how to present their venture in front of the financial system. A firm with transparent information, clear financial statements, a defined business plan, and an idea of its valuation; has a higher probability of finding better financing options.

The study aims to evoke researchers' attention to not only explore female entrepreneurs' access to financial resources but also how better-fitted financial solutions could reduce less favouring conditions toward female entrepreneurs. Similarly, expanding

financial development capable of attending riskier firms could foster innovative entrepreneurship.

### 3.5.3 Limitations and further research

An essential part of the study insisted on considering entrepreneurial gender differences as a social construction (Bettio & Verashchagina, 2008); to better understand certain female behaviours in innovative entrepreneurship, and encourage further research contrasting information related to leadership styles, managerial styles, entrepreneurial role models and firms' internal innovative processes. In addition, it could be beneficial to analyse further the type of technology employed by the innovative venture.

It is also relevant to highlight that innovation was measured by the entrepreneurs' responses to innovation-related questions. Therefore, combining the analysis with other innovation metrics unrelated to the entrepreneurs' responses could broaden the findings.

Along the study, credit from financial institutions to promote innovative projects has been classified as not the most appropriate financing mechanism. A deeper study on this area would assist in getting a better understanding of the debt financial sector as a determinant of new venture innovation. With the negative relation identified, it would be helpful to recognise financial institutions' elements that reduce innovative entrepreneurship and how they could enhance it (Miglo, 2022). For example, it would be interesting to test if commercial credits have the same effect as policy-driven credits fostering entrepreneurship, such as productive state loans. A cross-country analysis investigating venture capital enhancement could confirm their role in promoting innovative ventures.

The indirect effect of financial markets over gender as predictors of innovative entrepreneurship could also be further explored and amplified. Policymakers could benefit from specific actions to facilitate female entrepreneurs' immersion into financial markets. In this sense, recent developments in financial markets could be analysed, such as crowdfunding (Estrin et al., 2018; Kleinert et al., 2020), alternative stock markets especially designed for small businesses (Colombelli, 2010), and other financial engineering mechanisms that could facilitate the match between investors and innovative new ventures.

### 3.5.4 Conclusion

This study highlights how female traits might increase the likelihood of innovative entrepreneurship. It also emphasizes the importance of improving financial development structures for innovative ventures. The study contributes by including gender in the discussion

of innovative entrepreneurship while insisting on developing financial structures that better fit innovative new ventures. The findings suggest that financial development should consider the characteristics of innovative entrepreneurship since many of the current structures limit it. However, the study proposes that creating an environment that nurtures innovative entrepreneurship is possible by implementing tailored financial support through financial institutions or market-based mechanisms. These developments are particularly significant for individuals traditionally facing greater financing challenges, such as innovative female entrepreneurs.

# Chapter 4

# 4 New ventures' export orientation: wealth-based impacts of informal investors and the rule of law

## 4.1 Introduction

As the global business environment evolves rapidly, new ventures are increasingly looking beyond their domestic markets to achieve growth. This shift has led to a significant rise in internationalization as a strategic option for these ventures to expand their customer base and penetrate new markets. Moreover, successful internationalization allows ventures to create value in foreign markets, positively impacting their country's economic growth. As a result, the study of new ventures' internationalization has become an integral area of research in entrepreneurship and international business (Hessels & Van Stel, 2011; Oviatt & McDougall, 2005).

International new ventures (INV) are defined as those that generate more than 25% of their revenues from foreign customers, creating a competitive advantage in global markets at an early stage of their growth or near their inception (Buccieri et al., 2022; G. Knight et al., 2004; Phillips McDougall et al., 1994). However, their home-based market conditions vary significantly from country to country (Clercq et al., 2013). Therefore, the relevance in understanding the role of country-level factors in influencing their internationalization likelihood (Chen et al., 2018; Rialp et al., 2005; Romanello & Chiarvesio, 2019).

This research focuses on the role of informal investors and the level of institutional protection offered by a country's rule of law in determining the landscape of new venture's export orientation. Informal investors provide personal financial resources and expertise to entrepreneurs, helping them to start and grow their businesses (De Clercq et al., 2012; Qin et al., 2022). On the other hand, a country's rule of law strength refers to the extent to which a country has a fair, transparent, and predictable legal system that protects property rights, enforces contracts, and provides a level playing field for businesses, providing a legal framework that reduces uncertainty and transactions costs (D'Ingiullo et al., 2023; Kaufmann et al., 2011).

In this study, the objectives are threefold. Firstly, the study investigates the impact of informal investors in facilitating the internationalization of new ventures. Secondly, the aim is to assess the extent to which the rule of law moderates the association between informal investors and entrepreneurial export orientation. Finally, it examines these relationships, utilizing a wealth stratification approach highlighting the role of household income as a

critical variable that shapes the entrepreneurial behaviour and outcomes of individuals across different income levels.

To date, limited research examines the role of informal investors and the rule of law in entrepreneurial export orientation, especially in a multilevel framework that accounts for different countries (D'Ingiullo et al., 2023; İpek & Bıçakcıoğlu-Peynirci, 2020; Qin et al., 2022). Moreover, few studies have explored the moderating effect of a country's rule of law and household income on these relationships. The findings contribute to literature by highlighting the importance of recognizing the role of informal investors in supporting entrepreneurship and promoting international trade, particularly in countries with weaker enforcement of the rule of law. The findings suggest that policies promoting entrepreneurship and international trade should consider the differing needs of entrepreneurs from different wealth backgrounds and strive to create an enabling environment for all entrepreneurs.

Empirically, data combining individual-level observations from the Global Entrepreneurship Monitor (GEM) and country-level data from the World Bank (World Development Indicators, WDI) and the Worldwide Governance Indicators (WGI) are used. Assembling a dataset of 78,368 early-stage entrepreneurs (i.e., those who started a firm within the past 42 months) representing 110 countries from 2005 to 2020, using a multilevel logistic regression model to analyse the direct and indirect relation of the role of informal investors and rule of law predicting export-oriented new ventures.

The rest of the chapter is organized as follows. Section 2 presents the study's theoretical framework, explaining the theoretical approaches this study draws to formulate the hypotheses. Section 3 then describes the data and methodology used. Section 4 reports the results and findings; Section 5 discusses the study's findings and implications.

## 4.2 Theory and hypotheses

The theoretical background for this study draws on several streams of literature. First, the theory of entrepreneurial finance focuses on understanding the financial aspects of entrepreneurial ventures, particularly in the context of obtaining funding and capital for export oriented ventures to overcome resource constraints and achieve competitive advantage and compete in international markets (Cumming et al., 2019; Phillips McDougall et al., 1994). Second, the institutional theory (North, 1990) suggests that the rule of law is an important institutional factor that influences the behaviour and performance of businesses in a country. Finally, wealth inequality is explored due to contextual influences of the institutional setting

where entrepreneurs interact, resulting in different behaviours and outcomes across different income levels (Bapuji et al., 2020; Corrigan et al., 2014; Pathak & Muralidharan, 2018).

### 4.2.1 The role of informal investors on export-oriented new ventures

Entrepreneurial finance theory provides valuable insights into the dynamics of international new ventures, which have unique requirements compared to other new ventures due to their presence in global markets (Cumming et al., 2019). The financing alternatives chosen by international new ventures play a crucial role in enabling their participation in international markets. The characteristics of international trade, such as the need to satisfy contracts with international clients and the need of financial backing from strategic partners, make the selection of appropriate financing options critical (Bowe et al., 2010).

While traditionally firms prioritize internal financing before seeking external sources, and then follow a pecking order pattern, international new ventures often face the challenge of rapidly entering and navigating unfamiliar global markets (Vanacker & Manigart, 2010). This pressures them to secure financial resources to support their internationalization efforts. Financial pressure is particularly pronounced in contexts with lower financial development (Svirydzenka, 2016), where there may be limited availability of traditional financial alternatives to support new ventures' international expansion. In such cases, informal investors emerge as an immediate and rapid response from the economy to fulfil this financial role. In addition, informal investors often have a deeper understanding of the entrepreneurial landscape and may be more willing to take risks in supporting ventures with an international focus (Maula et al., 2005).

Informal investors play a critical role in the success of new ventures (Ardichvili et al., 2002; Hellmann et al., 2021). These investors are different from formal investors as they invest their own money (Mason & Harrison, 2002), so they cultivate a stronger connection to the firm, which is not limited to their financial assistance but extends to knowledge sharing, expertise, and networks (Landström & Mason, 2016; Qin et al., 2022). Furthermore, many share close friendships or family bonds with the entrepreneur (Korosteleva & Mickiewicz, 2011). Often the agreement is based on an exchange of equity in the company or, in other cases, active involvement in mitigating the inherent risks related to the investment, as would be the case of an international new venture (Kerr et al., 2014). This relational aspect differentiates them from formal or institutional investors, given that their capital can be a vital source of funding for entrepreneurs who may struggle to secure financing from traditional

sources, such as banks or venture capital firms, in some cases providing altruistic investment (Klyver et al., 2017; Sudek, 2006).

Unlike traditional sources of financing, informal investors provide a unique type of capital that is particularly valuable for entrepreneurs. The funding provided by informal investors is often more flexible and accessible than traditional financing options. In many cases, help them address the lack of collateral by providing financing without requiring one (Allen et al., 2019; Mason & Stark, 2004). The availability of informal investors can be crucial for export-oriented new ventures, which may need significant upfront investment (De Clercq et al., 2008; Manova, 2013). Their flexibility can extend to the capital structure that adapts better to the firm, whether it is debt, equity, or a mix (J. Wu et al., 2016). As highlighted by previous entrepreneurial studies, the investment destined by informal investors might vary significantly, from micro-investments to more significant amounts (Moen et al., 2008).

The term "informal investors" is used in line with previous studies (Qin et al., 2022; Shane et al., 2020) and differentiate it from "angel investors," "business angels," or "micro-angels" (De Clercq et al., 2012; Reynolds et al., 2005; Wong et al., 2004). While these latter terms are commonly used in entrepreneurial literature and tend to be associated with investors in developed economies (Cumming & Zhang, 2019; Edelman et al., 2017), they represent a more sophisticated type of informal investor. However, the nature of these financers is more diverse when considering a broader range of countries, making the term "informal investors" a more inclusive concept that covers a wider spectrum of investors and is compatible with studies of informal financing (Allen et al., 2019; Sørheim & Landström, 2001).

Informal investors can be classified into different types based on their involvement level, risk management strategies, size of capital invested, growth and exit expectations, and individual motivations (Cumming & Zhang, 2019). For instance, informal investors actively involved in the new venture can provide valuable guidance and mentorship to entrepreneurs. They can help new ventures to develop their internationalization strategies and make informed decisions based on their knowledge and experience in the industry (Moen et al., 2008). Additionally, these investors can access their networks (Qin et al., 2022), which can help the new venture to establish relationships with potential customers, suppliers, and partners in international markets. These networks can also provide valuable information and insights about the international business environment, regulations, cultural differences, or any other disadvantage in terms of international markets related to their newness and foreignness (Croce et al., 2023).

Some informal investors may prioritize risk management when investing in new ventures. Investing in a business that exports exposes the investor to the local and global markets, which can offer different opportunities and risks (Moen et al., 2008). For example, the local market may be small and volatile, making it difficult for the business to grow and generate returns for the investor. On the other hand, internationalizing exposes the business to potentially more significant and stable markets, reducing the risk of failure and increasing the potential for higher returns. Therefore, this type of investor may be more interested in investing in export-oriented new ventures, as these ventures have a higher potential for growth and returns (Mason et al., 2017).

Moreover, informal investors' growth and exit expectations can also vary. Previous studies found that informal investors' exit time is generally longer when investing in international new ventures than in ones that are not (Mason & Botelho, 2016). When investors have a longer time horizon for their investment, they are more likely to support the entrepreneur's efforts to expand into new international markets, providing the resources and stability needed to succeed. In this case, investors willing to stick with the venture for the long haul may be more willing to tolerate short-term setbacks in pursuit of long-term gains (Mason & Harrison, 2002), providing the new venture with the stability and support they need to pursue their internationalization goals.

Informal investors exhibit varying investing motivations, ranging from financial gain to non-financial factors, such as supporting local entrepreneurs or contributing to social causes (Maula et al., 2005; Shane, 2005). Such motivations may be associated with personal values and social interests, as evidenced by informal investors supporting new ventures providing some social benefits (Mason et al., 2017). These motivations could also be related to the opportunity for international exposure through investing in a new venture that surpasses territorial borders, and can provide a sense of personal pride for informal investors.

The prevalence and density of informal investors vary widely across different countries, and several factors contribute to this variation (Lerner et al., 2018). For example, in countries where entrepreneurship and risk-taking are highly valued, there may be a higher proportion of informal investors. As a result, informal investors are attracted to the potential rewards of investing in expanding new ventures and are willing to accept the risks of investing in such (Sørheim & Landström, 2001). Additionally, access to capital can also impact the number of informal investors. In countries with limited formal financing options, individuals may rely on informal networks to raise capital (Mertzanis, 2019). Education, awareness, and social networks can also influence the number of informal investors in a country (Maula et al.,

2005). The regulatory environment also plays a role (De Clercq et al., 2012; Prokop & Wang, 2022), with more relaxed regulations leading to a higher number of informal investors.

In countries with a larger stock of informal investors, there may also be a greater diversity of investor types, including those with experience and expertise in specific international markets or industries. These investors can provide valuable knowledge and insights to help new ventures navigate the complexities of doing business abroad, including cultural differences, legal and regulatory frameworks, and market dynamics (Cumming & Zhang, 2019).

Understanding these factors is essential for creating an environment that encourages entrepreneurship and facilitates capital flow to new international ventures. As the number of informal investors grows, so does the potential for the emergence of different types of investors. One of the advantages of a denser set of informal investors emerges from their continuous specialization, as could be high-end investors, syndicate investors, and crowdfunding investors (Galema, 2020). High-end investors are usually wealthier investors willing to invest in international new ventures. On the other hand, syndicate investors create groups of investors who come together to pool their resources and provide more comprehensive support to invest in a venture with the potential to compete in global markets (Mason et al., 2016). Similarly, crowdfunding platform formations allow individuals to invest small capital in an export-oriented new venture (Prokop & Wang, 2022).

From all these factors, a more extensive stock of informal investors can increase the likelihood of new ventures becoming export-oriented due to the diversity in the amounts, motives, types, and specialization of these investors. Accordingly, the research posits the following hypothesis:

> **Hypothesis 1.** *New ventures in countries with higher proportions of informal investors are more likely to be export-oriented.*

### 4.2.2 Rule of law's impact on export-oriented new ventures

Research has demonstrated that good institutions are crucial for long-term economic development, and there are noticeable variations in institutional quality strength across countries (Acemoglu et al., 2005; Urbano, Aparicio, et al., 2019). Factors that affect export-oriented new ventures have been identified (I. C. Álvarez et al., 2018), with a country's rule of law being a crucial variable for entrepreneurship. A country with a robust rule of law configuration creates a stable and predictable legal environment, enabling entrepreneurs to

plan and conduct business activities confidently (Estrin et al., 2013). In addition, it ensures that all businesses, regardless of size, have equal opportunity, enforceable contracts, and protect property rights (Autio & Acs, 2010; Papageorgiadis et al., 2020).

The level of a country's rule of law can significantly impact the likelihood of entrepreneurs being export-oriented. A solid configuration can reduce transaction costs and provide entrepreneurs with a clear legal framework that establishes the rights and obligations of the parties involved (Kenneth-Southworth et al., 2018). This environment reduces the likelihood of disputes or litigation, which can be costly and time-consuming, especially for export-oriented new ventures requiring complex and long-term contracts.

Additionally, the rule of law promotes innovation (Agostino et al., 2020) in export-oriented new ventures. A predictable legal environment provides entrepreneurs with the necessary stability and confidence to invest in research and development, creating new products and services that can be exported and allowing ventures to differentiate and compete in international markets (S. L. Martin et al., 2017).

Furthermore, the rule of law is essential in attracting foreign investment. Investors are more attracted to countries with a stable and predictable legal environment, reducing the risk of their investment being expropriated or invalidated by arbitrary government action. This is especially important for new ventures seeking to internationalize in their search for foreign investors for their expansion or agreements with foreign companies (Li et al., 2022).

Another positive effect of the rule of law is its contribution to social and political stability, which is crucial for export-oriented new ventures. A stable and predictable legal environment reduces the risk of social unrest, political instability, and conflict, which can disrupt supply chains, logistics, and market access. Export-oriented new ventures require a stable and predictable environment to internationalize (Zhang et al., 2019).

Overall, the level of a country's rule of law can significantly impact the likelihood of entrepreneurs being export-oriented. Entrepreneurs in countries with a higher level of the rule of law are more likely to have the legal and regulatory support they need to succeed in international markets. In contrast, those in countries with weak rule of law enforcement may face significant challenges when attempting to export their goods or services. This formulation is tested this with the following hypothesis:

> **Hypothesis 2.** *New ventures in countries with higher enforcement of the rule of law are more likely to be export-oriented.*

### 4.2.3 The moderating role of rule of law on the relation between informal investors and export-oriented new ventures

The success of export-oriented new ventures is influenced by multiple factors, including the institutional context, availability of financing sources, and their interplay. The relationship between these factors and their impact on the success of such ventures remains a topic that requires further analysis.

When searching for financing sources, the level of institutional protection offered by a country's rule of law has significant implications for the financing decisions and expansion strategies of export-oriented new ventures (Castellani et al., 2022; Ren & Gao, 2023).

In countries where the rule of law is strict, formal institutional protections such as contract enforcement and property rights can offer crucial benefits to entrepreneurs (Cumming & Zhang, 2019; Papageorgiadis et al., 2020). These protections can be especially valuable for export-oriented ventures, which face significant legal and financial risks due to cross-border transactions. This suggests that while having a high proportion of informal financing sources is generally beneficial for entrepreneurial activities, this effect might be dampened in countries with strong rule of law.

In addition, where the rule of law is strong, formal institutional protections may not only provide legal and financial security to entrepreneurs (Castellani et al., 2022; Levratto et al., 2018), but also enhance the reputation and credibility of their ventures. This may be because formal institutional protections may signal to potential investors, customers, and suppliers that the context of the venture is trustworthy and reliable. In contrast, informal financing sources may not provide the same level of credibility and may limit the potential of export-oriented ventures. However, the availability of formal institutional protections may also generate complex and time-consuming procedures to access financing, potentially limiting the speed and flexibility of internationalization (Riding et al., 2012).

Conversely, in countries with low enforcement of their rule of law, informal financing sources may be more critical for export-oriented new ventures, as entrepreneurs may lack access to formal institutional protections (Abor, 2007; Madestam, 2014). Under these circumstances, informal financing sources may prevail due to lacking access to formal financing sources (Aidis et al., 2008). This may be because formal financing sources may be unavailable or too costly due to the high risks of cross-border transactions, lack of collateral, or inadequate credit history. In such cases, informal financing sources, such as angel investors

or family and friends, might be the main viable option for entrepreneurs seeking to finance their export-oriented ventures.

Therefore, the level of institutional protection offered by a country's rule of law might weaken the relationship between informal financing sources and export-oriented new ventures, highlighting the need for entrepreneurs to carefully consider the trade-offs of informal financing sources depending on the institutional context of their country.

With the previous formulation, it is formally proposed the following hypothesis:

> **Hypothesis 3**. *The level of institutional protection offered by a country's rule of law weakens the relationship between informal financing sources and export-oriented new ventures.*

### 4.2.4 Focus on wealth inequality

Exploring the relationship between the level of institutional protection provided by a country's rule of law and the impact of informal financing sources on export-oriented new ventures can shed light on the pervasiveness of wealth inequality in shaping the success of new ventures (Bruton et al., 2021). Over time, individuals in an economy continue to experience a significant variation in economic outcomes due to wealth inequality (Bapuji et al., 2020), which manifests in different ways, ultimately affecting entrepreneurial internationalization opportunities.

When examining how firms access resources and navigate their institutional environment, notable disparities arise between wealthier entrepreneurs and those with lower-wealth. Wealthier entrepreneurs are likely to have superior access to resources and networks, which confers a competitive edge in successful exporting. Contrariwise, lower-wealth entrepreneurs may encounter hurdles in securing these resources, which can impede their exporting endeavours (Agarwal & Holmes, 2019; De Soto & others, 1989; Dutt et al., 2016).

Analysing wealth in two income groups separately allows for a more targeted examination of how wealth inequality affects different entrepreneurial outcomes, specifically on export-oriented new ventures. In research, this would imply splitting the outcomes from high-income entrepreneurs on one side and middle/low-income on the other.

Wealthy entrepreneurs may have a competitive advantage in entrepreneurship, having access to personal savings to fund their venture's internationalization, a broader network of potential investors, and higher educational levels and business experience (Cressy, 1996; Lofstrom et al., 2014). This confidence in their internationalization ability may lead to a

higher willingness to take on financial risks from formal sources and lower reliance on informal funding sources.

On the other hand, entrepreneurs with lower wealth may have limited access to capital and resources; they may face barriers such as a lack of education, limited networks, and limited access to business opportunities (Braggion et al., 2018; Fairlie, 2007). These disadvantages may explain their need to rely more heavily on informal investors as a source of funding their internationalization (Riding et al., 2012). Therefore, the availability and effectiveness of informal investors may be more critical for lower-wealth entrepreneurs' success than for wealthier entrepreneurs.

Overall, the difference in the dependence on informal investors as a predictor of export orientation between wealthy and lower-wealth entrepreneurs can be attributed to various factors, including personal financial resources, access to networks, education, and business experience. Wealthier entrepreneurs are expected to rely less on informal investors than lower-wealth entrepreneurs. This expectation is tested with the following hypothesis:

> **Hypothesis 4.** *Entrepreneurs with higher levels of wealth are less likely to rely on informal financing sources to establish export-oriented new ventures than those with lower levels of wealth.*

While a country's rule of law is an important institutional factor for entrepreneurs (Levie & Autio, 2011; Urbano, Aparicio, et al., 2019), it may not be as crucial for lower-wealth entrepreneurs of exporting-oriented new ventures. These entrepreneurs may face challenges and rely on different resources to succeed (Braggion et al., 2018).

Wealthier entrepreneurs may be more sensitive to this institutional factor because they are more likely to have assets and investments at stake and, therefore, a greater need for legal protections and enforceable contracts (Cagetti & De Nardi, 2006). Moreover, wealthier entrepreneurs are more likely to be able to operate in global markets with increasingly complex and heterogeneous legal frameworks. The rule of law becomes particularly important in this context, as it provides a common language and set of norms that facilitate international trade and investment (D'Ingiullo et al., 2023; Kaufmann et al., 2011). Countries with high levels of the rule of law can often negotiate more favourable trade agreements and benefit from increased foreign investment, which can be essential for export-oriented new ventures.

Lower-wealth entrepreneurs may focus more on developing and leveraging social networks and personal relationships to access resources such as capital, information, and customers (Andersen & Buvik, 2002). In addition, entrepreneurs may rely on these networks

for support and mentoring, such as advice on navigating regulatory barriers or finding new customers (van Stel et al., 2007).

Additionally, lower-wealth entrepreneurs may face various other barriers to success unrelated to the rule of law. These may include limited access to capital, lack of formal education or business training, inadequate infrastructure, and weak regulatory frameworks. Addressing these barriers may be a more pressing concern for these entrepreneurs (Lofstrom et al., 2014) than addressing how to benefit from the advantages that a country's rule of law system may offer for export-oriented new ventures.

In this sense, wealthier entrepreneurs may be more influenced by the benefits of a country's stricter rule of law than lower-wealth entrepreneurs, who have more urgent needs to satisfy first to internationalize. This formulation is to be tested by the following:

> **Hypothesis 5.** *Entrepreneurs with higher levels of wealth are more likely to rely on a country's rule of law to establish export-oriented new ventures than those with lower levels of wealth.*

Wealthier entrepreneurs typically have greater access to formal financing sources such as banks, venture capitalists, and other formal financing resources, which are better equipped to deal with the risks associated with exporting. As such, they might rely less on informal financing and personal savings (Mertzanis, 2019) to establish export-oriented new ventures. Therefore, the level of institutional protection provided by a country's rule of law may have minimal to no effect on the relationship between informal financing sources and export-oriented new ventures for wealthy entrepreneurs.

On the other hand, lower-wealth entrepreneurs may have limited access to formal financing sources, which makes them more reliant on informal financing sources to establish export-oriented new ventures (Manova, 2013). In such cases, the level of institutional protection provided by a country's rule of law becomes crucial as it can affect the availability and cost of informal financing sources. For instance, in countries with a weak rule of law, the impact of informal investors may be more pronounced, as lower-wealth entrepreneurs have fewer alternative funding options and face more regulatory barriers (Agostino et al., 2020). Subsequently, the relationship between the proportion of informal investors and export-oriented new ventures is expected to be stronger in these countries. Conversely, in countries with a strong rule of law, other funding sources would be more accessible to lower-wealth entrepreneurs. As a result, the impact of informal investors may be less significant in these

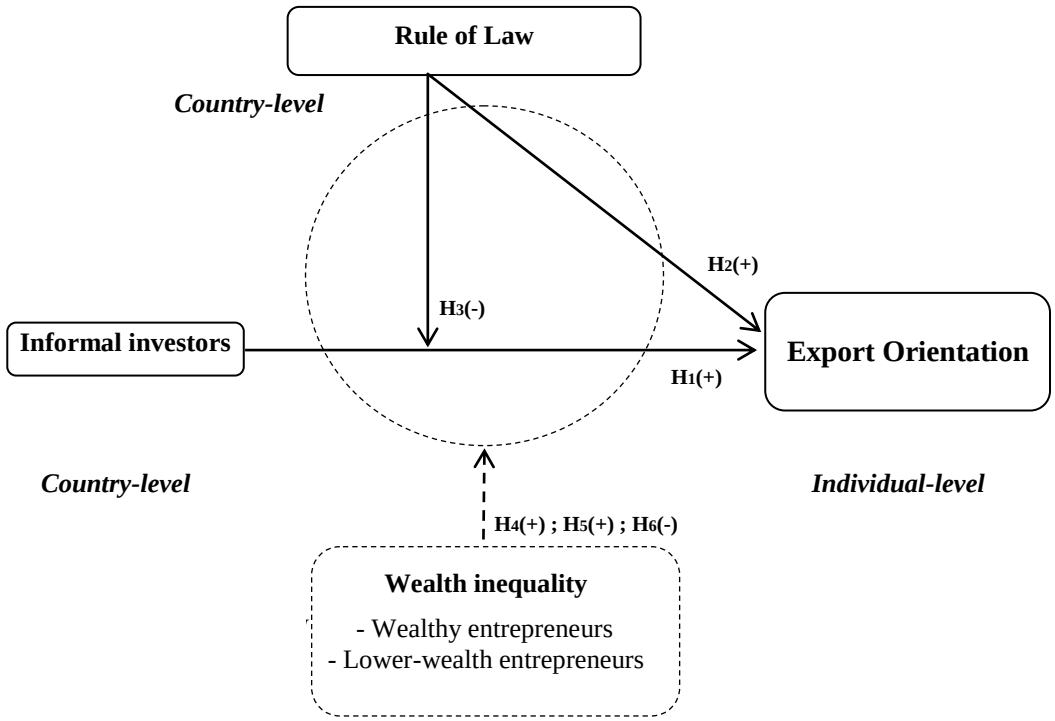
countries. Additionally, a country's stricter rule of law among lower-wealth entrepreneurs may be more favourable to succeed without a significant presence of informal investors.

Based on the above discussion, the research aims to investigate whether the influence of informal investors on export-oriented new ventures is affected by a country's rule of law and whether this effect differs depending on the entrepreneurs` wealth. Therefore, the following research question is formulated:

> **Hypothesis 6**. *Compared to wealthier entrepreneurs, the level of institutional protection provided by a country's rule of law has a stronger impact on the relationship between informal financing and export-oriented new ventures among entrepreneurs with lower-wealth.*

Figure 11 summarizes the conceptual model.

**Figure 11 Conceptual framework and hypotheses – EO**




## 4.3 Data and methodology

### 4.3.1 Data

The research hypotheses are tested using cross-sectional data obtained from the GEM Adult Population Survey, the WDI World Development Indicators and the World Bank's Governance Indicators (WGI). The time frame of the information analysed in this study runs from 2005 to 2020.

At the individual level, a filter was introduced to limit the sample to new ventures, meaning those in the early stage of entrepreneurial activity. Specifically, only ventures in which salaries or wages had been paid for between 3 and 42 months were included (Reynolds et al., 2005). This characteristic is relevant for the study to explore export-oriented ventures showing a rapid internationalization, taking place within three years of its foundation date (Crick, 2009; Hessels et al., 2008).

Additional country-level data were also used for the analysis. Besides controlling for inter-country differences in per capita GDP, GDP growth, and population growth (using data sourced from the WDI), the research also includes each country's rule of law enforcement indicator.

After removing missing observations and applying filters, the final dataset used for the study consisted of 110 countries from diverse regions with varying contexts, amounting to 78,368 observations. The study also divided the dataset into two groups based on wealth inequality: wealthier entrepreneurs (33,879 observations) belonging to the upper-income tercile of the Global Entrepreneurship Monitor, and lower-wealth entrepreneurs (44,489 observations) from the lowest and middle-income terciles.

### 4.3.2 Variables

*Dependent variable*

Following previous studies using GEM data to analyse export-oriented new ventures, the study captures *export-orientation* (EO) as the proportion of new ventures having part of their customers outside their home country. The variable takes the value 1 if the percentage of the customers living abroad is more than 25% and 0 otherwise (Capelleras et al., 2018; De Clercq et al., 2008; Hessels & Van Stel, 2011).

*Country-level predictors*

To evaluate a country's proportion of *informal investors*, the study employs the GEM variable "business angel", estimating the percentage of a country's population that in the past three years have personally provided funds for a new business (De Clercq et al., 2012). The resulting variable is a continuous variable estimated by year and country.

The theoretical formulation on this research suggests that a country's *rule of law* has a direct and moderating effect on the relation of informal investors predicting export-oriented new ventures. To operationalize the rule of law variable, the study relies on the World Bank's Governance Indicators (WGI), which measure the level of trust and adherence to the norms of a society, especially in relation to the effectiveness of enforcing contracts, upholding property

rights, maintaining law enforcement, and ensuring judicial systems, while also taking into account the probability of criminal activities and physical aggression, as well as the quality of governance within a country. WGI scores range from approximately -2.5, indicating weak rule of law, to 2.5, indicating strong rule of law (Kaufmann et al., 2011).

*Interaction*

This study explores the moderating effect of the rule of law on the relationship between the proportion of informal investors and an entrepreneur's individual export-orientation. To investigate this relationship, the study employs an interaction analysis of the two predictors. As Rabe-Hesketh and Skrondal (2008, p. 37) explain, an interaction between two variables means that the impact of each variable depends on the value of the other variable. Specifically, a two-level model was utilized, and an interaction analysis was conducted to assess the joint effect of the proportion of informal investors and the rule of law on an entrepreneur's individual export-orientation. This model assumes that there is no cross-level interaction between the individual-level controls and the country-level predictors.

*Individual-level controls*

To control for differences among entrepreneurs, several variables were introduced at an individual level. Firstly, *age, age squared* and *gender* were considered. Age was measured in years. Secondly, *household income* was classified into low, medium, and high categories, according to each country's grouping. Thirdly, a categorical variable was considered for differences in the entrepreneurs' general human capital attainment, which includes secondary *education,* secondary degree, post-secondary education, and graduate experience. Higher education is related to having more resources to identify opportunities to internationalize (Capelleras et al., 2018; Samuelsson & Davidsson, 2009). Fourthly, specific human capital was taken from the Global Entrepreneurship Monitor (GEM), where two types of entrepreneurial experience were assessed: *serial entrepreneurial experience* and *portfolio experience*. Serial entrepreneurial experience refers to owning a business that was sold, shut down, discontinued, or quit in the past twelve months and continued to exist after their departure (Estrin et al., 2016). Portfolio experience refers to being the owner-manager of another established existing firm (Capelleras et al., 2019). Fifthly, experience acting as *informal investors* or business angels was measured. Sixthly, the entrepreneurs' network was assessed by asking if they *know someone* who recently started a business.

## Table 8 Variables definitions and data sources

| Variable | Definition | Source |
|---|---|---|
| *Dependent Variable* | | |
| Export Orientation (EO) | Dummy variable. International new ventures at an early stage of their growth or near their inception, where the percentage of the customers living abroad is more than 25%, taking value 1 and 0 otherwise. | GEM |
| *Country-level predictors* | | |
| Informal Investors | Continuous variable. GEM "business angel" variable, estimating the percentage of a country's population that in the past three years have personally provided funds for a new business. | GEM |
| Rule of Law | Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. | WGI |
| *Individual-level controls* | | |
| Gender | Dummy: 1 =female, 0 = male | GEM |
| Age | Current age of participants in years | GEM |
| Household Income | Three categories based on the income categories by country. "Low income"; "Middle income"; "High income" A dummy variable corresponds to the category indicated by the entrepreneur." | GEM |
| Education | Four categories, based on schooling years, "secondary education" = 1, "secondary degree" = 2, "post-secondary education" = 3, and "graduate experience" = 4 | GEM |
| Serial Experience | Has the entrepreneur sold, shut down, discontinued, or quit a business that they owned/managed in the past 12 months, and did that business continue to exist after their departure? Dummy: 1 = yes, 0 = no. | GEM |
| Portfolio Experience | If the entrepreneur currently owns/manages an existing business that is older than 42 months = 1, if not = 0 | GEM |
| Investment Experience | In the past three years, has the entrepreneur personally provided funds for a new business? Dummy: 1 = yes, 0 = no. | GEM |
| Knows other entrepreneur | Does the participant know someone who started a business in the past two years? Dummy: 1 = yes, 0 = no. | GEM |
| Perceived Founding Opportunities | In the next six months, there will be good opportunities for starting a business. Dummy: 1 = yes, 0 = no | GEM |
| Self-efficacy | Does the participant think they have the knowledge, skills, and experience to start a new business? Dummy: 1 = yes, 0 = no | GEM |
| Fear of failure | Would fear of failure prevent the entrepreneur from starting a business? Dummy: 1 = yes, 0 = no | GEM |
| Venture Size | Logarithm of the current number of employees | GEM |
| *Country-level controls* | | |
| GDP per capita PPP (ln) | Logarithmic GDP per capita based on purchasing power parity in 2017 constant USD. | WDI |
| GDP growth | Annual percentage growth in GDP. | WDI |
| Population growth | Annual population growth, expressed in percentage change. | WDI |
| *Wealth inequality focus* | | |
| Wealthy entrepreneurs | Entrepreneurs corresponding to the category "High-income" on the Household Income. | GEM |
| Lower- wealth entrepreneurs | Entrepreneurs corresponding to the categories "Middle-income" and "Low-income" on the Household Income. | |

*Sources:* GEM – Global Entrepreneurship Monitor Adult Population Survey (https://www.gemconsortium.org) for the individual-level variables. WGI - Worldwide Governance Indicators WDI (www.govindicators.org) – World Bank's World Development Indicators (https://data.worldbank.org/products/wdi) for the country-level variables.

Seventhly, their sense of optimism was measured by asking if they consider that there will be *good opportunities* to start a business in the next six months. Eighthly, perceived *self-efficacy* was measured by questioning whether they think they have the required knowledge, skill, and experience to start a business. Ninthly, *fear of failure* was included as an inhibitor of entrepreneurial activity (Boudreaux et al., 2019). Except for the categorical variables, the rest of the individual controls are decoded as a binary variable, taking the values 0 and 1. Finally, the *size* of their new venture was included in the model, controlling for the number of current employees.

*Country-level controls*

To account for differences among countries, several variables were included. First, the level of development of each country, which was measured using the logarithmic *GDP per capita* based on purchasing power parity (PPP) in 2017 constant USD (GDP Per Capita PPP). It was also included annual *GDP growth* as a control variable to reflect each country's economic performance cycles (Koellinger, 2009). Additionally, *Population Growth* is included, expressed as the percentage variation from one year to the next, to capture long-term economic growth (Strulik, 2005). In the research model' time dummies are included to control for the years in the sample period, with one year excluded as a reference category (Hair et al., 2014). Finally, industry controls were added to account for sectoral differences in export oriented new ventures (Capelleras et al., 2019; Estrin et al., 2013).

*Wealth inequality focus*

By investigating the disparities arising from wealth inequality and their impact on the relationship between informal investors and rule of law, the study aims to gain a deeper insight into the obstacles that entrepreneurs encounter while initiating and expanding their export-oriented ventures.

To conduct this analysis, the sample was divided into two groups: wealthy entrepreneurs, who reported having a high income in the GEM Adult population survey, and lower-wealth entrepreneurs, who reported being in the low or middle income classification.

All variable definitions and data sources are presented in Table 8.

### 4.3.3 Empirical Model

The most suitable model for testing the hypotheses' characteristics is the multi-level logistic regression (mixed-effects logistic regression) (Rabe-Hesketh & Skrondal, 2008). The study uses this random intercept model because it allows to analyse the dependence of individual responses (represented by i) within clusters of the countries where they live

(represented by j). The residuals can be split into two uncorrelated components to examine the within-dependence of each individual with their country. The model is specified as:

*Level 1 Individual-level*

$$Logit(Pr(EO_{ij}=1)) = \beta_{0j} + \beta_{nj}X_{ij} + \varepsilon_{ij}$$

*Level 2 Country-level*

$$\beta_{0j} = \gamma_{00} + \gamma_{01}V_j + \gamma_{02}W_j + \gamma_{03}(V_j*W_j) + \gamma_{0m}Z_j + \mu_{0j}$$

where:

- $EO_{ij}$ is the likelihood of exhibiting export orientation for the $i_{th}$ individual in the $j_{th}$ group.
- $\beta_{0j}$ is the is the intercept term for country j, representing the average level of export orientation for entrepreneurs in that country.
- $\beta_{nj}$ are the corresponding level 1 regression coefficients, and $X_{ij}$ the level 1 control variables for the $i_{th}$ individual in the $j_{th}$ group
- $\varepsilon_{ij}$ is the level 1 residual for the $i_{th}$ individual in the $j_{th}$ group
- $\gamma_{00}$ is the grand mean intercept, representing the average level of export orientation across all countries.
- $\gamma_{01}$ is the coefficient of informal investors for country j, representing the effect of this predictor on export orientation.
- $\gamma_{02}$ is the coefficient of rule of law for country j, representing the effect of this predictor on export orientation.
- $\gamma_{03}$ is the coefficient of the interaction between informal investors and rule of law for country j, representing the joint effect of these two predictors on export orientation.
- $\gamma_{0m}$ are the coefficients of additional country-level controls, and $Z_j$ representing the effects of these controls on export orientation.
- $V_j$ is the informal investors stock predictor for country j.
- $W_j$ is the predictor of the country's rule of law for country j.
- $\mu_{0j}$ is the error term representing the random variation in the intercept term for country j that is not explained by the model.

## 4.4 Results

### 4.4.1 Descriptive results

Table 9 provides information about the average and standard deviation of all the study variables and the correlation matrix.

The study's scope is limited to firms three and a half years old or younger and has paid salaries or wages for three to forty-two months. Within this sample, 10.7% of the entrepreneurs reported that their ventures were export-oriented, meaning they had more than 25% of their customer revenues from foreign customers. When examining wealth differences, it was found that 12.6% of the wealthier entrepreneurs are export-oriented. However, the percentage is smaller for entrepreneurs with lower wealth, with only 9.3% being export-oriented.

Regarding household income, 43.23% of entrepreneurs belong to the high-income group in their respective countries, while 31.27% belong to the middle-income group and 25.50% to the low-income group. This indicates that many entrepreneurs may have access to financial resources that can help them start and expand their businesses. High-income entrepreneurs are wealthier and tend to have more disposable income and greater access to credit and investment opportunities for internationalization. It is interesting to note that some countries have a particularly high proportion of entrepreneurs in the high-income group, with more than 80% of entrepreneurs falling into this category. These countries include Russia, Algeria, Senegal, Malawi, Armenia, Costa Rica, Qatar, and the United Arab Emirates. This concentration of high-income entrepreneurs may indicate a high level of wealth inequality in these countries. Combined, the average of middle- and low-income entrepreneurs represent 56.77% of the entrepreneurs in the study. The wealth differences observed among the countries in the study also affect entrepreneurial opportunities. In countries with high levels of wealth inequality, the majority of resources may be concentrated in the hands of a few individuals or groups, leading to significant disadvantages for the rest of the entrepreneurial population in terms of access to resources in order to internationalize.

Of all entrepreneurs, 42.5% are women, and 57.5% are men. The average age of these entrepreneurs is 37 years old. Regarding their educational attainment, only 7.65% of individuals have attained higher education, while 30.08% have attained post-secondary education. In contrast, the majority (62.27%) have lower levels of education, such as some secondary education, a secondary degree, or no education at all.

## Table 9 Descriptive statistics and correlation matrix

| VARIABLES | Mean | SD | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) EO | 0.107 | 0.309 | 1 | | | | | | | | | | | | | | | | | | |
| (2) Informal investors | 0.070 | 0.055 | **-0.03** | 1 | | | | | | | | | | | | | | | | | |
| (3) Rule of law | 0.262 | 0.894 | **0.11** | **-0.23** | 1 | | | | | | | | | | | | | | | | |
| (4) Gender | 0.425 | 0.494 | **-0.07** | **0.03** | **-0.06** | 1 | | | | | | | | | | | | | | | |
| (5) Industry | 3 | 1 | **-0.03** | **0.01** | **-0.08** | **0.18** | 1 | | | | | | | | | | | | | | |
| (6) Age | 37 | 11.242 | 0 | **-0.1** | **0.17** | 0 | **-0.07** | 1 | | | | | | | | | | | | | |
| (7) Education | 2.034 | 1.127 | **0.1** | **-0.15** | **0.32** | **-0.07** | **0** | **-0.01** | 1 | | | | | | | | | | | | |
| (8) Household income | 2.177 | 0.810 | **0.05** | **0** | 0.06 | **-0.11** | **-0.03** | **0.01** | **0.25** | 1 | | | | | | | | | | | |
| (9) Serial experience | 0.036 | 0.187 | **0.06** | **0.07** | **-0.03** | **-0.02** | **0.01** | **-0.02** | 0 | 0 | 1 | | | | | | | | | | |
| (10) Portfolio experience | 0.022 | 0.148 | **0.03** | **0.01** | **0.02** | **-0.03** | **-0.01** | **0.04** | **0.02** | **0.05** | **0.02** | 1 | | | | | | | | | |
| (11) Invest. Experience | 0.124 | 0.330 | **0.08** | **0.18** | **-0.01** | **-0.07** | **-0.01** | **-0.04** | **0.05** | **0.08** | **0.14** | **0.06** | 1 | | | | | | | | |
| (12) Know entrepreneur | 0.680 | 0.466 | **0.05** | **0.1** | **0.01** | **-0.07** | **0.03** | **-0.08** | **0.13** | **0.12** | **0.04** | **0.03** | **0.11** | 1 | | | | | | | |
| (13) Self-efficacy | 0.844 | 0.363 | **0.04** | **0.05** | **0.04** | **-0.06** | 0 | 0.01 | **0.08** | **0.08** | **0.02** | **0.03** | **0.05** | **0.16** | 1 | | | | | | |
| (14) Fear of failure | 0.286 | 0.452 | 0 | **-0.04** | **-0.02** | **0.05** | **0.02** | **0.01** | **-0.03** | **-0.07** | **0.04** | **-0.01** | -0.01 | **-0.04** | **-0.17** | 1 | | | | | |
| (15) Perceived opport. | 0.615 | 0.487 | **0.03** | **0.14** | **-0.06** | **-0.02** | **0.03** | **-0.08** | **-0.01** | **0.04** | **0.03** | **0.02** | **0.06** | **0.17** | **0.15** | **-0.09** | 1 | | | | |
| (16) Venture Size | 0.897 | 0.973 | **0.18** | **0.03** | **0.07** | **-0.16** | **-0.09** | 0.01 | **0.18** | **0.17** | **0.07** | **0.05** | **0.15** | **0.1** | **0.05** | **-0.02** | **0.04** | 1 | | | |
| (17) GDP per capita | 23,617 | 0.880 | **0.14** | **-0.45** | **0.75** | **-0.09** | **-0.06** | **0.18** | **0.4** | **0.06** | **-0.03** | 0 | **-0.04** | -0.01 | **0.02** | 0.01 | **-0.1** | **0.15** | 1 | | |
| (18) GDP growth | 2.822 | 3.758 | **-0.03** | **0.15** | **-0.22** | **0.02** | **0.02** | **-0.06** | **-0.1** | **-0.02** | **0.01** | 0.01 | **0.03** | 0 | **-0.05** | **-0.03** | **0.09** | **0.03** | **-0.3** | 1 | |
| (19) Population growth | 1.161 | 1.007 | 0 | **0.42** | **-0.31** | 0.01 | **0.05** | **-0.11** | **-0.2** | **-0.05** | **0.06** | **0.02** | **0.07** | **0.03** | **0.03** | **-0.03** | **0.13** | **0.03** | **-0.38** | **0.19** | 1 |

*Notes:* Correlation coefficients displayed in bold are significant at 0.1%

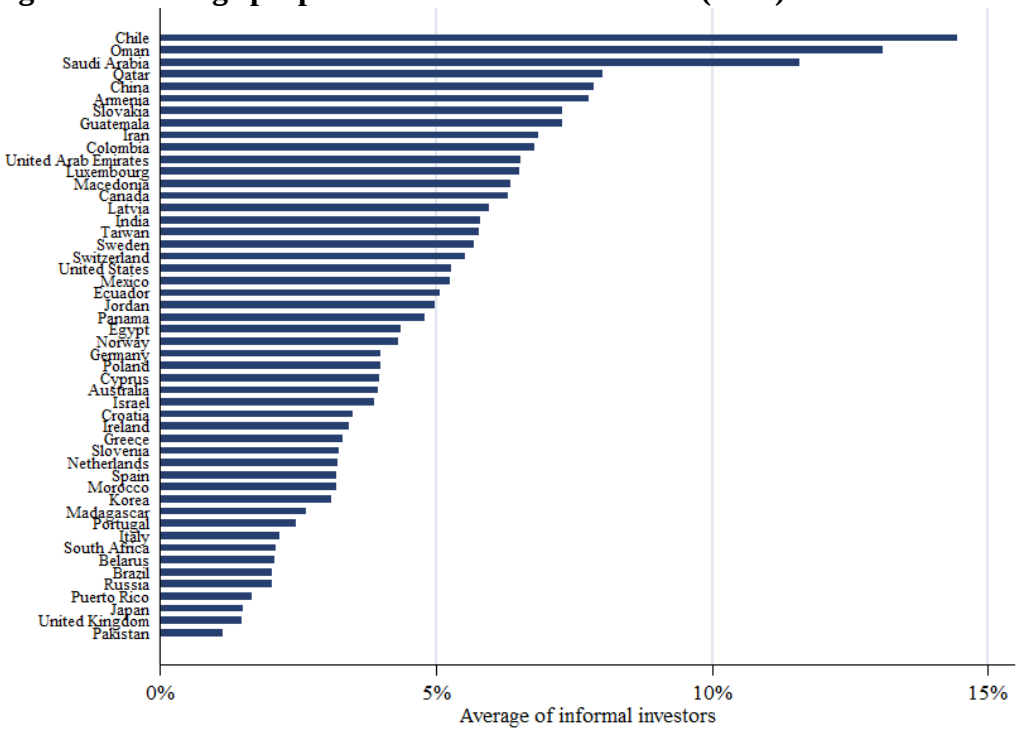
Only a small percentage of entrepreneurs, 12.4%, have previous experience as business angels, indicating that most of the sample has not provided funds for any other new business in the past. Despite this, 61.5% of the respondents believe that there will be good opportunities for starting a business within the next six months. However, 28.6% of entrepreneurs reported that their fear of failure would prevent them from starting a business, although 84.4% believe they have the necessary skills and experience to undertake entrepreneurial activities.

When considering their entrepreneurial experience, only 3.6% of the entrepreneurs in the sample have serial experience, and 2.2% have portfolio experience. On the other hand, their entrepreneurial networks appear to be more extensive; 68% of the entrepreneurs reported that they know another entrepreneur.

On a country-level basis, the average proportion of informal investors is 7%, with a standard deviation of 0.05, which aligns with previous research (De Clercq et al., 2012). However, there is considerable variation among countries. For instance, some countries such as Brazil, Italy, Japan, and Pakistan have relatively low levels of informal investor activity. In contrast, other countries such as Chile, Saudi Arabia, Qatar have more than 10% of their population involved as informal investors. This disparity in the presence of informal investors reflects differences in access to financial resources, whereby informal investors support entrepreneurial activities in the absence or with weak access to formal financing. To provide a broader perspective, the United Kingdom, the United States, and Spain have average proportions of 1.5%, 5.3%, and 3.2%, respectively. Figure 12 highlights the average of informal investor activity across some of the other countries in the study.

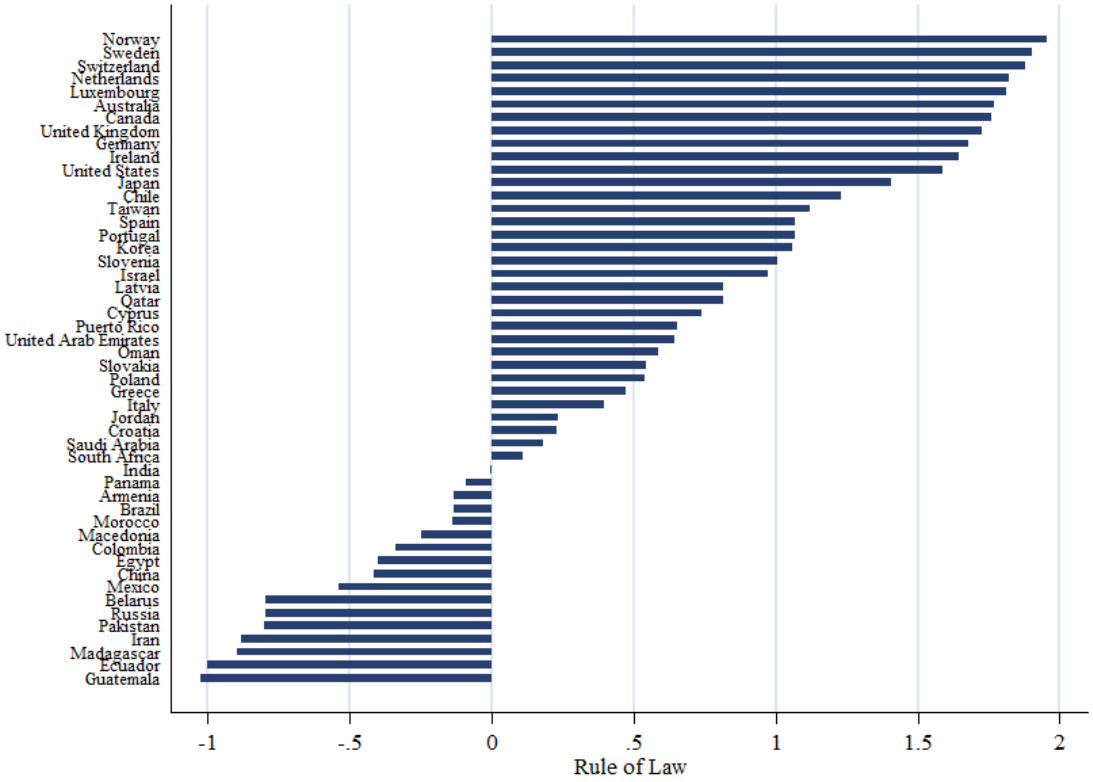
The extent to which countries enforce their laws differs greatly. This can be measured using an indicator that ranges from -2.5 to 2.5, with an average score of 0.26 and a standard deviation of 0.89. In the sample of countries studied, Iran, Guatemala, Ecuador had some of the weakest levels of the rule of law. On the other hand, Denmark, Sweden, Norway, Finland, Switzerland had the some of the strongest levels of the rule of law. Countries with weak rules of law may have high levels of corruption, lack of property rights, and inefficient legal systems, making it challenging for new ventures to enter the market and thrive. In contrast, countries with strong rule of law provide a more stable and predictable business environment, making it easier for new ventures to internationalize. Figure 13 illustrates the average of rule of country enforcement across different countries.

**Figure 12 Average proportion of informal investors (2019)**




Source: Author with data from the Adult Population Survey - GEM
*Data of the year 2019, presenting selected countries from the total sample under study

**Figure 13 Rule of Law enforcement across different countries (average 2019)**




Source: Author with data from the World Governance Indicators
*Data of the year 2019, presenting selected countries from the total sample under study

When it comes to the control variables at the country level, the average per capita GDP is USD 23,618, with a range from the lowest annual income of USD 1,387 to the highest of USD 116,284. In the total sample of countries studied, the average per capita GDP growth rate was 2.82%, and the average annual population growth rate was 1.16%.

### 4.4.2 Multilevel model results

Table 10 displays the outcomes of the multilevel logistic random intercept models that predict entrepreneurial export orientation. The analysis also focuses on wealth inequality, and the results are presented separately in Table 11 for wealthier entrepreneurs (in Models 1A to 5A) and lower-wealth entrepreneurs (in Models 1B to 5B). Models 1 to 5 show the results for all entrepreneurs, without distinguishing between wealthier and lower-wealth. entrepreneurs.

In Model (1), all the independent control variables are included to predict the likelihood of a firm engaging in international trade activities. The results indicate that female entrepreneurs are less likely to be export-oriented, and this factor is significant. Additionally, the age of the entrepreneur has a negative relationship with entrepreneurial export orientation, suggesting that older entrepreneurs are less likely to engage in export-oriented activities.

Factors related to the entrepreneurs' human capital, such as higher education, serial entrepreneurial experience, and portfolio entrepreneurial experience, are significant predictors of new ventures' internationalization. Furthermore, regarding socio-cognitive traits, alertness to opportunities contributes more strongly to predicting export orientation than entrepreneurial self-efficacy and fear of failure, which are also positively related to predicting EO.

Entrepreneurs' networks, personal experience as an informal investor, and firm size are individual factors positively related to new businesses focused on exporting and rapid internationalization.

When analysing the split sample for wealth inequality, as presented in Table 11, all of the individual factors that were significant in the overall analysis remained significant for both samples except for socio-cognitive variables, which were not significant for wealthier entrepreneurs, as presented in Models (1A) and (1B).

## Table 10 Multilevel logistic random intercept model predicting new venture's export orientation - Total sample

| VARIABLES | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***Country-level predictor*** | | | | | |
| Informal investors | | 1.380** | | 1.439** | 1.409** |
| | | (0.696) | | (0.697) | (0.697) |
| ***Moderator*** | | | | | |
| Rule of Law | | | 0.291*** | 0.296*** | 0.387*** |
| | | | (0.095) | (0.095) | (0.106) |
| ***Cross-level interactions*** | | | | | |
| Informal investors*Rule of Law | | | | | -1.461** |
| | | | | | (0.744) |
| ***Control Variables*** | | | | | |
| Gender | -0.123*** | -0.123*** | -0.123*** | -0.124*** | -0.124*** |
| | (0.027) | (0.027) | (0.027) | (0.027) | (0.027) |
| Age | -0.034*** | -0.034*** | -0.034*** | -0.034*** | -0.034*** |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| Age square | 0.000*** | 0.000*** | 0.000*** | 0.000*** | 0.000*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Secondary education | 0.010 | 0.011 | 0.011 | 0.011 | 0.012 |
| | (0.060) | (0.060) | (0.060) | (0.060) | (0.060) |
| Secondary degree | 0.122** | 0.122** | 0.123** | 0.123** | 0.123** |
| | (0.056) | (0.056) | (0.056) | (0.056) | (0.056) |
| Post-secondary | 0.118** | 0.116** | 0.121** | 0.118** | 0.117** |
| | (0.056) | (0.056) | (0.056) | (0.056) | (0.056) |
| Graduate experience | 0.318*** | 0.316*** | 0.318*** | 0.317*** | 0.316*** |
| | (0.066) | (0.066) | (0.066) | (0.066) | (0.066) |
| Mid Income | -0.053 | -0.053 | -0.051 | -0.052 | -0.052 |
| | (0.036) | (0.036) | (0.036) | (0.036) | (0.036) |
| High Income | 0.059* | 0.060* | 0.059* | 0.060* | 0.061* |
| | (0.034) | (0.034) | (0.034) | (0.034) | (0.034) |
| Serial experience | 0.377*** | 0.372*** | 0.378*** | 0.373*** | 0.370*** |
| | (0.057) | (0.057) | (0.057) | (0.057) | (0.057) |
| Portfolio experience | 0.369*** | 0.369*** | 0.366*** | 0.366*** | 0.367*** |
| | (0.071) | (0.071) | (0.071) | (0.071) | (0.071) |
| Invest.experience | 0.382*** | 0.375*** | 0.382*** | 0.375*** | 0.375*** |
| | (0.034) | (0.034) | (0.034) | (0.034) | (0.034) |
| Know entrepreneur | 0.116*** | 0.115*** | 0.115*** | 0.114*** | 0.114*** |
| | (0.029) | (0.029) | (0.029) | (0.029) | (0.029) |
| Self-efficacy | 0.067* | 0.067* | 0.066* | 0.066* | 0.066* |
| | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) |
| Perceived opportunity | 0.136*** | 0.136*** | 0.135*** | 0.135*** | 0.135*** |
| | (0.028) | (0.028) | (0.028) | (0.028) | (0.028) |
| Fear of failure | 0.079*** | 0.078*** | 0.079*** | 0.079*** | 0.079*** |
| | (0.029) | (0.029) | (0.029) | (0.029) | (0.029) |
| Venture Size (ln) | 0.335*** | 0.335*** | 0.336*** | 0.335*** | 0.335*** |
| | (0.012) | (0.012) | (0.012) | (0.012) | (0.012) |
| GDP PPP(ln) | 0.518*** | 0.540*** | 0.325*** | 0.345*** | 0.341*** |
| | (0.076) | (0.076) | (0.098) | (0.098) | (0.098) |
| GDP Growth | 0.011** | 0.010* | 0.012** | 0.010* | 0.010* |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| Population growth | -0.042** | -0.047** | -0.032* | -0.036* | -0.034* |
| | (0.018) | (0.018) | (0.019) | (0.019) | (0.019) |
| Intercept | -7.172*** | -7.440*** | -5.419*** | -5.669*** | -5.667*** |
| | (0.756) | (0.765) | (0.941) | (0.948) | (0.947) |
| Years Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| LR vs. linear model | 2,972 | 2,967 | 2,976 | 2,966 | 2,877 |
| Wald Chi-square | 2,032 | 2,036 | 2,038 | 2,042 | 2,047 |
| Prob > chi2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Log-likelihood | 22,877 | 22,875 | 22,873 | 22,870 | 22,869 |
| Akaike crit. (AIC) | 45,835 | 45,833 | 45,827 | 45,825 | 45,823 |
| Degrees of Freedom | 40 | 41 | 41 | 42 | 43 |
| Intraclass corr. coeff. | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Observations | 78,368 | 78,368 | 78,368 | 78,368 | 78,368 |
| Number of groups | 110 | 110 | 110 | 110 | 110 |

Yes[i], to denote that the model includes Year Fixed Effects, Industry Fixed Effects for the different years, from 2005 to 2020.
*Notes:* Reported values are non-standardized β coefficients. Robust standard errors are given in parentheses. AIC is Akaike's information criterion = $2k - 2$ x (log likelihood), where indicates the degrees of freedom. *$p < 0.10$, **$p < 0.05$, ***$p < 0.001$; two-tailed significance. The spatial controls are included in all the models.

## Table 11 Multilevel logistic random intercept model predicting new venture's export orientation – Wealth inequality

| | Wealthier entrepreneurs | | | | | Lower-wealth entrepreneurs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **VARIABLES** | **(1A)** | **(2A)** | **(3A)** | **(4A)** | **(5A)** | **(1B)** | **(2B)** | **(3B)** | **(4B)** | **(5B)** |
| ***Country-level predictor*** | | | | | | | | | | |
| Informal investors | | 0.368 | | 0.341 | 0.341 | | 2.155** | | 2.171** | 1.939** |
| | | -0.934 | | (0.936) | (0.936) | | (0.964) | | (0.964) | (0.966) |
| ***Moderator*** | | | | | | | | | | |
| Rule of Law | | | 0.288*** | 0.287*** | 0.281** | | | 0.170 | 0.173 | 0.353*** |
| | | | (0.105) | (0.105) | (0.121) | | | (0.117) | (0.118) | (0.134) |
| ***Cross-level interactions*** | | | | | | | | | | |
| Informal investors*Rule of Law | | | | | 0.103 | | | | | -2.935*** |
| | | | | | (1.000) | | | | | (1.041) |
| ***Control Variables*** | | | | | | | | | | |
| Gender | -0.160*** | -0.160*** | -0.161*** | -0.161*** | -0.161*** | -0.078** | -0.079** | -0.079** | -0.079** | -0.081** |
| | (0.039) | -0.039 | (0.039) | (0.039) | (0.039) | (0.037) | (0.037) | (0.037) | (0.037) | (0.037) |
| Age | -0.042*** | -0.042*** | -0.042*** | -0.042*** | -0.042*** | -0.025** | -0.026** | -0.025** | -0.026** | -0.026** |
| | (0.011) | -0.011 | (0.011) | (0.011) | (0.011) | (0.010) | (0.010) | (0.010) | (0.010) | (0.010) |
| Age square | 0.001*** | 0.001*** | 0.001*** | 0.001*** | 0.001*** | 0.000** | 0.000** | 0.000** | 0.000** | 0.000** |
| | (0.000) | 0 | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Secondary education | -0.038 | -0.038 | -0.033 | -0.033 | -0.033 | 0.008 | 0.009 | 0.009 | 0.010 | 0.011 |
| | (0.106) | -0.106 | (0.106) | (0.106) | (0.106) | (0.074) | (0.074) | (0.074) | (0.074) | (0.074) |
| Secondary degree | 0.048 | 0.049 | 0.055 | 0.055 | 0.055 | 0.132* | 0.132* | 0.133* | 0.133* | 0.133* |
| | (0.097) | -0.097 | (0.097) | (0.097) | (0.097) | (0.069) | (0.069) | (0.069) | (0.069) | (0.069) |
| Post-secondary | 0.093 | 0.093 | 0.102 | 0.101 | 0.101 | 0.082 | 0.079 | 0.084 | 0.081 | 0.077 |
| | (0.097) | -0.097 | (0.097) | (0.097) | (0.097) | (0.072) | (0.072) | (0.072) | (0.072) | (0.072) |
| Graduate experience | 0.319*** | 0.319*** | 0.324*** | 0.323*** | 0.323*** | 0.250*** | 0.248*** | 0.250*** | 0.248*** | 0.247*** |
| | (0.105) | -0.105 | (0.105) | (0.105) | (0.105) | (0.092) | (0.092) | (0.092) | (0.092) | (0.092) |
| Serial experience | 0.271*** | 0.270*** | 0.272*** | 0.271*** | 0.271*** | 0.476*** | 0.466*** | 0.477*** | 0.467*** | 0.461*** |
| | (0.083) | -0.083 | (0.083) | (0.083) | (0.083) | (0.080) | (0.080) | (0.080) | (0.080) | (0.080) |
| Portfolio experience | 0.344*** | 0.343*** | 0.341*** | 0.341*** | 0.341*** | 0.398*** | 0.399*** | 0.396*** | 0.397*** | 0.400*** |
| | (0.091) | -0.091 | (0.091) | (0.091) | (0.091) | (0.115) | (0.115) | (0.115) | (0.115) | (0.115) |
| Investment experience | 0.372*** | 0.370*** | 0.372*** | 0.371*** | 0.370*** | 0.381*** | 0.369*** | 0.382*** | 0.370*** | 0.369*** |
| | (0.045) | -0.045 | (0.045) | (0.045) | (0.045) | (0.052) | (0.053) | (0.052) | (0.053) | (0.053) |
| Know entrepreneur | 0.115*** | 0.115*** | 0.114*** | 0.114*** | 0.114*** | 0.109*** | 0.108*** | 0.109*** | 0.107*** | 0.107*** |
| | (0.043) | -0.043 | (0.043) | (0.043) | (0.043) | (0.040) | (0.040) | (0.040) | (0.040) | (0.040) |
| Self-efficacy | 0.036 | 0.036 | 0.035 | 0.035 | 0.035 | 0.088* | 0.089* | 0.088* | 0.088* | 0.088* |
| | (0.059) | -0.059 | (0.059) | (0.059) | (0.059) | (0.053) | (0.053) | (0.053) | (0.053) | (0.053) |
| Perceived opportunity | 0.084** | 0.084** | 0.083** | 0.083** | 0.083** | 0.200*** | 0.199*** | 0.199*** | 0.198*** | 0.199*** |
| | (0.039) | -0.039 | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) |
| Fear of failure | 0.037 | 0.037 | 0.038 | 0.038 | 0.038 | 0.107*** | 0.106*** | 0.107*** | 0.106*** | 0.108*** |
| | (0.042) | -0.042 | (0.042) | (0.042) | (0.042) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) |
| Venture Size (ln) | 0.291*** | 0.291*** | 0.292*** | 0.292*** | 0.292*** | 0.385*** | 0.384*** | 0.386*** | 0.384*** | 0.384*** |
| | (0.016) | -0.016 | (0.016) | (0.016) | (0.016) | (0.018) | (0.018) | (0.018) | (0.018) | (0.018) |
| GDP PPP(ln) | 0.413*** | 0.419*** | 0.214** | 0.220** | 0.220** | 0.586*** | 0.625*** | 0.468*** | 0.505*** | 0.500*** |
| | (0.075) | -0.077 | (0.104) | (0.106) | (0.106) | (0.089) | (0.090) | (0.119) | (0.120) | (0.120) |
| GDP Growth | 0.015* | 0.014* | 0.015* | 0.014* | 0.014* | 0.008 | 0.006 | 0.008 | 0.006 | 0.005 |
| | (0.008) | -0.008 | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Population growth | -0.039 | -0.041 | -0.031 | -0.033 | -0.033 | -0.032 | -0.040* | -0.025 | -0.033 | -0.028 |
| | (0.032) | -0.032 | (0.032) | (0.033) | (0.033) | (0.023) | (0.023) | (0.023) | (0.023) | (0.023) |
| Intercept | -5.685*** | -5.760*** | -3.875*** | -3.947*** | -3.942*** | -8.272*** | -8.734*** | -7.199*** | -7.646*** | -7.672*** |
| | (0.780) | -0.802 | (1.019) | (1.038) | (1.039) | (0.896) | (0.920) | (1.154) | (1.171) | (1.171) |
| Years Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| LR vs. linear model | 1,210 | 1,208 | 1,218 | 1,215 | 1,190 | 1,615 | 1,614 | 1,611 | 1,605 | 1,538 |
| Wald Chi-square | 876 | 876 | 882 | 882 | 882 | 1,104 | 1,108 | 1,107 | 1,110 | 1,118 |
| Prob > chi2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Log-likelihood | 11,285 | 11,284 | 11,281 | 11,281 | 1,190 | 11,584 | 11,582 | 11,583 | 11,580 | 11,576 |
| Akaike crit. (AIC) | 22,645 | 22,647 | 22,639 | 22,641 | 22,643 | 23,244 | 23,241 | 23,244 | 23,241 | 23,235 |
| Degrees of Freedom | 38 | 39 | 39 | 40 | 41 | 38 | 39 | 39 | 40 | 41 |
| Intraclass corr. coeff. | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| Observations | 33,879 | 33,879 | 33,879 | 33,879 | 33,879 | 44,489 | 44,489 | 44,489 | 44,489 | 44,489 |
| Number of groups | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |

Yes[i], to denote that the model includes Year Fixed Effects, Industry Fixed Effects and Income Fixed Effects for the different years, from 2005 to 2016.

*Notes:* Reported values are non-standardized β coefficients. Robust standard errors are given in parentheses. AIC is Akaike's information criterion = $2k - 2$ x (log likelihood), where indicates the degrees of freedom. *$p < 0.10$, **$p < 0.05$, ***$p < 0.001$; two-tailed significance. The spatial controls are included in all the models.

At the country level, higher GDP per capita PPP and GDP growth are significant factors that increase the likelihood of entrepreneurs having a higher likelihood of being export-oriented. However, these country-control variables are not significant in the models focusing on wealth inequality as predicting factors related to rapid internationalization.

Model (2) results assist in evaluating hypothesis 1, exploring the role of a country's density of informal investors. With these results, the study fails to reject the formulation of the hypothesis. New ventures are more likely to be export oriented in countries with a higher proportion of informal investors. From a practical perspective, this result suggests that entrepreneurs who have access to informal investors in their country may be better positioned to develop and expand their export activities. Informal investors can provide valuable financial resources, expertise, and networks that can help entrepreneurs overcome the challenges associated with entering foreign markets. Thus, entrepreneurs could benefit from seeking out and building relationships with informal investors to increase their export orientation.

However, when the focus is on exploring the relationship between wealth inequality and the presence of informal investors, the significance of informal investors in a country is less relevant for wealthier entrepreneurs, as indicated by the smaller and not significant coefficient in Model (2A). On the other hand, in Model (2B), the coefficient is larger and significant. This suggests that lower-wealth export-oriented entrepreneurs rely more on the availability of informal investors in their country. These contrasting results between wealthier and lower-wealth entrepreneurs helps to illustrate the formulation of hypothesis 4. Therefore, lower-wealth entrepreneurs are more likely to rely on informal sources of investment for internationalization than wealthier entrepreneurs, for whom this factor is not significant for internationalization since they might have access to other financial sources given their wealthier position.

Model (3) results insist on the formulation established on hypothesis 2 regarding a country's rule of law enforcement in predicting export-oriented new ventures. This Model tests the direct effect of developing activities in an environment that provides a stable and predictable legal framework that reduces uncertainty and risk for new ventures. As expected, entrepreneurs operating in such an environment are more likely to engage in internationalization, as their business environment safeguards property rights, enforces contracts, and ensures fair business competition.

All these desirable attributes to be found in a favourable environment towards early internationalization are perceived differently depending on the entrepreneurs' wealth. This is evident in Model (3A), showing that a country's rule of law is a significant variable to explore for wealthier entrepreneurs. However, Model (3B) highlights that lower-wealth entrepreneurs seem unaffected by their country's rule of law as an explanatory variable for internationalization. These results provide evidence for formulating hypothesis 5, exploring how reliant entrepreneurs are on their country's rule of law depending on their wealth.

Hypotheses 4 and 5 emphasize the distinct entrepreneurial needs that arise from different wealth backgrounds regarding early internationalization. Additional evidence can be observed in Models (4A) and (4B), having both predictors in the Model, but only one significant depending on the entrepreneurs' wealth. Wealthier entrepreneurs benefit more from being located in an environment with a stricter rule of law enforcement. In contrast, they may not require the proximity of a larger stock of informal investors for internationalization. In contrast, lower-wealth entrepreneurs heavily rely on informal sources of financing and may not necessarily require strict enforcement of the law for their internationalization.

Finally, Model (5) evaluates the interaction effect of these two country variables, explicitly exploring the moderating role of the rule of law on the presence of informal investors, as proposed by hypothesis 3. The reporting results present a negative interaction coefficient, suggesting that while having a high proportion of informal investors is generally beneficial for export-oriented new ventures, this effect is reduced in countries where the rule of law is strict.

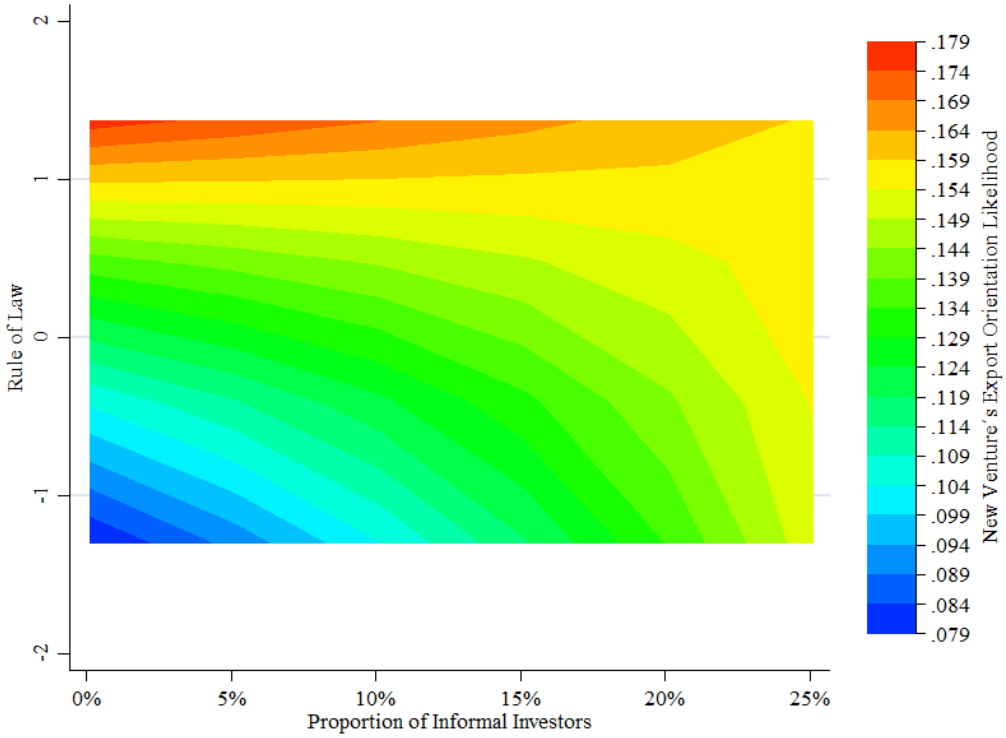
There could be several reasons for this result. One possibility is that in countries with a strong rule of law, other funding sources may be more accessible to new ventures. As a result, the impact of informal investors may be less significant in these countries. Additionally, in countries with strong rule of law, the regulatory environment may be more favourable for early internationalization, making it easier for them to succeed without significant investment from informal investors.

In contrast, in countries with a weak rule of law, the impact of informal investors may be more pronounced, as new ventures may have fewer alternative funding options and face more regulatory barriers. As a result, the relationship between the proportion of informal investors and export-oriented new ventures may be stronger in these countries.

Overall, this analysis suggests that while the proportion of informal investors is generally beneficial for internationalization, the impact of this variable may vary depending on the level

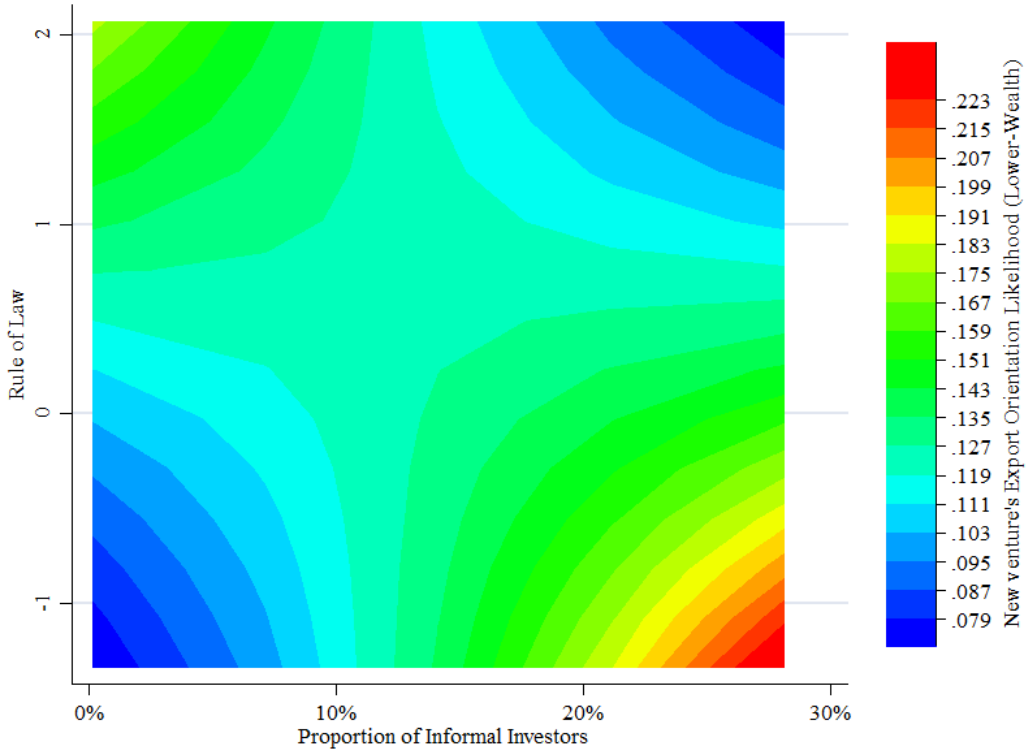
of rule of law in a given country. Finally, Figure 14 graphically presents the resulting outcome of the different variations as formulated in hypothesis 3.

**Figure 14 Moderating effect of a country's Rule of Law on the relationship between informal investors and new venture's export orientation**




However, further exploring wealth inequality, the results also evidence differences between wealthier and lower-wealth entrepreneurs, as suggested by hypothesis 6. Model (5A) exhibits that the interaction effect is not significant for wealthy entrepreneurs. The only significant variable for this set of entrepreneurs is a context ensuring the enforcement of the rule of law. On the contrary, Model (5B) shows that the results from the full sample apply to them. In other words, the results suggest that for lower-wealth entrepreneurs, a high proportion of informal investors is typically advantageous for export-oriented new ventures. Nevertheless, this advantage is less significant in countries where the rule of law enforcement is strong. Figure 15 illustrates this relationship.

**Figure 15 Moderating effect of a country's Rule of Law on the relationship between informal investors and new venture's export orientation (Lower-wealth entrepreneurs)**




### 4.4.3 Robustness checks

To ensure the robustness of the findings, an analysis was conducted using a logarithmic regression for the two datasets. The results were similar to those obtained using multilevel logistic regression models, but the data were less precise when using the logarithmic regression.

It was also tested for high-export oriented new ventures, which are entrepreneurs with more than 75% of their customers abroad (De Clercq et al., 2008). The results for these entrepreneurs were consistent with the findings, but the availability of informal investors as a predictor factor was less relevant.

Additionally, other country governance indicators were examined, and found that the direction of the results was consistent. However, the study focused on the Rule of Law indicator as it provided the most relevant contextual information for international trade related to entrepreneurial activities.

Finally, the study tested the results for wealth inequality among lower-wealth entrepreneurs, specifically those in the low-income and middle-income categories. No significant differences were observed in this more meticulous stratification, so the study

employed two samples to be analysed: one consisting of wealthier entrepreneurs (high-income), and another consisting of lower-wealth entrepreneurs (low-income and middle-income).

## 4.5 Discussion

### 4.5.1 Key Findings

This study provides valuable insights into the factors that influence entrepreneurial export orientation. The findings suggest that a country's rule of law and the existence of informal investors are important predictors of entrepreneurial export orientation, but their interaction is complex. Additionally, the findings suggest that the impact of these factors varies depending on the entrepreneur's wealth. These results have practical implications for entrepreneurs and policymakers and theoretical implications for future entrepreneurship research (Paul & Rialp, 2020).

As expected, the research has shown that countries with stronger rule of law promote international trade and support the internationalization of new ventures. However, entrepreneurs from various countries often face challenges when attempting to engage in international trade, particularly if they are based in countries with weaker institutional contexts that exhibit lower levels of rule of law (D'Ingiullo et al., 2023; Levie & Autio, 2011). This finding stresses the need to support entrepreneurship in countries facing these challenges, which could translate to difficulties in enforcing contracts, weak intellectual property protection, red tape obstacles, or even difficulties accessing capital.

This study consolidates the previous finding by complementing it with analysing informal investors' presence in a context as a factor stimulating international trade. Consequently, it highlights the relevance of acknowledging the contribution of informal investors to encourage entrepreneurship and advance international trade, particularly in countries characterized by a weaker rule of law. Despite being frequently relegated in conversations about entrepreneurial internationalization, informal investors such as business angels, family, and friends play a critical role in fostering the growth of new ventures and supporting their expansion into international markets (De Clercq et al., 2012). The importance of these investors is rooted in their relationship with the entrepreneur, which is not limited to providing funding but extends to cultivating a stronger connection with them, knowledge sharing, expertise, and networks (Landström & Mason, 2016; Qin et al., 2022). This relationship is often based on friendships or family bonds (Korosteleva & Mickiewicz, 2011),

which can translate into the investors' active involvement in the new venture (Kerr et al., 2014).

Then, an additional analysis layer is added to consider the interplay of these two contextual factors, the presence of informal investors and the enforcement of the rule of law, by exploring different entrepreneurial wealth levels. The findings suggest that entrepreneurs shape their strategies according to their immediate needs.

This distinction implies the existence of different entrepreneurial needs emerging from varying wealth levels. As revealed by previous entrepreneurial literature, the primary distinguishing factor among these needs is the accessibility to financial liquidity, identified as a constraint for lower-wealth entrepreneurs, particularly during the initial phases of business establishment. However, once they overcome this hurdle, they have the potential to achieve performance levels similar to wealthier entrepreneurs. Nonetheless, literature has also highlighted that a gap in returns and growth exists between lower-wealth and wealthier entrepreneurs due to the latter's capacity to invest more personal funds (Frid et al., 2016). This financial advantage provides them with greater opportunities, including enhanced market visibility, technological adoption, a higher risk tolerance, and overall ease of expansion.

A comparable tendency emerges when considering these differential needs in entrepreneurial export orientation. The desire to choose export-oriented strategies is prevalent across all wealth levels, but financial restrictions are more pronounced for lower-wealth entrepreneurs. Consequently, this study identifies the presence of informal investors as a means for lower-wealth entrepreneurs to overcome these financial constraints due to their enhanced assistance in promoting their internationalization.

For wealthier entrepreneurs who aim to expand their business internationally or engage in complex legal arrangements abroad, having sufficient financial capital is likely already assured. However, having well-established and enforced legal frameworks, contracts, and property rights holds greater urgency for them. These predictability and legal protection elements become particularly beneficial, given their involvement in intricate and costly business activities due to exposure to international markets. Conversely, the lack of significance of informal investors for wealthier entrepreneurs stands, opposing to the pivotal role of the robust rule of law structures in driving their export-oriented endeavours.

In a contrasting situation, the impact on lower-wealth entrepreneurs by the presence of informal investors becomes substantial in facilitating their internationalization efforts, overshadowing the influence of the regulatory environment. This finding suggests that a significant enabler of internationalization for lower-wealth entrepreneurs centres on first

solving their financial constraints. However, developing their activities in a stricter environment of the rule of law enforcement does not influence their export behaviour. This could indicate that the type of international activities they embark on might rely less on the predictability of legal frameworks.

This research's significance lies in its comprehensive examination of the multifaceted dynamics influencing entrepreneurial export orientation. By disentangling the interplay between informal investors, a country's rule of law, and entrepreneurial wealth, the study presents pathways for lower-wealth entrepreneurs to overcome financial constraints and facilitates informed decision-making for wealthier entrepreneurs engaged in complex international endeavours.

### 4.5.2 Policy implications

The findings of this research have important implications for encouraging entrepreneurship and facilitating international trade, especially for entrepreneurs facing financial limitations. The research suggests that lower-wealth entrepreneurs may rely more on informal investors to support their export-orientation efforts (Pathak & Muralidharan, 2018). In contrast, wealthier entrepreneurs may be more influenced by the strength of a country's rule of law. Addressing these different entrepreneurial needs towards enhancing their likelihood of internationalization would simultaneously promote inclusive economic growth.

Therefore, policies aimed at fostering entrepreneurship and international trade should take into account the distinct requirements of entrepreneurs across diverse economic backgrounds. These policies should work towards establishing a supportive ecosystem that outfits to the specific needs of all entrepreneurs, ensuring that their varied requirements are met effectively (Bapuji et al., 2020).

For lower-wealth entrepreneurs, the research suggests that informal investors can play a critical role in supporting their export-orientation efforts. In addition, informal investors may be more willing to invest in new ventures with limited financial resources and may provide valuable mentorship and guidance to entrepreneurs. Hence, policies promoting entrepreneurship and international trade should aim to create an enabling environment for informal investors (Maula et al., 2005), which could include reducing regulatory investment barriers, enhancing access to capital, providing tax incentives for these investors, and facilitating information sharing, like creating online platforms for crowding investment opportunities or establishing investor networks (Prokop & Wang, 2022).

Another relevant aspect for policymakers to consider concerning informal investors is the need for a more accurate depiction and comprehensive understanding of the characteristics of existing informal investors within the country. As indicated in this research, certain informal investors—predominantly in developed economies—have adopted a more sophisticated investment approach (Cumming & Zhang, 2019; Edelman et al., 2017). However, it is important to note that in the rest of the economies, most informal investors possess limited experience in entrepreneurial activities, potentially resulting in less substantial assistance or support for entrepreneurs.

For wealthier entrepreneurs, the strength of a country's rule of law may be a more significant factor in promoting export orientation. Wealthier entrepreneurs may have greater access to capital and resources, but may be deterred from engaging in international trade if they perceive that the institutional environment is not strong and stable. Therefore, policies promoting entrepreneurship and international trade should strengthen the institutional environment, taking action on specific areas, such as improving intellectual property protection and contract enforcement (Kaufmann et al., 2011).

While the areas mentioned above constitute only a limited scope of potential enhancements within a country's regulatory framework, it would be worth it for policymakers to set a basic guideline for improvement. Their aim should be to establish and adhere to regulations that are harmonized on an international scale. This approach would ensure that the entrepreneurs and businesses within the country can compete on a level playing field in the global arena.

For international entrepreneurship research, this study has detangled the benefits of sensitizing the effects of contextual factors according to the entrepreneurs' different needs, in this case, their different household income levels. Literature in this area could benefit by further exploring the interaction of entrepreneurs with their ecosystem, capturing their intrinsic differences and constraints.

Lastly, it is advisable to seek support from friends and family for entrepreneurs seeking to internationalize their ventures early in their formation, particularly when originating from lower-wealth backgrounds. This research features the positive outcomes observed in similar situations worldwide.

### 4.5.3 Limitations and further research

While the research provides important insights into the relationship between informal investors, a country's rule of law, and export orientation among entrepreneurs, several limitations should be acknowledged.

Firstly, the study is based on cross-sectional data, which limits the ability to assess individual entrepreneurs' changes over time. Future research could utilize a longitudinal design to explore the relationships between these variables over time and to examine the underlying nature of these relationships deeper.

Secondly, the study is limited by the availability of the data used. For example, the measure of informal investment activity is based on self-reported data from entrepreneurs, which may be subject to reporting biases. Future research could incorporate alternative measures of informal investment activity, such as the size and composition of personal networks.

Thirdly, the study focuses on the role of informal investors and a country's rule of law in promoting export orientation among entrepreneurs while it is acknowledged that other important factors may influence internationalization efforts, such as cultural factors and government policies (İpek & Bıçakcıoğlu-Peynirci, 2020). Future research could incorporate additional factors into the analysis to provide a more comprehensive understanding of the determinants of internationalization among entrepreneurs.

Finally, the study is limited by the focus on the dichotomy of wealthy and lower-wealth entrepreneurs, as more nuanced socioeconomic distinctions may affect the impact of informal investors and the rule of law. Future research could explore the impact of other socioeconomic factors such as educational background, family background, or gender.

In summary, while the research provides valuable insights into the relationship between informal investors, a country's rule of law, and export orientation among entrepreneurs, several limitations should be addressed in future research. By addressing these limitations, future research (Paul & Rialp, 2020) can provide a more comprehensive understanding of the determinants of internationalization among entrepreneurs and support the development of policies to foster entrepreneurial activities.

### 4.5.4 Conclusion

The study's findings highlight the intricate relationship between a country's stock of informal investors and the enforcement of the rule of law, in determining the likelihood

emergence of international new ventures. This research contributes to our existing knowledge by deepening the understanding of how these factors interact within a country's entrepreneurial ecosystem. It also highlights that the outcomes can vary based on the context of the entrepreneurs, particularly when considering differences in wealth. A robust rule of law positively influences ventures with an export orientation, while the presence of informal investors significantly supports entrepreneurship and facilitates global market expansion. Interestingly, in the interplay between these two factors, countries with weaker rule of law tend to rely more on informal investors. Furthermore, the study's additional findings regarding the entrepreneur's wealth emphasize the importance of comprehending the contrasting effects of various contextual variables, such as institutional factors, especially when considering sociodemographic difference.

# Chapter 5

# 5 Conclusions

## 5.1 Findings

This research provides valuable insights into the factors influencing entrepreneurial aspirations for growth, innovative entrepreneurship, and export-oriented entrepreneurs. The findings from each chapter contribute to understanding how various factors shape the entrepreneurial landscape and have important implications for entrepreneurs, policymakers, and future entrepreneurship research.

The findings are relevant in fostering high-impact entrepreneurs, who drive innovation, economic growth, and job creation (Davidsson et al., 2006).

Schumpeterian entrepreneurs are known for their role in disrupting the economy through innovation and their pursuit of growth. However, it is important to note that their emergence is greatly influenced by the context in which they operate. To illustrate this point, let's consider two portfolio entrepreneurs operating in different countries.

The first entrepreneur operates in a country where the annual research and development (R&D) investment amounts to around 0.5% of its GDP. On the other hand, the second entrepreneur operates in a country that invests over 4% of its GDP in generating new knowledge. Consequently, the opportunities available to these two entrepreneurs will be vastly different.

As explored in chapter 2, the second entrepreneur, benefiting from a country with higher R&D investment, will have closer access to the latest technological advancements and new knowledge generation. Moreover, their proximity to these innovative ecosystems gives them an advantage by providing access to a broader network of desirable participants typically found in such contexts, including highly skilled human capital, a demanding and dynamic market, sophisticated investors, accelerators, co-working spaces, makerspaces, and educational and research institutions (Autio & Thomas, 2022; Isenberg, 2010).

While the less advantaged entrepreneur can still leverage their resources when growth and expansion opportunities arise, their circumstances will be more constrained. Over time, these differences become more evident at the national level, with consequences over economic growth, as evidence suggests for countries with significant investment in R&D (Gilbert et al., 2020).

However, it is important to not only focus on the amount of R&D expenditure at a national level but also pay attention to the proliferation of portfolio entrepreneurs, since they

are better prepared in recognizing the novelties emerging from new knowledge generation, as it has been unveiled in this study exploring different types of entrepreneurial experience.

The relevance of this chapter analysing these multilevel factors elucidates on its contribution to the Knowledge Spillover Theory of Entrepreneurship (KSTE) (Acs et al., 2009), visibly spotting on the relevance of entrepreneurial experience as a factor enabling new knowledge absorption, while specifying the type of experience that serves as a better channel for this purpose.

If the entrepreneur aims to achieve growth through an innovative strategy, chapter 3 also explores the enabling and hindering factors from a gender perspective. Similar to the previous chapter findings, high-impact entrepreneurs face different circumstances depending on the context of their countries. When attempting to introduce innovation, entrepreneurs often require external financing. However, the availability of financing options varies based on the financial development of their surroundings. Countries with low financial development often have developmental gaps caused by differences in intermediation mechanisms, with financial institutions being significantly more developed than market-based alternatives. Consequently, entrepreneurs in such countries have limited financing options that do not align with the needs of their innovative ventures. The study emphasized the importance of tailored financial alternatives, such as specialized venture capital for high-risk business opportunities, crowdfunding, and business angel syndicates, to support innovative ventures and reduce gender biases (Balachandra et al., 2019; Davis, 2003).

In the discussion of innovation, the study reveals that financial development is crucial but should be aligned with the specific needs of ventures. It is particularly important to consider the direction of financial development. Within the ongoing debate in entrepreneurial studies about enhancing financing accessibility, this study drives us to inquire whether the present structures are indeed optimal for cultivating innovation. For this, it suggests that the focus should shift towards determining the types of financial alternatives best suited for innovative new ventures. Similarly, rather than trying to “fix” female entrepreneurs to improve their chances of accessing sources of financing, the study proposes understanding their unique financial needs and behaviours to propose financing alternatives that better suit them. For example, the chapter highlighted the marginal higher likelihood of female entrepreneurs embarking on innovation, which might be linked to some female traits, such as leadership style and a more collaborative environment of work that promotes the emergence of ideas (Q. Wu et al., 2021) and serve as evidence of female entrepreneurs motivation in building creative new ventures.

On the ongoing conversation of this study's findings on Schumpeterian entrepreneurs, chapter 4 addresses concerns regarding entrepreneurs in less favourable entrepreneurial environments. It suggests that although these entrepreneurs may face constraints, their ability to identify growth opportunities allows them to discover alternative contextual factors to achieve high-impact endeavours. For example, they may seek financing for internationalization from informal sources.

While it is clear that strong rule of law enforcement facilitates internationalization, it is not so clear how entrepreneurs in contexts with weaker legal protection manoeuvre to internationalize. In this aspect, the study reveals that other aspects of the context come into play, with particular emphasis on the significance of informal investors. Building upon the discussion in chapter 3 regarding alternative financing options, the findings in chapter 4 demonstrate that when the necessary conditions are not met (such as low rule of law enforcement), the market provides solutions through informal financing alternatives for entrepreneurial activities to develop.

This study digs into the interaction between two contextual factors in predicting international new ventures. Additionally, the findings highlight how different perceptions toward internationalization emerge based on the entrepreneurs' wealth circumstances.

Overall, this research comprehensively explains how individual and contextual factors shape Schumpeterian entrepreneurs. For their effect on economic growth, these entrepreneurs represent desirable entrepreneurs to cultivate (Estrin et al., 2022). Some of their particular characteristics were presented, as well as the importance of developing an environment that fosters their expansion. Through an extensive exploration of numerous countries, the research uncovered the presence of Schumpeterian entrepreneurs across all of these nations. The study's findings indicate that while certain contextual factors play a role in their widespread occurrence, the individual characteristics possessed by these entrepreneurs also contribute significantly to their ability to engage in high-impact entrepreneurship.

While each study in this research examined whether Schumpeterian entrepreneurs have higher growth aspirations for their new ventures, engage in innovative behaviour, or pursue export-oriented strategies, it is important to note that in practice, entrepreneurs may choose one or a combination of these strategies when developing their ventures (Estrin et al., 2022). This is already an important acknowledgement because it suggests that Schumpeterian entrepreneurs do not follow one single path to achieve their ambitious plans, but could be motivated by different variations of the strategic choices explored in the research,

highlighting the potential interplay of the strategies studies. This finding also implies that among the three studies there are some shared characteristics predicting their likelihood of engaging in high impact entrepreneurship.

Consistently, on an individual level, Schumpeterian entrepreneurs are more likely to arise from individuals with advanced human capital development. This includes individuals with higher educational attainment and those with previous entrepreneurial experience. However, age is negatively associated with this entrepreneurial profile.

Similarly, Schumpeterian entrepreneurs often emerge from individuals who have previous experience as business angels. These individuals tend to perceive good opportunities in their environment, possess connections with other entrepreneurs in their network, and have confidence in their entrepreneurial skills.

However, the impact of certain factors remains less straightforward. Take, for instance, the influence of an entrepreneur's gender. As elucidated in the study, certain personality traits associated with gender can either amplify or diminish their Schumpeterian behaviour. Additionally, the findings reveal conflicting effects when examining the socio-cognitive variable of fear of failure. In some instances, fear of failure prompts Schumpeterian behaviour, such as export orientation, while in others, like growth aspirations, it tends to diminish it. The examination of firm size presents a comparable pattern, underscoring the necessity for a more thorough investigation into refining the understanding of this variable, such as the sensitizing analysis performed in chapter 4. This applies similarly to the income level of the entrepreneurs.

At the contextual level, a recurring theme in this research thesis revolved around the entrepreneurial financial environment. The consistency observed across all the studies highlights the relevance of creating financial frameworks tailored to bolster Schumpeterian entrepreneurs. This entails improved coordination in national R&D investments to attract the participation of Schumpeterian entrepreneurs, the development of financing options aligned with their specific needs, and exploration of avenues for leveraging informal investments to benefit these high-impact entrepreneurs.

While the findings and interconnections in the three study chapters offer valuable insights into the factors influencing Schumpeterian entrepreneurship at both the individual and contextual levels, nurturing these types of entrepreneurs may require a more intricate approach. Nevertheless, this thesis has endeavoured to examine this complexity by investigating three key behaviours associated with Schumpeterian entrepreneurship: the pursuit of higher growth, innovation, and an export orientation focus.

## 5.2 Theoretical and practical implications

### 5.2.1 Theoretical implications

The conclusions of this research have several theoretical implications for the field of entrepreneurship:

Firstly, the research advances in the understanding of entrepreneurial growth aspirations and contributes to the existing body of knowledge on entrepreneurial growth aspirations by highlighting the influence of different types of entrepreneurial experience. The distinction between novice, serial, and portfolio entrepreneurs (Westhead, Ucbasaran, & Wright, 2005; Westhead & Wright, 1998) in shaping growth aspirations provides a nuanced understanding of how prior entrepreneurial experiences impact entrepreneurs' growth aspirations. This enhances theoretical frameworks related to the formation of growth aspirations and contributes to the ongoing discourse on the factors influencing entrepreneurial success (Estrin et al., 2022; Gilbert et al., 2006).

Secondly, the study unveils one of the links connecting a country's new knowledge generation and entrepreneurial activity, as proposed by the Knowledge Spillover Theory of Entrepreneurship (KSTE) (Acs et al., 2009). It accomplishes this by highlighting the role of portfolio entrepreneurs in this process. These entrepreneurs leverage their existing resources and knowledge gained through prior entrepreneurial experiences, enabling them to rapidly bring forth discoveries resulting from research and development (R&D) investments and effectively capitalize on business opportunities in the market.

Thirdly, the study has shed light on unique contributions and characteristics related to feminine traits encouraging innovative entrepreneurship. Specifically, it addresses the relevance of including gendered perspectives in the discussion of entrepreneurial studies and innovation (Cowling et al., 2020), not as something that needs to be fixed, but rather recognizing the differences as valuable information for entrepreneurial research (Ahl & Marlow, 2012; L. Foss et al., 2019). The findings have also highlighted the importance of focusing entrepreneurial financing development studies that adapt to the needs of female entrepreneurs, instead of working solutions on existing financial mechanisms where female entrepreneurs adjust to less favourable financing alternatives (Block et al., 2021)

Fourthly, the study makes a valuable contribution to entrepreneurial finance theory (Cumming et al., 2019) by examining the impact of financial institutions' development on constraining innovative entrepreneurship while emphasizing the effectiveness of market-based financing alternatives in supporting this form of entrepreneurship. It highlights the

significance of recognizing that not all financing options have equal potential for fostering innovation. Furthermore, it expands upon the notion of continuously evolving financial alternatives better suited to meet the needs of innovative new ventures.

Fifthly, the findings enrich the growing interest in international new ventures. The study contributes to the existing literature on international new ventures by highlighting the significant role played by informal investors. Particularly in contexts characterized by weak law enforcement and entrepreneurs from economically disadvantaged backgrounds, the research explores the importance of informal investors' presence when entrepreneurs seek to internationalize their operations.

Sixthly, the study offers a valuable contribution to institutional theory (North, 1990) by uncovering a substitution effect between the presence of a larger pool of informal investors and the degree of enforcement of a country's rule of law in the specific contexts where new ventures attempt to internationalize. This effect becomes more apparent when considering individual wealth disparities. This contribution enhances our understanding of how different institutional factors interact and influence the evolution of diverse entrepreneurial activities.

### 5.2.2 Practical implications

The conclusions of this research also have several practical implications for entrepreneurs, policymakers, and practitioners in the field of entrepreneurship:

Countries striving for higher economic growth should prioritize the establishment of a favourable environment that fosters active entrepreneurship (Estrin et al., 2022). This can be achieved by nurturing the entrepreneurial experience of habitual entrepreneurs who possess the skills and knowledge to aspire for greater growth. By creating an "entrepreneurial society," countries can benefit from the agility of experienced entrepreneurs in absorbing new discoveries and transforming them into viable business opportunities (Fan et al., 2021). Additionally, first time entrepreneurs could gain valuable insights from more experienced entrepreneurs. Novice entrepreneurs might find difficult to assess the results of their first endeavour, however experience from other entrepreneurs could assist them in better adjusting their expectations, towards successfully navigate the entrepreneurial process to achieve their goals.

For the case of more experienced entrepreneurs, it is essential to invest significantly in research and development at a national level and establish mechanisms that facilitate the transfer and exploitation of knowledge (Amorós et al., 2019). By synchronizing knowledge

transfer systems with institutions that promote innovation, countries can create virtuous circles that accelerate economic growth (Chung et al., 2022).

To further encourage innovative entrepreneurship and alleviate constraints faced by participants, it is necessary for all stakeholders to contribute to the financial development process, involving a better understanding of the financing needs of new ventures and implementing regulations that foster financial development, directly or indirectly (Castellani et al., 2022; Shane et al., 2020). Effective regulation can also help mitigate gender biases and promote a more balanced development between financial institutions and markets. Policymakers can incentivize participation in underdeveloped financial markets by reducing entry barriers for small firms and creating favourable conditions to attract investor's interest. Financial specialists, on the other hand, have a responsibility to continuously innovate and engineer financial solutions that better fit the needs of innovative new ventures. Additionally, as Chen (2019) highlights, the integration of new technologies in finance represents a promising avenue for advancement in this field.

In line with financial developments the study emphasizes the role of informal investors in entrepreneurial activities (B. Nguyen & Canh, 2021), specifically in export-oriented new ventures. This implies expanding the focus of entrepreneurial financing beyond traditional institutional channels. Often, informal investors emerge without any regulatory coverage. However, they play an important role in entrepreneurial activities and policymakers could assist in creating the conditions for their active involvement, and in general promoting the formation of experienced investors.

Finally, the research stresses the need to support entrepreneurship in countries with weaker rule of law (D'Ingiullo et al., 2023; Levie & Autio, 2011). Policy actors could work on such contexts to reduce their challenges, generally including a lack of access to capital, weak intellectual property protection, and difficulties in enforcing contracts (Alimov, 2019; Autio & Acs, 2010; Bellavitis et al., 2022; Papageorgiadis et al., 2020).

Emerging from the analysis in this research, some specific initiatives that can be considered include:

- Establishing collaborative platforms that facilitate knowledge sharing and collaboration among entrepreneurs, researchers, and industry experts.
- Implementing policies that incentivize the commercialization of research and development outputs and promote technology transfer between academic institutions and businesses.

- Strengthening entrepreneurship education and training programs to equip aspiring entrepreneurs with the necessary skills and knowledge.
- Creating supportive ecosystems that provide access to capital, mentorship, and resources for entrepreneurial ventures, as well as assessing on how to access to appropriate funding sources.
- Encouraging public-private partnerships to foster collaboration between government agencies, research institutions, and businesses.
- Encourage financial specialists and regulatory frameworks to develop financial products and services that better adjust the needs of innovative new ventures.
- Reduce entry barriers and create favourable conditions for new ventures to participate in underdeveloped financial markets.
- Create spaces for investors' active involvement in financing new ventures, such as crowdfunding platforms, syndicate business angels, second-tier financial markets, informal investors societies.
- Fostering diverse funding sources in entrepreneurial ecosystems
- Lower the burden emerging from strict regulation limiting high-impact entrepreneurs, and simultaneously guaranteeing the enforce of contracts and intellectual property protection.

Overall, the practical implications of this research highlight the importance of tailored support programs, initiatives focused in attending the needs of entrepreneurs under less favourable conditions, institutional improvements, facilitation of informal investment networks, and support for international trade. By implementing these practical strategies, policymakers, support organizations, and practitioners can create an enabling environment that fosters high-impact entrepreneurship, innovation, and economic development.

### 5.3 Limitations and future research

This research provides important insights into the factors contributing to the emergence of high-impact entrepreneurs; however, some limitations should be acknowledged.

Firstly, this study relies on cross-sectional data, which presents limitations in assessing individual changes over time. Future research can employ alternative data sources that capture longitudinal information to address this limitation. This would allow for a more comprehensive exploration of the relationships between the variables analysed over time and a deeper understanding of their underlying nature. For example, in terms of how entrepreneurial experience is approached, upcoming research could further explore disparities

in the extent and length of these experiences. For instance, it could examine the experiences gained over the span of several years, comparing them with those acquired in recent months. Additionally, researchers could elucidate the process of how these experiences mature. Did individuals progress from being novices to becoming serial entrepreneurs and, eventually, portfolio entrepreneurs? Or did they transition directly from novice to portfolio entrepreneurs? Exploring these patterns and understanding the underlying reasons could enhance entrepreneurial research. Moreover, investigating individuals' attitudes toward success and failure could provide a more comprehensive understanding of their inclination to become serial or portfolio entrepreneurs. This research could also track how these attitudes change over time, adding another layer of insight to entrepreneurial experience analysis.

Secondly, the findings of this study are constrained by the nature of the data utilized. While the data provides advantages in terms of cross-country comparability and has been validated and widely employed in previous entrepreneurial studies, it is important to acknowledge its limitations at the individual level. This specific individual-level dataset relies on self-reported assessments of various entrepreneurial factors, such as opportunity recognition, fear of failure, and self-efficacy. However, these self-reported perceptions may not fully reflect entrepreneurs' experiences and behaviours. To address this limitation, future research could incorporate more in-depth interviews or qualitative methodologies to provide a more nuanced understanding of these constructs and capture the complexities of the entrepreneurial journey more accurately. This would enhance the validity and richness of the findings. For example, during this research, it became evident the need for a qualitative further exploration of distinct personal characteristics that are more prevalent in either female or male entrepreneurs, influencing their likelihood of leading innovative new ventures. As an illustration, examining gender-related variances in leadership styles could be further scrutinized. This exploration can potentially extract valuable insights into fostering the innovativeness of new ventures. Additionally, it could shed light on other gender-related entrepreneurial managerial and behavioural practices that play a role in nurturing an innovative environment. Similarly, investigating the firm-level variables explored in this study with a focus on qualitative aspects rather than solely relying on entrepreneurs' self-reports could bring valuable insights to entrepreneurial research. For instance, by deepening the understanding of the nuances within dimensions such as the innovation process, product development, and business model, entrepreneurial research could develop a more comprehensive grasp of how an entrepreneurs' personal traits play a substantial role in shaping the trajectory of their venture's journey toward innovation.

Thirdly, the research limitations presented in each chapter provide valuable insights into the predictor variables, but additional measurement possibilities could further enhance future research. For example, a more comprehensive analysis could be conducted on national research and development (R&D) expenditure, considering its different funding sources, such as business enterprises, government, higher education, and private non-profit organizations. This would provide a finer understanding of how different investment sources affect knowledge transfer and innovation. Additionally, a deeper analysis of financial development could go beyond just measuring its depth and explore aspects of access and efficiency. This would provide a more comprehensive assessment of the overall financial landscape and its impact on entrepreneurial activities. Furthermore, future research could consider alternative measures of informal investors, expanding the scope of analysis and providing a more comprehensive understanding of them and their role in entrepreneurial ecosystems.

Fourthly, chapter 4 highlighted distinctive entrepreneurial outcomes emerging from inequality disparities and their interaction with surrounding institutional factors. While this analysis focused solely on the entrepreneurs' wealth distribution at a specific moment, an extension of this form of sensitivity analysis could offer advantages to entrepreneurial research, particularly in providing insights for potential policymaker recommendations. Moreover, additional benefits for entrepreneurial research might arise through conducting sensitivity analysis that considers other approaches to estimate inequality.

Fifthly, while the dataset used in this study includes information from the year 2020, which provides some preliminary insights into the effects of the COVID-19 pandemic, the study did not specifically focus on its impacts. Future research could explore deeper into the consequences of the pandemic on entrepreneurship and explore how it has influenced various aspects such as entrepreneurial activity, innovation, access to financing, export orientation, and the overall entrepreneurial ecosystem. By examining the pandemic's specific effects, researchers can better understand the challenges and opportunities it has presented to entrepreneurs and develop strategies to support their resilience and recovery in the post-pandemic era, specifically among Schumpeterian entrepreneurs.

Lastly, as a researcher, I have noticed a recurring theme across the three study chapters, which revolves around the need to develop more tailored entrepreneurial financing solutions for Schumpeterian entrepreneurs. Therefore, it is highly probable that my future research studies will be directed towards further exploring this area to gain a clearer understanding of the specific nature of these solutions.

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