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**Universitat Autònoma
de Barcelona**

**ANTECEDENTS AND CONSEQUENCES OF DYNAMIC CAPABILITIES IN NEW
VENTURES: AN INTERNATIONAL STUDY**

Doctoral Thesis

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PREFACE

PREFACE

When I decided to quit my job in Mexico to do a PhD program, I did not know how challenging this journey could be. However, after four years of having invested a lot of time, effort, and commitment, I realize I could not have ended this endeavor without many persons' support and advice. I would like, then, to express my gratitude to those who contributed to my personal and professional goal in one way or another.

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I also thank CONACYT (National Council of Science and Technology in Mexico) for sponsoring my Master's and doctorate programs at the UAB. The scholarship I was granted has paid my tuition and living expenses for me and my family in Barcelona. Undoubtedly, this kind sponsorship has helped Mexico to shape its human capital beyond its borders and has allowed graduates to improve their professional future.

Special thanks to my classmates from the MAREB program who supported me in the hardest times and with whom I had the funniest moments: Mileidy Loaiza from Colombia, Reyna Rodarte from Mexico, and Obryan Poyser from Costa Rica. We became friends during that program and our friendship will last a lifetime.

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Karen Viviana Barrañón Navarro

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ABSTRACT

ABSTRACT

Dynamic capabilities are vital elements in entrepreneurship and economic development due to their favorable effects on the performance of firms. However, dynamic capabilities have been mostly studied considering an organizational angle. Consequently, scholars have shown interest in understanding this phenomenon mainly among multinational enterprises or large businesses.

The main objective of this investigation is to examine the antecedents and consequences of dynamic capabilities in new ventures within an international context. The methodologies applied are quantitative and the statistical techniques included in this thesis are multi-regression analysis and panel data, using mainly Global Entrepreneurship Monitor data. This data base is complemented by others, such as the International Monetary Fund, the World Bank's World Development Indicators, Worldwide Governance Indicators, and the Eurostat Community Innovation Survey. From the conceptual point of view, the investigation is framed in the dynamic capabilities theory, the human capital theory, the resource-based theory, the institutional economics theory, and the open innovation theory.

The main findings show the evolution of dynamic capabilities research and suggestions for future research; the antecedents of dynamic capabilities; the institutional environment that affects dynamic capabilities; the effect of open innovation on dynamic capabilities; and the effect of dynamic capabilities on competitiveness. Additionally, various moderating effects of formal and informal institutions draw the attention of this research. In addition, the results support the relationship between dynamic capabilities and competitiveness. Likewise, the contributions of this thesis are in terms of advancing the knowledge of dynamic capabilities in new ventures, by linking them with the entrepreneurship field and by conducting empirical research within an international context.

Specifically, the findings of the thesis suggest undertaking further investigation regarding antecedents and consequences of the dynamic capabilities in new ventures and SMEs in an international context. Also, it was found that formal and informal institutions influence dynamic capabilities (entrepreneurial capabilities) in new ventures. Besides, the relationship between formal institutions and DC (entrepreneurial capabilities) is strengthened when informal institutions act as moderators. Furthermore, the findings determine that human capital and formal institutions influence DC (sensing capabilities) in new ventures. Moreover, it was observed that the influence of human capital over DC (sensing capabilities) is stronger when formal institutions are introduced as moderators. In the same way, the results indicated, that human capital and informal institutions have a direct relationship with DC (learning capabilities) in new ventures. Similarly, indirect

stronger relationships between human capital and DC (learning capabilities) were identified when moderated by informal institutions. In addition, the findings exposed that learning capabilities negatively influence DC (sensing capabilities). Correspondingly, the relationship between learning capabilities and sensing capabilities become stronger when informal institutions moderate the relationship. Furthermore, the results established that DC (sensing capabilities) have a positive influence on competitiveness. Likewise, we find a moderating effect of the formal institution government effectiveness in the relationship between DC (sensing capabilities) and competitiveness.

Moreover, from a policymaker point of view, the results could be helpful to government policies that support the enhancement of dynamic capabilities in new ventures. Furthermore, from a practitioner point of view, entrepreneurs developing new ventures could benefit from the knowledge that highlights moderations of formal and informal institutions.

Keywords: dynamic capabilities, new ventures, human capital theory, resource-based theory, institutional economics theory, open innovation theory.

CHAPTER 1
INTRODUCTION

1. INTRODUCTION

1.1 Problem statement and research objectives

Entrepreneurship can be defined, for example, as the creation of new organizations (Gartner, 1989). The research focus on this phenomenon is not only on new ventures' creation, but also on the entrepreneurial process that comprises the gestation, birth, and growth of new ventures (Reynolds, Camp, Bygrave, Autio, & Hay, 2002). On the one hand, the study of how entrepreneurs contribute to development through the introduction of changes in technology has been important for scholars (Schumpeter, 1934). Therefore, many studies have included cross-sectoral, cross-national, and longitudinal analyses to link the entrepreneurship activity with economic growth (Rocha, 2004). On the other hand, investigation has been conducted into how entrepreneurs face changing market requirements or new competitive situations, applying dynamic capabilities (Boccardelli & Magnusson, 2006). Dynamic capabilities are higher-order capabilities that help to create, to re-configure, and to leverage organizational resources and capabilities (Teece, Pisano, & Shuen, 1997). Also, dynamic capabilities define the capacity of the firm to innovate, adapt to change, and create change that benefits customers (Teece, Peteraf, & Leih, 2016). Moreover, the dynamic capabilities perspective (Teece et al. 1997) has been used, for example, in the fields of strategy and international business. The core reasoning is that enterprises should administer and acquire their resources dynamically to deal with the uncertainty generated by external environment and to obtain higher competitiveness.

Overall, the main objective of this investigation is to examine the antecedents and consequences of dynamic capabilities in new ventures within an international context. In this regard, the thesis places emphasis on different theoretical frameworks, at a country level, for several countries.

The specific objectives of the research are outlined below, each specific objective corresponding to a different research phase.

Phase 1: Literature review

Specific objective 1. To explore the content and evolution of dynamic capabilities research and to develop and suggest an agenda for future research.

Phase 2: Antecedents of dynamic capabilities

Specific objective 2. To examine the institutional environment that affects the dynamic capabilities.

Specific objective 3. To examine the direct relationship of human capital and formal institutions with dynamic capabilities, and to study indirect relationships between human capital and dynamic capabilities in new ventures when moderated by formal institutions.

Specific objective 4. To examine the direct relationship of human capital and informal institutions with dynamic capabilities in new ventures, and to study indirect relationships between human capital and dynamic capabilities when moderated by informal institutions.

Specific objective 5. To analyze the effect of open innovation on dynamic capabilities.

Phase 3: Consequences of dynamic capabilities

Specific objective 5. To study the effect of dynamic capabilities on competitiveness.

1.2 Research contributions

The main contributions of this thesis will be in terms of advancing the knowledge of dynamic capabilities in new ventures, by linking them with the entrepreneurship field and by conducting empirical research within an international context. There is an identified gap in the literature regarding research and theory building of dynamic capabilities in new ventures and small and medium enterprises (SMEs) (Zahra, Sapienza, & Davidsson, 2006). According to these authors, the antecedents of dynamic capabilities for new ventures have been studied by Arthurs and Busenitz (2006), while most of the research on the antecedents of dynamic capabilities has been focused on established companies, such as in Blyler and Coff (2003), Kor and Mahoney (2005), Verona and Ravasi (2003), Wheeler (2002), and Zollo and Winter (2002). In the same manner, Zahra, Sapienza, and Davidsson (2006) have identified only the research carried out by Arthurs and Busenitz (2006), Newbert (2005), and, Sapienza, Autio, George, and Zahra (2006) in relation to outcomes of dynamic capabilities. Meanwhile the identified research in this area for established companies is that by Blyler and Coff (2003), Bowman and Ambrosini (2003), Eisenhardt and Martin (2000), George (2005), Lazonick and Prencipe (2005), Lenox and King (2004), Verona and Ravasi (2003), and Zahra and George (2002b). Given the importance of entrepreneurship in the economy, entrepreneurship may be a useful mechanism to represent dynamic capabilities at a country level. Therefore, the entrepreneurship field would benefit from more research on the role of dynamic capabilities in new ventures.

1.3 Linking dynamic capabilities to human capital theory, resource-based theory, institutional economics theory, and open innovation framework

According to Drucker (1985), the basis of entrepreneurship is continuous systematic innovation, as both a practice and discipline. Drucker describes the existence of innovation opportunities both within and outside a company. In this way, the key to success for entrepreneurs relies on the fact of how to innovate. The relationship between entrepreneurship and innovation is also acknowledged by Schumpeter (2000). Schumpeter describes innovation as a core characteristic in entrepreneurs. However, Chesbrough's (2003) open innovation model relies on a

distributed model of innovation, where businesses access and integrate technology that was developed by others. In the same manner, Teece (2007) declares that dynamic capabilities enable new businesses to develop intangible assets that allow better and longer business performance in an open economy characterized by rapid innovation and several sources of invention, innovation, and manufacturing capability. Among the dynamic capabilities are skills, processes, procedures, organizational structures, decision rules, and disciplines which support the sensing (opportunity recognition), seizing, and reconfiguring of capacities. Furthermore, entrepreneurial capabilities are the antecedent of entrepreneurial opportunities (Reynolds et al., 2005); therefore, businesses with stronger dynamic capabilities are more entrepreneurial because they shape themselves through innovation and collaboration with others, such as companies, entities, and organizations.

Dynamic capabilities (Teece, 2007) are considered to provide stepping-stones in order to advance more dynamic variants of the resource-based theory (Kraaijenbrink, Spender, & Groen, 2010). The essence of the dynamic capabilities approach is that competitive success arises from the continuous development, alignment, and reconfiguration of firm-specific assets (Augier & Teece, 2009; Teece & Pisano, 1994; Teece et al., 1997). The dynamic capabilities framework is useful to identify those factors more likely to impact firm performance. It is gradually developing into an interdisciplinary theory of the modern corporation (Teece, 2010). Also, areas for empirical research in dynamic capabilities include regional and national competitiveness among emerging and transition economies (Teece, 2009). From the conceptual point of view, the investigation will be framed in human capital theory (HCT), resource-based theory (RBT), dynamic capabilities (DC), institutional economics (IE), and open innovation (OI) frameworks. Therefore, based on the proposed investigation, some conditioning factors can be identified for dynamic capabilities at dissimilar level of analysis—for instance, internal with HCT and external with IE.

1.3.1 Human capital theory (HCT)

Human capital is considered as person attributes, which refers to people's knowledge, skills, and abilities (achieved through education, training, and experience); effectiveness of interpersonal relationships; network effects; and communication skills (Belso-Martinez, Molina-Morales, & Mas-Verdu, 2013). Therefore, the entrepreneur's human capital is an important resource for a new firm. Backes-Gellner & Werner (2007) found that the generic and specific components of the founder's human capital produce direct and indirect positive influences on a new venture's growth. Access to external resources in, for example, financial capital, skilled employees, or knowledge is more likely to occur when the entrepreneur accumulates high human capital.

1.3.2 Resource-based theory (RBT) and dynamic capabilities (DC)

The resource-based view of the firm is a theoretical framework to understand how competitive advantage within firms is achieved and how that advantage can be sustained over time. Also, firms are considered to be full of resources that are heterogeneously distributed across them and, over time, differences in resources persist. Under these assumptions, when firms have resources that are valuable, rare, inimitable, and non-substitutable (also called VRIN attributes), they can obtain sustainable competitive advantage when applying novel value-creating strategies that are difficult to duplicate by their competitors (Eisenhardt & Martin, 2000). In recent years, some researchers have extended the RBT to dynamic markets (Teece et al., Pisano, 1997). In this way, where the competitive environment is shifting, the dynamic capabilities by which managers “integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516) become the source of sustained competitive advantage. Dynamic capabilities are defined as a group of particular and detectable processes, for example, product development, strategic decision making, and alliancing, among others (Eisenhardt & Martin, 2000). These authors studied two different markets: dynamic and high-velocity markets. In the first kind of market, dynamic capabilities reflect the traditional conception of routines. In other words, they represent detailed, analytic, stable processes with predictable outcomes. On the other hand, in high-velocity markets, they become simple, highly experiential, and fragile processes delivering unpredictable outcomes. Dynamic capabilities fall into three primary clusters. The ‘sensing’ of unknown futures includes the identification, development, co-development, and assessment of technological opportunities (and threats) regarding customer needs. The ‘seizing’ or mobilization of resources addresses needs and opportunities and captures value from doing so. ‘Transforming’, ‘shifting’, or ‘pivoting’ comprises continued renewal. Sensing activities are the most immediately recognizable as entrepreneurial. In dynamic capabilities, sensing is quite similar to the concept of opportunity recognition by individuals that has been developed in the entrepreneurship literature (Baron & Ensley, 2006).

1.3.3 Institutional economics (IE)

This study uses the institutional economics framework (North, 2005). Institutions were defined by North in 1990 as principles of behavior in a society or, formally speaking, the restraints that frame human interplay (Aparicio, Urbano, & Audretsch, 2016). Also, in 1990, North proposed that institutions can be divided into formal and informal (Urbano & Alvarez, 2014). Formal institutions consist of constitutions, regulations, and contracts. Informal institutions comprise attitudes, values, norms of behavior, and conventions—in other words, the culture of a society. On

the one hand, comparative entrepreneurship research based on institutional economics examines formal institutions (Autio & Acs, 2010); on the other hand, entrepreneurship research based on cultural sociology and cross-cultural psychology mostly examines informal institutions (Autio, Pathak, & Wennberg, 2013). The institutional approach to entrepreneurship research has been useful in that field through the description of several cases, and its potential in the future is pointed out (Bruton, Ahlstrom, & Li, 2010). Formal factors (agencies, policies, procedures) and informal factors (networks, role models, attitudes) can be distinguished among these institutional factors of entrepreneurship (Veciana & Urbano, 2008). Together, the formal and informal institutions that define the ‘rules of the game’ affect whether or not individuals elect to pursue entrepreneurial activity.

Researchers encourage empirical research into the organizational antecedents and performance consequences of the knowledge management capacity. The knowledge management capacity framework offers an integrative perspective that considers the understanding of dynamic capabilities for managing knowledge in a firm’s knowledge base in open innovation processes (Lichtenthaler & Lichtenthaler, 2009). Other research, based on how opportunity recognition and exploitation depend on the dynamic capabilities within the firm to configure and reconfigure knowledge resources such as entrepreneurial networks, suggests that dynamic capabilities and firm growth should be applied to obtain generalized results (Macpherson, Jones, & Zhang, 2004). In terms of small firms’ dynamic, entrepreneurial capabilities are defined as those patterns of collective activity that are associated with opportunity recognition and exploitation (Zollo & Winter, 2002). These are the reasons for proposing to examine the individual, organizational, and environmental (formal and informal institutions) antecedents of dynamic capabilities (phase 2).

Recent investigation provides a basis for future research regarding empirical literature and the linkages between managerial actions, dynamic capabilities, and long-run firm performance (Teece, 2016). For instance, in the health sector, dynamic capabilities were developed in order to generate improved performance and competitive advantage (Agwunobi & Osborne, 2016). Moreover, dynamic capabilities are linked to the competitive advantage of the firm—in other words, to its performance (Eisenhardt & Martin, 2000).

1.3.4 Open innovation (OI)

The open innovation framework of Chesbrough’s (2003) refers to a distributed model of innovation, in that model the businesses get access and can integrate technology that has been developed by other parties. Also, the definition of open innovation includes collaboration with a group of participants to insource or outsource technologies (Chesbrough, 2003). Besides, the open

innovation theory has been studied regarding the intra and interorganizational networks, the business level, the partner level, and the regional systems of innovation (Vanhaverbeke, 2005). Studies show that to benefit from open innovation practices, business need to develop their knowledge capacities (Chesbrough, 2006; Teece, 2007). In fact, the knowledge management capacity framework actively uses dynamic capabilities in knowledge-based firms for open innovation purposes (Lichtenthaler & Lichtenthaler, 2009). Moreover, open innovation applications can be increasingly applied by SMEs (Van de Vrande et al., 2009) and new ventures can exploit business opportunities based on open innovation (Gruber & Henkel, 2006). Besides, other research has been conducted to show the theoretical linkages between open innovation, organizational ambidexterity, and dynamic capabilities (Huang, Wagner, & Fain, 2016); however, no empirical investigation has been conducted that illustrates generalized results. These are some of the reasons why we propose to investigate the effect of open innovation on dynamic capabilities (phase 2) and to study the effect of dynamic capabilities on competitiveness (phase 3).

1.4 Structure of the research and methodological approach

The methodology to be used in this research is quantitative and principally based on data from the Global Entrepreneurship Monitor data (GEM). Specifically, two tools are used in the investigation: the Adult Population Survey (APS) and the National Expert Survey (NES). In addition, the data will be complemented by the World Bank's World Development Indicators, the World Bank's annual Doing Business report, and the Eurostat Science, Technology and Innovation database. The period of time to be covered in the different chapters of the thesis ranges from 2005 to 2015. The thesis combines research techniques including a systematic literature review, regression analysis, and panel data.

Phase 1: Literature review

Phase 1 includes a systematic review of the papers on dynamic capabilities in Chapter 2, with the objective of analyzing the content and evolution in this field. A rigorous search of articles published in the top management and entrepreneurship journals—Social Science Citation Index (SSCI)—in the last 20 years is conducted. In this investigation, the current state of the art is assessed, and potential future research is proposed.

Phase 2: Antecedents of dynamic capabilities

In phase 2, the effects of different conditioning factors on dynamic capabilities are examined. Specifically, the investigation focuses on institutional environment (Chapter 3), formal institutions (Chapter 4), and informal institutions (Chapter 5).

Recent research has considered the dynamic capabilities required to create new and successful international ventures from the institutional economics framework (Karra, Phillips, & Tracey, 2008). Therefore, in Chapter 3, a model is tested explicitly using the IE, investigating how a set of (external) environmental factors affected the dynamic capabilities for panel data of 22 countries in 2006–2012 using GEM data along with the International Monetary Fund (IMF), the World Bank World Development Indicators (WDI), and Worldwide Governance Indicators (WGI). Other scholars have examined and delineated dynamic capabilities from entrepreneurial capabilities in entrepreneurship (Arthurs & Busenitz, 2006).

This study will provide quantitative research on this field through the operationalization of variables related to the IE theory. According to Shane and Venkataraman (2000) and Venkataraman (1997), the activity of entrepreneurship includes the discovery, creation, and exploitation of opportunities with the purpose of introducing, for instance, new good and services, new processes, or novel ways of organizing. Arenius and De Clercq (2005) recognize the first part of the entrepreneurial process as opportunity discovery. Shane (2000) affirms that individuals discover opportunities through the process of recognizing the value of the information they are exposed to. In this way, Arenius and De Clercq (2005) argue that different structures of individuals' networks affect the likelihood of being exposed to new information and therefore of perceiving entrepreneurial opportunities. These authors used the opportunity recognition measure as a dependent variable (binary variable) to address the question of whether there may be good opportunities for starting a venture in the coming six months in the area they live in. Teece (2007) explains the micro-foundations of sensing opportunities and threats, focusing on opportunity creation and/or discovery by individuals, specifying that this individual or organizational process requires both access to information and the ability to recognize, sense, and shape developments. The ability to recognize opportunities depends in part on the individual's capabilities and extant knowledge (or the knowledge and learning capacity of the organization to which the individual belongs), particularly about user needs in relation to both existing and novel solutions. Thus, the dependent variable perceived opportunities, representing the dynamic capability entrepreneurial capability, is a measure at a country level obtained from the APS GEM (Barazandeh, Parvizian, Alizadeh, & Khosravi, 2015; Urbano & Alvarez, 2014).

Chapter 4 makes explicit use of the DC approach to test a model with panel data that investigates how a set of formal factors affected dynamic capabilities for 21 countries in several years (2006–2013) using the GEM data. Likewise, Chapter 5 presents a model that includes informal factors affecting dynamic capabilities. In these chapters, the HCT and IE perspectives are used. In addition, GEM data along with the IMF, WDI, and WGI data bases for the period 2006–

2013 are used for 21 countries by using panel data. These studies will provide quantitative research on this field through the operationalization of variables related to the HCT and IE theories.

The ability of the firm to build and manage innovation networks has been studied in terms of both the organizational and individual level determinants to identify different capabilities and skills by Ritala, Armila, & Blomqvist (2009). Their research found a connection between the levels and the effect of open innovation practices/policies on the dynamic capabilities at a regional level. We analyze the effect of open innovation on dynamic capabilities through multi-regression analysis in Chapter 6, using the GEM, the Eurostat Community Innovation Survey (ECIS), and IMF databases for the year 2012 for 24 European countries. This study will provide quantitative research on this field through the operationalization of variables related to the DC theory. The measurements to be used are sensing capabilities (as the dependent variable) (Vanhaverbeke, Van de Vrande & Cloudt, 2008) and several cooperation capabilities (as independent variables) (Zahra, 2008).

Phase 3: Consequences of dynamic capabilities

In the final phase, or phase 3, the emphasis is on the effect of dynamic capabilities on performance (Chapter 7). Recent investigation provides a basis for future research to dig deeper into the linkages between managerial actions, dynamic capabilities, and long-run firm performance (Teece, 2016). Hence, Chapter 7 studies the effect of dynamic capabilities on competitiveness. In this case, panel data are applied using the GEM, WDI, and WGI for the years 2005 to 2013 for 30 countries. This study will provide quantitative research on the field through the operationalization of variables related to the DC theory.

In this way, the thesis will be structured in three phases. The first phase will contain the literature review on the content and evolution of dynamic capabilities research. The second and third phases will include empirical chapters that comprise the antecedents (second phase) and consequences (third phase) of dynamic capabilities. Figure 1.1 summarizes the different phases of the thesis.

Figure 1.1 Main phases of the thesis

| | | |
|---------|--|-------------------------|
| Phase 1 | Specific objective 1. To explore the content and evolution of dynamic capabilities research and to develop and suggest an agenda for future research. | Chapter 2 |
| Phase 2 | Specific objective 2. To examine the institutional environment that affects the dynamic capabilities. Specific objective 3. To examine the direct relationship of human capital and formal institutions with dynamic capabilities, and to study indirect relationships between human capital and dynamic capabilities in new ventures when moderated by formal institutions. Specific objective 4. To examine the direct relationship of human capital and informal institutions with dynamic capabilities in new ventures, and to study indirect relationships between human capital and dynamic capabilities when moderated by informal institutions. Specific objective 5. To analyse the effect of open innovation on dynamic capabilities. | Chapters 3, 4, 5, and 6 |
| Phase 3 | Specific objective 6. To study the effect of dynamic capabilities on competitiveness. | Chapter 7 |

CHAPTER 2

DYNAMIC CAPABILITIES: CONTENT, EVOLUTION, AND RESEARCH AGENDA

2. DYNAMIC CAPABILITIES AND NEW VENTURES: CONTENT, EVOLUTION, AND RESEARCH AGENDA

2.1 Introduction

As discussed in the previous chapter, the importance of entrepreneurship, the creation of new ventures, and the entrepreneurship process are related to the role played by dynamic capabilities in the capacity of the firm to innovate, to adapt, and to create changes, and ultimately to changes in technology and economic growth (Gartner, 1989; Reynolds et al., 2002; Schumpeter, 1934; Teece et al., 1997, 2016).

Researchers encourage empirical research into the organizational antecedents and performance consequences of the knowledge management capacity. The knowledge management capacity framework offers an integrative perspective that considers the understanding of dynamic capabilities for managing knowledge in a firm's knowledge base in open innovation processes (Lichtenthaler & Lichtenthaler, 2009). Other research is based on how opportunity recognition and exploitation depend on the dynamic capabilities within the firm to configure and reconfigure knowledge resources such as entrepreneurial networks and suggests applying dynamic capabilities and firm growth in order to obtain generalized results (Macpherson et al., 2004). Regarding small firms' dynamic, entrepreneurial capabilities are defined as those patterns of collective activity that are associated with opportunity recognition and exploitation (Zollo & Winter, 2002).

However, previous literature reviews have not provided a complete picture of the research regarding dynamic capabilities, specifically in new ventures. This chapter seeks to give a notion of dynamic capabilities' status in the literature. The research identifies the main work that has been developed in general in this field and specifically in new ventures. Additionally, this article provides future research lines.

This research makes three contributions to the literature. Firstly, we indicate the fields where the dynamic capabilities theories and practices have been applied by reviewing the literature and identifying the most cited articles published in the top journals regarding dynamic capabilities, including the most used theoretical frameworks and techniques of analysis. Secondly, we identify the investigation that has been conducted in both new ventures and established business in order to acknowledge the number and type of articles published according to this classification. Thirdly, regarding the dynamic capabilities research in new ventures, we contribute by identifying the studied variables and classifying them, as well as by highlighting the main findings in the investigation and the level of analysis.

This chapter is organized as follows. We first review the existent literature related to dynamic capabilities to show how they have been reflected in the literature by presenting the key theoretical and empirical research findings. Then, we examine the literature of dynamic capabilities that contains investigations in relation to new ventures and established companies. Next, focusing on dynamic capabilities in new ventures, we identify the main studied variables and possible future research gaps.

2.2 Conceptual framework

2.2.1 Dynamic capabilities

As discussed above in Chapter 1, dynamic capabilities are higher-order capabilities that help to create, to re-configure, and to leverage organizational resources and capabilities (Teece, Pisano, & Shuen, 1997). In the same way, dynamic capabilities define the capacity of the business to innovate, adapt to change, and create change that provide gains to customers (Teece, Peteraf, & Leih, 2016). Dynamic capabilities (Teece, 2007) are considered to provide stepping-stones in order to advance more dynamic variants of the resource-based theory (Kraaijenbrink et al., 2010). The essence of the dynamic capabilities approach is that competitive success arises from the continuous development, alignment, and reconfiguration of firm-specific assets (Augier & Teece, 2006; Teece & Pisano, 1994; Teece et al., 1997). The dynamic capabilities framework is useful to identify the factors more likely to impact the firm performance. It is gradually developing into an interdisciplinary theory of the modern corporation (Teece, 2010). Also, areas for empirical research in dynamic capabilities include regional and national competitiveness among emerging and transition economies (Teece, 2009). In recent years, some researchers have extended the RBT to dynamic markets (Teece et al., 1997). In this way, where the competitive environment is shifting, the dynamic capabilities by which managers “integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516) have become the source of sustained competitive advantage.

2.2.2 Entrepreneurial capabilities

Considering the understanding of Ambrosini and Bowman (2009) and Teece (2007), Woldesenbet, Ram and Jones (2012) suggest that entrepreneurial capability is a micro-foundation for dynamic capabilities. SMEs may apply patterns of collective activity that are associated with opportunity recognition and exploitation (Zollo & Winter, 2002). The entrepreneurship literature refers to the concept of entrepreneurial capabilities as “the ability to identify a new opportunity and develop the resource base needed to pursue the opportunity” (Arthurs & Busenitz, 2006, p. 199). This has become an increasingly important concept that has been used to explain the

resources and skills required for effective entrepreneurial activity (Alvarez & Busenitz, 2001; Chell & Allman, 2003). Even though this concept has often been used in the context of individual entrepreneurs, it is also applicable to entrepreneurial teams and to organizations acting as corporate entrepreneurs.

According to Díaz-Casero, Hernández-Mogollón, and Roldán (2011), the creation of new businesses depends on the entrepreneurial capability to evaluate opportunities, and these opportunities and entrepreneurial capability rely on the specific entrepreneurial framework conditions (EFCs) in each country. In this way, entrepreneurial opportunities refer to the existence and perception of opportunities to be considered in the market. On the other hand, entrepreneurial capability suggests the individual motivation and skills required to initiate a new business (Levie & Autio, 2008; Reynolds et al., 2005). Nicolaou, Shane, Cherkas, Hunkin, and Spector (2008) point out that individual differences matter for explaining who becomes an entrepreneur. Furthermore, Clarysse, Tartari, and Salter (2011) conclude that the opportunity recognition capability of academics, better known as entrepreneurial capability, is the single most important variable that explains academics' engagement in entrepreneurial initiatives.

2.2.3 Importance of dynamic capabilities in entrepreneurship

The foundation of entrepreneurship is the continuous practice of systematic innovation as both a practice and a discipline (Drucker, 1985). The author describes the existence of innovation opportunities within a company as including unexpected occurrences, incongruities, process needs, industry, and market changes. He identifies other innovation opportunities outside the company as demographic changes, changes in perception, and new knowledge. Therefore, the key to success for any entrepreneur is knowing how to innovate. The entrepreneurship and innovation relationship is also acknowledged by Schumpeter (2000). He identifies innovation as a main characteristic in entrepreneurs and distinguishes between the terms 'innovation' and 'invention'. Moreover, according to Teece (2007), dynamic capabilities enable new businesses to develop intangible assets that permit superior long business performance within an open economy with rapid innovation and dispersed sources of invention, innovation, and manufacturing capability.

These dynamic capabilities include skills, processes, procedures, organizational structures, decision rules, and disciplines which give fundamental support to sensing (opportunity recognition), seizing, and reconfiguring capacities. Given that entrepreneurial capacities are the antecedent of entrepreneurial opportunities (Reynolds et al., 2005), businesses with stronger dynamic capabilities are more entrepreneurial because they shape themselves through innovation and collaboration with other companies, entities, and organizations.

2.3 Methodology

For the literature review, the papers were selected with consideration of their inclusion in the SSCI Web of Science in the search for empirical and theoretical papers. The research was conducted by topic according to the following keywords in the topic, abstract, and text in the articles: “dynamic capabilities”, “dynamic capabilities framework”, “dynamic capabilities perspective”, “entrepreneurial capabilities”, “new ventures”, “new firms”, and “new business”. The search was limited to a specific 20-year period.

With the research domain “social sciences”, research area “business economics”, document type “article”, and language “English”, the selection was conducted in three rounds. Using the first keywords “dynamic capabilities”, “dynamic capabilities framework”, and “dynamic capabilities perspective”, we found 271 articles satisfying the aforementioned criteria. From this result, we focused on the highest five-year impact factors on the basis of the Journal Citations Report (JCR), which are listed in Appendix 1. This selection yielded 100 articles; however, 14 were discarded because they were book reviews, introductions, commentaries, or were not available, so only 86 remained.

Therefore, the research was extended to the nine entrepreneurship and small business journals indexed in the JCR. These are *Journal of Business Venturing* (JVB, 2015 five-year impact factor of 6.097); *Entrepreneurship Theory and Practice* (ETP, 5.681); *Strategic Entrepreneurship Journal* (SEJ, 2.818); *Small Business Economics* (SBE, 2.318); *Journal of Small Business Management* (JSBM, 2.868); *International Small Business Journal* (ISBM, 3.1); *International Entrepreneurship and Management Journal* (IEMJ, 1.164); and *Family Business Review* (FBR, 5.011). Finally, we added 13 articles because some of the articles from the ETP, SEJ, ISBM, and IEMJ were retracted, book reviews, or not available. In sum, a total of 99 articles were analyzed.

Table 2.1 Journals and impact factors

| No. | Journal | 5-year | |
|-----|---|-------------|-------|
| | | (2011–2015) | 2015 |
| 1. | ACADEMY OF MANAGEMENT JOURNAL** | 10.588 | 6.233 |
| 2. | JOURNAL OF MANAGEMENT | 10.48 | 6.051 |
| 3. | JOURNAL OF OPERATIONS MANAGEMENT | 8.229 | 4 |
| 4. | INTERNATIONAL JOURNAL OF MANAGEMENT REVIEWS | 6.942 | 4.854 |
| 5. | JOURNAL OF MANAGEMENT STUDIES | 6.497 | 4.131 |
| 6. | ORGANIZATION SCIENCE | 6.137 | 3.36 |
| 7. | JOURNAL OF BUSINESS VENTURING* | 6.097 | 4.204 |

| | | | |
|-----|--|-------|-------|
| 8. | JOURNAL OF THE ACADEMY OF MARKETING SCIENCE | 6.062 | 3.744 |
| 9. | STRATEGIC MANAGEMENT JOURNAL | 5.952 | 3.38 |
| 10. | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | 5.659 | 3.62 |
| 11. | FAMILY BUSINESS REVIEW* | 5.011 | 4.147 |
| 12. | BUSINESS STRATEGY AND THE ENVIRONMENT | 4.74 | 3.479 |
| 13. | JOURNAL OF SUPPLY CHAIN MANAGEMENT | 4.611 | 4.571 |
| 14. | SUPPLY CHAIN MANAGEMENT: AN INTERNATIONAL JOURNAL | 4.567 | 2.731 |
| 15. | TOURISM MANAGEMENT | 4.324 | 3.14 |
| 16. | JOURNAL OF ENVIRONMENTAL MANAGEMENT | 4.049 | 3.131 |
| 17. | INFORMATION SYSTEMS RESEARCH | 4.014 | 3.047 |
| 18. | JOURNAL OF SERVICE MANAGEMENT | 3.927 | 2.233 |
| 19. | ORGANIZATION STUDIES | 3.899 | 2.798 |
| 20. | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | 3.882 | 2.647 |
| 21. | TECHNOVATION | 3.833 | 2.243 |
| 22. | JOURNAL OF WORLD BUSINESS | 3.729 | 2.811 |
| 23. | MANAGEMENT SCIENCE | 3.728 | 2.741 |
| 24. | GLOBAL STRATEGY JOURNAL | 3.657 | 1.206 |
| 25. | INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS | 3.548 | 2.782 |
| 26. | HUMAN RELATIONS | 3.544 | 2.619 |
| 27. | JOURNAL OF STRATEGIC INFORMATION SYSTEMS | 3.486 | 2.595 |
| 28. | INTERNATIONAL JOURNAL OF INFORMATION MANAGEMENT | 3.241 | 2.692 |
| 29. | JOURNAL OF PRODUCT INNOVATION MANAGEMENT | 3.178 | 2.086 |
| 30. | INDUSTRIAL MARKETING MANAGEMENT | 3.132 | 1.93 |
| 31. | INTERNATIONAL SMALL BUSINESS JOURNAL* | 3.1 | 2.215 |
| 32. | JOURNAL OF RETAILING | 3.096 | 2.014 |
| 33. | BRITISH JOURNAL OF MANAGEMENT | 3.096 | 2.188 |
| 34. | EUROPEAN JOURNAL OF INFORMATION SYSTEMS | 3.01 | 2.892 |
| 35. | INTERNATIONAL JOURNAL OF PHYSICAL DISTRIBUTION & LOGISTICS MANAGEMENT | 3.005 | 2.101 |
| 36. | TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE*** | 3.005 | 2.678 |
| 37. | JOURNAL OF SMALL BUSINESS MANAGEMENT* | 2.868 | 1.937 |
| 38. | SMALL BUSINESS ECONOMICS* | 2.318 | 1.795 |
| 39. | INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL* | 1.164 | 0.659 |

*Entrepreneurship and small business journals; **Highest impact factor; *** Lowest impact factor

Within the analysis, the revision of every article included identification of the author(s), year of publication, title, and journal, and the classification of the theoretical framework, objective of the investigation, research type (theoretical, empirical, or literature review), methodology (qualitative or quantitative, or both), research technique (case study, regression analysis,

simultaneous equation modeling), and number of times cited. (See Appendix A for the full list and classification of the reviewed articles.) The titles, authors, and years of publication of the articles identified as the top ten most cited articles are listed in Table 2.2. In this table, the most acknowledged authors in the field of dynamic capabilities are shown according to the most cited articles, to be Teece et al. (1997), Eisenhardt and Martin (2000), Zollo and Winter (2002), Teece (2007), Winter (2003), Zahra, Sapienza, and Davidsson, (2006), Zott (2003), Wang and Ahmed (2007), Rindova and Kotha (2001), and Rothaermel and Hess (2007).

Table 2.2 List of the main articles (most cited articles)

| No. | Articles | Authors & year of publication |
|------------------|--|---------------------------------------|
| 1st | Dynamic capabilities and strategic management | Teece, Pisano, and Shuen (1997) |
| 2nd | Dynamic capabilities: What are they? | Eisenhardt and Martin (2000) |
| 3rd | Deliberate learning and the evolution of dynamic capabilities | Zollo and Winter (2002) |
| 4rd | Explicating dynamic capabilities: The nature and micro-foundations of (sustainable) enterprise performance | Teece (2007) |
| 5th | Understanding dynamic capabilities | Winter (2003) |
| 6th | The net-enabled business innovation cycle and the evolution of dynamic capabilities | Zahra, Sapienza, and Davidsson (2006) |
| 7th | Dynamic capabilities and the emergence of intra-industry differential firm performance: Insights from a simulation study | Zott (2003) |
| 8th | Dynamic capabilities: A review and research agenda | Wang and Ahmed. (2007) |
| 9th | Continuous morphing: Competing through dynamic capabilities, form, and function | Rindova and Kotha (2001) |
| 10 th | Building dynamic capabilities: Innovation driven by individual-, firm-, and network-level effects | Rothaermel and Hess (2007) |

After the selection process, 99 papers remained: 61 were empirical (62%), 35 were theoretical developments (35%), and three were literature reviews (3%). Table 2.3 classifies the papers by type of research, author(s), and year of publication.

Table 2.3 Papers classified by type of research

| Type of research | Articles | | Authors and year of publication |
|------------------|----------|----|--|
| | No. | % | |
| Empirical | 61 | 62 | <p>Anand, Ward, Tatikonda, and Schilling (2009); Arend (2013, 2014); Arthurs and Busenitz (2006); Barrales-Molina, Bustinza, and Gutiérrez-Gutiérrez (2013); Bingham, Heimeriks, Schijven, and Gates (2015); Butler and Soontiens (2015); Cabanelas, Omil, and Vazquez (2013); Chen, Sun, Helms, and Jih (2008); Cheng, Chen, and Huang (2014); Chirico and Nordqvist (2010); Daniel, Ward and Franken (2014); Daniel and Wilson (2003); Deeds, DeCarolis, and Coombs (2000); Jeng and Pak (2016); Døving and Gooderham (2008); Drnevich and Kriauciunas (2011); El Akremi, Perrigot, and Piot-Lepetit (2015); Fainshmidt, Pezeshkan, Frazier, Nair, and Markowski (2016); Fang and Zou (2009); Fawcett, Wallin, Allred, Fawcett, and Magnan (2011); Fischer, Gebauer, Gregory, Ren, and Fleisch (2010); Gebauer (2011); Griffith and Harvey (2001); Griffith, Noble, and Chen (2006); King and Tucci (2002); Koch (2010); Lee, Lin, Chen, and Shyr (2011); Leonidou, Leonidou, Fotiadis, and Aykol (2015); Macher and Mowery (2009); Madhok and Osegowitsch (2000); Malik and Kotabe (2009); McKelvie and Davidsson (2009); Narayanan, Colwell, and Douglas (2009); Nieves and Haller (2014); Nonaka, Hirose, and Takeda (2016); Pablo, Reay, Dewald, and Casebeer (2007); Petroni (1998); Piening and Salge (2015); Ramírez, Österman, and Grönquist (2013); Ravishankar and Pan (2013); Reuter, Foerstl, Hartmann, and Blome (2010); Rice, Liao, Galvin, and Martin (2015); Rindova and Kotha (2001); Rodríguez-Serrano and Martín-Armario (2017); Rothaermel and Hess (2007); Russo (2009); Salunke, Weerawardena, and McColl-Kennedy (2011); Sawers, Pretorius, and Oerlemans (2008); Schilke (2014); Swoboda and Olejnik (2016); Townsend and Busenitz (2015); Vanpoucke, Vereecke, and Wetzels (2014); Wang, Senaratne, and Rafiq (2015); Weerawardena, Mort, Salunke, Knight, and Liesch (2015); Wilden and Gudergan (2015); Wilhelm, Schlömer, and Maurer (2015); Williamson (2016); Woldeesenbet, Ram, and Jones (2012); Zhu, Cordeiro, and Sarkis (2013); Zott (2003).</p> <p>Ambrosini and Bowman (2009); Ambrosini, Bowman, and Collier (2009); Augier and Teece (2008, 2009); Beske (2012), Beske, Land, and Seuring (2014); Blyler and Coff (2003); Camisón and Monfort-Mir (2012); Chirico, Nordqvist, Colombo, and Mollona (2012); Dixon, Meyer, and Day (2010); Easterby-Smith, Lyles, and Peteraf (2009);</p> |

| | | | |
|-------------------|-----------|------------|---|
| Theoretical | 35 | 35 | Easterby-Smith and Prieto (2008); Eisenhardt and Martin (2000); Helfat and Peteraf (2015); Hodgkinson and Healey (2011); Lessard, Teece, and Leih (2016); Luo (2000); Marsh and Stock (2003); Michailova and Zhan (2015); Mitchell and Skrzypacz (2015); Pandza and Thorpe (2009); Peteraf, Di Stefano, and Verona (2013); Prange and Verdier (2011); Ramachandran (2011); Regnér (2008); Teece (2007, 2014a); Teece, Pisano, and Shuen (1997); Vergne and Durand (2011); Weerawardena, Mort, Liesch, and Knight (2007); Wheeler (2002); Winter (2003); Zahra and George (2002b); Zollo and Winter (2002); Zollo, Bettinazzi, Neumann and Snoeren (2016). |
| Literature review | 3 | 3 | Barreto (2010); Wang and Ahmed (2007); Zahra, Sapienza, and Davidsson (2006). |
| Total | 99 | 100 | |

An exploratory study was then performed regarding the research framework and specific theories and the different methodologies used. In addition, the number of articles published every five years, the impact of these papers based on the number of citations in the SSCI, the number of authors per country, the most cited authors, and the most active authors in publishing were analyzed. Finally, a correspondence analysis was conducted in order to identify the type of firm studied (i.e., dynamic capabilities approach vs. author, level of analysis, and statistical technique).

2.4 Results

2.4.1 Qualitative analysis

As stated earlier, this literature review used dynamic capabilities as the conceptual framework, with the emphasis on new ventures. Table 2.4 shows that the dynamic capabilities perspective was the main approach of the analyzed articles, comprising 60 percent of the articles. This same framework combined with other specific theories featured in 37 percent of the papers, using theoretical frameworks such as the resource-based view (and resource advantage theory), learning and organizational approaches (i.e., learning theory, organizational learning, organizational path dependence, and organization transformation approaches); strategy frameworks (i.e., competition-based strategy, strategic management frameworks, strategy-as-practice approach, strategic nets perspective, strategy and product innovation frameworks, service innovation theory of competitive strategy, information system and strategy theories); other theories (i.e., social capital, industrial network perspective, relational governance perspective, marketing dynamic capabilities, firm performance); entrepreneurship theories (i.e.,

entrepreneurship views, entrepreneurial capabilities, Schumpeterian perspectives, and resource-based theory); management approaches (i.e., systems, knowledge, and modular management theories); international perspectives (i.e., born global and multinational enterprise theories); and sustainable supply chain management theory. Other theories are used alone in 3 percent of the articles, including competence analysis, organizational form, and organizational management systems perspectives. See Table 2.4 for detailed information related to the approaches used alone or in combination with others, along with authors and years of publication.

Table 2.4 Approaches of the analyzed articles

| No. | Framework | Articles | | Specific Theories | Author and year of publication |
|-----|--|----------|----|---------------------------|--|
| | | No. | % | | |
| 1. | Dynamic capabilities perspective (alone) | 59 | 60 | Dynamic capabilities (59) | Ambrosini and Bowman (2009); Ambrosini Bowman and Collier (2009); Arend (2013); Augier and Teece (2009); Barrales-Molina, Bustinza, and Gutiérrez-Gutiérrez (2013); Barreto (2010); Bingham, Heimeriks, Schijven, and Gates (2015); Chen, Sun, Helms, and Jih (2008); Chirico and Nordqvist (2010); Chirico, Nordqvist, Colombo, and Mollona (2012); Daniel and Wilson (2003); Døving and Gooderham (2008); Drnevich and Kriauciunas (2011); Easterby-Smith, Lyles, and Peteraf (2009); El Akremi, Perrigot, and Piot-Lepetit (2015); Fainshmidt, Pezeshkan, Frazier, Nair, and Markowski (2016); Fischer, Gebauer, Gregory, Ren, and Fleisch (2010); Gebauer (2011); Griffith, Noble, and Chen (2006); Helfat and Peteraf (2015); Hodgkinson and Healey (2011); King and Tucci (2002); Koch (2010); Leonidou, Leonidou, Fotiadis, and Aykol (2015); Lessard, Teece, and Leih (2016); Luo (2000); Macher and Mowery (2009); Madhok and Osegowitsch (2000); Malik and Kotabe (2009); McKelvie and Davidsson (2009); Michailova and Zhan (2015); Mitchell and Skrzypacz (2015); Narayanan, Colwell, and Douglas (2009); Nieves and Haller (2014); Nonaka, Hirose, and Takeda (2016); Pandza and Thorpe |

| | | | | |
|----|---|----|----|---|
| | | | | (2009); Peteraf, Di Stefano, and Verona (2013); Piening and Salge (2015); Prange and Verdier (2011); Ramírez, Österman, and Grönquist (2013); Reuter, Foerstl, Hartmann, and Blome (2010); Rice, Liao, Galvin, and Martin (2015); Rodríguez-Serrano and Martín-Armario (2017); Rothaermel and Hess (2007); Russo (2009); Sawers, Pretorius, and Oerlemans (2008); Schilke (2014); Swoboda and Olejnik (2016); Teece (2007); Townsend and Busenitz (2015); Vanpoucke, Vereecke, and Wetzels (2014); Wang, Senaratne, and Rafiq (2015); Weerawardena, Mort, Salunke, Knight, and Liesch (2015); Wheeler (2002); Wilden and Gudergan (2015); Wilhelm, Schlömer, and Maurer (2015); Williamson (2016); Winter (2003); Zollo, Bettinazzi, Neumann, and Snoeren (2016). |
| 2. | Dynamic capabilities perspective combined with other theories | 37 | 37 | Resource-based view and resource advantage theory (7) Deeds, DeCarolis, and Coombs (2000); Don Jyh-Fu Jeng (); Eisenhardt and Martin (2000); Fawcett, Wallin, Allred, Fawcett, and Magnan (2011); Griffith and Harvey (2001); Teece, Pisano, and Shuen (1997); Wang and Ahmed (2007). |
| | | | | Learning theory, organizational learning, organizational path dependence, and organization transformation approaches (7) Anand, Ward, Tatikonda, and Schilling (2009); Dixon, Meyer, and Day (2010); Lee, Lin, Chen, and Shyr (2011); Ramachandran (2011); Vergne and Durand (2011); Zahra, Sapienza, and Davidsson (2006); Zollo and Winter (2002). |
| | | | | Competition-based strategy, strategic management frameworks, strategy-as-practice approach, strategic nets perspective, strategy and product innovation frameworks, service innovation theory of Augier and Teece (2008); Butler and Soontiens (2015); Marsh and Stock (2003); Pablo, Reay, Dewald, and Casebeer (2007); Regnér (2008); Salunke, Weerawardena, and McColl-Kennedy (2011); Zahra and George (2002). |

| | | | | | |
|----|--|-----------|------------|---|--|
| | | | | competitive strategy, information system and strategy theories (7) | |
| | | | | Other theories: social capital, industrial network perspective, relational governance perspective, marketing dynamic capabilities, firm performance (5) | Blyler and Coff (2003); Cabanelas, Omil, and Vázquez, (2013); Cheng, Chen, and Huang (2014); Fang and Zou (2009); Zott (2003). |
| | | | | Entrepreneurship views, entrepreneurial capabilities, Schumpeterian perspectives, and resource-based theory (4) | Arend (2014); Arthurs and Busenitz (2006); Camisón and Monfort-Mir (2012); Woldesenbet, Ram, and Jones (2012). |
| | | | | Systems, knowledge, and modular management approaches, (3) | Daniel, Ward, and Franken (2014); Easterby-Smith and Prieto (2008); Ravishankar and Pan (2013). |
| | | | | Born global and Multinational enterprise theories (2) | Teece (2014); Weerawardena, Mort, Liesch, and Knight (2007). |
| | | | | Sustainable Supply Chain Management theory (2) | Beske (2012); Beske, Land, and Seuring (2014). |
| 3. | Other theories (without dynamic capabilities theory) | 3 | 3 | Competence analysis, Organizational form, Organizational management systems (3) | Petroni (1998); Rindova and Kotha (2001); Zhu, Cordeiro, and Sarkis (2013). |
| | Total | 99 | 100 | | |

2.4.2 Quantitative analysis

According to the Journal Citations Report, specifically in the business and economics categories, these articles are shown with a corresponding table of impact index journals (see Table 2.5). We identified the impact of these articles considering the number of citations in the Web of Science. Furthermore, we performed an exploratory study of the approach, methodologies, level of analysis, type of firm, technique used, authors per country, and publications per author.

The results indicate that the number of published articles per five-year period has increased considerably in the last ten years. The largest number of articles (50) was published in 2011–2016 and another 32 articles were published in 2006–2010; this indicates a growing trend in the dynamic capabilities field, representing across these two periods 83 percent of the articles published. One of the first seminal articles on dynamic capabilities was published by Teece, Pisano, and Shuen almost twenty years ago, in 1997, in the *Strategic Management Journal* with the title ‘Dynamic capabilities and strategic management’. Also, it is noteworthy that the *Strategic Management Journal*, *British Journal of Management*, and *Technovation* together have published almost 30 percent of the research in the last 20 years; other journals in the field of entrepreneurship, small business, and business creation—*Journal of Business Venturing*, *International Entrepreneurship and Management Journal*, *International Small Business Journal*, *Journal of Small Business Management*, *Small Business Economics*, and *Family Business Review*, among others—have published only around 14.5 percent of the published articles in the last ten years. This might be considered an important opportunity for future research on dynamic capabilities in new ventures research.

Table 2.5 Journals and articles published per five-year period by area of research

| Area of Research | No. | % | Specific Area of Research | No. | Journal | 1996–2000 | 2001–2005 | 2006–2010 | 2011–2016 | Total |
|------------------|-----|----|---|-----|--|-----------|-----------|-----------|-----------|-------|
| Business | 13 | 13 | Retailing | 1 | JOURNAL OF RETAILING | | | 1 | | 1 |
| Business | | | Supply chain | 2 | SUPPLY CHAIN MANAGEMENT: AN INTERNATIONAL JOURNAL | | | | 1 | 1 |
| Business | | | Technological forecasting | 3 | TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE | | | | 1 | 1 |
| Business | | | International business | 4 | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | 1 | 1 | 1 | 1 | 4 |
| Business | | | International business | 5 | JOURNAL OF WORLD BUSINESS | 1 | | 1 | 4 | 6 |
| Entrepreneurship | 13 | 13 | Entrepreneurship | 6 | JOURNAL OF BUSINESS VENTURING* | 1 | | 1 | 1 | 3 |
| Entrepreneurship | | | Entrepreneurship and management of entrepreneurial organizations | 7 | INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL* | | | | 1 | 1 |
| Entrepreneurship | | | Entrepreneurship and small business | 8 | INTERNATIONAL SMALL BUSINESS JOURNAL* | | | 1 | 2 | 3 |
| Entrepreneurship | | | Entrepreneurship and small business management | 9 | JOURNAL OF SMALL BUSINESS MANAGEMENT* | | | | 3 | 3 |
| Entrepreneurship | | | Entrepreneurship, family firms, SMEs, and new ventures | 10 | SMALL BUSINESS ECONOMICS* | | | | 2 | 2 |
| Entrepreneurship | | | Entrepreneurship: family-controlled enterprise (large to small firms) | 11 | FAMILY BUSINESS REVIEW* | | | | 1 | 1 |
| Information | 7 | 7 | Information management | 12 | INTERNATIONAL JOURNAL OF INFORMATION MANAGEMENT | | | 1 | 1 | 2 |
| Information | | | Information systems | 13 | EUROPEAN JOURNAL OF INFORMATION SYSTEMS | | 1 | | | 1 |
| Information | | | Information systems | 14 | INFORMATION SYSTEMS RESEARCH | | 2 | | | 2 |
| Information | | | Information systems | 15 | JOURNAL OF STRATEGIC INFORMATION SYSTEMS | | | 1 | 1 | 2 |
| Management | 35 | 35 | Management | 16 | BRITISH JOURNAL OF MANAGEMENT | | | 7 | 3 | 10 |
| Management | | | Management | 17 | INTERNATIONAL JOURNAL OF MANAGEMENT REVIEWS | | | 2 | | 2 |
| Management | | | Management | 18 | MANAGEMENT SCIENCE | | 1 | | 1 | 2 |
| Management | | | Management and development of new products | 19 | JOURNAL OF PRODUCT INNOVATION MANAGEMENT | | 1 | | 1 | 2 |

| | | | | | | | | | | |
|--------------|-----------|------------|--|----|---|----------|-----------|-----------|-----------|------------|
| Management | | | Management and organization | 20 | JOURNAL OF MANAGEMENT STUDIES | | | 4 | 1 | 5 |
| Management | | | Management field | 21 | JOURNAL OF MANAGEMENT | | | 1 | | 1 |
| Management | | | Management theory | 22 | ACADEMY OF MANAGEMENT JOURNAL | | 1 | | | 1 |
| Management | | | Organization | 23 | ORGANIZATION STUDIES | | | 1 | 1 | 2 |
| Management | | | Physical distribution and logistics management | 24 | INTERNATIONAL JOURNAL OF PHYSICAL DISTRIBUTION AND LOGISTICS MANAGEMENT | | | | 1 | 1 |
| Management | | | Planning and management of travel and tourism | 25 | TOURISM MANAGEMENT | | | | 3 | 3 |
| Management | | | Service management | 26 | JOURNAL OF SERVICE MANAGEMENT | | | 1 | | 1 |
| Management | | | Social relationships | 27 | HUMAN RELATIONS | | | 1 | | 1 |
| Management | | | Social responsibility and environmental management | 28 | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | | | | 1 | 1 |
| Management | | | Supply chain management | 29 | JOURNAL OF SUPPLY CHAIN MANAGEMENT | | | 1 | 1 | 2 |
| Management | | | Management of environment | 30 | JOURNAL OF ENVIRONMENTAL MANAGEMENT | | | | 1 | 1 |
| Marketing | 5 | 5 | Marketing | 31 | JOURNAL OF THE ACADEMY OF MARKETING SCIENCE | | | | 2 | 2 |
| Marketing | | | Marketing, industries, and business-to-business | 32 | INDUSTRIAL MARKETING MANAGEMENT | | | | 3 | 3 |
| Operations | 5 | 5 | Manufacturing and process industries, and production | 33 | INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS | | | | 1 | 1 |
| Operations | | | Operations management | 34 | JOURNAL OF OPERATIONS MANAGEMENT | | | 1 | 1 | 2 |
| Operations | | | Technological innovation | 35 | TECHNOVATION | 1 | | 1 | | 2 |
| Strategy | 21 | 21 | Strategic management | 36 | STRATEGIC MANAGEMENT JOURNAL | 2 | 3 | 2 | 6 | 13 |
| Strategy | | | Strategy and environmental management | 37 | BUSINESS STRATEGY AND THE ENVIRONMENT | | | 1 | | 1 |
| Strategy | | | Strategy and strategic management | 38 | GLOBAL STRATEGY JOURNAL | | | | 4 | 4 |
| Strategy | | | Strategy, management, and organization | 39 | ORGANIZATION SCIENCE | | 1 | 2 | | 3 |
| Total | 99 | 100 | | | No | 6 | 11 | 32 | 50 | 99 |
| | | | | | % | 6 | 11 | 32 | 51 | 100 |

Regarding the analyzed techniques (see Table 2.6), most of the reviewed articles use grounded theory (38%), followed by case studies (25%), regression analysis (19%), structural equation modeling (7%), other techniques (7%), and logit and Tobit models (4%). These findings highlight the trend of using theoretical research over the empirical. Additionally, there is a low tendency to use logit and Tobit models and structural equation modeling, as well as only one article using panel data. These findings pointed to gaps in the empirical research.

Table 2.6 Main technique used in the analyzed articles

| No. | Technique | Articles | | Author and year of publication |
|-----|---|----------|----|---|
| | | No. | % | |
| 1. | Ordinary least squares regression, hierarchical ordinary least squares regression, partial least squares regression, or meta regression | 19 | 19 | Arend (2013, 2014); Arthurs and Busenitz (2006); Deeds, DeCarolis, and Coombs (2000); Jeng and Pak (2016); Døving and Gooderham (2008); Drnevich and Kriauciunas (2011); El Akremi, Perrigot, and Piot-Lepetit (2015); Fainshmidt, Pezeshkan, Frazier, Nair, and Markowski (2016); Griffith and Harvey (2001); Leonidou, Leonidou, Fotiadis, and Aykol (2015); Malik and Kotabe (2009); McKelvie and Davidsson (2009); Nieves and Haller (2014); Rodríguez-Serrano and Martín-Armario (2017); Rothaermel and Hess (2007); Schilke (2014); Swoboda and Olejnik (2016); Wilden and Gudergan (2015). |
| 2. | Structural equation modeling | 7 | 7 | Barrales-Molina, Bustinza, and Gutiérrez-Gutiérrez (2013); Cheng, Chen, and Huang (2014); Griffith, Noble, and Chen (2006); Rice, Liao, Galvin, and Martin (2015); Vanpoucke, Vereecke, and Wetzels (2014); Wang, Senaratne, and Rafiq (2015); Wilhelm, Schlömer, and Maurer (2015). |
| 3. | Other techniques (i.e., descriptive statistics, simulation, principal component analysis) | 7 | 7 | Fang and Zou (2009); Lee, Lin, Chen, and Shyr (2011); Macher and Mowery (2009); Madhok and Osegowitsch (2000); Russo (2009); Zhu, Cordeiro, and Sarkis (2013); Zott (2003). |

| | | | | |
|----|--------------------|----|----|--|
| 4. | Logit, Tobit model | 4 | 4 | King and Tucci (2002); Piening and Salge (2015); Sawers, Pretorius, and Oerlemans (2008); Townsend and Busenitz (2015). |
| 5. | Grounded theory | 37 | 38 | Ambrosini and Bowman (2009), Ambrosini, Bowman, and Collier (2009); Augier and Teece (2008, 2009); Barreto (2010); Beske (2012); Beske, Land, and Seuring (2014); Blyler and Coff (2003); Camisón and Monfort-Mir (2012); Dixon, Meyer, and Day (2010); Easterby-Smith, Lyles, and Peteraf (2009); Easterby-Smith and Prieto (2008); Eisenhardt and Martin (2000); Helfat and Peteraf (2015); Hodgkinson and Healey (2011); Lee, Lin, Chen, and Shyr (2011); Luo (2000); Marsh and Stock (2003); Michailova and Zhan (2015); Mitchell and Skrzypacz (2015); Pandza and Thorpe (2009); Peteraf, Di Stefano, and Verona (2013); Prange and Verdier (2011); Ramachandran (2011); Regné (2008); Teece (2007, 2014); Teece, Pisano, and Shuen (1997); Vergne and Durand (2011); Wang and Ahmed (2007); Weerawardena, Mort, Liesch, and Knight (2007); Wheeler (2002); Winter (2003); Zahra and George (2002); Zahra, Sapienza, and Davidsson (2006); Zollo, Bettinazzi, Neumann, and Snoeren (2016); Zollo and Winter (2002). |
| 6. | Case study | 25 | 25 | Anand, Ward, Tatikonda, and Schilling (2009); Bingham, Heimeriks, Schijven, and Gates (2015); Butler and Soontiens (2015); Cabanelas, Omil, and Vázquez (2013); Chen, Sun, Helms, and Jih (2008); Chirico and Nordqvist (2010); Daniel, Ward, and Franken (2014); Daniel and Wilson (2003); Fawcett, Wallin, Allred, Fawcett, and Magnan (2011); Fischer, Gebauer, Gregory, Ren, and Fleisch (2010); Gebauer (2011); Koch (2010); Lessard, Teece, and Leih (2016); Narayanan, Colwell, and Douglas (2009); Nonaka, Hirose, and Takeda (2016); Pablo, Reay, Dewald, and Casebeer (2007); Petroni (1998); Ramírez, Österman, |

and Grönquist (2013); Ravishankar and Pan (2013); Reuter, Foerstl, Hartmann, and Blome (2010); Rindova and Kotha (2001); Salunke, Weerawardena, and McColl-Kennedy (2011); Weerawardena, Mort, Salunke, Knight, and Liesch (2015); Williamson (2016); Woldeesenbet, Ram, and Jones (2012).

| | | |
|--------------|-----------|------------|
| Total | 99 | 100 |
|--------------|-----------|------------|

With the purpose of approximating the research activity of national teams, the articles were classified according to the country from which the authors came (associated with the first affiliation institution of the researcher). The country contributing the most articles is the USA (35%), followed by the UK (13%), Australia (7%), France (6%), and Germany (5%). Table 2.7 presents the published articles by country.

Table 2.7 Countries and published articles

| No. | Country | Articles | |
|-----|-------------|----------|---|
| | | No. | % |
| 1 | AUSTRALIA | 10 | 7 |
| 2 | BELGIUM | 1 | 1 |
| 3 | CANADA | 3 | 2 |
| 4 | CHINA | 2 | 1 |
| 5 | CYPRUS | 1 | 1 |
| 6 | FINLAND | 2 | 1 |
| 7 | FRANCE | 8 | 6 |
| 8 | GERMANY | 7 | 5 |
| 9 | GREECE | 1 | 1 |
| 10 | INDIA | 1 | 1 |
| 11 | ITALY | 4 | 3 |
| 12 | JAPAN | 1 | 1 |
| 13 | MALAYSIA | 1 | 1 |
| 14 | NETHERLANDS | 2 | 1 |
| 15 | NEW ZEALAND | 1 | 1 |
| 16 | NORWAY | 1 | 1 |
| 17 | PORTUGAL | 1 | 1 |

| | | | |
|--------------|-----------------|------------|---------------|
| 18 | SINGAPORE | 1 | 1 |
| 19 | SOUTH AFRICA | 1 | 1 |
| 20 | SPAIN | 6 | 4 |
| 21 | SWEDEN | 6 | 4 |
| 22 | SWITZERLAND | 4 | 3 |
| 23 | TAIWAN | 5 | 4 |
| 24 | THE NETHERLANDS | 1 | 1 |
| 25 | TURQUEY | 1 | 1 |
| 26 | UK | 17 | 13 |
| 27 | USA | 47 | 35 |
| Total | | 136 | 100.00 |

In order to analyze the impact of the articles, the total number of citations according to the SSCI was used. The results indicate that the most cited article (6,428 citations) is that by Teece et al. (1997), whose objective was to analyze the source and methods of wealth creation by private enterprises operating in rapid technological change environments. This work is followed by those by Eisenhardt and Martin (2000) (3,158 citations); Zollo and Winter (2002) (1,615 citations); Teece (2007) (1,446 citations); and Winter (2003) (951 citations). Table 2.8 shows the most cited articles by author and year of publication.

Table 2.8 Most cited articles

| No. | Author(s) and year of publication | Year | Total citations in SSCI | |
|-----|---------------------------------------|------|-------------------------|----|
| | | | No. | % |
| 1 | Teece, Pisano, and Shuen (1997) | 1997 | 6,428 | 38 |
| 2 | Eisenhardt and Martin (2000) | 2000 | 3,158 | 19 |
| 3 | Zollo and Winter (2002) | 2002 | 1,615 | 10 |
| 4 | Teece (2007) | 2007 | 1,446 | 9 |
| 5 | Winter (2003) | 2003 | 951 | 6 |
| 6 | Zahra, Sapienza, and Davidsson (2006) | 2006 | 471 | 3 |
| 7 | Zott (2003) | 2003 | 342 | 2 |

| | | | | |
|--------------|---|------|---------------|------------|
| 8 | Wang and Ahmed (2007) | 2007 | 319 | 2 |
| 9 | Rindova and Kotha (2001) | 2001 | 254 | 2 |
| 10 | Rothaermel and Hess (2007) | 2007 | 222 | 1 |
| 11 | Ambrosini and Bowman (2009) | 2009 | 219 | 1 |
| 12 | Barreto (2010) | 2010 | 211 | 1 |
| 13 | King and Tucci (2002) | 2002 | 183 | 1 |
| 14 | Weerawardena, Mort, Liesch, and Knight (2007) | 2007 | 163 | 1 |
| 15 | Blyler and Coff (2003) | 2003 | 152 | 1 |
| 16 | Augier and Teece (2009) | 2009 | 102 | 1 |
| 17 | Reuter, Foerstl, Hartmann, and Blome (2010) | 2010 | 96 | 1 |
| 18 | Easterby-Smith, Lyles, and Peteraf (2009) | 2009 | 96 | 1 |
| 19 | Hodgkinson and Healey (2011) | 2011 | 88 | 1 |
| 20 | Drnevich and Kriauciunas (2011) | 2011 | 76 | 0.5 |
| 21 | Teece (2014) | 2014 | 61 | 0.4 |
| 22 | Schilke (2014) | 2014 | 58 | 0.3 |
| 23 | Helfat and Peteraf (2015) | 2015 | 43 | 0.3 |
| 24 | Beske, Land, and Seuring (2014) | 2014 | 41 | 0.2 |
| Total | | | 16,795 | 100 |

The authors who have published the most articles are Teece (six), Peteraf (three), and Weerawardena (three). See Table 2.9 for authors sorted according to number of publications.

Table 2.9 Authors sorted by number of publications

| No. | Author | Articles |
|-----|----------------------|----------|
| 1 | Teece, David J. | 6 |
| 2 | Peteraf, Margaret A. | 3 |
| 3 | Weerawardena, Jay | 3 |
| 4 | Ambrosini, Veronique | 2 |

| | | |
|----|------------------------|---|
| 5 | Bowman, Cliff | 2 |
| 6 | Arend, Richard J. | 2 |
| 7 | Augier, Mie | 2 |
| 8 | Beske, Philip | 2 |
| 9 | Chirico, Francesco | 2 |
| 10 | Nordqvist, Mattias | 2 |
| 11 | Daniel, Elizabeth M. | 2 |
| 12 | Easterby-Smith, Mark | 2 |
| 13 | Griffith, D. A. | 2 |
| 14 | Wang, Catherine L. | 2 |
| 15 | Mort, Gillian Sullivan | 2 |
| 16 | Knight, Gary | 2 |
| 17 | Winter, S. G. | 2 |
| 18 | Zahra, S. A. | 2 |
| 19 | Zollo, Maurizio | 2 |

Table 2.10 shows the firm type in the analyzed articles, excluding theoretical studies of dynamic capabilities and literature reviews. This table shows that most of the empirical works are related to large firms and other sort of firms, such as multinational or international firms (80%) followed by SMEs, early stage, and new firms (20%).

For instance, Sawers et al. (2008) examine to what extent the number of dynamic capabilities of SMEs is associated with partnership success and to what extent this relationship is influenced by the number of safeguards used by the SMEs. McKelvie and Davidsson (2009) examine in new firms founder human capital, access to employee human capital, access to technological expertise, access to other specific expertise, and access to two types of tangible resources. Woldesenbet et al. (2012) examine the capabilities that allow small firms to operate as suppliers to large organizations in the public and private sectors. Arend (2013) studies whether SMEs have ‘dynamic’ capabilities that change their ethics-focused operational capabilities; what effects those dynamic capabilities have on both ethical and competitive performance; and whether

those effects are contingent on a firm’s entrepreneurial characteristics. Arend (2014) studies how strategic change can drive firm performance in SMEs. Wang et al. (2015) examine the effects of success traps on dynamic capabilities and consequently firm performance, taking into account firm strategy and market dynamism in SMEs. Wilhelm et al. (2015) underscore the overall importance of dynamic capabilities as a way to understand differences in operating-routine performance in SMEs. Swoboda and Olejnik (2016) argue that SMEs can capitalize on scanning and planning processes because of their international entrepreneurial orientation. Jeng and Pak (2016) considers the relationships among capabilities and performance under conditions of high industry competitiveness in SMEs. Rodríguez-Serrano and Martín-Armario (2017) study the role of dynamic absorption capacity in small businesses that internationalize from startup, showing positive performance and the influence of an entrepreneurial market-oriented culture.

Table 2.10 Type of firms studied

| Type of firm | Articles | | Level of analysis | Authors & year of publication |
|-------------------------------------|----------|----|--|---|
| | No. | % | | |
| SMEs, early stage, and new ventures | 12 | 20 | Seed/early-stage companies | Townsend and Busenitz (2015) |
| | | | Early internationalizing firms | Weerawardena, Mort, Salunke, Knight, and Liesch (2015) |
| | | | Technology innovative SMEs | Sawers, Pretorius, and Oerlemans (2008) |
| | | | Small firm suppliers to large purchasing organizations | Woldesenbet, Ram, and Jones (2012) |
| | | | New firms | McKelvie and Davidsson (2009) |
| | | | 113 UK high tech SME's | Wang, Senaratne, and Rafiq (2015) Wilhelm, Schlömer, and Maurer (2015) |

| | | | | |
|---|-----------|------------|---|---|
| | | | 200 engineering, rubber and plastics, and paper processing SMEs | Swoboda and Olejnik (2016) |
| | | | 604 SMEs | Rodríguez-Serrano and Martín-Armario (2017) |
| | | | 102 born-global SMEs | Arend (2013) |
| | | | 215 for profit SMEs | Arend (2014) |
| | | | 220 SMEs | Jeng and Pak (2016) |
| | | | 692 SMEs and large enterprises | |
| Large firms and others (multinational or international) | 49 | 80 | Regional, national and multinational firms from several industries, such as manufacturing, pharmaceutical, biotechnological, chemical, tourism, digital network, capital goods, healthcare, computer, food, electronic, IT, and retailer industries | The rest of the authors |
| Total | 61 | 100 | | |

In order to be able to identify the antecedents and consequences of the research related to dynamic capabilities, a classification of the dependent variables, independent variables, variables of control, findings, origin of data base, level of analysis, and authors was constructed. See Appendix B for the classification of the dependent variables under investigation in the reviewed literature.

The dependent variables were categorized as follows: performance, innovation, capabilities, operations, finance, alliances/partnerships, and others such as experience and firms' power. Performance comprises dependent variables such as firm performance, organizational

performance, relative firm performance, global finance performance, financial performance, chain performance, competitive performance, and ethical performance. Innovation includes dependent variables like innovative output, innovation performance, new product development, and number of new services. Capabilities incorporate sensing capability, learning capability, integrating capability, coordinating capability, alliance management capability, new product development capability, idea generation capability, market disruptiveness capability, new product development capability, and new process development capability. Operations show successful total quality environmental management adoption, operation statistics, and operation effectiveness. Finance includes one-year Sharpe's measure (measure for calculating risk-adjusted return) and early stage capital raised. Finally, alliances and partnerships involve home country embeddedness of technology creation, host country embeddedness of technology commercialization, extent of interaction required, absorptive capacity, number of alliances, and partnership success. In the classification, 'others' includes production and sales experience, prior transition experience, cumulative industry experience, and firm's power.

On the other side, independent variables are studied by Jeng and Pak (2016) in the form of innovation capability and marketing capability; by Wilden and Gudergan (2015) as reconfiguring capabilities, sensing capabilities, operational capabilities, and environmental turbulence; by Fainshmidt et al. (2016) to include higher order dynamic capability (and lower order dynamic capability), technological dynamism, higher-order dynamic capability, and developed economy; by Drnevich and Kriauciunas (2011) in the form of ordinary capability, dynamic capability, environmental dynamism, and degree of heterogeneity of the capability; by Arend (2013) as ethics-focused dynamic capability, routinized ordinary capability changes, changed operational capabilities, and changed ethical stance; by Cheng et al. (2014) as market orientation, entrepreneurial orientation, and dynamic absorptive capacity; by Wilhelm et al. (2015) in the form of sensing, learning, and reconfiguring dynamic capabilities; by Townsend and Busenitz (2015) as managerial capabilities, radical innovation, and demand uncertainty; and by Sawers et al. (2008) in the form of strategic capabilities possessed by SMEs, internal capabilities of SMEs, and external capabilities of SMEs.

Finally, Table 2.11 shows the main findings by year in terms of the antecedents and consequences of the last ten years, including the origin of the data base, the level of the analysis, and authors.

Table 2.11 Main findings 2006–2017 regarding dynamic capabilities

| Main findings | Origin of data base | Level of analysis | Author(s) |
|--|----------------------------|-----------------------------|---------------------------------|
| Dynamic capabilities vs. entrepreneurial capabilities. | USA | National | Arthurs and Busenitz (2006) |
| Three dynamic capability development mechanisms: organizational learning, reverse engineering, and manufacturing flexibility. | INDIA, PAKISTAN | Manufacturing industry | Malik and Kotabe (2009) |
| Environmental dynamism negatively affects the contribution of ordinary capabilities and positively affects the contribution of dynamic capabilities to relative firm performance (building a model of capabilities, dynamism, heterogeneity, and relative firm performance). | CHILE | N/A | Drnevich and Kriauciunas (2011) |
| The general effect of capabilities (ethics-focused operational capabilities) is positive on an SME's ethical performance, and the performance effects are contingent on an SME's degree of entrepreneurial orientation and sensitivity to changes in the business context. | USA | 215 for profit SMEs | Arend (2013) |
| Most entrepreneurial ventures report having dynamic capabilities and their differences in age and size lead to differences in how dynamic capabilities affect firm performance. | USA | 220 SMEs | Arend (2014) |
| The success of born-global firms is determined by their ability to assimilate and to use knowledge in accordance with the demands of the market. | TAIWAN | Manufacturing industry SMEs | Cheng et al. (2014) |
| Firms can develop dynamic capabilities if they have high levels of knowledge at both the individual and the collective level. | SPAIN | Tourism industry | Nieves and Haller (2014) |

| | | | |
|---|-------------|---|---|
| Dynamic capabilities have different performance effects in high-dynamic and low-dynamic environments. | GERMANY | 200 engineering, rubber and plastics, and paper processing SMEs | Wilhelm et al. (2015) |
| Large firms prospered from building dynamic capabilities under conditions of high industry competitiveness, while investments in innovation and marketing individually diminished small firms' performance. The effect was mixed for medium-size firms. | USA, CANADA | 692 SMEs and large enterprises | Jeng and Pak (2016) |
| Linking inter-organizational innovation performance with relational governance and dynamic capabilities. | SPAIN | 102 born-global SMEs | Rodríguez-Serrano and Martín-Armario (2017) |

2.5 Discussion and conclusions

As discussed in Chapter 1, there is a specific gap in the literature regarding research and theory-building around dynamic capabilities in new ventures and SMEs (Zahra et al., 2006). The results of this literature review support these previous findings by showing that only around 20 percent of the research regarding dynamic capabilities has been done on new ventures and SMEs. These studies include the work regarding SMEs and early stage firms that has been done by Arend (2013, 2014), Don (2016), McKelvie and Davidsson (2009), Rodríguez-Serrano and Martín-Armario (2017), Sawers et al. (2008), Swoboda and Olejnik, (2016), Townsend and Busenitz (2015), Wang et al. (2015), Weerawardena et al. (2015), Wilhelm et al. (2015), and Woldesenbet et al. (2012). Only the work of McKelvie and Davidsson (2009) was focused on new ventures.

The dynamic capabilities theory was identified as the main approach used to study dynamic capabilities, with 60 percent of the articles. Besides, the dynamic capabilities framework combined with other specific theories accounted 37 percent of the papers, using theoretical frameworks such as the resource-based view (7 percent of articles), learning and organizational approaches (7 percent of articles), strategy frameworks (7 percent of articles), other theories (5 percent of articles), entrepreneurship theories (4 percent of articles), management approaches (3 percent of articles), international perspectives (2 percent of articles), and sustainable supply chain (2 percent of articles) management theory. Therefore, there is an area of opportunity in developing research in the field of dynamic capabilities combining the dynamic capabilities perspective with other

theories, such as HCT, OI and the IE approach. Moreover, there is a failure in the research with the lack of studies of dynamic capabilities in new ventures that besides combine the dynamic capabilities approach with other frameworks. In this way, the entrepreneurship field would benefit if more research is undertaken concerning the application of dynamic capabilities in new ventures.

Regarding the type of research, the empirical literature is scarce, and more research should be done considering the results of this investigation. Furthermore, the application of other techniques in empirical research may include, for instance, logit, probit, and panel data.

In addition, most of the investigation has been done by teams from developed countries such as the USA, UK, and Australia regarding developing countries, and sparse research has been conducted, for instance, by Latin American research teams regarding Latin American countries. In the same way, most of the analyses regarding antecedents and consequences of dynamic capabilities in new ventures and SMEs have been done only at country or region level, giving space for more investigation on an international level.

Although the number of papers in the field of dynamic capabilities has increased in recent years, limited research has been published in entrepreneurship, and small and new business journals. Autio, George, and Alexy (2011), through qualitative research, show how new capabilities originate in and strengthen new businesses in uncertain environments; as a result, they encourage further research of the emergence and evolution of capabilities in new ventures. However, we argue that the lack of entrepreneurship data bases has limited the applicability of research on dynamic capabilities in entrepreneurship research papers.

2.6 Limitations and future research lines

This chapter is not without its limitations, suggesting the potential for further relevant research. However, academic progress needs to be made in social sciences that extends the field of dynamic capabilities in the entrepreneurship arena by researching dynamic capabilities in new ventures, especially in high impact journals, including the business and management areas.

Another consideration for future research is the analysis of dynamic capabilities in new ventures applying the human capital and institutional economics approaches combined with the dynamic capabilities' perspective, as well as using entrepreneurship data bases in combination with a variety of statistical techniques.

In relation to the scope of research, the majority of the papers are related to developing countries. Consequently, further study overcoming this shortcoming, and even undertaking a comparative study between developing and developed countries, would facilitate a better understanding of dynamic capabilities in new ventures. In this sense, the participation of international research teams could benefit not only the production of high-quality reports, but also the international level of the analysis.

CHAPTER 3
INSTITUTIONAL CONDITIONS AND DYNAMIC CAPABILITIES
ACROSS COUNTRIES

3. INSTITUTIONAL CONDITIONS AND DYNAMIC CAPABILITIES ACROSS COUNTRIES

3.1 Introduction

Entrepreneurship has been identified as a key driver of economic growth, employment, and innovation (Bosma, Sanders, & Stam, 2018; Urbano & Aparicio, 2016; Wennekers & Thurik, 1999). According to Reynolds et al. (2005), new firms have a substantial impact in diverse ways. For instance, firms may create jobs if they grow, and/or may introduce new products or services that alter the economy. Bjørnskov and Foss (2016) suggest that these effects take place in countries where the quality of institutions is improved.

According to Bruton et al. (2010), two streams of comparative entrepreneurship research have been identified depending on the institution chosen to predict entrepreneurship: formal institution (Autio & Acs, 2010) vs. informal institution (Autio et al., 2013). Some institutional researchers (e.g. North, 2005) have suggested the possibility of combining both streams to understand productive decisions. Though there are scholars analyzing the relationship between institutions and entrepreneurship (Aidis, Estrin, & Mickiewicz, 2008; Thornton, Ribeiro-Soriano, & Urbano, 2011; Welter, 2011; Welter & Smallbone, 2011, among others), empirical studies that integrate both streams in comparative entrepreneurship research are still unusual (Stephan & Uhlaner, 2010). Moreover, no research has been conducted to analyze the relationships between the EFCs, such as formal and informal institutions and dynamic capabilities in new ventures, at a country level. Chapter 2 discussed the identified gap in the literature regarding research and theory-building of dynamic capabilities in new ventures and SMEs. Zahra et al. (2006) claim that further evidence is needed for theory-building about dynamic capabilities in new ventures and SMEs. Díaz-Casero et al. (2011) assert that the creation of new ventures depends on the entrepreneurial capability to evaluate opportunities which, alongside entrepreneurial capabilities, relies on specific EFCs in each country.

This research therefore examines the relationship between institutional conditions (formal and informal) and dynamic capabilities in new ventures. Grounded in the dynamic capabilities perspective and institutional economics, our study follows recent calls for greater consideration of

the importance of modeling institutional conditions as antecedents of DC, such as entrepreneurial capabilities (Mai & Gan, 2007), driven by the fact that both formal and informal institutions set the environment in which entrepreneurs decide whether or not to initiate an entrepreneurial activity (Meek, Pacheco, & York, 2010). These kinds of analyses also enable us to understand opportunities identification, as well as the abilities and knowledge to set up a new firm in a given context. We therefore hypothesize that formal (finance, government policies, government programs, market openness, market openness, physical infrastructure, and intellectual property rights) and informal institutions (abilities, knowledge to start up, entrepreneur social image, and women's support to start up) influence dynamic capabilities (entrepreneurial capabilities) in new ventures. We also hypothesize that informal institutions moderate the relationship between formal institutions and dynamic capabilities in new ventures. To test these associations, we use unbalanced panel data on a sample of 131 observations (22 countries) during the period 2006–2012. Data are taken from the Adult Population Survey (APS), aggregated at country level and the National Expert Survey (NES), both from the GEM, and complemented with information from the IMF, WDI, and WGI.

It is expected that the study will contribute to the research field in three ways: firstly, by advancing the application of institutional economics theory (North, 2005) in the analysis of dynamic capabilities (Teece et al., 1997); secondly, by exploring the effects of formal and informal institutions on entrepreneurial capabilities for new ventures across countries; and thirdly, by analyzing the moderating effects of informal institutions on the relationship between formal institutions and dynamic capabilities to provide some implications and directions for theory and practical aspects. The results could be considered by educators and policymakers in order to facilitate and contribute to the transition of countries' economies from factor-driven and efficiency-driven economies to innovation-driven economies.

The chapter is structured as follows. After this brief introduction, we provide the theoretical framework, which explains dynamic capabilities and institutional economics, and distinguishes entrepreneurial capabilities from other dynamic capabilities. We then present the hypothesis development and describe the proposed model. Following this, we explain the methodology used to test the suggested hypotheses. Subsequently, we show and explain the results of this study. Finally, we discuss some implications and concluding remarks, where limitations are identified that open potential avenues for future research.

3.2 Conceptual framework

3.2.1 Entrepreneurial activity

Reynolds et al. (2005) pointed out that entrepreneurial activity across countries differs in terms of entrepreneurial opportunity and entrepreneurial capability. In the same way, entrepreneurial activities vary according to the EFCs (Reynolds, Hay, & Camp, 1999). The EFCs specify a group of conditions that affect the intensity of new business activity, and these conditions are considered as rules of the entrepreneurial activity game in a specific context (Reynolds, Hay, & Camp, 1999); that is to say, when the EFCs change, then the rate and nature of entrepreneurial activity may change as well (Levie & Autio, 2008). Additionally, it is found that the economic context affects the rate of entrepreneurial activity, since it differs depending on the economic development level (Reynolds, Bygrave, & Autio, 2004). The skills and competencies that new ventures apply in the entrepreneurial activity must be upgraded, and dynamic capabilities are needed to survive, adapt, and grow (Zahra et al., 2006).

3.2.2 Dynamic capabilities

According to Barreto (2010), Woldesenbet et al. (2012), and Zahra et al. (2006), some definitions of dynamic capabilities are developed by Barreto (2010), Eisenhardt and Martin (2000), Helfat (1997), Helfat and Peteraf (2009), Teece (2007), Teece et al. (1997), Winter (2003), Zahra and George (2002a), Zahra et al. (2006), and Zollo and Winter (2002). Teece (2007) affirms that dynamic capabilities can be disaggregated into the capacity to sense and shape opportunities and threats, to seize opportunities, and to maintain competitiveness when it is necessary by reconfiguring the business enterprise's intangible and tangible assets. Furthermore, Zahra et al. (2006) recognize that different forms or levels of dynamic capabilities exist in firms. These authors also identify the owners' "perception of opportunities to underpin changes in existing routines or resource configurations, their willingness to undertake such change and their ability to implement these changes" (Zahra et al., 2006, p. 918) as representing dynamic capabilities. This perspective thus highlights that dynamic capabilities enable a firm to adapt and evolve (Helfat and Peteraf, 2009; Teece, 2007) thanks to the owner-manager's motivation, skills, and experience (Penrose,

1959). Woldesenbet et al. (2012) agrees with Ambrosini and Bowman (2009), Ambrosini et al. (2009), Helfat and Peteraf. (2009), and Zahra et al. (2006) that even though dynamic capabilities may permit small firms to penetrate the new product market in an effective manner, they guarantee neither their success nor their continuity. However, Woldesenbet et al. (2012, p. 497) proposes that “small firms with developed dynamic capabilities have a greater chance of operating in mainstream markets by supplying high-value-added services and products than those of firms with less developed dynamic capabilities.” Also, Woldesenbet et al. (2012) identifies four types of capabilities, namely, entrepreneurial capabilities, networking and bridging capabilities, resource development capabilities, and integrative and strategic service delivery capabilities. Arthurs and Busenitz (2006, p. 199) refer to entrepreneurial capabilities as “the ability to identify opportunities and develop the resource based needed to pursue the opportunities”. Moreover, Woldesenbet et al. (2012) recognizes that entrepreneurial capability is dynamic, interacting with the changing environment. Furthermore, even though these entrepreneurial capabilities have a significant impact on the resource base of small firms (Ambrosini & Bowman, 2009), other scholars observe that studies of capability rarely focus on small firms (Zahra et al., 2006). Besides, entrepreneurial capability is comparable to the searching and sense-making capability (Ambrosini & Bowman, 2009). Also, entrepreneurial capability “represents practices that represent a basis for entrepreneurial decisions and actions” (Rauch, Wiklund, Lumpkin, & Frese, 2009, p. 763) and is strengthened by processes and routines related to a firm’s proactiveness, innovativeness, and risk-taking.

3.2.3 Entrepreneurial capabilities

Similarly, Alvarez and Busenitz (2001) suggest that small firms use their intuition and trial and error methods to enter into current markets characterized by ambiguity and uncertainty, through their supply chain relations with large purchasing organizations. Even though Arthurs and Busenitz (2006) consider entrepreneurial capabilities as mainly linear, Woldesenbet et al. (2012) recognize them to be dynamic, as they interact in the environment in complicated and sophisticated ways. Furthermore, for Rauch et al. (2009), crucial entrepreneurial capabilities that are demonstrated by small firms can facilitate an engagement in strategy-making processes that contributes to supporting entrepreneurial decisions and actions. Considering the thoughts of Ambrosini and Bowman (2009) and Teece (2007), Woldesenbet et al. (2012) argue that entrepreneurial capability is a micro-foundation for dynamic capabilities, which includes a creative

search enabling the identification of “opportunities and threats or the ability to sense changing customer needs, technological opportunities and competitive developments” (Ambrosini & Bowman, 2009, p. 36). Teece (2007, p. 5) describe the micro-foundations of sensing opportunities and threats, concentrating on the individual’s opportunity creation and/or discovery. Kevill, Trehan, and Easterby-Smith’s (2017, p.3) findings indicate that “owner-managerial perceived self-efficacy can act as a micro-foundation of dynamic capabilities” and can affect the accomplishment of such capabilities in several ways. Moreover, they discovered the process that identifies opportunities through customers. Therefore, entrepreneurial capabilities may represent dynamic capabilities. This means that these managerial and organizational processes are relevant elements for the formation of dynamic capabilities. Therefore, a dynamic capability is not a resource but a process or routine that has an impact on the resource base of the firms (Easterby-Smith et al., 2009; Teece, 2007). Lee and Venkataraman (2006) observe that entrepreneurial features and the opportunities that small firms pursue may suffer changes due to unstable market conditions. These conditions may be studied through the lens of institutional economics.

3.2.4 Institutional economics

This study is focused on institutional economics (North, 2005). North (1990) defines institutions as the guidelines for human interaction. According to North (1990), these institutions can be divided into formal and informal. The former consists of constitutions, regulations, and contracts, whereas the latter comprises attitudes, values, norms of behavior, and conventions—in other words, the culture of a society. North’s (1990) theory of institutional change explains that formal institutions are a solid construction of informal ones, and that both advance and adapt through the operation of organizations such as informal and formal social groups, from households and villages to networks, firms, parties, and governments (Casson, Della Giusta, & Kambhampati, 2010). Accordingly, informal institutions are long-lasting systems of shared meanings and collective understandings that reflect a socially constructed reality and produce cohesion and coordination among individuals in a society, as long as they are not codified into documented rules and standards (North, 1990).

This framework has been largely adopted in entrepreneurship research. For instance, Veciana and Urbano (2008) suggest that the institutional conditions for entrepreneurship have been distinguished between formal (agencies, policies, procedures) and informal conditions (networks, role models, attitudes). Therefore, the study of the country’s institutional context and its

relationship with entrepreneurship becomes critical (Veciana & Urbano, 2008) as the environments become more complex and diversified for entrepreneurship across countries. Regarding the institutional influences on entrepreneurial activity, we consider Alvarez, Urbano, Corduras, and Ruiz-Navarro's (2011) classification of EFCs, previously identified by Reynolds et al. (1999) and based on the GEM model (Bosma & Levie, 2010). In that classification, formal institutions involve finance, government policies, government programs, research and development transfer, commercial and services infrastructure, market openness, physical infrastructure, and intellectual property rights, whereas informal institutions comprise education and training, cultural and social norms, opportunities to start up, abilities and knowledge to start up, entrepreneur social image, women's support to start up, and interest in innovation. We include the variable attention to high growth among the informal institutions (Reynolds, Bosma, Autio, Hunt, De Bono, Servais, & Chin, 2005), which started to be measured in the GEM in 2005 among the informal institutions.

3.3 Hypothesis development

3.3.1 Formal institutions and dynamic capabilities

This study is focused on the institutional economics theory (North, 2005) previously discussed in Chapter 1. Following Alvarez et al. (2011), as well as the update on the GEM model EFCs (Bosma & Levie, 2010), we consider formal institutions: finance, government policies, government programs, market openness, market openness, physical infrastructure, and intellectual property rights. Regarding opportunity identification and opportunity exploitation, Venkataraman (1997) mentions the field of entrepreneurship as the learned examination of how, by whom, and with what effects opportunities to generate future goods and services are discovered, evaluated, and exploited. Therefore, entrepreneurship requires the study of sources of opportunities, the processes of discovery, the evaluation and exploitation of opportunities, and the set of individuals who discover, evaluate, and exploit those opportunities (Shane & Venkataraman, 2000). Vaghely and Julien (2010) note that entrepreneurial opportunity is objective, endogenous, discovered, exclusive, and centered on the entrepreneur and his information process, among other aspects, while, on the other hand, entrepreneurial opportunity is subjective, exogenous, executed, inclusive, and social-cognition based, centered on the entrepreneur and his information network. However, both interpretations share the same objective—that is, knowledge development. According to Acs,

Desai, and Hessels (2008), opportunity recognition and skills perception are affected by EFCs, including formal institutions. In this respect, Woldesenbet et al. (2012) discuss that entrepreneurial capability is a micro-foundation for dynamic capabilities because it may include the process of opportunity identification and customer needs sensing. Also, a country's entrepreneurial capability is commonly defined by the formal institutional environment comprising political, economic, and legal structures (Acs et al., 2008).

Dynamic capabilities reveal themselves in specific business processes (Eisenhardt & Martin, 2000; Helfat & Peteraf, 2009; Helfat & Winter, 2011). Thus, rather than measuring a necessarily vague, generic dynamic capability, empirical researchers have been advised to carefully select a set of relevant business processes in which these capabilities exist to test their hypotheses (Gruber, Heinemann, Brettel, & Hungeling, 2010; Helfat & Peteraf, 2009; Helfat & Winter, 2011). In addition, Woldesenbet et al. (2012) identifies the entrepreneurial capabilities among the four types of dynamic capability. According to Ambrosini and Bowman (2009), entrepreneurial capability is like search and sense-making capability. Venkataraman (1997) refers to perceived opportunities as the best proxy to represent the opportunity identification activity related to entrepreneurial capabilities. Sirmon and Hitt (2009) consider that the benefits of dynamic capabilities depend on the context in which these capabilities are set up, and not only on the existence of organizational routines. Also, modes of organizational adaptation that are effective are indeed determined by environmental forces (Hrebiniak & Joyce, 1985). Some theoretical studies related to dynamic capabilities, such as those by Helfat and Peteraf (2009), Helfat and Winter (2011), and Zahra et al. (2006), emphasize, for instance, the role of environmental dynamism as a potentially important contextual variable. Likewise, Schilke (2014) mentions some important elements of environmental dynamism that affect dynamic capabilities—for instance, changes in industry structure, the instability of market demand, and the probability of environment change. Therefore, we formulate the following hypotheses:

Hypothesis 1. Formal institutions influence dynamic capabilities in new ventures.

Hypothesis 1a. Finance influences entrepreneurial capabilities.

Hypothesis 1b. Government policies influence entrepreneurial capabilities.

Hypothesis 1c. Government programs influence entrepreneurial capabilities.

Hypothesis 1d. Market openness influences entrepreneurial capabilities.

Hypothesis 1e. Physical infrastructure influences entrepreneurial capabilities.

Hypothesis 1f. Intellectual property influences entrepreneurial capabilities.

3.3.2 Informal institutions and dynamic capabilities

Alvarez et al.'s (2011) classification of informal institutions and the updated measurements made by the GEM project in 2005 consider informal institutions: education and training, cultural and social norms, opportunities to start up, abilities and knowledge to start up, entrepreneur social image, women's support to start up, interest in innovation, and attention to high growth. Indeed, informal institutions matter at least as much as formal institutions for fostering entrepreneurial activity (Alvarez et al., 2011). In domestic environments with under-reformed and weak formal institutions, such as transition economies, entrepreneurial activity is mainly guided and governed by informal codes of conduct (Ahlstrom & Bruton, 2002). Furthermore, for Acs et al. (2008), opportunity recognition and skills perception are influenced by EFCs, in which informal institutions are included. Levie and Autio (2008) tested the relations between informal institutions, specifically entrepreneurs' education and training, and opportunity perception in national populations, including the types of entrepreneurial activity at a national level. Over time, informal institutions can be influenced, and improved, and entrepreneurial activity can contribute to wider societal change (Welter & Smallbone, 2011). Regarding the relationship between informal institutions and entrepreneurship, Muralidharan and Pathak (2017) examine the influence of informal institutions on the internationalization of early stage entrepreneurial firms. Also, Petti and Zhang (2011) study internal and external factors that influence technological entrepreneurship capabilities. Concerning the link between entrepreneurship and dynamic capabilities, Jantunen, Puumalainen, Saarenketo, and Kyläheiko (2005) examine firms' relationship between entrepreneurial orientation, dynamic capabilities, and performance. Schilke (2014) identifies researchers who emphasize that routine-based dynamic capabilities are not necessarily enough means of change, even when there is a meaningful need for resource configurations (Eisenhardt & Martin, 2000; Schreyögg & Kliesch-Eberl, 2007). Schreyögg and Kliesch-Eberl (2007) posit that an important characteristic of the routines underlying dynamic capabilities is that they are path dependent and, as a result, they depend on interpretations and outcomes of past actions. Moreover, Bruton et al. (2010) consider study of the institutional economics approach useful to understand which factors boost opportunity entrepreneurship. These authors also affirm that there is a lack of research that examines informal institutions in the entrepreneurial context. Castaño, Méndez, and Galindo (2015) performed a comparative analysis of European countries versus Latin-American

and Caribbean countries and identified how social, cultural, and economic factors differ across different countries regarding stimulating entrepreneurship. Furthermore, according to Urbano and Alvarez (2014), the informal conditions have a greater influence on entrepreneurial activity than the formal conditions. Moreover, Teece (2018) argues that informal institutions like increased competition and disruptive digital technology may affect the capabilities of university leaders through the development of the dynamic capabilities approach. In other words, the strengthening of dynamic capabilities can help universities to overcome uncertain factors surrounding the university's education and research missions. Thus, we propose:

Hypothesis 2. Informal institutions influence dynamic capabilities in new ventures.

Hypothesis 2a. Abilities and knowledge to start up influence entrepreneurial capabilities.

Hypothesis 2b. Entrepreneur social image influences entrepreneurial capabilities.

Hypothesis 2c. Women's support to start up influence entrepreneurial capabilities.

3.3.3 Moderating effect of informal institutions

In North's (1990) study, culture is an important reflection of a country's informal institutions (Holmes, Miller, Hitt, & Salmador, 2013). Although reforms for the improvement of formal institutions may represent a positive step in fostering entrepreneurship, where they are not compatible with informal institutions, economic development will not be affected in a positive way. Research on institutions shows that formal and informal institutions interact with formal institutions in two ways: by supporting or complementing and/or undermining or substituting informal institutions (Estrin & Prevezer, 2011). On the one hand, informal institutions are complementary if they create and strengthen incentives to comply with formal institutions, therefore addressing problems of social interaction and coordination and enhancing the efficiency of formal institutions (Baumol, 1990). On the other hand, informal institutions substitute for formal institutions when individual incentives are structured in a way such that they are incompatible with the formal ones, which at the same time are weak or not enforced (Estrin & Prevezer, 2011). According to Reynolds et al. (1999, p. 43), "among the many factors that contribute to entrepreneurship, perhaps the most critical is a set of social and cultural values, along with the appropriate social, economic and political institutions that legitimize and encourage the pursuit of entrepreneurial opportunity."

Recently, the influence of cultural and social norms on entrepreneurship in European Union countries has been explored based on the GEM 2013 report, showing that national entrepreneurial

culture has a positive effect on entrepreneurship (Wach, 2015). A cultural descriptive norms approach to entrepreneurship was developed at a national level by Stephan and Uhlaner (2010), which showed that dimensions of culture relate to both entrepreneurship rates and EFCs from the GEM. Díaz-Casero et al.'s (2011) findings confirm that the role of cultural and social norms is important in entrepreneurial capabilities. Meek et al. (2010) demonstrate the integral influential role that social norms play in the creation of a new business. The authors also illustrate the potential effect that social norms have on the effect of policy that tries to foster economic activity, specifically environmentally responsible activity. In other words, their study indicates that social norms can also influence the effect of government-sponsored incentives. However, there are recent studies that examine the indirect effect of regional characteristics such as opportunities to start up and abilities and knowledge to start up on the individual perception of founding opportunities, which in turn predict start up intentions and activity (Stuetzer, Obschonka, Brixy, Sternberg, & Cantner, 2014). Following this rationale, we identify the possible interactions between formal institutions and informal institutions. Therefore, we suggest:

Hypothesis 3. Informal institutions moderate the relationship between formal institutions and dynamic capabilities in new ventures.

Hypothesis 3a. Abilities and knowledge to start up moderate the relationship between government policies and entrepreneurial capabilities.

Hypothesis 3b. Entrepreneur social image moderates the relationship between government policies and entrepreneurial capabilities.

Hypothesis 3c. Abilities and knowledge to start up moderate the relationship between market openness and entrepreneurial capabilities.

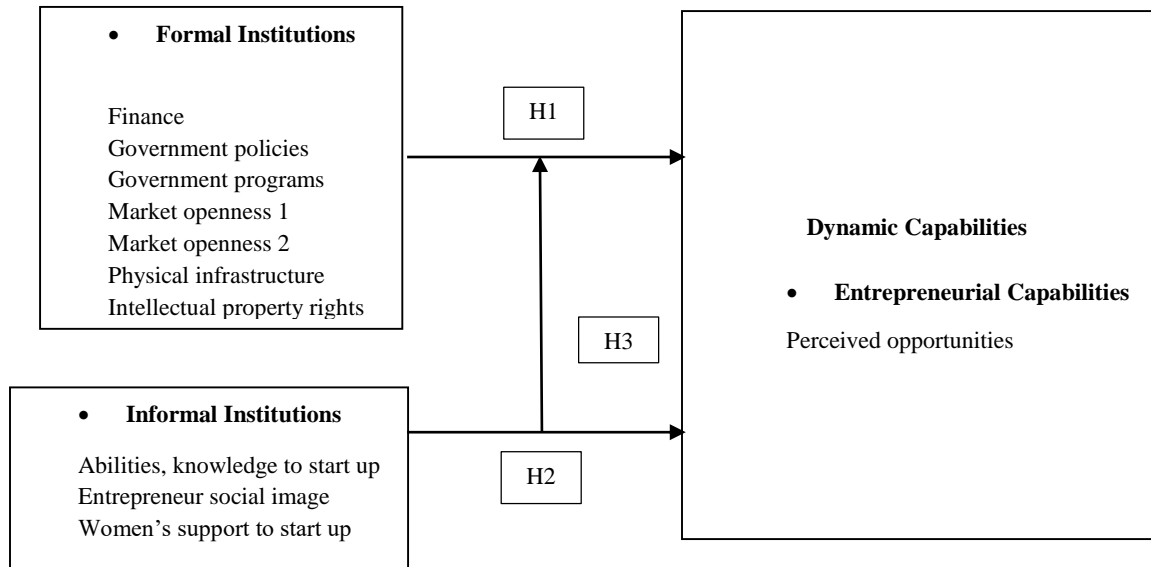
Hypothesis 3d. Entrepreneur social image moderates the relationship between market openness and entrepreneurial capabilities.

Hypothesis 3e. Entrepreneur social image moderates the relationship between physical infrastructure and entrepreneurial capabilities.

Hypothesis 3f. Women's support to start up moderates the relationship between physical infrastructure and entrepreneurial capabilities.

Figure 1 provides the model that illustrates each of the above hypotheses.

Figure 3.1 Model



3.4 Methodology

3.4.1 Data

As mentioned above, this study combines APS and NES data from the GEM and the IMF. The GEM is the largest annual study of entrepreneurial activity in the world. It mainly explores the role of entrepreneurship within countries by providing characteristics related to their entrepreneurial activity (Reynolds et al., 1999). Relevant research has been done using GEM information regarding the influence of entrepreneurship on economic growth (Alvarez, Urbano, & Amorós, 2014). The GEM survey collects basic data through the APS of at least 2,000 randomly selected adults from 18 to 64 years of age in each country. Furthermore, national teams collect opinions from experts related to components of the entrepreneurship ecosystem through the NES.

The analysis in this study is based on a final sample consisting of panel data with 131 observations of 22 countries (see Appendix 2), surveyed in the APS and in the GEM NES questionnaire during the period 2006–2012. Although the sample varies among countries (five to seven years for most of the countries), we selected a sample of at least three to seven years per

country. In this research, the entrepreneurial capabilities variable is represented by perceived opportunities, which is our dependent variable.

3.4.2 Variables

3.4.2.1 Dependent variable

Entrepreneurial capabilities are used as the dependent variable, given the fact that some authors recognize this dynamic capability of opportunity recognition as the trigger for the creation of new ventures. For instance, Teece (2012) affirms that entrepreneurship is related to sensing and understanding opportunities, simply getting things started, and involves finding new and better ways of assembling things. Levie and Autio (2008) describe how GEM proposes this paramount process in which entrepreneurs perceive opportunities and are therefore motivated to create new ventures which, according to the model, have an impact on economic growth. Furthermore, to Shane and Venkataraman (2000) and Venkataraman (1997), the activity of entrepreneurship includes the discovery, creation, and exploitation of opportunities with the purpose of introducing, for instance, new goods and services, new processes, or novel ways of organizing. Arenius and De Clercq (2005) recognize the first part of the entrepreneurial process as an opportunity discovery. Also, Shane (2000) affirms that individuals discover opportunities through the process of recognizing the value of the information to which they are exposed. In this way, Arenius and De Clercq (2005) argue that different structures of individuals' networks affect the likelihood of being exposed to new information and therefore perceiving entrepreneurial opportunities. These authors used the opportunity recognition measure as the dependent variable (binary variable), based on the question: in the next six months, will there be good opportunities for starting a business in the area where you live?

Teece (2007, p. 5) explains the micro-foundations of sensing opportunities and threats, focusing on the individual's opportunity creation and/or discovery, specifying that this individual or organizational process requires both access to information and the ability to recognize, sense, and shape developments. The ability to recognize opportunities depends in part on the individual's capabilities and extant knowledge (or the knowledge and learning capacities of the organization to which the individual belongs), particularly about user needs in relation to existing and novel solutions. Although selecting a limited number of specific processes as proxies for dynamic capabilities may affect the universality of results, doing so is necessary for empirical research on dynamic capabilities to be practicable. It is through theoretical induction that such empirical

research on specific types of dynamic capability “sheds light not only on these specific processes, but also on the generalized nature of dynamic capabilities” (Eisenhardt & Martin, 2000, p. 1108).

Kevill, Trehan, and Easterby-Smith’s (2017, p.3) findings suggest that “owner-managerial perceived self-efficacy can act as a micro-foundation of dynamic capabilities” and can influence the execution of such capabilities in various ways. These authors highlight the importance of the micro-foundational role played by the perceived self-efficacy of the owner-manager in micro-enterprises’ dynamic capabilities. Furthermore, among common practices in achieving small media businesses’ dynamic capability, they encountered the process of identifying opportunities through customers.

Thus, perceived opportunities may be an accurate proxy for the dependent variable entrepreneurial capabilities, representing dynamic capability. This is a measure at a country level obtained from the APS of the GEM (Barazandeh et al., 2015; Urbano & Alvarez, 2014). This variable measures the percentage of the 18–64 year–old population seeing good opportunities to start a firm in the area where they live. (See Appendix 3).

3.4.2.2 Independent variables

With regard to formal institutions, we acknowledge the relevance of tangible resources, meaning the physical resources (i.e., plant, equipment, computers, and machinery) enabling production and/or distribution of a new product or service (Dollinger, 2003). Tangible resources are often the second type of resource that a new venture possesses once it starts off, immediately after founder-based resources (since they constitute basic factors of production). Additionally, having access to financial resources allows firms to invest in exploiting resources and to purchase other necessary factors of production (McKelvie & Davidsson, 2009). Given the importance of tangible resources in entrepreneurship, the formal institutions of finance and physical infrastructure represent these tangible resources in our study and are measured at country level according to the NES of the GEM database. In this way, finance represents the perception of the financial environment related to entrepreneurship—that is, the existence of enough equity funding, debt funding, government subsidies, private individual funding (different than founders), venture capitalist funding, and funding available through initial public offerings (IPOs) for new and growing firms. This variable assesses the perception of the national condition of finance affecting entrepreneurship and is expressed by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true.

In the same way, the physical infrastructure variable explains the perception of the physical infrastructure situation related to entrepreneurship—for instance, whether the physical infrastructure provides good support for new and growing firms in terms of roads, utilities, communications, water, and disposal, and—if it is not too expensive—whether a new or growing firm can get good access in about a week to communications such as telephone, internet, etc., or whether a new or growing firm can afford the cost and can get good access in about a month to basic utilities such as gas, water, electricity, and waste removal. This variable assesses the perception of the national condition regarding physical infrastructure influencing entrepreneurial activity and is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 3, Topic A: Finance and Topic H: Physical infrastructure.)

In the same way, we consider other intangible resources that new ventures utilize. For instance, the government policies variable reflects those government policies favoring new firms and if support is a high priority for policy at the national and local government levels. This variable measures the perception of the national condition referring to government policies affecting entrepreneurship and is described by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true.

The government programs variable relates to the assistance new firms can get through a single agency, the support from science parks and business incubators, the number of programs for new firms, whether the people working for government agencies are competent and effective in supporting new firms, and whether government programs are effective at supporting new firms. This variable assesses the perception of the national condition concerning government programs influencing entrepreneurial activity and is displayed by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true.

The market openness variable explains that markets for consumer and business to business goods and services change yearly, and includes the easiness for new firms to enter a new market, the way new firms afford the cost of market entry, how new firms are blocked by established firms, and how effective and enforced the antitrust legislation is. This variable measures the perception of the national condition respecting market openness affecting entrepreneurship and is illustrated by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true.

Similarly, the intellectual property rights variable represents the legislation's comprehensiveness and efficiency; the extent of illegal sales; the trust in patents, copyrights, and trademarks; and the recognition and respect of inventors' rights for their inventions. This variable assesses the perception of the national condition regarding intellectual property rights influencing entrepreneurial activity and is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 3, Topic B: Government policies, Topic C: Government programs, Topic G: Market openness, and Topic N: Intellectual property rights.)

Concerning informal institutions, research related to new ventures within the resource-based view considers the role of the human capital of the founder(s) (Alvarez & Busenitz, 2001). Helfat and Lieberman (2002) and King and Tucci (2002) suggest that appropriate managerial experience plays a role in the development of dynamic capabilities. Furthermore, Bantel and Jackson (1989) and Hambrick and Mason (1984) argue that the formal education of the founders or executives affects the knowledge bases of firms, and as a consequence, their organizational capabilities. Therefore, given that the human capital is relevant in entrepreneurship for the creation of new ventures, we consider the informal institutions of abilities and knowledge to start up, which are measured at a country level, also from the NES of the GEM database. Abilities and knowledge to start up refer to the degree of skills and abilities to start up in the population—in other words, whether there are people that know how to start a high growth business and how to manage it, people that know how to start and manage a small enterprise, people that have previous experience in starting a new company, people that can react rapidly to good opportunities for a new start up, and people that have the ability to organize the means required for a new business. This variable measures the perception of the national condition referring to abilities and knowledge to start up affecting entrepreneurship and is displayed by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true (taken from the NES of the GEM) (see Appendix 3, Topic L: Abilities and knowledge to start up). In this respect, we also consider other informal variables: entrepreneur social image and women's support to start up. The entrepreneur social image variable reflects the perception of the creation of new firms by entrepreneurs in terms of the desire to become rich, seeing being an entrepreneur as a desirable career, the level of status and respect entrepreneurs should have, success stories in the media related to entrepreneurs, and the competence and resourcefulness of entrepreneurs. This

variable assesses the perception of the national condition about entrepreneur social image influencing entrepreneurial activity and is shown by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true.

The variable women’s support to start up relates to the sufficiency of social services that female entrepreneurs count on after starting a family, society’s acceptance of women starting new businesses, the equality of exposure to good opportunities to start a business, and the equality of ability to start a new firm. This variable represents the influence on entrepreneurship of perception of the national condition regarding women’s support to start up and is expressed by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. Both variables are taken from the NES of the GEM. (See Appendix 3, Topic M: Entrepreneur social image and Topic P: Women’s support to start up.)

3.4.2.3 Control variables

According to Reynolds et al. (2005) the primary source of measures of economic growth has been the World Economic Outlook data base (GDP per capita and GDP per capita growth). We consider the GDP per capita reported by the International Monetary Fund (IMF), which has served as a control variable in similar studies considering the GEM database analysis (Kelley, Brush, Green, & Litovski, 2011; Levie & Autio, 2008; Urbano, Alvarez, & Turró, 2013). From the WDI, we use population, labor force, and total unemployment. Similarly, from the WGI we utilize voice and accountability, political stability and absence of violence/terrorism, regulatory quality, and rule of law. Table 3.1 shows the description of the variables used in this study.

Table 3.1 Description of variables

| Construct | Measures | Description | Source ^a |
|------------------------------|------------------------------|--|----------------------------|
| Dependent variable | | | |
| Dynamic capabilities | Entrepreneurial capabilities | Perceived opportunities are represented by the percentage of the 18–64 year-old population that sees good opportunities to start a firm in the area where they live. | APS GEM 2006–2012 |
| Independent variables | | | |
| Formal institutions | Finance | Average of summary blocks of the financial environment related to entrepreneurship. | NES GEM 2006–2012 |

| | | | |
|--------------------------|-------------------------------------|---|-------------------|
| | Government policies | Average of summary blocks of the government policies regarding support for new firms. | NES GEM 2006–2012 |
| | Government programs | Average of summary blocks of the government programs regarding assistance and support for new firms. | NES GEM 2006–2012 |
| | Market openness 1 | Average of summary blocks of the market change for consumer- and business-to-business goods and services. | NES GEM 2006–2012 |
| | Market openness 2 | Average of summary blocks of the market entry for new firms. | NES GEM 2006–2012 |
| | Physical infrastructure | Average of summary blocks of the physical infrastructure accessibility and affordability to support new firms. | NES GEM 2006–2012 |
| | Intellectual property rights | Average of summary blocks of the intellectual property right legislation and trust ability. | NES GEM 2006–2012 |
| Informal institutions | Abilities and knowledge to start up | Average of summary blocks of the degree of skills and abilities to start up in the population. | NES GEM 2006–2012 |
| | Entrepreneur social image | Average of summary blocks of the social image of entrepreneurs regarding status, respect, competence, and success of entrepreneurs. | NES GEM 2006–2012 |
| | Women’s support to start up | Average of summary blocks of the acceptance, encouragement, and equality for women to start a new business. | NES GEM 2006–2012 |
| Control variables | GDP per capita (constant 2005 US\$) | Gross domestic product divided by midyear population. | IMF 2006–2012 |
| | GDP per capita growth (annual %) | Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 US dollars. | IMF 2006–2012 |
| | Population total | Total population counts all residents regardless of legal status or citizenship. | WDI 2006–2012 |

| | | |
|---|---|---------------|
| Labor total | Labor force comprises people aged 15 and older who supply labor for the production of goods and services during a specified period. | WDI 2006–2012 |
| Unemployment | Unemployment refers to the share of the labor force that is without work but available for and seeking employment. | WDI 2006–2012 |
| Voice and accountability | Measures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2012 |
| Political stability and absence of violence/terrorism | Measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2012 |
| Regulatory quality | Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2012 |
| Rule of law | Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2012 |
| Government effectiveness | Measures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. | WGI 2006–2012 |

| | | |
|-----------------------|--|---------------|
| | Values range from -2.5 (weak) to 2.5 (strong) governance performance. | |
| Control of corruption | Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as perceptions of the state by elites and private interests. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2012 |

^aGlobal Entrepreneurship Monitor (GEM): <http://www.gemconsortium.org>; International Monetary Fund (IMF): <https://www.imf.org/external/index.htm>; World Development Indicators (WDI) by World Bank: <http://databank.worldbank.org/data/home.aspx>; Worldwide Governance Indicators (WGI) by World Bank Group: <http://info.worldbank.org/governance/wgi/#home>

3.4.3 Data analysis and model

Similar to Aparicio et al. (2016), data analysis was performed by using unbalanced panel data using GEM at the national level. As argued above, a dynamic capability is influenced by formal and informal institutional conditions. Taking this into consideration, we specify the first equation as follows:

$$DC_{it} = \alpha + \beta_1 FI_{it} + \beta_2 II_{it} + \beta_3 VC_{it} + \varepsilon_{it} \quad (1)$$

$i = 1, 2, \dots, 22 \text{ countries}$
 $t = 2006, 2007, \dots, 2012$

where FI and II are vectors representing formal institutions and informal institutions, respectively, and VC denotes the control vector that influences dynamic capability DC in country i at time t . The vector of control refers to GDP per capita, GDP per capita growth (annual %), population total, labor total, unemployment, voice and accountability, political stability and absence of violence/terrorism, regulatory quality, rule of law, government effectiveness, and control of corruption.

In order to determine whether informal institutions moderate the relationship between formal institutions and dynamic capabilities, we consider a second equation:

$$DC_{it} = \alpha + \beta_1 FI_{it} + \beta_2 II_{it} + \beta_3 VC_{it} + \beta_4 (FI_{it} \times II_{it}) + \beta_5 (FI_{it} \times II_{it}) + \dots + \varepsilon_{it} \quad (2)$$

$i = 1, 2, \dots, 22 \text{ countries}$

$$t = 2006, 2007, \dots, 2012$$

where *Fla x Ilb* represents the interaction between government policies and abilities and knowledge to start up, and *Fic x IId* represents the interaction between government policies and entrepreneur social image. Other included interactions are as follows: market openness and abilities, knowledge to start up, market openness and entrepreneur social image, physical infrastructure and entrepreneur social image, and physical infrastructure and women’s support to start up. Regarding the model selection, we use the Breusch and Pagan test for random effects (Var(u) = 0; $\chi^2(01) = 0.00$; Prob > $\chi^2 = 1.0000$) and F test of significance of the fixed effects (F test that all $u_i=0$; $F(21, 82) = 6.73$; Prob > F = 0.0000) to discard the grouped model (ordinary least squares regression).

Afterwards we implemented the Hausman test to decide whether a fixed effects model is more suitable than a random effects model. We found in the model that there are systematic differences between random and fixed effects with $\chi^2(10) = 37.07$ and Prob> $\chi^2 = 0.0001$, and conclude by selecting the fixed effects model.

3.5 Results

Table 3.2 reports the means and standard deviations of the variables used in this study. This table shows the mean of the dependent variable entrepreneurial capability (40.07%). Regarding the independent variables, most of the countries are characterize by medium levels in finance (2.46), government policies (2.51), governmental programs (2.61), market openness 2 (2.56), and abilities knowledge to start up (2.44), and slightly higher levels in market openness 1 (2.82), physical infrastructure (3.64), intellectual property rights (2.86), entrepreneurial social image (3.37), and women’s support to start up (3.24).

Table 3.2 Descriptive statistics

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|----------------------------|------|---------|-----------|---------|---------|
| Entrepreneurial capability | 140 | 40.0723 | 15.4871 | 10.5713 | 73.0583 |
| Finance | 140 | 2.4655 | 0.3834 | 1.6500 | 3.9076 |
| Government policies | 140 | 2.5182 | 0.4195 | 1.5900 | 3.6711 |
| Government programs | 140 | 2.6178 | 0.4400 | 1.7200 | 3.7139 |
| Market openness 1 | 140 | 2.8245 | 0.4189 | 1.8400 | 3.8700 |

| | | | | | |
|--|-----|------------|------------|-----------|-------------|
| Market openness 2 | 140 | 2.5643 | 0.2944 | 1.9400 | 3.4167 |
| Physical infrastructure | 140 | 3.6433 | 0.4204 | 2.7400 | 4.6504 |
| Intellectual property rights | 140 | 2.8653 | 0.5355 | 1.9262 | 4.2543 |
| Abilities, knowledge to start up | 140 | 2.4457 | 0.2818 | 1.8700 | 3.6841 |
| Entrepreneur social image | 140 | 3.3773 | 0.4142 | 2.4543 | 4.5637 |
| Women's support to start up | 140 | 3.2444 | 0.3727 | 2.1290 | 4.2088 |
| GDP per capita (constant 2005 US\$) | 140 | 22555 | 18956 | 2883 | 69095 |
| GDP per capita (annual growth) | 140 | 1.4292 | 3.8494 | -8.9980 | 8.7209 |
| Population total | 140 | 54,300,000 | 72,700,000 | 2,006,868 | 314,000,000 |
| Labor total | 140 | 26,500,000 | 37,100,000 | 1,016,608 | 158,000,000 |
| Unemployment | 140 | 9.1903 | 4.8152 | 2.4900 | 24.7900 |
| Voice and accountability | 140 | 0.7888 | 0.6351 | -0.9788 | 1.7282 |
| Political stability and absence of violence/terrorism | 140 | 0.2359 | 0.8072 | -1.9016 | 1.5014 |
| Regulatory quality | 131 | 0.8170 | 0.7141 | -0.9292 | 1.9251 |
| Rule of law | 131 | 0.6890 | 0.9424 | -0.9701 | 2.0137 |
| Government effectiveness | 131 | 0.7862 | 0.8065 | -0.6694 | 2.3540 |
| Control of corruption | 131 | 0.7372 | 0.9891 | -1.1320 | 2.4700 |

Notes: $N=131$, $n=22$

Table 3.3 reports the correlation coefficients of the same variables and shows that entrepreneurial capabilities are positively and weakly correlated with market openness and negatively and weakly correlated with women's support to start up. Furthermore, most of the independent variables are related between themselves.

In Table 3.4, the regression results of seven different models are presented. Fixed effects coefficients, corrected standard errors, and significance levels are also shown in this table. We conducted the Wooldridge test for autocorrelation in panel data: it indicated that we had an autocorrelation problem ($F(1, 21) = 4.668$ Prob > $F = 0.0424$) which we corrected with an autoregressive term of 1 degree (AR1). Also, we conducted the modified Wald test for groupwise heteroskedasticity in a fixed effect regression model to test for multicollinearity, where we detected a heteroskedasticity problem ($\chi^2(22) = 1225.53$ Prob > $\chi^2 = 0.0000$). To address the heteroskedasticity, contemporary correlation, and autocorrelation problems among observations regarding the sample of countries, we applied the Prais-Winsten regression, while heteroskedastic panel-corrected standard errors (PCSEs) were estimated. Dichotomized variables for years and

countries were introduced to calculate fixed effects. In this way, year and country effects are controlled but not shown.

Table 3.3 Correlation matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 Entrepreneurial capabilities | 1 | | | | | | | | | | |
| 2 Finance | 0.0411 | 1 | | | | | | | | | |
| 3 Government policies | 0.1159 | 0.6426* | 1 | | | | | | | | |
| 4 Government programs | 0.0793 | 0.5864* | 0.6681* | 1 | | | | | | | |
| 5 Market openness 1 | -0.3255* | -0.1261 | -0.3297* | -0.3457* | 1 | | | | | | |
| 6 Market openness 2 | 0.1087 | 0.6167* | 0.6365* | 0.5857* | -0.3865* | 1 | | | | | |
| 7 Physical infrastructure | 0.2039 | 0.4751* | 0.4077* | 0.5612* | -0.2664* | 0.5059* | 1 | | | | |
| 8 Intellectual property rights | 0.0393 | 0.7260* | 0.6997* | 0.7372* | -0.3054* | 0.7211* | 0.5688* | 1 | | | |
| 9 Abilities, knowledge to start up | 0.1849 | 0.4064* | 0.1889 | 0.2505* | -0.3055* | 0.5591* | 0.3218* | 0.3353* | 1 | | |
| 10 Entrepreneur social image | 0.1357 | 0.1983 | 0.1937 | -0.0313 | 0.0805 | 0.2871* | -0.1403 | 0.0752 | 0.2360* | 1 | |
| 11 Women's support to start up | 0.3758* | 0.4564* | 0.4270* | 0.4540* | -0.3447* | 0.4649* | 0.5680* | 0.5454* | 0.4850* | 0.0212 | 1 |
| 12 GDP per capita (constant 2005 US\$) | -0.1146 | 0.6098* | 0.4329* | 0.6137* | -0.164 | 0.5443* | 0.4598* | 0.7785* | 0.4235* | 0.06 | 0.4994* |
| 13 GDP per capita growth (annual %) | 0.3904* | -0.0004 | -0.0258 | -0.1018 | -0.0307 | 0.003 | -0.0388 | -0.1826 | 0.032 | 0.0238 | -0.0707 |
| 14 Population total | -0.2210* | 0.1376 | -0.0208 | -0.11 | 0.3733* | -0.0375 | -0.1267 | -0.0637 | -0.1407 | 0.4167* | -0.1343 |
| 15 Labor total | -0.2166 | 0.155 | -0.0041 | -0.0804 | 0.3486* | -0.0189 | -0.0964 | -0.0466 | -0.1182 | 0.3976* | -0.0926 |
| 16 Unemployment | -0.3182* | -0.3641* | -0.1152 | -0.3436* | 0.0138 | -0.3011* | -0.3644* | -0.213 | -0.4126* | -0.0153 | -0.4085* |
| 17 Voice and accountability | 0.0018 | 0.5340* | 0.3834* | 0.6113* | -0.3431* | 0.4722* | 0.5431* | 0.7612* | 0.2273* | -0.0928 | 0.3690* |
| 18 Political stability and absence of violence/terrorism | -0.0659 | 0.5540* | 0.3190* | 0.5003* | -0.1418 | 0.3441* | 0.5153* | 0.7005* | 0.186 | -0.2674* | 0.3991* |
| 19 Regulatory quality | -0.0363 | 0.6287* | 0.6180* | 0.6602* | -0.2900* | 0.5823* | 0.5451* | 0.7690* | 0.2580* | 0.1593 | 0.3548* |
| 20 Rule of law | -0.0914 | 0.6061* | 0.5491* | 0.6823* | -0.2888* | 0.5429* | 0.6371* | 0.8225* | 0.2399* | -0.0245 | 0.4156* |
| 21 Government effectiveness | -0.0182 | 0.6456* | 0.5991* | 0.6811* | -0.2520* | 0.5650* | 0.6923* | 0.8571* | 0.2452* | -0.0087 | 0.4889* |
| 22 Control of corruption | 0.1077 | 0.5916* | 0.5767* | 0.7243* | -0.3843* | 0.5656* | 0.6973* | 0.8297* | 0.2330* | -0.0515 | 0.4984* |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 12 GDP per capita (constant 2005 US\$) | 1 | | | | | | | | | | |
| 13 GDP per capita (annual growth) | -0.3095* | 1 | | | | | | | | | |
| 14 Population total | -0.0215 | 0.0723 | 1 | | | | | | | | |
| 15 Labor total | -0.0026 | 0.0675 | 0.9963* | 1 | | | | | | | |
| 16 Unemployment | -0.3480* | -0.2112 | -0.0949 | -0.1216 | 1 | | | | | | |
| 17 Voice and accountability | 0.7494* | -0.3061* | -0.2472* | -0.2370* | -0.1516 | 1 | | | | | |
| 18 Political stability and absence of violence/terrorism | 0.6791* | -0.2021 | -0.2466* | -0.2306* | -0.2773* | 0.8431* | 1 | | | | |

| | | | | | | | | | | | | |
|----|--------------------------|---------|----------|---------|---------|----------|---------|---------|---------|---------|---------|---|
| 19 | Regulatory quality | 0.7900* | -0.2858* | -0.1209 | -0.1055 | -0.2007 | 0.8246* | 0.6572* | 1 | | | |
| 20 | Rule of law | 0.8467* | -0.2939* | -0.1165 | -0.1016 | -0.2249* | 0.8962* | 0.7889* | 0.9324* | 1 | | |
| 21 | Government effectiveness | 0.8402* | -0.2996* | -0.1456 | -0.1292 | -0.2332* | 0.8554* | 0.7896* | 0.9109* | 0.9694* | 1 | |
| 22 | Control of corruption | 0.7844* | -0.1714 | -0.189 | -0.1737 | -0.2864* | 0.8945* | 0.7897* | 0.8901* | 0.9566* | 0.9471* | 1 |

*p<0.01

Table 3.4 Estimating entrepreneurial capabilities

| Dependent variable | MODEL 1 | MODEL 2 | MODEL 3 | MODEL 4 | MODEL 5 | MODEL 6 | MODEL 7 |
|-------------------------------------|------------------------|----------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|
| Independent variables | | | | | | | |
| Finance | -10.710 *** (1.808) | | -11.273 *** (2.067) | -10.015 *** (1.852) | -12.245 *** (2.473) | -12.267 *** (2.492) | -11.601 *** (2.650) |
| Government policies | 8.126 *** (1.532) | | 5.872 *** (1.461) | 28.738 ** (12.748) | 5.446 *** (1.298) | 5.522 *** (1.535) | 47.260 *** (16.532) |
| Governmental programs | -9.467 *** (1.360) | | -9.110 *** (2.288) | -9.554 *** (1.854) | -9.940 *** (2.262) | -8.447 *** (2.910) | -10.498 *** (2.511) |
| Market openness 1 | 5.992 *** (1.602) | | 5.369 ** (2.164) | 5.237 ** (2.363) | 14.109 (13.879) | 5.494 ** (2.126) | 30.610 ** (12.533) |
| Market openness 2 | -8.522 *** (2.276) | | -11.294 *** (2.510) | -12.603 *** (3.383) | -9.663 *** (3.313) | -9.641 *** (2.227) | -9.114 ** (4.306) |
| Physical infrastructure | 4.369 * (2.490) | | 3.913 ** (1.647) | 4.415 ** (1.763) | 2.708 (2.016) | -23.543 * (12.523) | -47.790 *** (12.801) |
| Intellectual property rights | 8.852 *** (3.373) | | 5.936 * (3.160) | 6.811 ** (3.121) | 7.313 ** (3.148) | 5.326 * (2.998) | 8.365 *** (2.426) |
| Abilities, knowledge to start up | | -4.759 * (2.651) | 4.901 ** (2.286) | 23.085 ** (11.596) | -29.196 *** (8.388) | 2.971 (2.060) | -5.593 (11.914) |
| Entrepreneur social image | | -4.415 (2.834) | -8.339 *** (1.295) | -3.760 (4.522) | 23.536 ** (10.980) | -18.324 * (9.871) | 30.670 * (17.050) |
| Women's support to start up | | 8.324 *** (2.530) | 8.277 *** (2.676) | 8.132 ** (3.179) | 9.494 ** (3.797) | -10.900 (12.744) | -25.947 (19.318) |
| Interactions | | | | | | | |
| Govern Policies x Abilities | | | | -6.561 * (3.652) | | | -7.652 ** (3.769) |
| Govern Policies x Social image | | | | -1.987 (1.766) | | | -6.969 *** (2.627) |
| Market O 1 x Abilities | | | | | 11.835 *** (2.995) | | 9.949 *** (2.201) |
| Market O 1 x Social image | | | | | -11.315 *** (3.757) | | -14.741 *** (4.361) |
| Physical inf x Social image | | | | | | 2.873 (2.575) | 5.310 ** (2.427) |
| Physical inf x Women's support | | | | | | 5.356 * (3.056) | 9.992 ** (4.404) |
| Controls | | | | | | | |
| GDP per capita (constant 2005 US\$) | 0.003 *** (0.000) | 0.002 ** (0.001) | 0.003 *** (0.000) | 0.003 *** (0.000) | 0.003 *** (0.001) | 0.003 *** (0.000) | 0.003 *** (0.001) |

| | | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|
| GDP per capita (annual growth) | 0.096 (0.144) | 0.291 (0.243) | 0.325 *** (0.104) | 0.296 ** (0.119) | 0.462 *** (0.133) | 0.303 *** (0.102) | 0.409 *** (0.131) |
| Population total | 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) |
| Labor total | 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) |
| Unemployment | -1.449 *** (0.198) | -1.258 *** (0.233) | -1.819 *** (0.118) | -1.771 *** (0.172) | -1.905 *** (0.162) | -1.811 *** (0.102) | -1.838 *** (0.196) |
| Voice and Accountability | 11.930 (7.429) | 12.226 (14.787) | 6.206 (7.413) | 5.715 (8.997) | 7.156 (7.140) | 5.055 (6.164) | 5.352 (7.160) |
| Political Stability and Absence of Violence/Terrorism | 7.742 *** (1.979) | 6.533 (4.368) | 5.752 *** (2.110) | 5.605 ** (2.539) | 5.116 ** (2.497) | 6.055 *** (1.947) | 5.450 ** (2.595) |
| Regulatory Quality | 4.917 (6.200) | 1.810 (6.350) | 2.746 (4.922) | 3.856 (6.191) | -2.453 (4.338) | 2.597 (4.007) | -0.997 (4.733) |
| Rule of Law | -37.509 *** (9.236) | -34.157 *** (9.726) | -39.443 *** (6.601) | -40.444 *** (7.137) | -36.022 *** (7.437) | -39.585 *** (5.635) | -38.656 *** (6.518) |
| Government Effectiveness | 0.867 (4.622) | 6.596 (8.261) | 7.911 * (4.479) | 8.297 * (4.341) | 8.737 ** (4.261) | 8.657 * (5.118) | 10.815 ** (5.232) |
| Control of Corruption | 9.362 *** (1.585) | 1.374 (6.724) | 9.226 *** (1.602) | 8.361 *** (2.330) | 8.235 *** (3.136) | 9.897 *** (1.552) | 8.488 *** (2.962) |
| Constant | -543.457 *** (41.451) | -480.280 *** (93.783) | -579.532 *** (55.069) | -592.510 *** (82.262) | -731.686 *** (73.173) | -537.098 *** (61.434) | -738.256 *** (109.578) |
| N of observations | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| N of groups | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| R2 | 0.8924 | 0.8715 | 0.9040 | 0.9051 | 0.9090 | 0.9051 | 0.9202 |

***p<0.001; **p<0.05; *p<0.1

Heteroskedastic panels corrected standard errors (PCSEs) are shown in parentheses. The estimates for country and time fixed effects dummies are not presented but can be supplied upon request.

Models 1 and 2 include formal institutions and informal institutions, respectively, that are related to dynamic capabilities. These models are significant, respectively explaining more than 89 and 87 percent of the entrepreneurial capability variation across countries. Model 3 includes both formal and informal institutions which are related to dynamic capabilities. This model is significant and predicts 90 percent of the responses correctly. Models 4, 5, and 6 show the moderating effects of informal institutions on the relationship between formal institutions—specifically government policies, market openness, and physical infrastructure individually—and dynamic capabilities. In these cases, the models are significant, and the percentages predicted are between 90.5 and 90.9 percent, which are slightly higher than Models 1, 2, and 3. Model 7 shows the moderating effects of informal institutions (all the interactions together) on the relationship between formal institutions and dynamic capabilities. In this last case, the model is significant, and the percentage predicted is 92 percent, the highest of all the models.

Regarding assessment of the hypotheses, Hypothesis 1 proposes that formal institutions influence dynamic capabilities in new ventures. Although Model 5 does not show all the variables to be significant, the other models all show that all the formal institutions influence dynamic capabilities. Specifically, finance, government programs, and market openness 2 show a negative and significant influence in all the models. Meanwhile, government policies, market openness 1, and intellectual property rights show a positive and significant influence in all the models. Moreover, physical infrastructure shows a positive and significant influence in Models 1, 3, and 4 and a negative and significant influence in Models 6 and 7. Therefore, Hypothesis 1 is supported by the data in that formal institutions influence dynamic capabilities in new ventures.

Hypothesis 2 suggests that informal institutions influence dynamic capabilities in new ventures. Particularly, Hypothesis 2a proposes that abilities and knowledge to start up influence entrepreneurial capabilities. The results from Models 3 and 4 show that the influence of abilities and knowledge to start up is significant and has a positive sign ($\beta = 4.901$, $p < .05$, and $\beta = 23.085$, $p < 0.05$ respectively). However, the results from Models 2 and 5 show that the influence of abilities and knowledge to start up is significant and has a negative sign ($\beta = -4.759$, $p < 0.10$, and $\beta = -29.196$, $p < 0.01$ respectively). Similarly, Hypothesis 2b proposes that entrepreneur social image influences entrepreneurial capabilities. The results from Models 5 and 7 show that the influence of entrepreneur social image is significant and has a positive sign ($\beta = 23.536$, $p < 0.05$, and $\beta = 30.670$, $p < 0.10$ respectively). However, the results from Models 3 and 6 show that the influence

of entrepreneur social image is significant and has a negative sign ($\beta = -8.339$, $p < 0.01$, and $\beta = -18.324$, $p < 0.10$ respectively). Correspondingly, Hypothesis 2c proposes that women's support to start up influences entrepreneurial capabilities. The results in Models 2, 3, 4, and 5 indicate that the influence of women's support to start up is significant and has a positive sign ($\beta = 8.324$, $p < 0.01$, $\beta = 8.277$, $p < 0.01$, $\beta = 8.132$, $p < 0.05$, $\beta = 9.494$, $p < 0.05$ respectively). Thus, the data support Hypothesis 2 in that informal institutions influence dynamic capabilities in new ventures.

Hypothesis 3 suggests that informal institutions moderate the relationship between formal institutions and dynamic capabilities in new ventures. In relation to Hypothesis 3a, Models 5 and 7 show that abilities and knowledge to start up moderate the relationship between government policies and entrepreneurial capabilities with a significant coefficient and negative sign ($\beta = -6.561$, $p < 0.10$, and $\beta = -7.652$, $p < 0.05$). Meanwhile, for Hypothesis 3b, results in Model 7 show that entrepreneur social image moderates the relationship between government policies and entrepreneurial capabilities with a significant coefficient and negative sign ($\beta = -6.969$, $p < 0.01$). Furthermore, results in Models 5 and 7 show that, in relation to Hypothesis 3c, abilities and knowledge to start up moderate the relationship between market openness and entrepreneurial capabilities with a significant coefficient and positive sign ($\beta = 11.835$, $p < 0.01$, and $\beta = 9.949$, $p < 0.01$ respectively). Also, results in Models 5 and 7, in relation to Hypothesis 3d, indicate that entrepreneur social image moderates the relationship between market openness and entrepreneurial capabilities with a significant coefficient and negative sign ($\beta = -11.315$, $p < 0.01$, and $\beta = -14.741$, $p < 0.01$ respectively). Moreover, Hypothesis 3e is answered by the results shown in Model 7, wherein entrepreneur social image moderates the relationship between physical infrastructure and entrepreneurial capabilities with a significant coefficient and positive sign $\beta = 5.310$, $p < 0.05$). Finally, the results in Models 6 and 7 indicate that, in relation to Hypothesis 3f, women's support to start up moderates the relationship between physical infrastructure and entrepreneurial capabilities with a significant coefficient and positive sign ($\beta = 5.356$, $p < 0.10$, and $\beta = 9.992$, $p < 0.05$). Hence, regarding Hypothesis 3, the results show that informal institutions moderate the relationship between formal institutions and dynamic capabilities in new ventures.

In this regard, the interaction terms between formal institutions and informal institutions are statistically significant, which allows the relationship between formal institutions and

entrepreneurial capabilities to be different for the entrepreneurs when informal institutions are below average versus when informal institutions are above average (see Figures 3.2–3.7).

Figure 3.2 Interaction between government policies and abilities and knowledge to start up

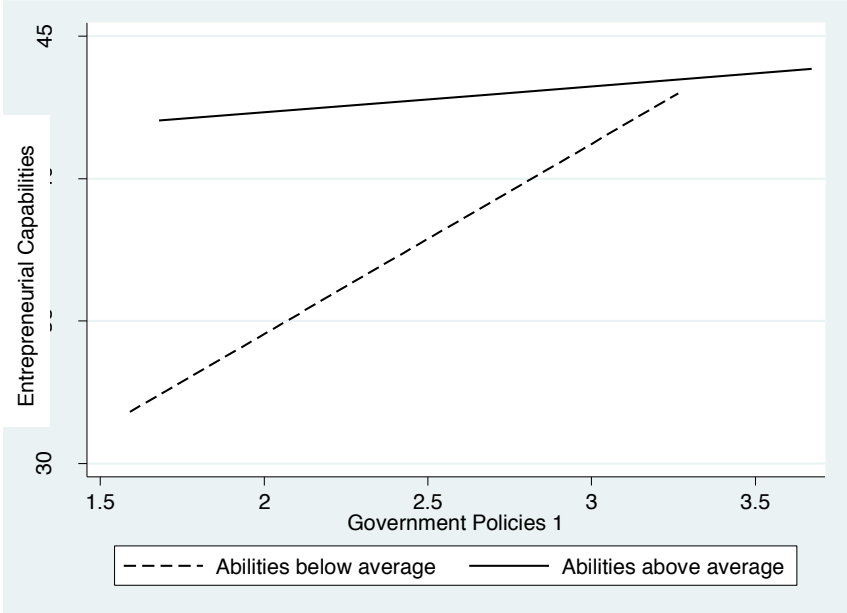


Figure 3.3 Interaction between government policies and entrepreneur social image

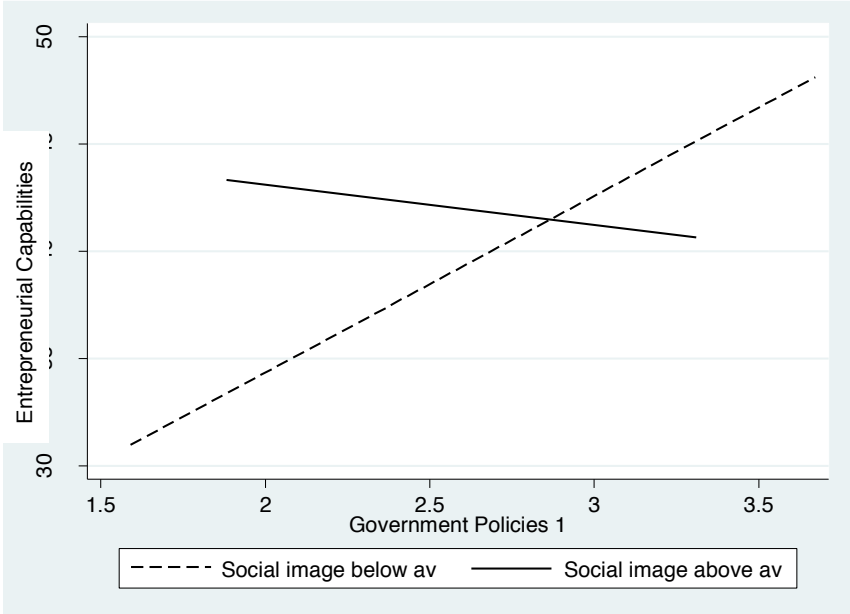


Figure 3.4 Interaction between market openness and abilities and knowledge to start up

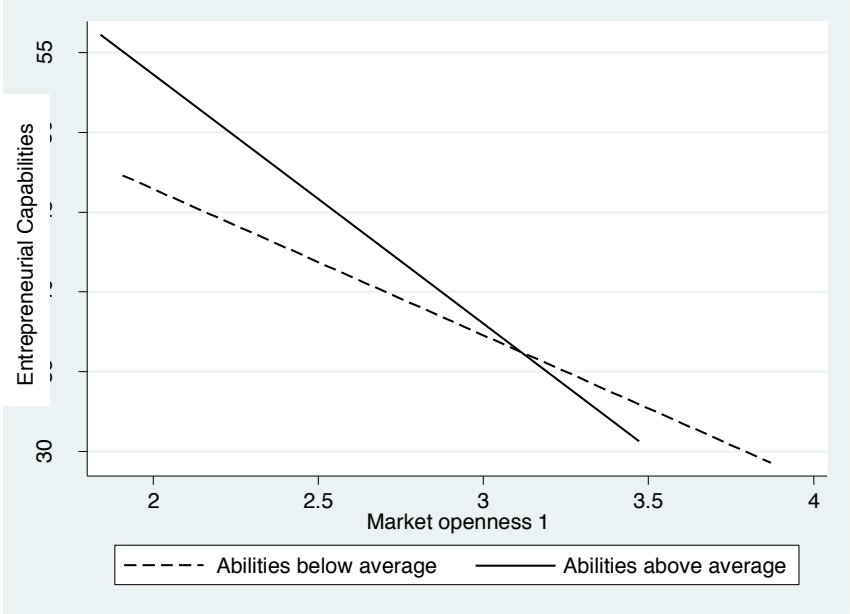


Figure 3.5 Interaction between market openness and entrepreneur social image

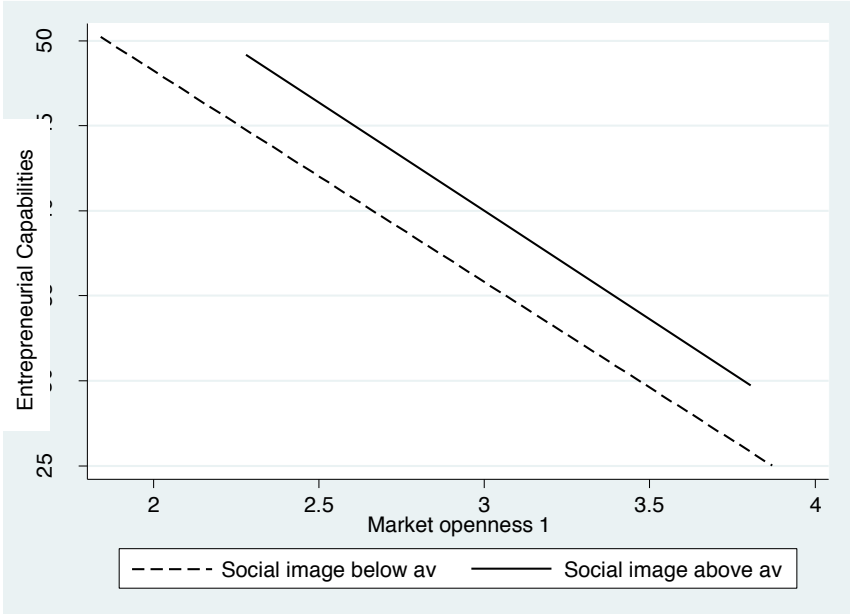


Figure 3.6 Interaction between physical infrastructure and entrepreneur social image

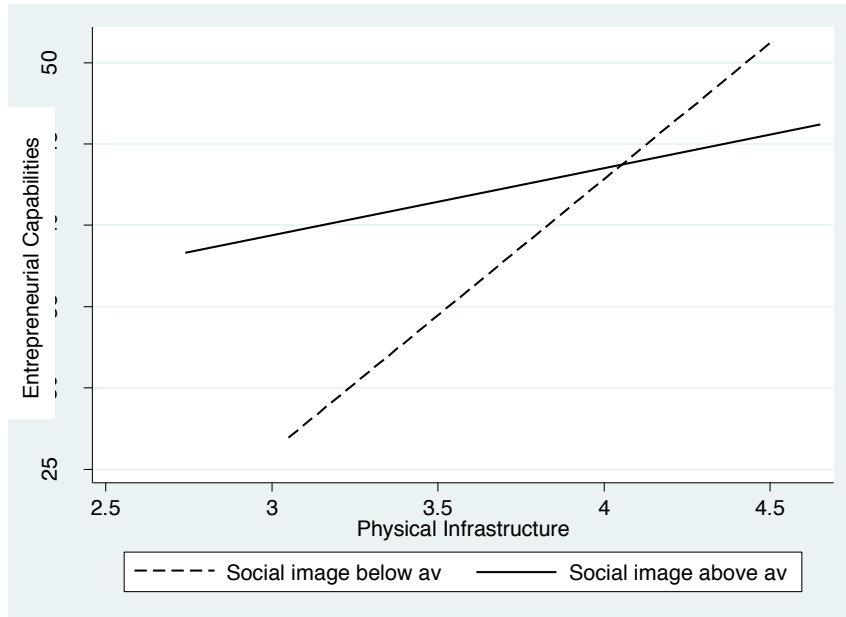
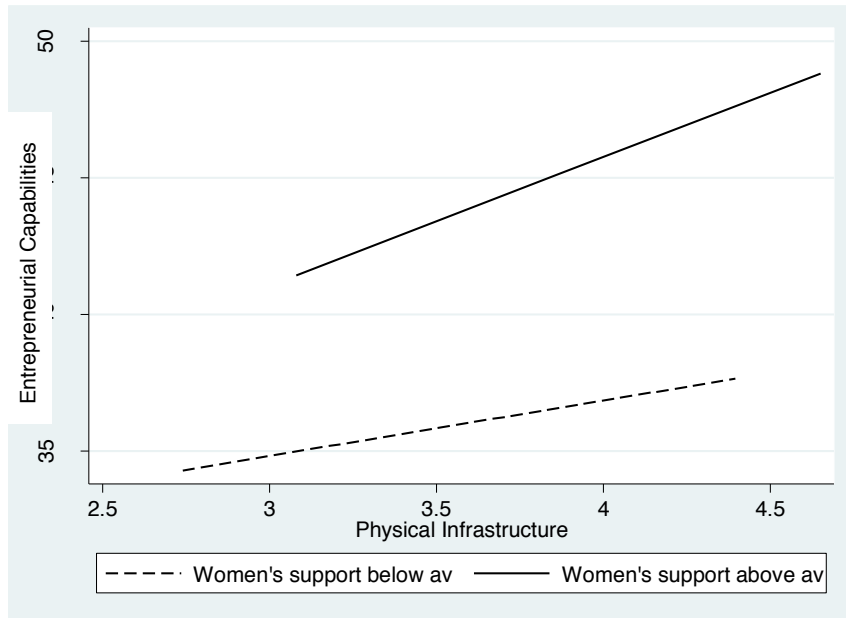


Figure 3.7 Interaction between physical infrastructure and women’s support to start up



3.6 Discussion and conclusions

The entrepreneurial capabilities (perceived opportunities) behave similarly to Kelley, Singer, and Herrington’s (2015) observations, where efficiency-driven economies exhibit lower levels on the perceived opportunities indicator among indicators such as perceived capabilities,

fear of failure, and entrepreneurial intentions, but higher than the innovation-driven economies. These authors consider it unusual that within the efficiency-driven and innovation-driven groups individuals are nearly equally apt to see opportunities.

The negative correlation between entrepreneurial capabilities (perceived opportunities) and GDP is similar to that found by Carree in 2002 and 2007, where there was a negative correlation between perceived opportunities and GDP per capita, which can be explained by the level of economic development (Aparicio et al., 2016). On one hand, the negative sign for the finance coefficient in Model 1 indicates that a lower finance environment perception in a country increases the percentage of the population who see good opportunities to start a firm. This finding could be related to necessity entrepreneurship (individuals who start their own firms due to other employment options being absent or unsatisfactory), mostly seen in less developed countries (Reynolds, Camp, Bygrave, Autio, & Hay, 2001). Also, finance is identified in the factor-driven and efficiency-driven economies as the major reason for leaving business, while in the innovation-driven economies, finance is less likely to be named as a reason for business exit (Kelley et al., 2015). Furthermore, insufficient finance has been cited by non-entrepreneurs as a barrier to starting a new venture (Choo & Wong, 2006).

This study analyzes the moderating effect that informal institutions have on the relationship between formal institutions and dynamic capabilities in new ventures. Some coefficient estimates for the interactions are significant and negative. Urbano and Alvarez (2014) report the same behavior in the coefficient estimates, the interaction term between the cultural-cognitive and normative dimensions is also significant and negative. Therefore, it is shown through this study that informal institutions moderate the relationship between formal institutions and dynamic capabilities in new ventures.

3.6.1 Theoretical implications

This research contributes to the existing literature in the following ways. Firstly, the work adds new empirical insights into the influence of formal and informal institutions on dynamic capabilities in new ventures. It uses a sample of 22 countries using the GEM data for seven years from 2006 to 2012, whereas other studies used a shorter time span (Alvarez & Urbano, 2012a; Autio et al., 2013; Urbano & Alvarez, 2014) or a smaller number of countries (Mai & Gan, 2007; Stuetzer, Obschonka, Brixy, Sternberg, & Cantner, 2014). Secondly, this study helps to advance the application of institutional economics theory (North, 2005) in the analysis of entrepreneurial

capabilities (perceived opportunities) (Urbano & Alvarez, 2014; Veciana & Urbano, 2008), specifically using the classification of formal and informal institutions (Alvarez et al., 2011).

3.6.2 Policy implications

Finally, policymakers and managerial plans of action should consider that dynamic capabilities are associated with a new entrepreneurial managerial capitalism (Teece, 2012), and this new hybrid concept involves the calibration of opportunities and the diagnosis of threats, the direction and redirection of resources, and the reshaping of organizational resources and systems, in order to accede to technological opportunities and overcome competitive treats. This research can be useful in the development of policies for the purpose of enhancing dynamic capabilities in new ventures in an economy, especially considering the relevance of informal institutions for entrepreneurial advancement.

3.6.3 Limitations and future research lines

It is suggested that future research be done in the following areas. Firstly, the size of the sample should be improved by augmenting either the number of years or the number of countries to be analyzed. However, this sample could be conditioned to the participation of countries in both the APS and NES GEM surveys. Secondly, further research could consider, besides the effects of institutional conditions, the effects of dynamism on the dynamic capabilities themselves (Zahra et al., 2006), considering that managerial choices (King & Tucci, 2002) may play a role in the creation of dynamic capabilities. Thirdly, future quantitative research could consider, instead of one construct, multidimensional constructs of dynamic capabilities, including the component factors of the model proposed in Wang and Ahmed (2007), or according to the definition offered by Barreto (2010), to measure both threats and timely and market-oriented decisions. Furthermore, we suggest considering specific contexts, such as Latin America (Alvarez & Urbano, 2011a; Aparicio et al., 2016). In addition, dynamic capabilities of national authorities can be studied in an international research to determine the role and contribution of authorities to the entrepreneurial world (Metaxas, 2011). Also, location, self-employment, and size of the business are not considered in this study, given the GEM conceptual framework (Kelley et al., 2015); therefore, future research may consider the influence of these characteristics on dynamic capabilities (Jeng & Pak, 2016).

3.6.4 Conclusions

The purpose of this research was to analyze the relationship between formal and informal institutions and dynamic capabilities in new ventures. Through seven unbalanced panel data models, the study shows that formal and informal institutions influence dynamic capabilities in new ventures. Interactions between formal and informal institutions were also found (the relationship between formal and informal institutions and dynamic capabilities in new ventures is moderated by the informal institutions). Therefore, informal institutions increase dynamic capabilities, even though the formal institutions are not the best in the entrepreneurial environment.

CHAPTER 4

HUMAN CAPITAL AND FORMAL INSTITUTIONS' INFLUENCE ON DYNAMIC CAPABILITIES IN NEW VENTURES

4. HUMAN CAPITAL AND FORMAL INSTITUTIONS' INFLUENCE ON DYNAMIC CAPABILITIES IN NEW VENTURES

4.1 Introduction

The entrepreneurship movement has been determined as a crucial driver of financial development, labor advancement, and modernization in economies by researchers including Acs and Audretsch (1991), Drucker (1985), Storey (1994), and Wennekers and Thurik (1999). Likewise, Reynolds et al. (2005) affirm that the new ventures that are created have meaningful impact in various ways. For instance, firms can create jobs if they grow and/or can introduce new products or services that will modify the economy.

This study draws on comparative entrepreneurship research conducted by Bruton et al. (2010), which has been identified depending on the selected institutional condition to predict entrepreneurship: formal vs. informal institutions. Also, comparative entrepreneurship research based on institutional economics examines formal institutions (Autio & Acs, 2010). However, in the literature, no research has been conducted to analyze the relationships between human capital and the dynamic capabilities, nor the relationships between institutional conditions, specifically formal institutions, and the dynamic capabilities in new ventures at a country level for a time frame from 2006 to 2013 under EFCs. As discussed in Chapter 2, it was found a gap in research for developing investigation in the field of dynamic capabilities considering the dynamic capabilities theory with other approaches, like HCT, OI and the IE frameworks. Additionally, it was discussed the failure in the research with the absence of investigation of dynamic capabilities in new ventures, that besides includes the dynamic capabilities approach with other frameworks. Thereby, the entrepreneurship field may benefit from research that develops the applicability of the dynamic capabilities' perspective in new ventures. Furthermore, as mentioned in previous chapters, there is an identified gap in the literature regarding research and theory-building of dynamic capabilities in new ventures and SMEs (Zahra et al., 2006). In addition, Díaz-Casero et al. (2011) affirm that the creation of new firms relies upon the entrepreneurial capabilities to assess opportunities, and these capabilities and assessments at the same time depend on explicit EFCs in every nation. This investigation will therefore study the relationships between human capital and dynamic capabilities, and the effect of formal institutions on the relationship between human capital and dynamic capabilities in new ventures.

Further research encourages empirical investigation into the organizational antecedents and performance consequences of the knowledge management capacity. As mentioned in Chapter 3, other research suggests including dynamic capabilities and firm growth (Macpherson et al., 2004). These are the reasons for proposing to examine the influence of human capital and formal institutions on dynamic capabilities.

This study is an attempt to follow recent calls for greater consideration of the importance of models that test the relationship between human capital and dynamic capabilities (Dimov & Shepherd, 2005), and between institutional conditions and dynamic capabilities (Mai & Gan, 2007), specifically sensing capabilities, driven by the fact that institutional conditions determine whether or not persons who start a new business choose to start an innovative action (Meek et al., 2010), and by understanding the perceived opportunities in the context in which a start-up operates.

Based on the evidence currently available, it seems valuable to study human capital and formal institutions, and the moderating effect that formal institutions such as research and development transfer and entrepreneurial finance have on dynamic capabilities, while interacting with human capital in the entrepreneurial environment. By doing so, on the basis of conducting a search based on a sample surveyed in the APS and the NES questionnaires of the GEM during the period 2006–2013, studying a sample of 21 countries and applying unbalanced panel data at a national level, we expect to contribute to the field of research by exploring the effects of human capital and formal institutions in an international study, before drawing some conclusions and guidance to theoretical and practical elements to consider.

This study is concerned with examining the direct relationship of human capital and formal institutions with dynamic capabilities (sensing capabilities) in new ventures. It seeks mainly to demonstrate, through unbalanced panel data, that human capital (abilities and knowledge to start up, education and training) and formal institutions (research and development transfer and entrepreneurial finance) influence sensing capabilities (perceived opportunities) in new ventures, and to identify the indirect relationship between human capital and dynamic capabilities in new ventures when moderated by formal institutions. The outcomes can be examined to encourage and assist in changing new ventures' human capital and dynamic capabilities in different countries.

The chapter has the following structure. After this brief introduction, we present the problem statement, the research gap, and the purpose of this chapter. Secondly, we provide the theoretical framework. We then develop the hypotheses and propose the model. Subsequently, we

disclose the methodology employed in the investigation, after which we show the results of this study. Next, we discuss the highlights of the findings. Finally, we leave a space to highlight limitations and identify the potential for future research, accompanied by some implications.

4.2 Conceptual framework

Following Chesbrough (2003), Drucker (1985), Schumpeter (2000), and Teece (2007) in Chapter 1, regarding entrepreneurship, the innovation creation process, the role of dynamic capabilities in new ventures, and the open innovation model, we also consider that entrepreneurial capabilities are the antecedent of entrepreneurial opportunities (Reynolds et al., 2005).

Dynamic capabilities (Teece, 2007) are considered to provide stepping-stones in order to advance more dynamic variants of the resource-based theory (Kraaijenbrink et al., 2010). The essence of the dynamic capabilities approach is that competitive success arises from the continuous development, alignment, and reconfiguration of firm-specific assets (Augier & Teece, 2009, Teece & Pisano, 1994; Teece et al., 1997). The dynamic capabilities framework is useful to identify those factors more likely to impact firm performance. It is gradually developing into an interdisciplinary theory of the modern corporation (Teece, 2010). Also, areas for empirical research in dynamic capabilities include regional and national competitiveness among emerging and transition economies (Teece, 2009).

4.2.1 Resource-based theory (RBT) and dynamic capabilities (DC)

The resource-based view of the firm is a theoretical framework to understand how competitive advantage within firms is achieved and how that advantage can be sustained over time. Firms are considered to be full of resources that are heterogeneously distributed across them and, over time, those differences in resources persist. Under these assumptions, when firms have resources that are valuable, rare, inimitable, and non-substitutable (VRIN attributes), they can obtain sustainable competitive advantage when applying novel value-creating strategies that are not easily replicated by their competitors (Eisenhardt & Martin, 2000). In recent years, some researchers have extended the RBT to dynamic markets (Teece et al., 1997). In this way, where the competitive environment is shifting, the dynamic capabilities by which managers “integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516) become the source of sustained competitive advantage. We referred to the definition and classification of dynamic capabilities in Chapter 1. Dynamic capabilities are defined as processes like product development, strategic decision making, and

alliancing (Eisenhardt & Martin, 2000). These authors studied two different markets: dynamic and high-velocity markets. In the first kind of market, dynamic capabilities reflect the traditional conception of routines. In other words, they represent detailed, analytic, stable processes with predictable outcomes. On the other hand, in high-velocity markets, they become simple, highly experiential, and fragile processes delivering unpredictable outcomes. Dynamic capabilities fall into three primary clusters, as previously discussed in Chapter 1. The ‘sensing’ of unknown futures includes the identification, development, co-development, and assessment of technological opportunities (and threats) regarding customer needs. The ‘seizing’ or mobilization of resources addresses needs and opportunities and captures value from doing so. ‘Transforming’, ‘shifting’, or ‘pivoting’ comprises continued renewal. Sensing activities are most immediately recognizable as entrepreneurial. In dynamic capabilities, sensing is quite similar to the concept of opportunity recognition by individuals that has been developed in the entrepreneurship literature (Baron & Ensley, 2006).

4.2.2 Human capital theory

Human capital is considered as person attributes, which refers to peoples' knowledge, skills, and abilities (achieved through education, training, and experience), the effectiveness of interpersonal relationships, network effects, and communication skills (Belso-Martinez et al., 2013). Therefore, the entrepreneur's human capital is an important resource for a new firm. Generic and specific components of the founder's human capital produce direct and indirect positive influences on a new venture's growth and access to external resources—for example, financial capital, skilled employees, or knowledge—has a higher chance of occurring when the entrepreneur accumulates high human capital (Backes-Gellner and Werner, 2007). Besides, Becker (2009) contributes with economics analysis regarding human capital focusing specifically in education and explains how investment in education and training is equivalent to investments in equipment. Moreover, Ashourizadeh, Rezaei, Schott, and Vang (2014), acknowledge that human capital in form of education benefit entrepreneurs’ performance and when combined with social capital add a boost to performance. Furthermore, the capital theory (Becker, 2009) considers formal college education as general human capital because of the general knowledge and skills it provides while corporate training programs may be tailored to specific processes or procedures of the business.

4.2.3 Institutional economics theory

This study, as discussed previously in Chapter 1, uses the institutional economics framework (North, 2005). Institutions are described as constraints that frame human interactions (North, 1990). North (1990) also proposes that institutions can be divided into formal and informal. Formal institutions consist of constitutions, regulations, and contracts. Informal institutions constitute frames of mind, values, standards of conduct, and traditions—at the end of the day, the way of life of societies. On the one hand, comparative entrepreneurship research based on institutional economics examines formal institutions (Autio & Acs, 2010). On the other hand, entrepreneurship research based on cultural sociology and cross-cultural psychology mostly examines informal institutions (Autio et al., 2013). The institutional approach to entrepreneurship research has been useful in that field through the description of several cases, and its potential is highlighted (Bruton et al., 2010). Formal factors (agencies, policies, procedures) and informal factors (networks, role models, attitudes) can be distinguished among these institutional factors in entrepreneurship (Veciana & Urbano, 2008). Together, the formal and informal institutions that define the ‘rules of the game’ affect whether or not individuals elect to pursue entrepreneurial activity.

4.3 Hypotheses development

4.3.1 Human capital and dynamic capabilities

In general, entrepreneurs rely on entrepreneurship skills and knowledge when they become founders; they must identify and exploit opportunities that are viable and can generate positive effects, and they need to apply economic and social logic besides developing capabilities. Even more, human capital characteristics such as education enhance individuals’ capacity to realize positive externalities and may encourage entrepreneurs to search for opportunities (Estrin, Mickiewicz, & Stephan, 2016). Furthermore, an investment in general human capital, which can be employed across a variety of occupations and industries, has positive effects on both entrepreneurial entry and performance because it adds to a vast knowledge base which helps individuals to consolidate new knowledge and readjust to new situations more easily (Lazear, 2005). In particular, human capital enhances the individual's ability to discover and exploit opportunities (Davidsson & Honig, 2003). Finally, human capital increases the capability of founders to perform the generic entrepreneurial tasks of both discovering and exploiting business

opportunities (Shane & Venkatraman, 2000). For instance, prior knowledge increases founders' entrepreneurial alertness (Westhead, Ucbasaran, & Wright, 2005); prior knowledge also prepares owners to discover specific opportunities that are not easily visible to other people (Shane, 2000). Based on these findings, the first hypothesis is as follows:

Hypothesis 1. Human capital will positively influence the development of dynamic capabilities in new ventures.

Hypothesis 1a. Education (entrepreneurial education at the school stage) will positively influence sensing capabilities in new ventures.

Hypothesis 1b. Training (entrepreneurial education at the post-school stage) will positively influence sensing capabilities in new ventures.

4.3.2 Institutional economics and dynamic capabilities

Considering the DC framework, innovation is an important source of sustained competitive advantage (Day & Wensley, 1988). Following the DC reasoning, the dynamic capabilities-based view (Eisenhardt & Martin, 2000; Teece et al., 1997) claims that sustainable competitive advantage depends on a firm's dynamic capabilities to innovate, considered as its ability to adapt and reconfigure both its resources and capabilities (Camisón & Villar-López, 2011). Also, organizational innovations rely on the system that generates them, which is commonly a highly complex social system that includes an extensive group of participants and the relationships among them (Birkinshaw, 2006). These features mean that organizational innovation has a capacity to generate long-term sustainable competitive advantage (Hamel, 2009). Specifically, dynamic capabilities can benefit organizational innovation using dissimilar channels (Camisón and Villar-López, 2011). Moreover, even though the concept of DC emerged on the organizational level, the role of networks has increased—in fact, networks are essential for the development of capabilities (O'Connor, Paulson, & DeMartino, 2008). The relevance of complementary resources and capabilities that are available through networks is accentuated (Chang, 2003), and access to complementary assets through partnerships has been found to stimulate dynamic capabilities (Liao, Kickul, & Ma, 2009). Smaller firms are affected due to their internal assets being very restricted (Døving & Gooderham, 2008). Additionally, partners may perform a crucial role regarding sensing opportunities because they can help in identifying unattended needs in the market (Ayuso, Ángel Rodríguez, & Enric Ricart, 2006). In this way, knowledge resources that are important for the firm's development are sometimes provided by members of the firm's

network or social capital—for instance, individuals who are neither founders nor employees (Davidsson & Honig, 2003). Lack of technological knowledge resources constrains the search zone for new opportunities of firms, in consequence reducing their ability to use knowledge from other sources (Zahra & Filatotchev, 2004). King and Tucci (2002) find a positive effect of technological experience on new market entry. Therefore, the following relationship is proposed:

Hypothesis 2. Formal institutions will positively influence the development of dynamic capabilities in new ventures.

Hypothesis 2a. Access to research and development will positively influence sensing capabilities in new ventures.

Tangible resources can be seen as physical resources that will allow the production and/or distribution of new products or services (Dollinger, 2003)—for instance, plant, equipment, computers, and machinery represent tangible resources. Also, according to Luo (2000), to commit unique resources is necessary in order to implement product differentiation strategies and to construct superior competitive building blocks, such as quality, innovation, and customer responsiveness. Besides, a multinational enterprise with a stock of well-developed learning capabilities should have a higher ability to deal with uncertainty, that will make international markets engaging, and be more likely to seek new opportunities (Tallman, 1992). For instance, Makkonen, Pohjola, Olkkonen, and Koponen (2014) and Nair, Rustambekov, McShane, and Fainshmidt (2014) found that dynamic capabilities allowed firms to perform better during the 2008 financial crisis, while, in contrast, Schilke's (2014) findings did not support this affirmation in more dynamic task environments. Furthermore, the external antecedents of DCs involve environmental factors and factors related to inter-organizational relationships. While environmental factors are regularly part of the context of study, however, they are not generally expressly approached (Eriksson, 2014). However, if environmental factors are explicitly addressed, they usually refer to turbulence in the institutional environment (Yiu & Lau, 2008), in the markets (Chung & Beamish, 2005), or in the technological environment (Benner, 2009). This turbulence in any one of these dimensions increases the need for DCs (Macher & Mowery, 2009). Finally, the institutional environment is considered uncertain (Yiu & Lau, 2008) or rigid (Delmas, 2002).

Therefore, the following relationship is proposed:

Hypothesis 2b. Physical infrastructure will positively influence the sensing capabilities in new ventures.

4.3.3 Moderating effects of formal institutions

The impact of some factors can be moderated by aspects of the institutional context. For instance, Estrin et al. (2016) considered differences in the propensity to enter social and commercial entrepreneurship among nations, where the balance of returns from human capital from different occupational choices depends on countries' specific institutional characteristics. We acknowledge that North (1990) stresses the importance of market supporting institutions for economic performance. As a result, institutional economists have pointed out, for example, the rule of law as the fundamental aspect of institutions (Acemoglu & Johnson, 2005). Also, researchers point out that returns on different forms of entrepreneurship and different types of human capital could be sensitive to institutional contexts (Estrin et al, 2016). For instance, Ambrosini and Bowman (2009) explain how the alignment and performance of dynamic capabilities is moderated by internal and external variables. They show that the external environment exercises a moderating influence between the alignment of dynamic capabilities and competitive advantage. The authors also describe the main external enablers and inhibitors: complexity, uncertainty, munificence, and home country characteristics. In this way, depending on how owners and managers perceive these external factors in their environments, they deploy or do not deploy dynamic capabilities, and the way they do it varies. In addition, Schilke (2014) found a moderating effect of environmental dynamism on the relationship between dynamic capabilities and competitive advantage. The results from that investigation suggest that dynamic capabilities have complicated performance effects depending on the dynamic of the environment. Therefore, the following hypotheses are proposed:

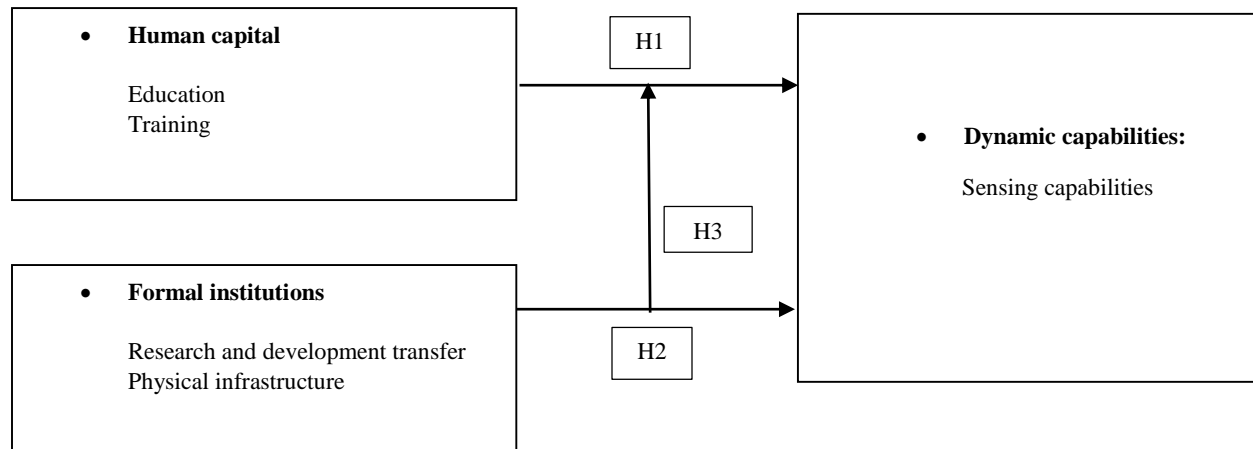
Hypothesis 3. Formal institutions moderate the relationship between human capital and dynamic capabilities in new ventures.

Hypothesis 3a. Physical infrastructure moderates the relationship between education and sensing capabilities in new ventures.

Hypothesis 3b. Research and development transfer moderates the relationship between training and sensing capabilities in new ventures.

In Figure 4.1, we specify the model that exhibits all the hypotheses previously proposed.

Figure 4.1 Model



4.4 Methodology

4.4.1 Data

This investigation makes explicit use of the DC approach to test a model with panel data that investigates how a set of factors are related to developing dynamic capabilities with 147 observations for 21 countries (see Appendix 4) in eight years (2006–2013) using GEM data along with IMF data, WDI, and WGI.

Likewise, this research presents a model that includes both factors affecting dynamic capabilities. In this way, the HC and IE perspectives are used.

The measurements to be used are dynamic capabilities and sensing capabilities (as the dependent variable), and education, training, research and development transfer, and physical infrastructure (as independent variables).

4.4.2 Variables

4.4.2.1 Dependent variable

Several authors have defined different types of dynamic capability (Ambrosini & Bowman, 2009; Augier & Teece, 2009; Danneels, 2011; Eisenhardt & Martin, 2000). However, Pavlou and El Sawy (2011) integrated in a model a set of capabilities: sensing, learning, coordinating, and integrating. This model is useful to reconfigure operational capabilities into new capabilities that match the environment in a better way. These authors define these capabilities as follows: sensing capability is the ability to identify, understand, and seek opportunities in the environment; learning capability is the ability to revamp actual operational capabilities with the use of new knowledge;

integrating capability is the ability to incorporate individual knowledge into the business unit's new operational capabilities; and coordinating capability is the ability to organize and redistribute tasks, resources, and activities in the new operational capabilities.

First of all, in order to sense and seize opportunities, reconfiguration needs an examination of market trends and novel technology (Pavlou & El Sawy, 2011). In this regard, Teece et al. (1997, p. 521) describe sensing as follows: "The ability to calibrate the requirements for change and to effectuate the necessary adjustments would appear to depend on the ability to scan the environment, to evaluate markets and competitors, and to quickly accomplish reconfiguration ahead of competition." Furthermore, in the new product development activity, firms have to sense the environment to assemble market intelligence on market needs, competitor moves, and new technologies with the purpose for managers to identify new product opportunities, to decide to employ research activities, and to develop new prototypes. According to Pavlou and El Sawy (2011), for sensing capability, the three fundamental routines are: (i) generating market intelligence, which refers to identifying customer needs (Teece, 2007), being responsive to market trends (Amit & Schoemaker, 1993), identifying market opportunities (Day, 1994), recognizing rigidities (Sinkula, 1994), and detecting resource combinations (Galunic & Rodan, 1998); (ii) disseminating market intelligence, which relates to interpreting market intelligence (Kogut & Zander, 1996), making sense of events and developments, and exploring new opportunities (Teece, 2007); and (iii) responding to market intelligence, which relates to initiating plans to capitalize on market intelligence (D'Aveni, 1994), and pursuing specific market segments with plans to seize the new market opportunities (Teece, 2007).

Therefore, perceived opportunities might be a precise proxy for the dependent variable sensing capabilities. This variable is assessed at country level and is derived from the APS of the GEM (Barazandeh et al., 2015; Urbano & Alvarez, 2014); it depicts the percentage of the 18–64 year old population that foresees good opportunities where they live to begin a business in the following six months.

4.4.2.2 Independent variables

Research related to new ventures within the human capital theory considers the function of the human capital of the person who establishes the firm (Alvarez & Busenitz, 2001). Also, suitable administrative experience contributes to the advancement of dynamic capabilities (Helfat & Lieberman, 2002; King & Tucci, 2002). Moreover, the education (primary, lower and upper

secondary education, higher and university education) of the executives and founders impacts the base of knowledge of organizations, and therefore their organizational capabilities (Bantel & Jackson, 1989; Hambrick & Mason, 1984). Given the relevance of human capital in the entrepreneurial field for the opening of new firms, we therefore consider education and training as independent variables.

In this way, the education (entrepreneurial education at school stage) and training (entrepreneurial education at post-school stage) variables represent the perception of education and training related to entrepreneurial activity. For instance, the education variable describes whether teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative, and whether this education provides adequate instruction in market economic principles and pays adequate attention to entrepreneurship and new firm creation. For example, the training variable represents whether colleges and universities provide good and adequate preparation for starting up and growing new firms. whether the level of business and management education provides good and adequate preparation for starting up and growing new firms, and whether the vocational, professional, and continuing education systems provide good and adequate preparation for starting up and growing new firms. These variables are measured at a country level in the GEM, specifically in the NES. They assess perceptions of the national condition in terms of education and training respectively influencing entrepreneurial activity and are represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 5, Topic D: Education—entrepreneurial education at school stage—and training— entrepreneurial education at post-school stage).

The research and development transfer variable is related to the perception of the activity of transferring research and development—for instance, to new technology, science, and other knowledge in terms of the efficiency of transference from universities and public research centers to new and growing firms; whether new and growing firms have just as much access to new research and technology as large, established firms; whether they can afford the latest technology; whether there are adequate government subsidies for new and growing firms to acquire new technology; whether the science and technology base efficiently supports the creation of world class new technology-based ventures in at least one area; and whether there is good support available for engineers and scientists to have their ideas commercialized through new and growing firms. Thus, this variable from the NES of the GEM assesses the perception of the national

condition regarding research and development effects on entrepreneurship and is illustrated by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true (see Appendix 5, Topic E: Research and development transfer).

Also, we acknowledge the relevance of physical resources. According to Dollinger (2003), physical resources permit the production and distribution of products and services—for instance, a factory and its buildings, machinery, computers, etc. Additionally, physical resources are often the second kind of assets that a new business owns, just after founders' assets. Regarding the relevance of tangible resources in entrepreneurship, we consider in this study the formal institution of physical infrastructure to describe these physical resources. These tangible resources are assessed at country level in the NES of the GEM. At this point, tangible resources refers to the physical requirements for business creation—for example, whether the physical resources give great assistance to new and developing firms in terms of streets, utilities, water, communications, and waste disposal; whether the costs of access to telephone or internet are low or high, and the speed of accessibility; and whether new ventures can manage the cost or can get good access in about a month to essential utilities like gas, water, power, and sewerage. Therefore, this variable assesses the perception of the national condition referring to physical infrastructure's influence on entrepreneurial activity and is illustrated by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 5, Topic H: Physical infrastructure.)

4.4.2.3 Control variable

The Innovation Competitive Index (GCR) describes the national innovative capacity as a country's potential to produce a stream of commercially relevant innovations. The innovation factors reflect the conditions, investments, and policy choices that settle the environment to innovate in a region or country (Wennekers, Van Stel, Thurik, & Reynolds, 2005). However, the essential source of dimensions that measure economic growth is the World Economic Outlook data base (Reynolds et al., 2005). We consider the GDP per capita and GDP per capita growth reported by the IMF. These two measurements were used as control variables in analogous research when performing GEM database analysis (Kelley et al., 2011; Levie & Autio, 2008; Urbano & Alvarez, 2014). Table 4.1 shows the description of the variables used in this study.

Table 4.1 Description of variables

| Construct | Measures | Description | Source ^a |
|-----------------------------|-------------------------------------|---|----------------------------|
| Dependent variables | | | |
| Dynamic capabilities | Sensing capabilities | Percentage of the 18–64-year old population who see good opportunities to start a firm in their living area. | APS GEM 2006–2013 |
| Independent variable | | | |
| Human capital | Education | Average of summary blocks of the education in the population. | NES GEM 2006–2013 |
| | Training | Average of summary blocks of the training in the population. | NES GEM 2006–2013 |
| Formal institutions | Research and development transfer | Average of summary blocks of the research and development transfer regarding entrepreneurship. | NES GEM 2006–2013 |
| | Physical infrastructure | Average of summary blocks of the physical infrastructure access for new and growing ventures. | NES GEM 2006–2013 |
| Control variables | | | |
| | GDP per capita (constant 2005 US\$) | Gross domestic product divided by midyear population. | IMF 2006–2013 |
| | GDP per capita growth (annual %) | Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 US dollars. | IMF 2006–2013 |
| | Population total | Total population counts all residents regardless of legal status or citizenship. | WDI 2006–2013 |
| | Labor total | Labor force comprises people aged 15 and older who supply labor for the production of goods and services during a specified period. | WDI 2006–2013 |
| | Unemployment | Unemployment refers to the portion of the labor force that is without work but available for and seeking employment. | WDI 2006–2013 |

| | | |
|---|--|------------------|
| Voice and accountability | Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2013 |
| Political stability and absence of violence/terrorism | Captures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2013 |
| Regulatory quality | Measures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Values vary from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2013 |
| Rule of law | Reflects 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. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2013 |
| Government effectiveness | Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2013 |
| Control of corruption | Measures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, and of the state | WGI 2006–2013 |

by elites and private interests. Values range from -2.5 (weak) to 2.5 (strong) governance performance.

^aGlobal Entrepreneurship Monitor (GEM): <http://www.gemconsortium.org>; International Monetary Fund (IMF): <https://www.imf.org/external/index.htm>; World Development Indicators (GDI) by World Bank: <http://databank.worldbank.org/data/home.aspx>; Worldwide Governance Indicators (WGI) by World Bank Group: <http://info.worldbank.org/governance/wgi/#home>

4.4.3 Data analysis and model

We executed unbalanced panel data in this study, using GEM, like Aparicio et al. (2016), at the national level. As mentioned, we argue that dynamic capabilities are influenced by human capital and institutions. We specify the first equation in its general form as follows:

$$DC_{it} = \alpha + \beta_1 HC_{it} + \beta_2 FI_{it} + \beta_3 VC_{it} + \varepsilon_{it} \quad (1)$$
$$i = 1, 2, \dots, 21 \text{ countries}$$
$$t = 2006, 2007, \dots, 2013$$

where *HC* is the vector that represents human capital, *FI* is the vector that represents formal institutions, and *VC* represents the control vector that influences dynamic capability *DC* in country *i* at time *t*. The vector of control includes GDP per capita, GDP per capita growth (annual %), population total, labor total, unemployment, voice and accountability, political stability and absence of violence/terrorism, regulatory quality, rule of law, government effectiveness, and control of corruption.

To determine whether formal institutions have an indirect effect on the relationship between human capital and dynamic capabilities (sensing capabilities), we propose the second equation as follows:

$$DC_{it} = \alpha + \beta_1 HC_{it} + \beta_2 FI_{it} + \beta_3 VC_{it} + \beta_4 (HC_{it} \times FI_{it}) + \beta_5 (HC_{it} \times FI_{it}) + \varepsilon_{it} \quad (2)$$
$$i = 1, 2, \dots, 21 \text{ countries}$$
$$t = 2006, 2007, \dots, 2013$$

where *HCA x FIB* represents the interaction between education and physical infrastructure, and *HCC x FID* represents the interaction between training and research and development transfer.

To select the econometric model to be used with panel data, we used the Breusch and Pagan test for random effects (Var(u) = 0; $\chi^2(01) = 49.61$; Prob > $\chi^2 = 0$) and identified that random effects is not the preferable model to use. We also executed the F test of significance of

the fixed effects (F test that all $u_i=0$; $F(20, 109) = 11.18$; $\text{Prob} > F = 0.0000$) and discarded the grouped model (ordinary least squares regression). In this way, we concluded in selecting the fixed effects model.

The dependent variable sensing capabilities, represented by perceived opportunities, is one of the best known indicators of the GEM and indicates the percentage of the 18–64 year old population that sees good opportunities to start a firm in the area where they live. With respect to the dependent and independent variables, detailed specification of the questions included in the NES and APS questionnaires is included (see Appendix 5).

4.5 Results

The means and standard deviations of the variables used in this research are shown in Table 4.2. This table illustrates the average of sensing capability (39.48%), the dependent variable. Regarding the independent variables, the countries indicate low levels in education (2.05), medium levels in training (2.78), research and development transfer (2.39), and higher levels in physical infrastructure (3.65).

Table 4.2 Descriptive statistics

| Variable | Mean | Std. Dev. | Min | Max |
|---|----------|-----------|----------|-----------|
| Sensing capabilities | 39.48 | 15.92 | 10.57 | 73.05 |
| Education | 2.05 | 0.32 | 1.36 | 2.92 |
| Training | 2.78 | 0.27 | 2.21 | 3.60 |
| Research and development transfer | 2.39 | 0.31 | 1.74 | 3.25 |
| Physical infrastructure | 3.65 | 0.42 | 2.74 | 4.65 |
| GDP per capita (constant 2005 US\$) | 23094.69 | 18857.53 | 2883.38 | 69094.74 |
| GDP per capita (annual growth) | 1.4203 | 3.7032 | -8.9980 | 8.7209 |
| Population total | 5.68E+07 | 7.38E+07 | 2.00E+07 | 31.60E+07 |
| Labor total | 2.77E+07 | 3.77E+07 | 1.01E+07 | 15.90E+07 |
| Unemployment | 9.3366 | 5.2507 | 2.4900 | 27.4700 |
| Voice and accountability | 0.7905 | 0.6484 | -1.0222 | 1.7380 |
| Political stability and absence of violence/terrorism | 0.2509 | 0.8094 | -1.9016 | 1.5014 |
| Regulatory quality | 0.8270 | 0.7193 | -0.9573 | 1.9251 |
| Rule of law | 0.7158 | 0.9316 | -0.9701 | 2.0137 |
| Government effectiveness | 0.8009 | 0.8027 | -0.6694 | 2.3540 |
| Control of corruption | 0.7540 | 0.9865 | -1.1320 | 2.4700 |

Notes: $N=147$, $n=21$

Meanwhile, Table 4.3 reports the correlation coefficients of the same variables. This shows that sensing capabilities are significantly positively correlated with education, training, and physical infrastructure. Also, education is correlated with training, research and development transfer, and physical infrastructure. Furthermore, training is correlated with research and development transfer. Additionally, the variable research and development transfer is correlated with physical infrastructure.

Table 4.3 Correlation matrix

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----|--|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | Sensing capabilities | 1 | | | | | | | |
| 2 | Education | 0.2071* | 1 | | | | | | |
| 3 | Training | 0.3031* | 0.3111* | 1 | | | | | |
| 4 | R&D transfer | -0.0071 | 0.5082* | 0.2196* | 1 | | | | |
| 5 | Physical infrastructure | 0.2122* | 0.3382* | 0.1452 | 0.5776* | 1 | | | |
| 6 | GDP per capita (constant 2005 US\$) | -0.0832 | 0.5115* | -0.1248 | 0.7244* | 0.4712* | 1 | | |
| 7 | GDP per capita (annual growth) | 0.4281* | -0.0046 | 0.2733* | -0.1684* | -0.0491 | -0.3439* | 1 | |
| 8 | Population total | -0.1647* | -0.1279 | 0.0375 | -0.0814 | -0.14 | -0.0368 | 0.0622 | 1 |
| 9 | Labor total | -0.1612* | -0.108 | 0.0561 | -0.0644 | -0.1101 | -0.0171 | 0.0585 | 0.9963* |
| 10 | Unemployment | -0.3791* | -0.4334* | -0.3275* | -0.3484* | -0.3320* | -0.3026* | -0.2282* | -0.1056 |
| 11 | Voice and accountability | 0.0214 | 0.1377 | -0.1896* | 0.6538* | 0.5531* | 0.7497* | -0.3186* | -0.2561* |
| 12 | Political stability and absence of violence/terrorism | -0.0597 | 0.2639* | -0.1346 | 0.6492* | 0.5169* | 0.6760* | -0.2387* | -0.2599* |
| 13 | Regulatory quality | 0.0064 | 0.2975* | -0.1990* | 0.5886* | 0.5609* | 0.7823* | -0.3000* | -0.1395 |
| 14 | Rule of law | -0.0527 | 0.3066* | -0.1970* | 0.7051* | 0.6535* | 0.8413* | -0.3289* | -0.1395 |
| 15 | Government effectiveness | 0.0036 | 0.4274* | -0.1648* | 0.7091* | 0.7019* | 0.8366* | -0.3240* | -0.1582 |
| 16 | Control of corruption | 0.145 | 0.3395* | -0.113 | 0.7161* | 0.7097* | 0.7769* | -0.1938* | -0.2093* |
| | | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 9 | Labor total | 1 | | | | | | | |
| 10 | Unemployment | -0.1314 | 1 | | | | | | |
| 11 | Voice and accountability | -0.2456* | -0.1191 | 1 | | | | | |
| 12 | Political stability and absence of violence/terrorism | -0.2427* | -0.2390* | 0.8463* | 1 | | | | |
| 13 | Regulatory quality | -0.1234 | -0.1712* | 0.8217* | 0.6457* | 1 | | | |
| 14 | Rule of law | -0.1236 | -0.1871* | 0.9034* | 0.7864* | 0.9322* | 1 | | |
| 15 | Government effectiveness | -0.1415 | -0.1938* | 0.8552* | 0.7840* | 0.9102* | 0.9727* | 1 | |
| 16 | Control of corruption | -0.1928* | -0.2693* | 0.8993* | 0.7870* | 0.8871* | 0.9551* | 0.9452* | 1 |

Notes: *p<0.05

In Table 4.4, we illustrate the results from regressions of four models. Furthermore, we show fixed effects coefficients, corrected standard errors, and significance levels. We performed the Wooldridge test for autocorrelation in panel data and this pointed out an autocorrelation problem ($F(1, 20) = 15.082$ Prob > F = 0.0009) which was corrected with the autoregressive term of 1 degree (AR1). Additionally, we executed the modified Wald test for groupwise heteroskedasticity in fixed effect regression models to test for multicollinearity. We detected a problem of heteroskedasticity ($\chi^2(21) = 785.15$ Prob > $\chi^2 = 0.0000$). Subsequently, to address the heteroskedasticity problem, contemporary correlation, and autocorrelation problems among observations referring the sample of economies, we employed the Prais-Winsten regression to estimate the heteroskedastic PCSEs. Finally, to calculate fixed effects, we introduced dichotomizing variables for years and countries. Hence, year and country effects were controlled.

Table 4.4 Estimating dynamic capabilities

| Dependent variable | MODEL 1 | | MODEL 2 | | MODEL 3 | | MODEL 4 | |
|-------------------------------------|--------------|--|--------------|--|--------------|--|--------------|--|
| Sensing capability | Coef. | | Coef. | | Coef. | | Coef. | |
| Independent variables | | | | | | | | |
| Education | 0.3943 | | 0.3732 | | -57.1728 *** | | -79.2666 *** | |
| | (4.2215) | | (4.2709) | | (17.9601) | | (19.6479) | |
| Training | -3.9808 | | 25.1127 | | -5.6238 | | 46.6477 ** | |
| | (4.0616) | | (16.8363) | | (4.0639) | | (18.0646) | |
| R&D Transfer | -10.4817 *** | | 23.53477 | | -9.3082 *** | | 53.0705 ** | |
| | (3.4353) | | (19.7058) | | (3.1888) | | (21.2029) | |
| Physical Infrastructure | 6.0262 ** | | 5.5867 ** | | -26.0371 ** | | -39.2321 *** | |
| | (2.7998) | | (2.7607) | | (11.4156) | | (12.3180) | |
| Interactions | | | | | | | | |
| Education x Phy Inf | | | | | 15.6326 *** | | 21.6609 *** | |
| | | | | | (4.8310) | | (5.2696) | |
| Training x R&D Transfer | | | -11.7061 * | | | | -21.3633 *** | |
| | | | (6.2491) | | | | (6.7276) | |
| Control variables | | | | | | | | |
| GDP per capita (constant 2005 US\$) | 0.0018 *** | | 0.0020 *** | | 0.0017 *** | | 0.0020 *** | |
| | (0.0006) | | (0.0007) | | (0.0005) | | (0.0005) | |
| GDP per capita (annual growth) | 0.3138 | | 0.2907 | | 0.2692 | | 0.2013 | |
| | (0.2647) | | (0.2769) | | (0.2315) | | (0.2389) | |
| Population total | 5.15E-07 * | | 2.69E-07 | | 7.65E-07 * | | 4.04E-07 | |
| | (2.96E-07) | | (2.63E-07) | | (4.25E-07) | | (2.83E-07) | |
| Labor total | 1.85E-06 ** | | 1.85E-06 *** | | 1.94E-06 ** | | 1.99E-06 ** | |
| | (7.58E-07) | | (7.03E-07) | | (9.7E-07) | | (8.64E-07) | |

| | | | | |
|---|---------------------------|----------------------------|---------------------------|---------------------------|
| Unemployment | -1.0058 *** (0.3206) | -0.9647 *** (0.3341) | -0.9262 *** (0.2899) | -0.8292 *** (0.2962) |
| Voice and Accountability | 15.9882 (12.8834) | 13.2593 (12.4325) | 22.5320 ** (10.5507) | 19.5268 ** (9.1075) |
| Political Stability and Absence of Violence/Terrorism | 4.8222 (4.2634) | 5.4987 (4.2583) | 5.4997 * (3.1415) | 7.1635 ** (2.8536) |
| Regulatory Quality | 7.1471 (6.9451) | 8.2933 (7.2296) | 7.8085 (6.3682) | 10.3876 (6.7215) |
| Rule of Law | -33.5439 *** (10.7138) | -33.675 *** (10.4615) | -38.9219 *** (10.5867) | -41.4864 *** (9.6929) |
| Government Effectiveness | 2.1474 (7.6287) | 1.0558 (7.8321) | 3.8955 (6.7230) | 2.3931 (6.8935) |
| Control of Corruption | 9.2708 ** (4.1521) | 8.4755 * (4.3590) | 11.4408 *** (3.4755) | 10.8310 *** (3.6105) |
| Constant | -467.13 *** (108.0119) | -477.345 *** (109.8644) | -443.515 *** (93.0814) | -450.434 *** (86.7027) |
| N of observations | 147 | 147 | 147 | 147 |
| N of groups | 21 | 21 | 21 | 21 |
| R2 | 0.8626 | 0.8679 | 0.872 | 0.8867 |

*** $p < 0.01$;
** $p < 0.05$;
* $p < 0.10$

Heteroskedastic panels corrected standard errors (PCSEs) are shown in parentheses. The estimates for country and time fixed effects dummies are not presented but can be supplied upon request.

Model 1 includes the human capital and formal institutions variables that are related to sensing capabilities and they explain 86.26 percent of sensing capability variation across countries. Model 2 includes the human capital and formal institutions variables that are related to sensing capabilities, and the interaction between training and R&D transfer. This model explains 86.79 percent of sensing capability variation across countries. Model 3 includes the human capital and formal institutions variables that are related to sensing capabilities, and the interaction between education and physical infrastructure. This model explains 87.2 percent of sensing capability variation across countries. Model 4 shows the human capital and formal institutions variables together with the two moderating effects of formal institutions on the relationship between human capital and sensing capabilities. This model predicts 88.67 percent, which is higher than Models 1, 2, and 3.

Hypothesis 1 proposes that human capital in new ventures will positively influence the development of dynamic capabilities. Specifically, Hypothesis 1a suggests that education (entrepreneurial education at school stage) will positively influence sensing capabilities in new ventures. The results from Models 3 and 4 show that the coefficient estimate for education is

statistically significant and negative. Likewise, Hypothesis 1b proposes that training (entrepreneurial education at post-school stage) will positively influence sensing capabilities in new ventures. The results from Model 4 show that the coefficient estimate for training is significant and positive. Therefore, the results partially support Hypothesis 1 in that human capital in new ventures will positively influence the development of dynamic capabilities.

Hypothesis 2 suggests that formal institutions will positively influence the development of dynamic capabilities. Particularly, Hypothesis 2a proposes that access to research and development will positively influence sensing capabilities in new ventures. The results from Models 1 and 3 show that research and development transfer is significant and has a negative sign. However, Model 4 shows that research and development transfer is significant and has a positive sign. Specifically, Hypothesis 2b suggests that access to physical infrastructure will positively influence sensing capabilities in new ventures. The results from Models 1 and 2 show that the coefficient for access to physical infrastructure is negative and significant. However, the results from Models 3 and 4 show that the coefficients are positive and significant. Therefore, the results partially support Hypothesis 2 in that formal institutions will positively influence the development of dynamic capabilities in new ventures.

Hypothesis 3 proposes that formal institutions moderate the relationship between human capital and dynamic capabilities in new ventures. Model 4 shows the moderating effect that formal institutions have in the relationship between human capital and sensing capabilities in new ventures. Hypothesis 3a suggests that physical infrastructure moderates the relationship between education and sensing capabilities. The results show the interaction term between physical infrastructure and education, where the coefficient estimate for this interaction is significant and positive. Hypothesis 3b proposes that research and development transfer moderates the relationship between training and sensing capabilities. The results show the interaction term between research and development transfer and training, where the coefficient estimate for this interaction is significant and negative. Referring to Hypothesis 3, then, the results show that formal institutions have a moderating effect on the relationship between human capital and dynamic capabilities in new ventures—that is, the interaction term between education and physical infrastructure is positive and statistically significant, which allows the relationship between education and sensing capabilities to be different for the entrepreneurs when physical infrastructure is below the average versus when physical infrastructure is above the average (see

Figure 4.2). Additionally, the interaction term between training and research and development transfer is negative and statistically significant, which allows the relationship between training and sensing capabilities to be different for the entrepreneurs when research and development transfer is below the average versus when research and development transfer is above the average (see Figure 4.3).

Figure 4.2 Interaction between physical infrastructure and education

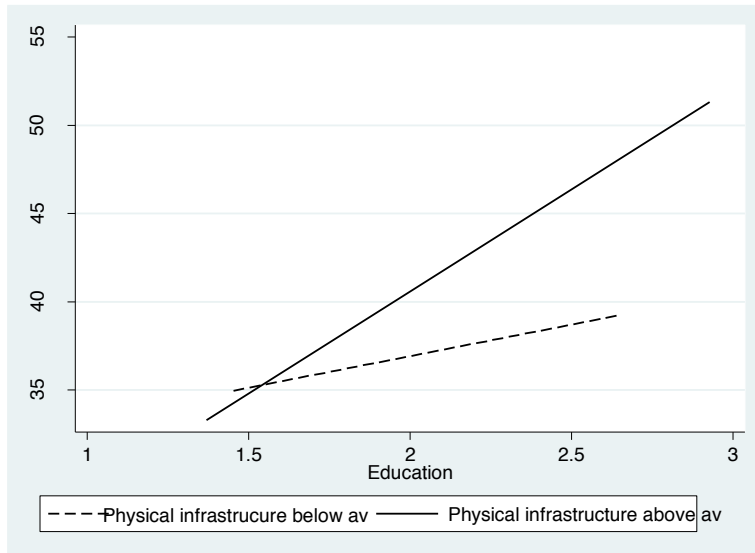
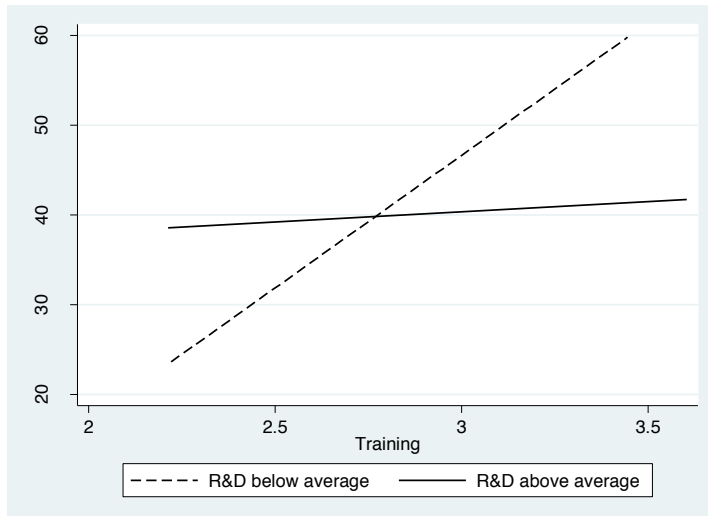


Figure 4.3 Interaction between research and development transfer and training



4.6 Discussion and conclusions

In respect of the results of education (entrepreneurial education at school stage), it is shown in this research that it negatively influences sensing capabilities. Similarly, past research found zero or negative effects on non-cognitive entrepreneurial skills, according to Huber, Sloof, and Van Praag (2014). These authors studied a program of early entrepreneurship education that was run worldwide in the last grade of primary school, and that was focused on entrepreneurship knowledge and non-cognitive skills appropriate for entrepreneurial activities. Their results suggest that non-cognitive skills are best developed at an early age. In the same way, the model of skill formation developed by Cunha and Heckman (2007) proposes that entrepreneurial skills and knowledge are easier cultivated earlier in life than during adolescence, when in secondary or higher education, and depicts these dynamic spill-over effects. In other words, in this model, investment in cognitive and non-cognitive skills may be effective in the long term, due to skills learned at school age increasing the benefits of investment in these skills at post-school age. However, according to Huber et al. (2014), the measurement of entrepreneurial intentions of children at the school stage is difficult. In this matter, the measurement of expert perceptions on a national level regarding the activity of teaching in primary and secondary education might be even more challenging, especially when it is related to the level of encouragement of creativity, self-sufficiency, and personal initiative, instruction in market economic principles, and entrepreneurship and new firm creation.

Regarding the results of training (entrepreneurial education at post-school stage), the results in this research show that training in new ventures positively influences sensing capabilities. DeTienne and Chandler (2004) show that individuals can learn processes of opportunity identification and improve both the number of ideas generated and the innovativeness of those ideas. Specifically, Mosey and Binks (2011) conclude that entrepreneurship courses need to modify the way students perceive reality and interpret information in order to enable them to identify new business opportunities more effectively. Baručić and Umihanić (2016) also confirm the correlation between entrepreneurship education and entrepreneurial opportunity recognition; however, they consider that it would be necessary to analyze the significance level of this correlation in comparison to the level of significance of the correlation between other factors and sensing capabilities.

With respect to research and development transfer, our results show that research and development transfer positively influences the development of sensing capabilities in new ventures. According to Teece and Pisano (1994), companies will have success in a global competition environment when they follow the fastest product innovation and exhibit the management capability to integrate and allocate internal and external resources. Integrating internal and external knowledge in the firm and maintaining good management will then lead to a positive effect on the performance of new product development (Liu, Chen, & Tsai, 2005). Teece et al. (1997) also highlight the importance of knowledge integration and consider that business owners must effectively acquire and integrate external knowledge to develop novel ideas. In this way, access to research and development transfer will bring the ventures the required external knowledge. Moorman (1995) identifies that a firm with good capability to assimilate market information will reduce market uncertainty (namely, external knowledge management—i.e., research and development transfer) and achieve success opportunities. Therefore, the better the access to research and development transfer, the better capabilities for managing external knowledge the entrepreneur must have in order to obtain successful new product development performance (Liu et al., 2005). For instance, Smith, Matthews, and Schenkel (2009) performed a research identifying that relatively more codified opportunities have higher probability of being discovered through systematic search, whereas more tacit opportunities have a higher likelihood of being identified due to prior experience. Furthermore, Vaghely and Julien (2010) depict how human information processing can moderate entrepreneurial opportunity identification: in their model, they include the endogenous discovery made by the entrepreneur and the exogenous enactment made by the entrepreneur, the venture, and the network.

Regarding physical infrastructure, this research shows that access to this resource negatively influences sensing capabilities in new ventures. In this respect, Ghani, Kerr, and O'Connell (2014) found that education and infrastructure are strong determinants of entrepreneurship in India for the manufacturing and service sectors, given regional conditions. However, physical infrastructure is particularly relevant to the unorganized sectors of the economy. According to Fox (2014, p. 18), the third wave of the do-it-yourself (DIY) paradigm, which involves “ordinary people inventing, designing, making, and/or selling physical goods”, could be carried out by anybody at any location. It was found that third-wave DIY could “better enable prosumption, innovation, and entrepreneurship, particularly by local populations that lack

functional literacy in any ‘lingua franca’, computer skills, and access to industrial manufacturing infrastructure”. Moreover, Hingtgen, Kline, Fernandes, and McGehee (2015) identified insufficient infrastructure in Cuba, among other barriers for increasing the creation of tourism private enterprises and promoting employment and competitiveness. Furthermore, Singapore planners intervened by adjusting infrastructure, training, and education with the purpose of enabling the economy to thrive through the creation of new ventures (Cuba Study Group, 2011). Similarly, Singh and Belwal (2008) found that infrastructural facilities are perceived by women entrepreneurs in Ethiopia in a range from low to high, and some revealed discontent caused by high rates. Most importantly, not only was the physical infrastructure identified as the main aspect to be developed, but so too was a healthy environment for entrepreneurship—that is to say, work culture, support of women, representation of women, access to education, and specialized training for women entrepreneurs. Likewise, Low, Henderson, and Weiler (2005) found that new categories of assets (different from land and labor) are shaping economic prospects—for instance, workforce skills, lifestyle amenities, access to capital and information, and innovative activity. These authors propose that by creating new solutions to improve these assets, economic success can be easier, and entrepreneurial activity emerges as a new instrument for regional growth.

Moreover, the moderating effect that physical infrastructure has on the relationship between education (entrepreneurial education at school stage) and sensing capabilities in new ventures is shown, given that the coefficient estimate for the interaction is significant and positive. Thus, when education is perceived as the best one to affect sensing capabilities, the immediate physical infrastructure increases the perceived opportunities in the population (see Figure 4.2). Furthermore, the moderating effect that research and development transfer have on the relationship between training (entrepreneurial education at post-school stage) and sensing capabilities in new ventures is shown, given that the coefficient estimate for the interaction is significant and negative. When training is perceived as the best one to affect sensing capabilities, the immediate research and development transfer decreases the perceived opportunities in the population (see Figure 4.3).

This study shows that formal institutions have a moderating effect on the relationship between human capital and dynamic capabilities in new ventures. Yun (2010) found that entrepreneurial self-efficacy positively moderates the relationship between entrepreneurial education and entrepreneurial intention. Ambrosini and Bowman (2009) also show how the arrangement and performance of dynamic capabilities is moderated by internal and external

variables. Specifically, they explain that the external environment has a moderating influence on the relationship between dynamic capabilities and competitive advantage. The authors also describe the main external environmental issues: complexity, uncertainty, generosity, and characteristics of the country of origin. Likewise, Schilke (2014) measured an indirect effect of environmental dynamism on the relationship between dynamic capabilities and competitive advantage. That research suggests that dynamic capabilities have complex performance effects, relying upon the dynamic of the environment.

4.6.1 Theoretical implications

The contribution of this investigation to the literature is as follows. Firstly, this study advances new empirical insights into the relationship of human capital and formal institutions in relation to dynamic capabilities in new ventures, using 147 observations in a sample of 21 countries and utilizing the GEM data base for eight years from 2006–2013. Other works used fewer years (Autio et al., 2013) or fewer countries (Mai & Gan, 2007). Secondly, this study helps to advance the application of human capital theory (Becker, 1975) and institutional economics theory (North, 2005) in the analysis of dynamic capabilities (Teece et al., 1997).

4.6.2 Policy implications

Regarding policy implications, Teece (2016) affirms that dynamic capabilities emphasize entrepreneurship, innovation, learning, and strategy at the enterprise level. Teece also asserts that the dynamic capabilities framework may be applied on a larger scale beyond managerial purposes. For example, for policymakers, an understanding of the foundations and progress of organizational capabilities may assist in foreseeing business reactions to policy changes. Therefore, this study may guide the development of policies to improve dynamic capabilities in new ventures considering in particular the relevance of the human capital and formal institutions to the entrepreneurial movement.

4.6.3 Limitations and future research lines

Further investigation is recommended as follows. First of all, it would be useful to increase either the number of years or the number of countries to improve the size of the sample. Nevertheless, this sample may depend on the willingness of countries to engage in the GEM surveys. In addition, future exploration may involve the effects of institutional conditions, and the effects of dynamism on the dynamic capabilities themselves (Zahra et al., 2006). Likewise,

research could include the role played by managerial choices (King & Tucci, 2002) in the creation of dynamic capabilities. Moreover, Gorman, Hanlon, and King (1997) suggest the measurement of educative entrepreneurship programs overall, since a greater impact is expected from repetitive exposure to education for entrepreneurship on attitudes and propensity to start new ventures. That is to say, a cumulative impact should be considered in future research, looking at the effectiveness of education and training together and the influence on dynamic capabilities in new ventures. Furthermore, Singh and Belwal (2008) recommend that infrastructure be supplemented by education and training to lead women entrepreneurs from small and micro enterprises to medium and large businesses, according to their research in Ethiopia. Further investigation should therefore consider the interaction among infrastructure, education, and training with the aim of measuring the impact on the dynamic capabilities in new ventures in several countries that share similar economic, political, or geographical environments. Additionally, Low et al. (2005) conclude that developing infrastructure allows entrepreneurs to facilitate a connection with markets and suppliers in alternative locations, and, by expanding communications, new ventures have access to new resources, assets, and information from other regions. Hence, the authors suggest that policies related to infrastructure can foster regional activity. In this way, subsequent investigation should examine the differences in infrastructure, communications, and utilities separately among world regions with regard to urban and rural areas. Finally, the Cuba Study Group (2011) and Hingtgen et al. (2015) agree that policy recommendations emerge from previous countries' experiences in studies on governmental interventions like in the cases of Singapore, China, and Bolivia, and point out that further analysis must be done in relation to entrepreneurial climate or external conditions conducive to the creation of new private ventures. In this manner, future research should include quantitative comparative studies among groups of countries with similar external environments that measure policymakers' interventions in variables that directly or indirectly affect the dynamic capabilities in new ventures.

4.6.4 Conclusions

The objective of this investigation was to study the relationship between human capital and formal institutions and dynamic capabilities in new ventures. Analysis of four unbalanced data panel models in the research shows that human capital in new ventures, represented by the variable training, positively influences sensing capabilities in new ventures. Contrary to what was expected, it is found that human capital, represented by the variable education, has a negative influence on

sensing capabilities in new ventures. Accordingly, our first hypothesis is partially supported in that human capital in new ventures will positively influence the development of dynamic capabilities. Also, the study shows that the formal institutions represented by the variable research and development transfer positively influence sensing capabilities in new ventures. However, it was found that the formal institution physical infrastructure negatively influences sensing capabilities in new ventures. Subsequently, our hypothesis is partially supported in that formal institutions will positively influence the development of dynamic capabilities in new ventures. Also, two interactions are studied, which show that formal institutions moderate the relationship between human capital and dynamic capabilities in new ventures. The first interaction indicates that when education is perceived as the best one to affect sensing capabilities, the immediate physical infrastructure increases the perceived opportunities in the population. The second interaction indicates that when training is perceived as the best one to affect sensing capabilities, the immediate research and development transfer decreases the perceived opportunities in the population.

CHAPTER 5

HUMAN CAPITAL AND INFORMAL INSTITUTIONS' INFLUENCE ON DYNAMIC CAPABILITIES IN NEW VENTURES

5. HUMAN CAPITAL AND INFORMAL INSTITUTIONS' INFLUENCE ON DYNAMIC CAPABILITIES IN NEW VENTURES

5.1 Introduction

Based on the research currently available, it seems fair to suggest that innovative initiatives are deployed by firms to develop new products and open new markets, and to redefine the firm's operations to meet their markets. Knight and Cavusgil's (2004) investigation links innovation to the phenomenon of early adoption of internationalization. Additionally, this early internationalization occurs in industries characterized by rapid growth, high knowledge intensity, and global interconnectedness. Further evidence lies in Knight and Cavusgil's (2004) findings and they provide a framework for the phenomenon of early and rapid internationalization of young entrepreneurial firms. The authors identify that unique capabilities and strengths are used by young firms, such as a high degree of entrepreneurial orientation, persistence, innovation, and differentiated offerings. That is to say, early internationalization is only possible through the availability of non-traditional organizational assets—for instance, proactive orientation, dynamic capabilities, and skillful strategy. Other research provides evidence that growth in a new business should be considered as a main element in international entrepreneurship. McDougall and Oviatt (1996) define international entrepreneurship as novel activities that aim to create value and growth within the organization in international fields. Researchers have related firm variables to international entrepreneurship. Other organizational factors that affect IE are size, age, location, origin, growth orientation, environmental scanning, and financial strength.

Other findings include the identification of factors related to the external environment that influences IE—for instance, intensity of domestic competition, limited domestic growth, intensity of international competition, restrictive government policies, institutional environment, economies of scale, retaliation by industry incumbents, industry gross profits, industry sales growth, and type of industry. According to Cavusgil and Knight (2015), factors that trigger early internationalization include size of the firm's home market, new market conditions in world markets (e.g., the emergence of global niche markets), technological developments in communications and production, emergence of global networks and alliances, and organizational capabilities.

Bruton et al. (2010) offered a comparative investigation in the entrepreneurial field: formal institutions versus informal institutions, determined by the institutional condition that estimates

entrepreneurship. Informal institutions have been examined based on institutional economics (Autio & Acs, 2010). Nevertheless, no exploration has investigated the connections between human capital and institutional conditions, explicitly informal institutions, and the dynamic capabilities in new ventures for the time period 2006–2013 at a country level. Research and theory-building gaps in the literature regarding dynamic capabilities in new ventures and SMEs are identified by Zahra et al. (2006). Therefore, this research will analyze the relationships between human capital and institutional conditions and the effect of informal institutions—specifically entrepreneur social image, women’s support to start up, and attention to high growth (key elements of international entrepreneurship)—on the influence of human capital on dynamic capabilities in new ventures.

The knowledge management capacity framework proposes an integrative point of view that considers understanding dynamic capabilities to oversee learning using open innovation in a knowledge-based firm (Lichtenthaler & Lichtenthaler, 2009), and empirical research on the antecedents and consequences of the learning management capacity is encouraged by these researchers. Dynamic, entrepreneurial capabilities in small firms are defined as patterns of collective activity that are related to opportunity recognition and exploitation, (Zollo & Winter, 2002). Previous research examines the connection between human capital and dynamic capabilities (Dimov & Shepherd, 2005). Furthermore, prior investigations study institutional conditions with dynamic capabilities (Mai & Gan, 2007). For instance, learning capabilities are tested considering which institutional conditions set the surroundings in which entrepreneurs resolve to start a new business (Meek et al., 2010). For these reasons, examination of human capital and informal institutions’ effects on dynamic capabilities in new ventures is suggested.

The objective of this investigation is therefore to examine the direct relationship between human capital and informal institutions and dynamic capabilities (learning capabilities) in new ventures, primarily to demonstrate, using unbalanced panel data, that human capital (abilities to start up, education, and training) and informal institutions (interest in innovation and attention to high growth) influence learning capabilities (perceived skills) in new ventures. Likewise, the study seeks to identify the indirect relationship or moderating effects between human capital and dynamic capabilities in new ventures when moderated by informal institutions. Educators and policymakers could acknowledge this investigation to facilitate development of the world economies.

Accordingly, this research is conducted using a sample of 147 observations of 21 countries from the APS and the NES questionnaires of GEM for a span time of eight years (from 2006 to 2013). Through unbalanced panel data, we look to provide new insights by analyzing the relationship between human capital and informal institutions and to offer implications and further directions for theoretical and empirical studies.

The chapter has the following structure. Firstly, we present the problem statement, the research gap, and the objective of this investigation after this brief introduction. Then we present the theoretical framework. Thirdly, we explain the hypotheses development and describe the proposed model. Next, we outline the methodology that has been used for analysis in the study. Subsequently, we present the results of the investigation and offer a discussion by highlighting the findings. Lastly, we allow room for limitations and suggest future research as well as major implications.

5.2 Conceptual framework

The foundation of entrepreneurship is the ceaseless application of practical and disciplined systematic innovation (Drucker, 1985). The existence of innovation opportunities within and outside the company is also described by Drucker. Therefore, for entrepreneurs, knowing how to innovate is essential to accomplishing their goals. Likewise, Schumpeter (2000) acknowledges the relationship between entrepreneurship and innovation. For Schumpeter, one of the central attributes of an entrepreneur is being an innovator. Additionally, an open innovation model indicates that market expansion and external use of innovation can be established by actors outside firms (Chesbrough, 2003). Moreover, Teece (2007) argues that dynamic capabilities enable new organizations to develop intangible assets that permit improved business performance in an open economy distinguished by accelerated innovation. There are skills, procedures, proceedings, hierarchical structures, resolution rules, and methods among the dynamic capabilities that allow assistance with sensing, seizing, and reconfiguring capacities. Furthermore, learning capabilities are proposed as enablers for reconfiguration that revamp actual operational capabilities (Zollo & Winter, 2002). Subsequently, organizations with vigorous dynamic capacities are increasingly entrepreneurial because they design themselves using innovation from other firms, ventures, and organizations.

Basically, the dynamic capabilities theory supposes that competitive achievement arises from continuous development, adjustment, and reshaping of organizations' explicit resources (Augier & Teece, 2009; Teece & Pisano, 1994; Teece et al., 1997). Mainly, dynamic capabilities (Teece, 2007) supply the mechanism to lead more dynamic variants of the resource-based theory (Kraaijenbrink et al., 2010). Additionally, the dynamic capabilities framework is appropriate to distinguish the variables that affect business performance. Furthermore, fields for practical research in dynamic capabilities involve regional and national competitiveness by developing and transitional economies (Teece, 2009). In other words, the dynamic capabilities framework is gradually evolving into a theory of the modern corporation combining two or more academic fields (Teece, 2010).

5.2.1 Resource-based theory (RBT) and dynamic capabilities (DC)

Lately, the RBT has been expanded to dynamic markets (Teece et al., 1997). Hence, dynamic capabilities engender an enduring competitive advantage where competitive conditions are constantly changing (Teece et al., 1997). Mainly, the RBT of the firm explains how organizations become competitive through an advantage, and how to remain competitive. Furthermore, the organizations own dissimilar resources that endure over time. Moreover, organizations that have unique attributes like valuable, rare, inimitable, and non-substitutable and that attain sustainable competitive advantage apply innovative strategies that are not easily copied by their rivals (Eisenhardt & Martin, 2000). In this way, dynamic capabilities are described as a group of particular and traceable process (Eisenhardt & Martin, 2000). Dynamic capabilities are identified in three essential groups. Sensing capabilities of an unexplored future combine the identification, development, co-advancement, and evaluation of technological opportunities and threats to clients' requirements; seizing capabilities refer to the preparation and assignation of resources to create value by meeting needs and opportunities; and transforming capabilities include continuous renewal. According to Teece (2007), referring to learning capabilities, when a market opportunity is identified, then new products must be developed, and a decision must be taken with the purpose of revamp actual operational capabilities with learning, new knowledge, and skills. Pavlou and El Sawy (2011) integrated a set of capabilities in a model, these being sensing, learning, coordinating, and integrating. The authors define the learning capability as the ability to upgrade actual operational capabilities with novel knowledge.

5.2.2 Human capital (HCT) theory

The basic principle of HCT is that the greater the human capital, the better the performance at a task (Becker, 1975). Human capital is defined as a collection of one's knowledge, skills, and abilities (Becker, 2009). Therefore, an important resource or asset for a new venture is represented by its human capital. Furthermore, the human capital has direct and indirect positive effects on the growth of the organization. The entrepreneur's concentration of high human capital facilitates the connection to external assets (Backes-Gellner & Werner, 2007). Essentially, human capital reveals attributes, including knowledge, skills, and abilities, which are accomplished through education, training, and experience, alongside the effectiveness of interpersonal relationships, network effects, and communication skills (Belso-Martinez et al., 2013). Also, knowledge and skills are human because they provide the entrepreneur with individual capabilities to achieve and generate value, and those individuals with superior knowledge, skills, or abilities should have higher odds to recognize and seize entrepreneurial opportunities (Cetindamar, Gupta, Karadeniz, and Egrican, (2012).

5.2.3 Institutional economics (IE) theory

Mostly, this research utilizes IE (North, 2005), as referred to in previous chapters. Institutions are described by North (1990) as standards of the conduct in a society and as the limitations that shape human association (Aparicio et al., 2016). North (1990) suggests that institutions be divided into formal and informal. Formal institutions comprise constitutions, regulations, and contracts, while informal institutions include attitudes, values, norms of behavior, and conventions. In the entrepreneurship field, formal institutions can be represented by agencies, policies, and procedures. Meanwhile, informal factors may be illustrated by networks, role models, and attitudes (Veciana & Urbano, 2008). Both kind of institution affect individuals' decision to seek entrepreneurial activity. Informal institutions in entrepreneurship investigation are examined through cultural sociology and cross-cultural psychology (Autio et al., 2013). In this respect, Bruton et al. (2010) reveal cases showing the potential value that IE has in entrepreneurship studies.

5.3 Hypotheses development

5.3.1 Human capital and dynamic capabilities

Some investigations of the RBT consider the role of the human capital of the founder(s) in new ventures (Alvarez & Busenitz, 2001). Aspects of the new venture creation process—for instance, the necessity to innovate, to take risks, and to coordinate resources (Schumpeter, 1934)—are common to social and commercial entrepreneurs and they rely upon different skills, abilities, and knowledge (Estrin et al., 2016). Looking beyond the concept of human capital and examining outcomes of actual learning activities and current learning may be useful, given the dynamics in entrepreneurship and the constant need to learn and to adapt (Unger, Rauch, Frese, & Rosenbusch, 2011). Helfat and Lieberman (2002) and King and Tucci (2002) confirm that appropriate managerial experience plays a role in the development of dynamic capabilities. Furthermore, Bantel and Jackson (1989) and Hambrick and Mason (1984) argue that the formal education of the founders or executives affects the knowledge base of a firm, and consequently its organizational capabilities. Finally, human capital is imperative for further learning and supports the accumulation of new knowledge and skills (Ackerman & Humphreys, 1990). In this way, owners with higher human capital may be more effective and efficient in developing their business. Considering these aspects, the first hypothesis is presented as follows:

Hypothesis 1. Human capital will positively influence dynamic capabilities in new ventures.

Hypothesis 1a. Abilities and knowledge to start up will positively influence learning capabilities.

Hypothesis 1b. Education will positively influence learning capabilities.

Hypothesis 1c. Training will positively influence learning capabilities.

5.3.2 Institutional economics and dynamic capabilities

Nowadays organizations are functioning in a more turbulent, fast changing, and diffuse environment than ever before (Mintzberg, 1994). Therefore, it is recommended that organizations develop several capabilities to handle continuous change. For example, it has been suggested that organizational learning capabilities enable continuous adaptation to external and internal changes; specifically, organizations need to develop their capacities for learning new things (Styhre, Josephson, & Knauseder, 2004). Knight and Cavusgil (2004) provide a framework for the

phenomenon of early and rapid internationalization for young entrepreneurial firms. They identify that unique capabilities and strengths are used by young firms, such as a high degree of entrepreneurial orientation, persistence, innovation, and differentiated offerings. That is, born-global firms' prevalence is only possible through the availability of non-traditional organizational assets such as proactive orientation, dynamic capabilities, and skillful strategy. Therefore, the role of innovation is emphasized because it is necessary to develop new knowledge and organizational capabilities. Finally, Knight and Cavusgil (2004) argue that the rapid pace of change in many industries increases the premiums achievable from active participation in the global economy. Surely the most important requirement to survive and thrive is a constant emphasis on innovation and entrepreneurial value. Finally, firms need to become more innovative along their value chains regarding the identification and exploitation of opportunities. Managers need to apply their capabilities in change management to be able to anticipate and control continuous change more effectively. Overall, innovation is an important entrepreneurial process for firm performance in competitive international markets (Knight & Cavusgil, 2004). Also, firms need to become more innovative through their value chains when identifying and exploiting opportunities (Knight & Cavusgil, 2004). According to Keen and Etemad (2012), high growth and rapid internationalization characteristics rely on economies of agglomeration and externalities, and international expansion and the resource-based view (RBV) of the firm. Therefore, the following relationship is proposed:

Hypothesis 2. Informal institutions will positively influence dynamic capabilities in new ventures.

Hypothesis 2a. Entrepreneur social image will positively influence learning capabilities.

Hypothesis 2b. Women's support to start up will positively influence learning capabilities.

Hypothesis 2c. Attention to high growth influences learning capabilities.

5.3.3 Moderating effects of informal institutions

North (1990) highlights the market significance of supporting institutions for economic development. Furthermore, institutional investigators indicate the rule of law as the fundamental aspect of institutions (Acemoglu & Johnson, 2005). For instance, the moderating effects that both internal and external variables have on the arrangement and performance of dynamic capabilities is analyzed by Ambrosini and Bowman (2009). In other words, administrators of organizations decide to use dynamic capabilities according to the factors they encounter within the environment.

Additionally, moderators like environmental dynamism affect the connection between dynamic capabilities and competitive advantage (Schilke, 2014). Furthermore, institutional contexts may influence relationships among entrepreneurship and human capital factors (Estrin et al., 2016). Moreover, the institutional context may moderate relationships between these factors. For example, particular institutional factors in economies may moderate the relationship between human capital and entrepreneurship variables (Estrin et al., 2016). Another example is provided by Weerawardena et al. (2015), who demonstrate an indirect effect of innovation on the connection between dynamic capabilities and early internationalization. Therefore, the following hypotheses are proposed:

Hypothesis 3. Informal institutions moderate the relationship between human capital and dynamic capabilities in new ventures.

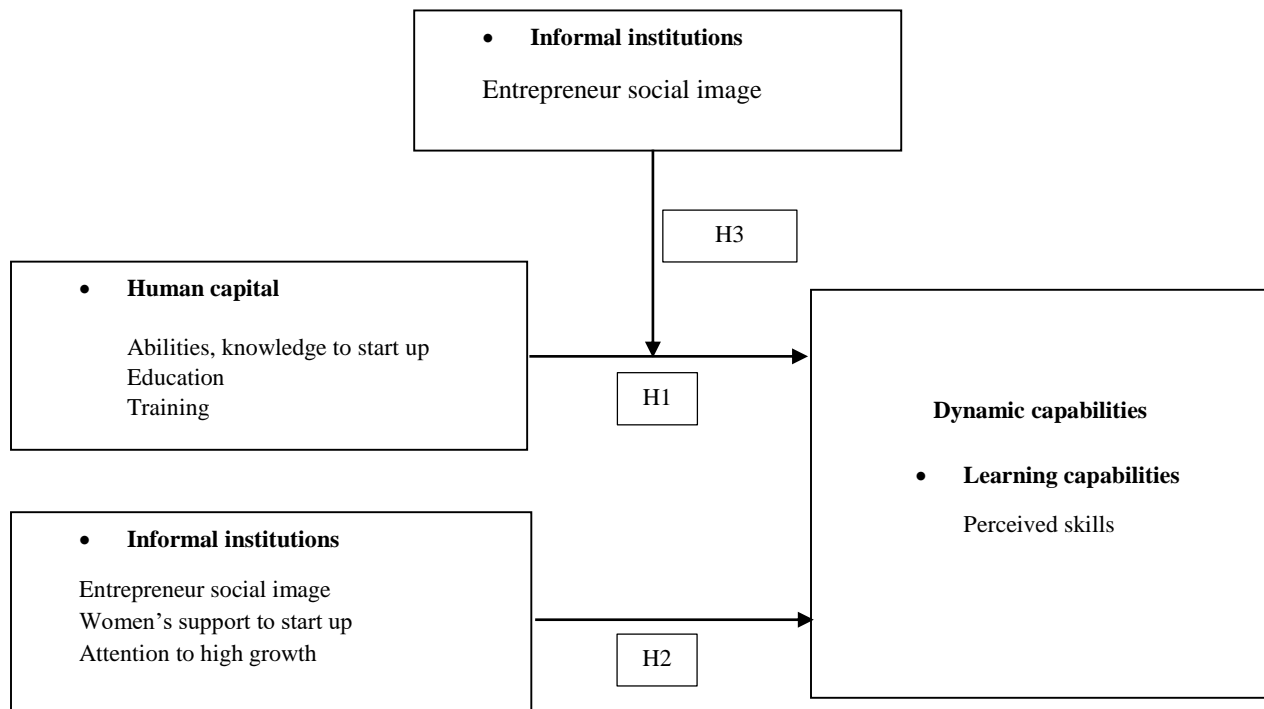
Hypothesis 3a. Entrepreneur social image moderates the relationship between education and learning capabilities.

Hypothesis 3b. Entrepreneur social image moderates the relationship between training and learning capabilities.

Hypothesis 3c. Entrepreneur social image moderates the relationship between abilities and knowledge to start up and learning capabilities in new ventures.

Figure 5.1 depicts these hypotheses.

Figure 5.1 Model



5.4 Methodology

5.4.1 Data

In this research, we utilize the DC, IE, and HC approaches to analyze a model that assesses the impact of a group of factors on dynamic capabilities in new ventures. To achieve this investigation, we use 147 observations in 21 countries (see Appendix 6) for the period 2006 to 2013. Data were gathered from the GEM along with IMF data, WDI, and WGI.

In this investigation, dynamic capabilities are represented by the dependent variable learning capabilities. The measurements used as independent variables in this study are education, training, abilities and knowledge to start up, entrepreneurs' social image, women's support to start up, and attention to high growth.

5.4.2 Variables

5.4.2.1 Dependent variable

Dissimilar types of dynamic capability have been characterized by some authors (Ambrosini & Bowman, 2009; Augier & Teece, 2009; Danneels, 2011; Eisenhardt & Martin, 2000). Nevertheless, a dynamic capabilities model was created by Pavlou and El Sawy (2011) to include sensing, learning, integrating, and coordinating capabilities. Sensing capability is

described as the capacity to detect, define, and go after opportunities in the environment. Learning capability is the capacity to revitalize actual operational capabilities with recent knowledge. Integrating capability represents the capacity to incorporate personal knowledge into the entity's updated operational capabilities. Finally, coordinating capability is determined by the capacity to coordinate and redistribute works, sources, and actions in the current operational capabilities.

Regarding learning capabilities, according to Teece (2007), when a market opportunity is identified, then new products must be developed, and a decision must be taken with the purpose of revamping actual operational capabilities with learning, and new knowledge and skills (Teece, 2007). Furthermore, to take advantage of market opportunities and develop new products in a changing environment, units must focus on learning to find novel solutions, creating new knowledge, and reconfiguring actual operational capabilities (Pavlou and El Sawy, 2011). Zahra and George (2002a) identify a relationship between sensing and learning capabilities in the way that learning improves the ability to detect new opportunities, while Hurley and Hult (1998) affirm that sensing and learning are dissimilar capabilities as sensing refers to gathering new market intelligence and learning to the creation of new knowledge. The absorptive capacity related to learning was developed by Zahra and George (2002a), and this dynamic capability is determined by four routines: acquiring, assimilating, transforming, and exploiting knowledge. According to Pavlou and El Sawy (2011), these routines correspond to terms in dynamic capabilities: acquiring knowledge is linked to obtaining new knowledge (Cohen & Levinthal, 1990); assimilating knowledge is associated with knowledge articulation (Zander and Kogut, 1995) and knowledge brokering (Eisenhardt & Martin, 2000); transforming knowledge is connected to innovative problem-solving (Iansiti and Clark, 1994), brainstorming (Pisano, 1994), and creative new thinking (Henderson & Cockburn, 1994); and exploiting knowledge is related to pursuing new initiatives (Van Den Bosch, Volberda, & De Boer, 1999), seizing opportunities with learning (Teece, 2007), and revamping operational capabilities (Grant, 1996). In this way, learning capabilities are proposed by Zollo and Winter (2002) as enablers for reconfiguration that revamp actual operational capabilities. Therefore, the variable learning capabilities in this study is represented by the widely known measurement of perceived skills, taken from the APS of the GEM. This variable measures the percentage that believes they have the required skills and knowledge to start a new business (Monitor, 2017). (See Appendix 7.)

5.4.2.2 Independent variables

Within human capital theory, research related to new ventures considers the role of the human capital of the founder(s) (Alvarez & Busenitz, 2001). Moreover, proper administrative experience assumes a function in the improvement of dynamic capabilities (Helfat & Lieberman, 2002; King & Tucci, 2002). Additionally, the education of managers influences the knowledge base of organizations, and ultimately their firm capabilities (Bantel & Jackson, 1989; Hambrick & Mason, 1984). Therefore, considering the importance of human capital in the entrepreneurship field for the conception of new firms, we include the education, training, and abilities and knowledge to start up variables. Fundamentally, the abilities and knowledge to start up variable refers to the perception of the intensity of skills and abilities to begin a business—that is, entrepreneurs that have the knowledge to start and manage a new venture, the prior experience in beginning a new business, rapid reactions to favorable opportunities, and the ability to organize resources for the new firm. Thus, this variable from the NES of the GEM assesses the perception of the national condition in terms of abilities and knowledge to start up influencing entrepreneurial activity and is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 7, Topic L: Abilities and knowledge to start up). Basically, both the education (entrepreneurial education at school stage) and training (entrepreneurial education at post-school stage) variables relate to the instruction and preparation identified with entrepreneurial action—for example, the education variable refers to whether education in primary and secondary schools empowers innovativeness, independence, and individual activity; and the training variable reflects whether this training gives satisfactory guidance in market monetary standards and a sufficient consideration regarding new business and firm creation, and whether schools and colleges assign enough good planning to beginning and developing new businesses. Also, this measurement covers whether professional, vocational, and training frameworks devote enough good attention to beginning and developing new firms. These variables are assessed at a country level in the NES of the GEM. They assess perceptions of the national condition in relation to education and training influencing entrepreneurial activity and are represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 7, Topic D: Education—entrepreneurial education at school stage—and training—entrepreneurial education at post school stage).

Regarding informal institutions, we include entrepreneur social image, women's support to start up, and attention to high growth from the NES of the GEM. Mainly, the entrepreneur social image variable refers to society's understanding of the opening of new ventures by entrepreneurs as a way to become wealthy; to the desirability to follow the path of an entrepreneur; to the status and respect given to entrepreneurs who have achieved success; to the media news covering the achievements of entrepreneurs; and to thoughts about entrepreneurs as capable and creative persons. This variable measures the perceptions of the national condition of entrepreneurial social image influencing entrepreneurship and is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 7, Topic M: Entrepreneur social image.)

Primarily, the women's support to start up variable reflects the adequacy of social services available to female entrepreneurs after having a family to keep working; the level of approval in society of the career of female entrepreneurs; support for women to become self-employed or open a new venture; the balance in the exposure to good opportunities for male and female entrepreneurs; and the abilities for both to start a new firm. This variable assesses the perceptions of the national condition of women's support to start up affecting entrepreneurial activity and is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 7, Topic P: Women's support to start up.)

Essentially, the attention to high growth variable expresses the perception of attention to growth in the entrepreneurial endeavor. For example, this variable refers to assistance in activities that encourage high growth; to awareness of the significance of high-growth by policymakers; to the sufficiency in skills and level of competition to enhance high growth among actors in the entrepreneurial world; to the selection criteria for beneficiaries to support high growth; and to the level of concern shown in relation to high growth of new ventures in entrepreneurship policy. This variable measures the perceptions of the national condition of attention to high growth influencing entrepreneurship and is illustrated by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true (see Appendix 7, Topic Q: Attention to high growth).

5.4.2.3 Control variables

In respect of the control variables, Table 5.1 describe the control variables utilized in this research (including the dependent and independent variables). Measures of economic growth have been taken from the IMF, development indicators from the GDI, and governance index from the WGI. Some of these variables have served as control variables in analogous investigations contemplating the GEM database (Acs & Amorós, 2008; Alvarez & Urbano, 2012a; Bosma, 2013; Levie & Autio, 2008).

Table 5.1 Description of variables

| Construct | Measures | Description | Source ^a |
|------------------------------|---|--|---------------------|
| Dependent variable | | | |
| Dynamic capabilities | Learning capabilities | Percentage of the 18–64 year old population that has the knowledge, skills, and experience required to start a new business. | APS GEM 2006–2013 |
| Independent variables | | | |
| Human capital | Abilities and knowledge to start up | Average of summary blocks of the skills and abilities to start up in the population. | NES GEM 2006–2013 |
| | Education (entrepreneurial education at school stage) | Average of summary blocks of the training in the population. | NES GEM 2006–2013 |
| | Training (entrepreneurial education at post-school stage) | Average of summary blocks of the training in the population. | NES GEM 2006–2013 |
| Informal institutions | Entrepreneur social image | Average of summary blocks of the competitiveness, status, and respect that successful entrepreneurs have within society. | NES GEM 2006–2013 |
| | Women’s support to start up | | NES GEM 2006–2013 |

| | | | |
|--------------------------|---|---|----------------------|
| | Attention to high growth | Average of summary blocks of the support, encouragement, and equality for women to start a business. | NES GEM 2006–2013 |
| | | Average of summary blocks of the attention to high growth related to entrepreneurship. | |
| Control variables | GDP per capita (constant 2005 US\$) | Gross domestic product divided by midyear population. | IMF 2006–2013 |
| | GDP per capita growth (annual %) | Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 US dollars. | IMF 2006–2013 |
| | Population total | Total population counts all residents regardless of legal status or citizenship. | WDI 2006–2013 |
| | Labor total | Labor force comprises people aged 15 and older who supply labor for the production of goods and services during a specified period. | WDI 2006–2013 |
| | Unemployment | Unemployment refers to the percentage of the labor force that is without work but available for and seeking employment. | WDI 2006–2013 |
| | Voice and accountability | Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006–2013 |
| | Political stability and absence of violence/terrorism | Measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. | WGI 2006–2013 |

| | | |
|--------------------------|--|-------------------|
| | Values range from -2.5 (weak) to 2.5 (strong) governance performance. | |
| Regulatory quality | Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006– 2013 |
| Rule of law | Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006– 2013 |
| Government effectiveness | Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006– 2013 |
| Control of corruption | Measures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, and of the state by elites and private interests. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2006– 2013 |

^aGlobal Entrepreneurship Monitor (GEM): <http://www.gemconsortium.org>; International Monetary Fund (IMF): <https://www.imf.org/external/index.htm>; World Development Indicators (WDI) by World Bank:

<http://databank.worldbank.org/data/home.aspx>; Worldwide Governance Indicators (WGI) by World Bank Group:
<http://info.worldbank.org/governance/wgi/#home>

5.4.3 Data analysis and model

This study will provide quantitative research in the dynamic capabilities field through the operationalization of variables related to the HCT and IE theories.

As stated before, we propose that dynamic capabilities (learning capabilities) are influenced by human capital and institutions (informal institutions). The first equation is depicted as follows:

$$DC_{it} = \alpha + \beta_1 HC_{it} + \beta_2 II_{it} + \beta_3 VC_{it} + \epsilon_{it} \quad (1)$$

$$i = 1, 2, \dots, 21 \text{ countries}$$

$$t = 2006, 2007, \dots, 2013$$

where *HC* is the vector that represents human capital, *II* is the vector representing informal institutions, *VC* is the vector that represents the control vector that influences dynamic capability *DC* in country *i* at time *t*. The vector of control comprises GDP per capita, GDP per capita growth (annual %), population total, labor total, unemployment, voice and accountability, political stability and absence of violence/terrorism, regulatory quality, rule of law, government effectiveness, and control of corruption.

To determine whether informal institutions moderate the relationship between human capital and dynamic capabilities (learning capabilities), we consider the second equation:

$$DC_{it} = \alpha + \beta_1 HC_{it} + \beta_2 II_{it} + \beta_3 VC_{it} + \beta_4 (HC_{ait} \times II_{bit}) + \beta_5 (HC_{cit} \times II_{dit}) + \beta_6 (HC_{eit} \times II_{fit}) + \epsilon_{it} \quad (2)$$

$$i = 1, 2, \dots, 21 \text{ countries}$$

$$t = 2006, 2007, \dots, 2013$$

where *HCa x Eb* describes the interaction between education and entrepreneur social image, *HCC x IID* displays the interaction between training and entrepreneur social image, and *HCE x IIf* illustrates the interaction between abilities and knowledge to start up and entrepreneur social image.

Referring to the model selection, the Breusch and Pagan test for random effects was utilized ($\text{Var}(u) = 0$; $\text{chibar2}(01) = 0.00$; $\text{Prob} > \text{chibar2} = 1.0000$) and the F test of significance for the fixed effects (F test that all $u_i=0$; $F(20, 106) = 20.59$; $\text{Prob} > F = 0.0000$) was applied to discard the selection of the grouped model (ordinary least squares regression). Later, we performed the Hausman test to determine if the fixed effects model was more appropriate than the random effects model. We discovered systematic differences between random and fixed effects ($\text{chi2}(6) = 26.63$ and $\text{Prob}>\text{chi2} = 0.0002$). Therefore, we concluded by selecting the fixed effects model.

The dependent variable learning capabilities, measured by perceived skills, pertains to the GEM key indicators and represents the percentage of the 18–64 year old population that believes it has the knowledge, skills, and experience needed to begin a new venture. Regarding the dependent and independent variables, comprehensive content of the questions pertaining to the NES and APS surveys is given in Appendix 7.

5.5 Results

Means and standard deviations are reported in Table 5.2 for the variables studied in this research. For the dependent variable learning capabilities, the mean was 49.22%. With respect to the independent variables, countries reflect low levels in education (2.051), medium levels in abilities and knowledge to start up (2.437) and training (2.789), and high levels in entrepreneur social image (3.356), women’s support to start up (3.236), and attention to high growth (3.005).

Table 5.2 Descriptive statistics

| Variable | Mean | Std. Dev. | Min | Max |
|-------------------------------------|-----------|-----------|----------|-----------|
| Learning capabilities | 49.220 | 12.433 | 8.652 | 78.010 |
| Abilities and knowledge to star up | 2.437 | 0.282 | 1.870 | 3.684 |
| Education | 2.051 | 0.322 | 1.369 | 2.929 |
| Training | 2.789 | 0.272 | 2.214 | 3.604 |
| Entrepreneur social image | 3.356 | 0.406 | 2.454 | 4.563 |
| Women’s support to start up | 3.236 | 0.379 | 2.129 | 4.294 |
| Attention to high growth | 3.005 | 0.481 | 2.060 | 4.160 |
| GDP per capita (constant 2005 US\$) | 23094.690 | 18857.530 | 2883.388 | 69094.740 |
| GDP per capita (annual growth) | 1.4203 | 3.7032 | -8.9980 | 8.7209 |
| Population total | 5.68E+07 | 7.38E+07 | 2.00E+07 | 31.60E+07 |
| Labor total | 2.77E+07 | 3.77E+07 | 1.01E+07 | 15.90E+07 |
| Unemployment | 9.3366 | 5.2507 | 2.4900 | 27.4700 |

| | | | | |
|---|--------|--------|---------|--------|
| Voice and accountability | 0.7905 | 0.6484 | -1.0222 | 1.7380 |
| Political stability and absence of violence/terrorism | 0.2509 | 0.8094 | -1.9016 | 1.5014 |
| Regulatory quality | 0.8270 | 0.7193 | -0.9573 | 1.9251 |
| Rule of law | 0.7158 | 0.9316 | -0.9701 | 2.0137 |
| Government effectiveness | 0.8009 | 0.8027 | -0.6694 | 2.3540 |
| Control of corruption | 0.7540 | 0.9865 | -1.1320 | 2.4700 |

Notes: $N=147$, $n=21$

Table 5.3 presents the correlation coefficients of all the variables. It shows that learning capabilities are significantly positively correlated with training and negatively correlated with education, women's support to start up, and attention to high growth. Also, abilities and knowledge to start up is significantly positively correlated with education, training, entrepreneur social image, women's support to start up, and attention to high growth. Furthermore, education has a positive significant correlation with training, women's support to start up, and attention to high growth. In addition, training has a positive significant correlation with entrepreneur social image, women's support to start up, and attention to high growth. Moreover, the variable women's support to start up is correlated with all the independent variables except entrepreneur social image. Likewise, the variable attention to high growth is correlated with all the independent variables.

Table 5.3 Correlation matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1 Learning capability | 1 | | | | | | | | |
| 2 Abilities, knowledge to start up | 0.08 | 1 | | | | | | | |
| 3 Education | -0.4016* | 0.5239* | 1 | | | | | | |
| 4 Training | 0.3003* | 0.3805* | 0.3111* | 1 | | | | | |
| 5 Entrepreneur social image | 0.1192 | 0.2580* | 0.1168 | 0.1643* | 1 | | | | |
| 6 Women's support to start up | -0.1826* | 0.5041* | 0.5988* | 0.2654* | 0.0104 | 1 | | | |
| 7 Attention to high growth | -0.1928* | 0.2949* | 0.4619* | 0.1654* | 0.3707* | 0.5188* | 1 | | |
| 8 GDP per capita (constant 2005 US\$) | -0.4368* | 0.4140* | 0.5115* | -0.1248 | 0.1316 | 0.5352* | 0.6304* | 1 | |
| 9 GDP per capita (annual growth) | 0.2563* | 0.0418 | -0.0046 | 0.2733* | 0.076 | -0.0589 | -0.0764 | -0.3439* | 1 |
| 10 Population total | -0.0795 | -0.1631* | -0.1279 | 0.0375 | 0.4686* | -0.1219 | 0.043 | -0.0368 | 0.0622 |
| 11 Labor total | -0.084 | -0.1418 | -0.108 | 0.0561 | 0.4476* | -0.0817 | 0.0683 | -0.0171 | 0.0585 |
| 12 Unemployment | 0.0027 | -0.4052* | -0.4334* | -0.3275* | -0.1042 | -0.4060* | -0.2762* | -0.3026* | -0.2282* |
| 13 Voice and accountability | -0.0885 | 0.2284* | 0.1377 | -0.1896* | -0.0569 | 0.3984* | 0.5359* | 0.7497* | -0.3186* |
| 14 Political stability and absence of violence/terrorism | -0.2665* | 0.1864* | 0.2639* | -0.1346 | -0.2369* | 0.4305* | 0.4440* | 0.6760* | -0.2387* |
| 15 Regulatory quality | -0.2135* | 0.2384* | 0.2975* | -0.1990* | 0.2048* | 0.3738* | 0.7075* | 0.7823* | -0.3000* |

| | | | | | | | | | | |
|----|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 16 | Rule of law | -0.2512* | 0.2282* | 0.3066* | -0.1970* | 0.0404 | 0.4511* | 0.6852* | 0.8413* | -0.3289* |
| 17 | Government effectiveness | -0.3094* | 0.2327* | 0.4274* | -0.1648* | 0.0346 | 0.5106* | 0.6970* | 0.8366* | -0.3240* |
| 18 | Control of corruption | -0.1676* | 0.2327* | 0.3395* | -0.113 | 0.0102 | 0.5303* | 0.6964* | 0.7769* | -0.1938* |
| | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 10 | Population total | 1 | | | | | | | | |
| 11 | Labor total | 0.9963* | 1 | | | | | | | |
| 12 | Unemployment | -0.1056 | -0.1314 | 1 | | | | | | |
| 13 | Voice and accountability | -0.2561* | -0.2456* | -0.1191 | 1 | | | | | |
| 14 | Political stability and absence of violence/terrorism | -0.2599* | -0.2427* | -0.2390* | 0.8463* | 1 | | | | |
| 15 | Regulatory quality | -0.1395 | -0.1234 | -0.1712* | 0.8217* | 0.6457* | 1 | | | |
| 16 | Rule of law | -0.1395 | -0.1236 | -0.1871* | 0.9034* | 0.7864* | 0.9322* | 1 | | |
| 17 | Government effectiveness | -0.1582 | -0.1415 | -0.1938* | 0.8552* | 0.7840* | 0.9102* | 0.9727* | 1 | |
| 18 | Control of corruption | -0.2093* | -0.1928* | -0.2693* | 0.8993* | 0.7870* | 0.8871* | 0.9551* | 0.9452* | 1 |

Note: *p<0.05

Table 5.4 contains the results of five regression models. Fixed effects coefficients, corrected standard errors, and significance levels are presented. We applied the Wooldridge test for autocorrelation in panel data and it highlighted that we had an autocorrelation problem ($F(1, 20) = 9.682$ Prob > F = 0.0055); we amended it with an autoregressive term of 1 degree (AR1). Also, we executed the modified Wald test for groupwise heteroskedasticity in the fixed effect regression model to test for multicollinearity and we identified a heteroskedasticity problem ($\chi^2(21) = 1084.34$ Prob> $\chi^2 = 0.0000$). Afterwards, regarding the sample of countries, to solve the heteroskedasticity, contemporary correlation, and autocorrelation problems among observations, we conducted the Prais-Winsten regression. In this way, we obtained heteroskedastic PCSEs. Finally, we included dichotomizing variables for years and countries to obtain fixed effects. Thus, year and country effects are not shown but are controlled.

Table 5.4 Estimating dynamic capabilities

| Dependent variable | MODEL 1 | | MODEL 2 | | MODEL 3 | | MODEL 4 | | MODEL 5 | |
|----------------------------------|----------|-----|----------|-----|----------|-----|----------|-----|-----------|-----|
| Learning capability | Coef. | | Coef. | | Coef. | | Coef. | | Coef. | |
| Independent variables | | | | | | | | | | |
| Abilities, knowledge to start up | -6.6753 | *** | -7.8947 | *** | -7.7361 | *** | -41.3836 | *** | -54.8074 | *** |
| | (1.5663) | | (1.6269) | | (1.6513) | | (7.7960) | | (11.4066) | |
| Education | -2.6544 | * | -19.9385 | ** | -2.5698 | * | -2.9222 | ** | 2.5039 | |
| | (1.4431) | | (8.8248) | | (1.3782) | | (1.3933) | | (8.9800) | |
| Training | 3.5772 | ** | 3.1258 | ** | -11.1910 | | 2.8106 | * | 21.9386 | * |
| | (1.5404) | | (1.4777) | | (8.0114) | | (1.5251) | | (11.2327) | |

| | | | | | | | | | | |
|--|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|
| Entrepreneur social image | -3.0708 | ** | -13.3356 | *** | -15.0803 | *** | -24.5545 | *** | -14.5664 | *** |
| | (1.4002) | | (4.8928) | | (5.4817) | | (4.5328) | | (5.0309) | |
| Women's support to start up | 2.6038 | * | 2.7220 | ** | 2.5579 | * | 2.3597 | * | 2.3429 | |
| | (1.3968) | | (1.2561) | | (1.3185) | | (1.3377) | | (1.4972) | |
| Attention to high growth | 1.9721 | * | 1.5884 | | 1.8579 | * | 1.9437 | * | 2.0596 | ** |
| | (1.0316) | | (1.0438) | | (1.0498) | | (1.0789) | | (1.0159) | |
| Interactions | | | | | | | | | | |
| Education x Entrep social image | | | 5.1636 | ** | | | | | -1.7058 | |
| | | | (2.5005) | | | | | | (2.5334) | |
| Training x Entrep social image | | | | | 4.3233 | ** | | | -5.6939 | * |
| | | | | | (2.1041) | | | | (3.1414) | |
| Abilities x Entrep social image | | | | | | | 9.2982 | *** | 13.2883 | *** |
| | | | | | | | (2.0155) | | (3.2188) | |
| Control variables | | | | | | | | | | |
| GDP per capita (constant 2005 US\$) | 0.0017 | *** | 0.0016 | *** | 0.0016 | *** | 0.0015 | *** | 0.0016 | *** |
| | (0.0004) | | (0.0003) | | (0.0003) | | (0.0003) | | (0.0003) | |
| GDP per capita (annual growth) | -0.1415 | | -0.1143 | | -0.1128 | | -0.1120 | | -0.1423 | |
| | (0.1183) | | (0.1146) | | (0.1157) | | (0.1139) | | (0.1198) | |
| Population total | 0.0000 | *** | 0.0000 | *** | 0.0000 | *** | 0.0000 | *** | 0.0000 | *** |
| | (0.0000) | | (0.0000) | | (0.0000) | | (0.0000) | | (0.0000) | |
| Labor total | 0.0000 | ** | 0.0000 | ** | 0.0000 | ** | 0.0000 | | 0.0000 | |
| | (0.0000) | | (0.0000) | | (0.0000) | | (0.0000) | | (0.0000) | |
| Unemployment | 0.0957 | | -0.0039 | | 0.0372 | | 0.0348 | | 0.1190 | |
| | (0.1721) | | (0.1516) | | (0.1526) | | (0.1599) | | (0.1621) | |
| Voice and Accountability | -9.9369 | | -9.8450 | | -9.9069 | * | -9.0474 | | -9.8008 | |
| | (6.3629) | | (6.4026) | | (5.9352) | | (6.2606) | | (7.0433) | |
| Political Stability and Absence of Violence/Terrorism | 0.1965 | | -0.0446 | | 0.4136 | | 0.4537 | | 0.4388 | |
| | (1.5843) | | (1.5857) | | (1.5012) | | (1.6353) | | (1.8415) | |
| Regulatory Quality | -2.7398 | | -4.3282 | | -3.0613 | | -4.6701 | ** | -4.0584 | |
| | (2.9555) | | (3.0835) | | (2.6512) | | (2.2329) | | (2.7752) | |
| Rule of Law | 0.6094 | | 1.0197 | | 0.3653 | | -1.5400 | | -2.4659 | |
| | (3.9294) | | (3.8438) | | (4.2966) | | (3.6977) | | (2.9571) | |
| Government Effectiveness | -6.9325 | ** | -7.3048 | ** | -7.1307 | ** | -7.9178 | ** | -8.4929 | *** |
| | (3.3991) | | (3.5528) | | (3.4724) | | (3.3343) | | (3.2474) | |
| Control of Corruption | 0.4071 | | 1.1965 | | 0.4649 | | 3.0100 | | 3.7937 | |
| | (1.8044) | | (1.8128) | | (1.7916) | | (2.1492) | | (2.3489) | |
| Constant | 48.2717 | | 88.0775 | ** | 82.4074 | | 36.0897 | | -19.4653 | |
| | (59.0064) | | (44.0172) | | (52.5506) | | (45.8252) | | (49.6314) | |
| N of observations | 147 | | 147 | | 147 | | 147 | | 147 | |
| N of groups | 21 | | 21 | | 21 | | 21 | | 21 | |
| R2 | 0.9384 | | 0.9399 | | 0.9389 | | 0.9446 | | 0.9501 | |

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Heteroskedastic panels corrected standard errors (PCSEs) are shown in parentheses. The estimates for country and time fixed effects dummies are not presented but can be supplied upon request.

Human capital and informal institution variables are included in Model 1. All independent variables are related to learning capabilities and they explain more than 93 percent of learning capability variation across countries. Model 2, alongside the human capital and informal institutions, includes the interaction between education and entrepreneur social image, where the majority are significant; the model explains almost 94 percent of learning capability variation across countries. Model 3 comprises human capital, informal institutions, and the interaction between training and entrepreneur social image, where most have significance and the model explains more than 93.8 percent of the learning capability variation. Model 4 illustrates human capital, informal institutions, and the moderating effect of entrepreneur social image in the relationship between abilities and knowledge to start up and learning capabilities, where all the variables are significant and the percentage predicted is 94.4 percent, which is higher than Models 2 and 3. Finally, Model 5 depicts human capabilities, informal institutions, and the three previous interactions: the percentage predicted is the highest of all, at 95.0 percent.

Hypothesis 1 proposes that human capital will positively influence dynamic capabilities in new ventures. Specifically, Hypothesis 1a suggests that abilities and knowledge to start up will positively influence learning capabilities. The results from Models 1 to 5 show that the coefficient estimate for abilities and knowledge to start up is statistically significant and negative. Likewise, Hypothesis 1b suggests that education (entrepreneurial education at school stage) will positively influence learning capabilities. In this case, the results from Models 1 to 4 show that the coefficient estimate for education is significant and negative, and in Model 5 this coefficient is not significant and positive. Hypothesis 1c suggests that training (entrepreneurial education at post-school stage) will positively influence learning capabilities. Results from Models 1, 2, 4, and 5 show that the coefficient for the variable training is significant and positive. However, in the results from Model 3, this coefficient is not significant and negative. Therefore, the results support Hypothesis 1 in that human capital will positively influence dynamic capabilities in new ventures.

Hypothesis 2 suggests that informal institutions will positively influence dynamic capabilities. Specifically, Hypothesis 2a proposes that entrepreneur social image will positively influence learning capabilities. The results from Models 1 to 5 show that entrepreneur social image is significant and has a negative sign. Particularly, Hypothesis 2b suggests that women's support

to start up will positively influence learning capabilities. The results from Models 1 to 4 show that the coefficient estimate for women's support to start up is statistically significant and positive. However, results in Model 5 indicate that women's support to start up is not significant and positive. Likewise, Hypothesis 2c proposes that attention to high growth will positively influence learning capabilities. Results from Models 1, 3, 4, and 5 illustrate that the coefficient estimate for attention to high growth is statistically significant and positive. Results in Model 2 show that the coefficient for attention to high growth is not significant and positive. Therefore, the results support Hypothesis 2 in that informal institutions will positively influence dynamic capabilities in new ventures.

Finally, Hypothesis 3 proposes that informal institutions have a moderating effect on the relationship between human capital and dynamic capabilities in new ventures. Models 2 to 5 show the moderating effects that informal institutions have on the relationship between human capital and learning capabilities in new ventures. Regarding Hypothesis 3a, which proposes that entrepreneur social image moderates the relationship between education and learning capabilities, the results show the interaction term between education and entrepreneur social image, where the coefficient that estimates this interaction is significant and positive in Model 2. Concerning Hypothesis 3b, which proposes that entrepreneur social image moderates the relationship between training and learning capabilities, the results show the interaction term between entrepreneur social image and training: the coefficient estimate for this interaction is not significant and positive in Model 3, but significant and negative in Model 5. Regarding Hypothesis 3c, which suggests that entrepreneur social image has a moderating effect on the relationship between abilities and knowledge to start up and learning capabilities, the results show the interaction term between abilities and knowledge to start up and entrepreneur social image, where the coefficient estimates for this interaction are significant and positive in Models 4 and 5. Thus, regarding Hypothesis 3, the results show that informal institutions moderate the relationship between human capital and dynamic capabilities in new ventures.

These results provide evidence to show that the interaction term between education and entrepreneur social image is positive and statistically significant. This interaction permits a dissimilar relationship between education and learning capabilities for entrepreneurs when entrepreneur social image is below the average versus when entrepreneur social image is above the average (see Figure 5.2). Also, the interaction term between training and entrepreneur social

image is positive in Model 3 and negative in Model 5, and statistically significant in both models. This interaction permits a dissimilar relationship between training and learning capabilities for the entrepreneurs when entrepreneur social image is below the average versus when entrepreneur social image is above the average (see Figure 5.3). The interaction term between abilities and knowledge to start up and entrepreneur social image is positive and statistically significant. This interaction permits a dissimilar relationship between abilities and knowledge to start up and learning capabilities for the entrepreneurs when entrepreneur social image is below the average versus when entrepreneur social image is above the average (see Figure 5.4).

Figure 5.2 Interaction between education and entrepreneur social image

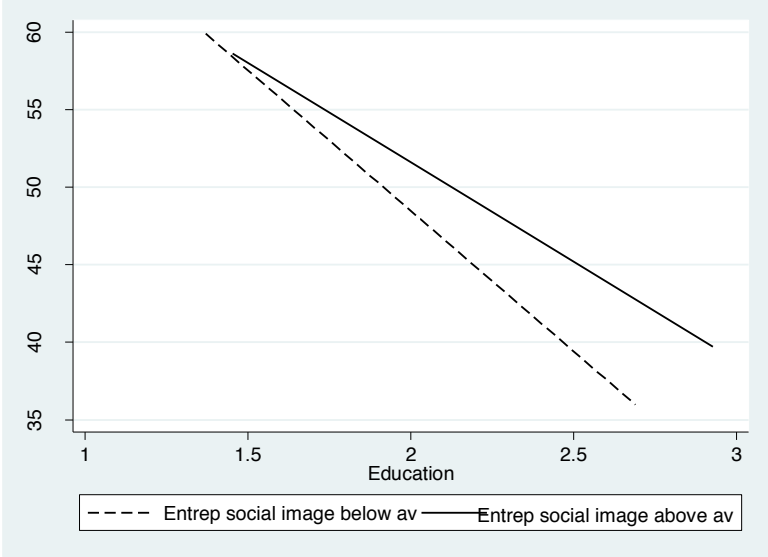


Figure 5.3 Interaction between training and entrepreneur social image

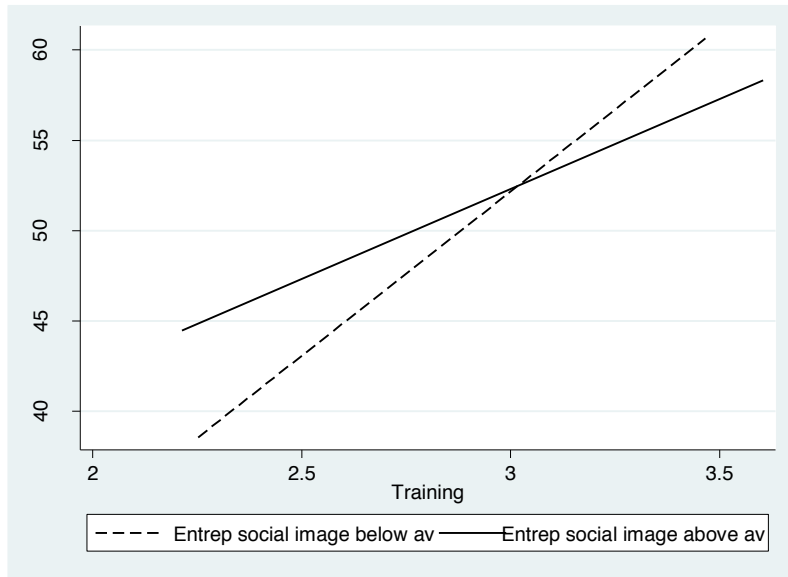
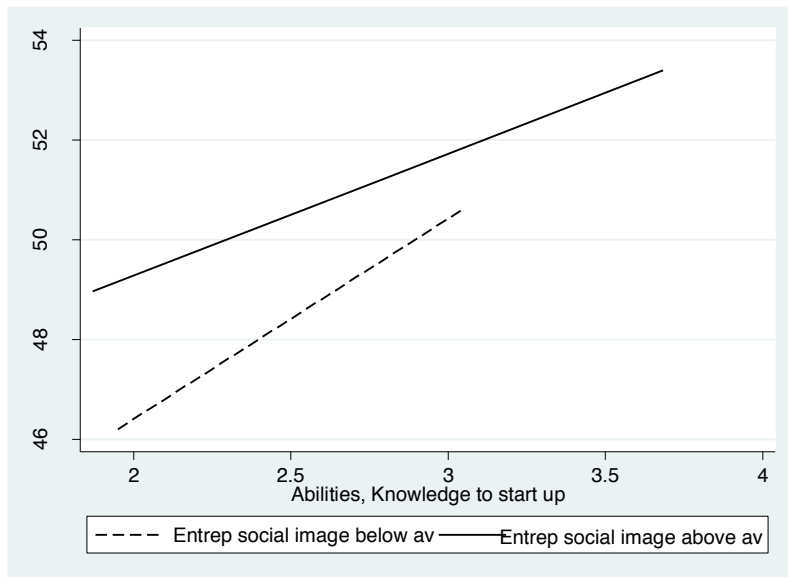


Figure 5.4 Interaction between abilities and knowledge to start-up and entrepreneur social image



5.6. Discussion and conclusions

The abilities and knowledge to start up variable refers to the perception of the extent of skills and abilities to start up in the population (confidence in one's skills)—whether there are people who know how to start a high growth business and how to manage it, who know how to start and manage a new venture, who have previous experience in starting a new firm, who can react quickly to good opportunities for a new start up, and who have the ability to organize the

resources required for a new business. The results of abilities and knowledge show that abilities and knowledge to start up in new ventures will negatively influence learning capabilities. In contrast, the available research seems to suggest that abilities and knowledge to start up is positively and significantly related to being a nascent entrepreneur (Arenius & Minniti, 2005). Further research confirms that abilities and knowledge to start up is one of the most important components of the decision process to start a new venture (Koellinger, Minniti, & Schade, 2004). However, the research does not include an investigation of the relationship between abilities and knowledge to start up and the learning capabilities or ability to revamp existing operational capabilities with new knowledge, which is certainly included in this research.

The results for education (entrepreneurial education at school stage) demonstrate a negatively influence on learning capabilities. Correspondingly, previous investigation found zero or negative effects on non-cognitive entrepreneurial skills (Huber et al., 2014). Likewise, Cunha and Heckman (2007) developed the model of skill formation, which suggests that entrepreneurial abilities and knowledge are easily nurtured in adolescents that are in secondary or higher education and characterized the dynamic spillover consequences.

The results for training (entrepreneurial education at post-school stage) reveal that training positively influences learning capabilities in new ventures. In contrast, results obtained in the Netherlands by Oosterbeek, Van Praag, and Ijsselstein (2010) indicate that the university program does not have the intended effects: the effect on students' self-assessed entrepreneurial skills is insignificant and the effect on the intention to become an entrepreneur is negative. Those results could be because students have more realistic perspectives of themselves and of what it means to be an entrepreneur. Nevertheless, Peterman and Kennedy (2003), in their study of Australian youth, observed that an enterprise program positively impacted both the perceived feasibility and perceived desirability of an entrepreneurial career, coinciding with the results of this research, where training positively affects the perceived skills or so called self-perceptions about entrepreneurship (Monitor, 2017). For example, social cognitive theory suggests that students' participation in an introductory course related to entrepreneurship should have a positive impact on their entrepreneurial self-efficacy (Shinnar, Hsu, & Powell, 2014). For that reason, at a country level, it should be considered that even though the entrepreneurship education has positive effects on business students and science and engineering students, the entrepreneurial intention has dissimilar outcomes, and entrepreneurship classes need more effective approaches to serve both

groups of students (Maresch, Harms, Kailer, & Wimmer-Wurm, 2016). One possible explanation for these contradictory findings is that there may be moderators in the relationship between entrepreneurship education and learning capabilities (entrepreneurial self-efficacy). Consequently, the findings of this study partially support that human capital in new ventures will positively influence learning capabilities.

Our results show that informal institutions influence learning capabilities in new ventures in contrasting ways. This research shows that entrepreneur social image negatively influences learning capabilities in new ventures. Meanwhile, women's support to start up and attention to high growth positively influence learning capabilities in new ventures. In addition, the moderating effect that entrepreneur social image has on the relationship between education (entrepreneurial education at school stage) and learning capabilities in new ventures is presented, given that the coefficient estimate for the interaction is significant and positive. The interaction term is positive and statistically significant, which allows the relationship between education and learning capabilities to be different when there are different levels of entrepreneur social image. When education is perceived as the best one to affect learning capabilities, the immediate entrepreneurship social image increases the learning capabilities in the population. The moderation effect of entrepreneur social image in the relationship between training (entrepreneurial education at post-school stage) and learning capabilities in new ventures is also illustrated. The coefficient estimate for this interaction is significant and positive when it is the only interaction in the model, and significant and negative when it is present in the model with other interactions. The interaction permits a different relationship between education and learning capabilities when there are different levels of entrepreneur social image and when there are more interactions within the model. Thus, when training is perceived as the best one to affect learning capabilities, the immediate entrepreneur social image increases the learning capabilities in the population.

Moreover, the moderating effect that entrepreneur social image has on the relationship between abilities and knowledge to start up and learning capabilities in new ventures is presented, and the coefficient estimate for the interaction is significant and positive. The interaction term is positive and statistically significant, which allows the relationship between abilities and knowledge to start up and learning capabilities to be different when there are different levels of entrepreneur social image. When abilities and knowledge to start up is perceived as the best one to affect learning capabilities, the immediate entrepreneurship social image increases the learning

capabilities in the population—that is, the knowledge, skills, and experience required to start a new venture. Therefore, it is shown through this study that informal institutions moderate the relationship between human capital and dynamic capabilities in new ventures. Current research seems to validate the view that entrepreneurial self-efficacy has a positive moderating effect on the relationship between entrepreneurial education and entrepreneurial intention (Yun, 2010). Further research in this area includes a description of how the arrangement and performance of dynamic capabilities is moderated by internal and external variables (Ambrosini & Bowman, 2009). The authors explain that the external environment exerts a moderating influence on the arrangement of dynamic capabilities and competitive advantage. Likewise, the indirect effect of environmental dynamism was detected on the relationship between dynamic capabilities and competitive advantage.

5.6.1 Theoretical implications

This research contributes in the following ways to the literature. Firstly, this study stimulates the amplification of practical thoughts related to the connection of human capital and informal institutions with dynamic capabilities in new ventures. For this to be possible, we work with a sample of 21 countries over eight years from 2006–2013. Similar studies used a smaller range of years (Autio et al., 2013) or fewer countries (Mai & Gan, 2007). Secondly, this investigation employs HC (Becker, 1975) and IE (North, 2005) in the analysis of dynamic capabilities (Teece et al., 1997). Moreover, this investigation detected that informal institutions moderate the relationship between human capital and dynamic capabilities in new ventures which motivates to continue the identification of other indirect effects on the relationship of antecedents or consequences with dynamic capabilities in new ventures like those found in Ambrosini and Bowman (2009).

5.6.2 Policy implications

According to Zollo and Winter (2002), there is little knowledge regarding the relationship of some informal institutions such culture and structures with learning behaviors in firms. Policy makers may create government programs with the aim of reinforcing informal institutions articulated to new ventures organizational needs. Consequently, this work can be beneficial in the development of policies for strengthen DC in new ventures in a country, acknowledging the importance of the human capital and informal institutions in the entrepreneurship field.

5.6.3 Limitations and future research lines

Future work regarding dynamic capabilities in new ventures is suggested as follows. First, future studies could increase the number of years or countries to consider a larger sample, though the size of the sample could depend on participation of the economies in applying the APS and NES GEM questionnaires. Further investigation should also acknowledge the impact of dynamism on the dynamic capabilities themselves, not only the influence of institutional conditions (Zahra et al., 2006). In addition, a cumulative impact could be considered in future research: for both human capital variables, education and training could be measured together to include greater effect and influence on dynamic capabilities in new ventures (Gorman et al., 1997). Kazadi, Lievens, and Mahr (2016) suggest investigating stakeholder co-creation capabilities and their outcomes: that is to say, the innovation process may be held either solely by the firm or co-created together with external stakeholders with dissimilar dynamic capabilities. Finally, future research should include quantitative comparative studies among groups of countries that foster similar attention to high growth so that the policymakers can act promptly in relation to informal institutions that direct or indirectly affect the dynamic capabilities in new ventures.

5.6.4 Conclusions

This research has sought to study the relationship between human capital and informal institutions with dynamic capabilities in new ventures. Through five unbalanced data panel models, the research demonstrates that human capital, represented by the variable abilities and knowledge to start up, will negatively influence learning capabilities in new ventures. The findings further indicate that human capital (training) positively influences learning capabilities in new ventures. Furthermore, it is found that human capital (education) has a negative influence on learning capabilities in new ventures. This study suggests that the informal institutions depicted by the variable entrepreneur social image will negatively influence learning capabilities in new ventures. Moreover, it is found that informal institutions, represented by women's support to start up and attention to high growth, positively influence learning capabilities in new ventures. Additionally, interactions are studied, which show that informal institutions moderate the relationship between human capital and dynamic capabilities in new ventures. One interaction indicates that when education is perceived as the best one to affect learning capabilities, entrepreneur social image increases the perception of having the knowledge, skills, and experience required to start a new business. Another interaction indicates that when training is perceived as

the best one to affect learning capabilities, the entrepreneur social image perceives increased skills in the population. The last interaction expresses that when abilities and knowledge to start up is perceived as the best in respect of learning capabilities, the entrepreneurial social image is of an increased perception of high skills, knowledge, and experience to begin a new firm.

CHAPTER 6

OPEN INNOVATION CAPABILITIES AND INFORMAL INSTITUTIONS' INFLUENCE ON DYNAMIC CAPABILITIES IN NEW VENTURES

6. OPEN INNOVATION CAPABILITIES AND INFORMAL INSTITUTIONS' INFLUENCE ON DYNAMIC CAPABILITIES IN NEW VENTURES

6.1 Introduction

Lichtenthaler and Lichtenthaler (2009) provide the knowledge management capacity (KMC) framework that combines a mindset including the study of dynamic capabilities for managing knowledge organizations' open innovation mechanism. They define the KMC as a dynamic capability that realign knowledge capacities. They suggest that empirical research be carried out in relation to the organizational antecedents and performance consequences of the KMC. Others suggest research on dynamic capabilities and firm growth, acknowledging the way opportunity recognition and exploitation rely upon dynamic capabilities to construct and reconstruct knowledge assets (Macpherson et al., 2004). Regarding small firms' dynamic, entrepreneurial capabilities are defined as those patterns of collective activity that are associated with opportunity recognition and exploitation (Zollo & Winter, 2002). Recent investigation provides a basis for future research in the empirical literature, digging deeper into the linkages between managerial actions, dynamic capabilities, and long-run firm performance (Teece, 2016). For instance, in the health sector, dynamic capabilities were developed to generate improved performance and competitive advantage (Awonobi & Osborne, 2016). Moreover, dynamic capabilities are linked to the competitive advantage of the firm—or, in other words, to its performance (Eisenhardt & Martin, 2000). Other research has been conducted to show the theoretical linkages between open innovation, organizational ambidexterity, and dynamic capabilities (Huang et al., 2016); however, no empirical investigation has been conducted that illustrates generalized results. These are some of the reasons why we propose to study the effect of open innovation on dynamic capabilities.

The main objectives of this investigation are to analyze the direct effect of learning capabilities and open innovation capabilities on dynamic capabilities (sensing capabilities). Primarily, the objective is to demonstrate that informal institutions (interest in innovation and attention to high growth) and open innovation capabilities (cooperation with other parties) influence sensing capabilities (perceived opportunities) in new ventures and to investigate the indirect effect of learning capabilities and open innovation capabilities on dynamic capabilities when moderated by informal institutions. Therefore, to evaluate the conditions under which open

innovation contributes to dynamic capabilities, we consider Zahra (2008), who proposes the connection among absorptive capacity (knowledge production, knowledge conversion, and knowledge exploitation), knowledge conversion, and opportunities. Also, we consider the capability-based framework for open innovation (Lichtenthaler & Lichtenthaler, 2009), which takes into account internal and external knowledge retention that can initiate new processes of exploration, retention, and exploitation. Vanhaverbeke (2008) analyzes how absorptive capacity and the outside-in dimension of open innovation (a firm's ability to learn from its external environment) can be linked. In sum, open innovation focuses on the combination of resources and competencies in different firms. In this way, absorptive capacity can be understood as a combination and integration of competencies (or knowledge) between organizations. Considering the investigations commented above, the following hypotheses are proposed: learning capabilities will positively influence the development of dynamic capabilities in new ventures; open innovation capabilities will positively influence the development of dynamic capabilities in new ventures; informal institutions moderate the relationship between learning capabilities and dynamic capabilities in new ventures; and informal institutions moderate the relationship between open innovation capabilities and dynamic capabilities in new ventures. In this way, the effect of dynamic capabilities on open innovation practices at the regional level will be analyzed, using the APS and NES surveys of the GEM and the Eurostat Community Innovation Survey (ECIS) for the year 2012, considering 24 countries.

The chapter is structured as follows. First, after this introduction, we present the conceptual framework. Then we develop the hypotheses. Afterwards, we specify the methodology by explaining the data source and describing the variables, the data analysis, and model. We then show the results. Next, we develop the discussion. Finally, we provide preliminary conclusions and some indications for future research.

6.2 Conceptual framework

As indicated by Drucker (1985), the foundation of entrepreneurship is the endless routine of systematic innovation (practically and theoretically). Drucker details the presence of innovation opportunities inside and outside a firm. Therefore, for entrepreneurs, the basis of success is dependent on the way to innovate. Schumpeter (2000) recognized the connection between entrepreneurship and innovation, characterizing the entrepreneur as an innovator. Additionally, Chesbrough (2003) proposed an open innovation model that depends on a distributed innovation

model in which access to the market and integration of technology can be generated from the outside. In a similar way, Teece (2007) asserts that dynamic capabilities empower new organizations to create immaterial resources that permit higher and longer business execution in an open economy, this last characterized by quick innovation and some sources of creativeness, novelty, and assembling ability. Sensing (opportunity recognition), seizing, and reconfiguring capacities are supported by structures, aptitudes, principles, practices, and methods.

6.2.1 Knowledge management capacity (KMC) and dynamic capabilities (DC)

The KMC framework has an active role in the application of dynamic capabilities in knowledge-based firms for open innovation purposes (Lichtenthaler & Lichtenthaler, 2009). For instance, dynamic capabilities affect how opportunity recognition and exploitation in the organizations configure and reconfigure knowledge resources (Macpherson et al., 2004). In small organizations, dynamic entrepreneurial capabilities are depicted as arrangements of shared processes that are related to opportunity recognition and exploitation (Zollo & Winter, 2002). Other research has been conducted to show the theoretical linkages between open innovation, organizational ambidexterity, and dynamic capabilities (Huang et al., 2016).

In recent years, some researchers have extended the resource-based theory to dynamic commerce (Teece et al., 1997). Dynamic capabilities have thus become the main resource for sustained competitive advantage when the environment is constantly changing. Thus, managers use dynamic capabilities to “integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516). In terms of learning capabilities, when an opportunity in the market is detected, novel products or services must be designed, and decisions are taken to revamp existing operational capabilities with learning, new knowledge, and skills (Teece, 2007). Likewise, Pavlou and El Sawy (2011) merged a group of capabilities in a model: sensing, learning, coordinating, and integrating. They describe learning capability as the ability to upgrade existing operational capabilities with novel knowledge, and delineate sensing capability as the recognition, improvement, co-development, and evaluation of technological opportunities.

6.2.2 Open innovation theory (OI)

Open innovation includes, by definition, close collaboration with a set of partners to insource or outsource technologies (Chesbrough, 2003). Since the Second World War, innovations

have been managed in a closed innovation paradigm. Firms generate and develop their own ideas internally, and market and launch as new products or businesses. In this way, innovating firms trust in their internal capabilities. Lately, ongoing trends such as increasing costs, complexity of research and development, short technology lifecycles, and knowledgeable universities and research labs have engaged firms to embrace open innovation practices, primarily as a result of the knowledge emerging outside the firm. The open innovation theory has been analyzed in relation to the intra-organizational networks, the firm level, the dyad level, the interorganizational level, and regional systems of innovation (Vanhaverbeke, 2005).

Recently, Lichtenthaler and Lichtenthaler (2009) proposed six knowledge capacities to capture internal and external knowledge exploration, retention, and exploitation (see Table 6.1). Those capacities are inventive, absorptive, transformative, connective, innovative, and desorptive. The authors also consider a firm’s capacity to manage the distinct knowledge processes to develop the concept of knowledge management capacity, which refers to a reconfiguring and realigning dynamic capability—according to Helfat and Peteraf (2009), the dynamic capability of a firm to create, extend, or modify its resource base. Accordingly, firms need to develop their knowledge capacities to benefit from open innovation (Chesbrough, 2006; Teece, 2007). According to Lichtenthaler and Lichtenthaler (2009), inventive capacity refers to the ability of a firm to explore internally new knowledge; absorptive capacity is the ability of a firm to explore external knowledge; transformative capacity is the ability of a firm to retain knowledge inside the organization; connective capacity is the ability of a firm to retain knowledge outside its organizational boundaries; innovative capacity is the ability of a firm to exploit knowledge internally; and desorptive capacity is the ability of a firm to exploit knowledge externally.

Table 6.1 Knowledge capacities

| | Knowledge exploration | Knowledge retention | Knowledge exploitation |
|-----------------------------|------------------------------|----------------------------|-------------------------------|
| Internal (intrafirm) | Inventive capacity | Transformative capacity | Innovative capacity |
| External (interfirm) | Absorptive capacity | Connective capacity | Desorptive capacity |

6.2.3 Institutional economics theory (IE)

Generally, this investigation utilizes the institutional economics theory (North, 2005). Institutions were characterized by North (1990) as the requirements that frame human interplay (Aparicio et al., 2016). Additionally, institutions can be classified into formal and informal (Urbano & Alvarez, 2014). Formal elements are organizations, policies, and systems, and informal components are systems of connections, role models, and attitudes and can act in the entrepreneurship field (Veciana & Urbano, 2008). Together, the formal and informal institutions influence whether people choose to seek entrepreneurial activity. From one perspective, entrepreneurship research looks into the institutional economics approach to analyze formal institutions (Autio & Acs, 2010). On the other hand, entrepreneurial investigations from the social human science point of view and culturally diverse research approach generally examine informal institutions (Autio et al., 2013). The institutional way of dealing with business enterprise has been helpful in the entrepreneurship field in several cases (Bruton et al., 2010). Finally, entrepreneurship research has benefited from the institutional economics theory through many described cases and its potential has been highlighted (Bruton et al., 2010).

6.3 Hypotheses development

6.3.1 Learning capabilities and dynamic capabilities

Learning capabilities in this study are represented by perceived skills—in other words, the percentage of those who believe they have the skills and knowledge, or efficacy, required to start a business (Monitor, 2017). For Krueger and Dickson (1994), an increase in skill (efficacy) leads to an increase in perceptions of opportunity and decreases perception of threat. Schumpeter (1950) proposed that when managers are more optimistic and take more risks, then they will innovate more, and society will benefit from that risk behavior. Schumpeter observed two business cycles. In the first cycle, a successful dose of risk-taking in an economy can create new firms and new jobs, increasing the business confidence and the risk innovative activity, which expands growth. In the second cycle, the economy declines when confidence diminishes and leads to less risk innovation, which decreases job creation and, in turn, leads to less confidence and low rates of risky innovation. Zahra and George (2002a) determined a connection between sensing and learning capabilities, given that learning enhances the ability to spot new opportunities. Moreover, Hurley

and Hult (1998) confirm that sensing and learning capabilities are dissimilar, because sensing refers to gathering novel market understanding while learning refers to the formulation of new knowledge. Therefore, the following hypotheses are proposed:

Hypothesis 1. Learning capabilities will positively influence sensing capabilities in new ventures.

Hypothesis 1a. Perceived skills will positively influence perceived opportunities.

6.3.2 Open innovation capabilities and dynamic capabilities

Regarding open innovation capabilities, Teece (1986) considers that firms may have the motivation to cooperate with other businesses or organizations to gain a new position in the market or to create a new product. In addition, firms may decide to participate in innovation collaborations that are not directly related to their main activities while conducting innovation activities within their boundaries. The open innovation model observes that small firms take on a heavy role in innovation activity nowadays. According to Chesbrough (2003), small enterprises accounted for around 24 percent of total industrial R&D expenses in the US in 2005, compared to only 4 percent in 1981. Additionally, there have been numerous studies on the strengths and weaknesses of SMEs in their organization of innovation processes (Vossen, 1998). As innovation in SMEs is restricted by limited financial resources, lack of specialized workers, and small innovation initiatives, the risks connected with innovation cannot be disseminated; therefore, SMEs need to extend their networks to find missing innovation resources (Van de Vrande, De Jong, Vanhaverbeke, & De Rochemont, 2009). In this complex and knowledge-intensive world with shortened product lifecycles, networking behavior (cooperative behavior) has become more important than before. As a result, open innovation practices are not exclusively applied by high tech multinationals, but will also be applied by SMEs, and will be increasingly adopted (Van de Vrande et al., 2009).

Antolin-Lopez, Martinez-del-Rio, Cespedes-Lorente, and Perez-Valls (2015) examine the types of cooperation new ventures have with partners for product innovation development. The authors state that the study of potential innovation partners in new ventures is important because it may help scholars, public administrators, and managers to foresee the odds of successful or unfavorable cooperation for product innovation development in new ventures. Their research includes information that shows that the characteristics and objectives of new ventures significantly influence the results of the collaboration. According to Antolin-Lopez et al. (2015), one should consider that R&D collaborations between new ventures and specific types of partner—

for instance, large corporations—are more likely to result in failure, while in other cases, other kinds of partner—for example, universities—most frequently tend to be successful. Rothaermel and Deeds (2006) affirm that companies with similar dominant logics and organizational structures tend to form profitable alliances for innovation. Also, there are more micro-foundations of open innovation capabilities, such as a determined alliance function with full-time alliance management employees (Kale & Singh, 2009). According to these authors, firms collaborate not only with other organizations (of any kind), but also directly with individuals: P&G’s Connect Develop (Huston & Sakkab, 2006) and the open innovation framework (Chesbrough, 2003) are some of the initiatives. The role of employee attitudes has also been recently highlighted in the context of open innovation (Lichtenthaler, 2011). For instance, Hughes and Wareham (2010) identify the open innovation capabilities that add value to the firm’s strategy, wherein the cooperation of several external parties was observed (consumers, professionals, research firms, partners, academic and clinical collaborators, providers, regulators, suppliers). Therefore, the following hypotheses are proposed:

Hypothesis 2. Open innovation capabilities will positively influence sensing capabilities in new ventures.

Hypothesis 2a. Cooperation with other firms will positively influence perceived opportunities.

Hypothesis 2b. Cooperation with competitors will positively influence perceived opportunities.

Hypothesis 2c. Cooperation with public sector clients will positively influence perceived opportunities.

Hypothesis 2d. Cooperation with suppliers will positively influence perceived opportunities.

Hypothesis 2e. Cooperation with universities will positively influence perceived opportunities.

6.3.3 Institutional economics and dynamic capabilities

According to Mintzberg (1994), firms are working in an increasingly fierce, fast changing, and diffusing condition than at any other time. In this way, firms may build up capabilities to deal with nonstop changes. For instance, learning abilities may empower firms for constant adjustment to outside and inner changes, and firms need explicitly to build up their capacities to acquire

information about novel knowledge (Styhre et al., 2004). Similarly, Knight and Cavusgil (2004) describe that uncommon capacities and qualities are utilized by new ventures—for example, a high level of entrepreneurial orientation, perseverance, novelty, and differentiation. Also, the authors affirm that the born global firm phenomenon is possible through the accessibility to cutting edge resources—for example, proactive orientation, dynamic capabilities, and effective plan of action. Thus, the function of innovation is essential to promote recent knowledge and organizational capabilities. Moreover, innovative initiatives are launched by firms not only to develop new products, but also to open new markets and to redesign the operations of the firm to meet the markets' needs. In other words, young firms that have a strong innovation culture and an internationalization proclivity are more likely to internationalize earlier than internationally oriented firms that do not have an innovation culture. In this way, innovation culture facilitates the acquisition of knowledge, leading to capabilities that drive international performance (Knight & Cavusgil, 2004).

In addition, firms internationalizing early have a higher capacity for innovation and a greater ability to serve their customers in innovative ways. The empirical work of Knight and Cavusgil (2004) illustrates the role of innovative culture and organizational capabilities in the early adoption of internationalization, and in international performance. As a result, a firmly innovative nature is likely to support these start-ups in forming specific types of knowledge, which at the same time drives the development of organizational capabilities that support early internationalization and superior performance in diverse international markets (Knight & Cavusgil, 2004). Consequently, innovative activities also facilitate the exploration of new markets and the redefining of the firm's operations in order to serve such markets.

Knight and Cavusgil (2004) contend that the quick pace of progress in numerous ventures increases the premiums attainable from effective cooperation in the worldwide economy. The authors also maintain that organizations are forced to be innovative in the process of identifying and exploiting opportunities, and that administrators must foresee and handle constant change effectively by applying their capabilities to change management. Generally, in competitive worldwide markets, innovation is a critical entrepreneurial procedure for firm accomplishment (Knight and Cavusgil, 2004). Additionally, when firms operate the process of identifying and exploiting opportunities, they need to be more innovative in the value chains (Knight & Cavusgil, 2004). Finally, as indicated by Keen and Etemad (2012), the attributes of high development and

fast internationalization depend, among others, on economies of agglomeration and externalities. Therefore, the following relationship is proposed:

Hypothesis 3. Informal institutions will positively influence sensing capabilities in new ventures.

Hypothesis 3a. Interest in innovation will positively influence the opportunities perceived.

Hypothesis 3b. Attention to high growth will positively influence the opportunities perceived.

6.3.4 Moderating effects of informal institutions

North (1990) stresses the relevance of institutions that assist the achievement of economic development. For instance, economists mention the rule of law as a key element of institutions (Acemoglu & Johnson, 2005). Ambrosini and Bowman (2009) clarify how the arrangement and execution of dynamic capabilities suffer moderating effects by inner and outer factors. They demonstrate that outside conditions have an indirect impact on the arrangement of dynamic capabilities and competitive advantage. Likewise, the authors show the basic external enablers and inhibitors: multifaceted nature, vulnerability, altruism, and home nation attributes. Hence, relying upon the perception of founders and administrators regarding these outer factors in their surroundings, the use of dynamic capabilities (or not), and the manner in which founders and administrators do it differs. Furthermore, Schilke (2014) found that a dynamic environment moderates the connection between dynamic capabilities and competitive advantage. Among the outcomes of that examination, they assert that dynamic capabilities have complex impact depending on the dynamic on the surroundings. Additionally, investigators indicate that results for various types of enterprise and various kinds of human capital may respond to institutional settings (Estrin et al., 2016). The institutional setting may have a moderating effect on certain factors. For example, Estrin et al. (2016) consider that dissimilarities in the predisposition to start new businesses among countries rely upon explicit institutional qualities in nations. Weerawardena et al. (2015), from the dynamic capabilities perspective, argue that innovation mediates the relationship between the dynamic capability structure and early internationalization. Therefore, the following hypotheses are proposed:

Hypothesis 4. Informal institutions moderate the relationship between learning capabilities and sensing capabilities in new ventures.

Hypothesis 4a. Interest in innovation (from the company perspective) moderates the relationship between perceived skills and perceived opportunities in new ventures.

Hypothesis 4b. Interest in innovation (from the customer perspective) moderates the relationship between perceived skills and perceived opportunities in new ventures.

Hypothesis 4c. Attention to high growth moderates the relationship between perceived skills and perceived opportunities in new ventures.

Hypothesis 5. Informal institutions moderate the relationship between open innovation capabilities and sensing capabilities in new ventures.

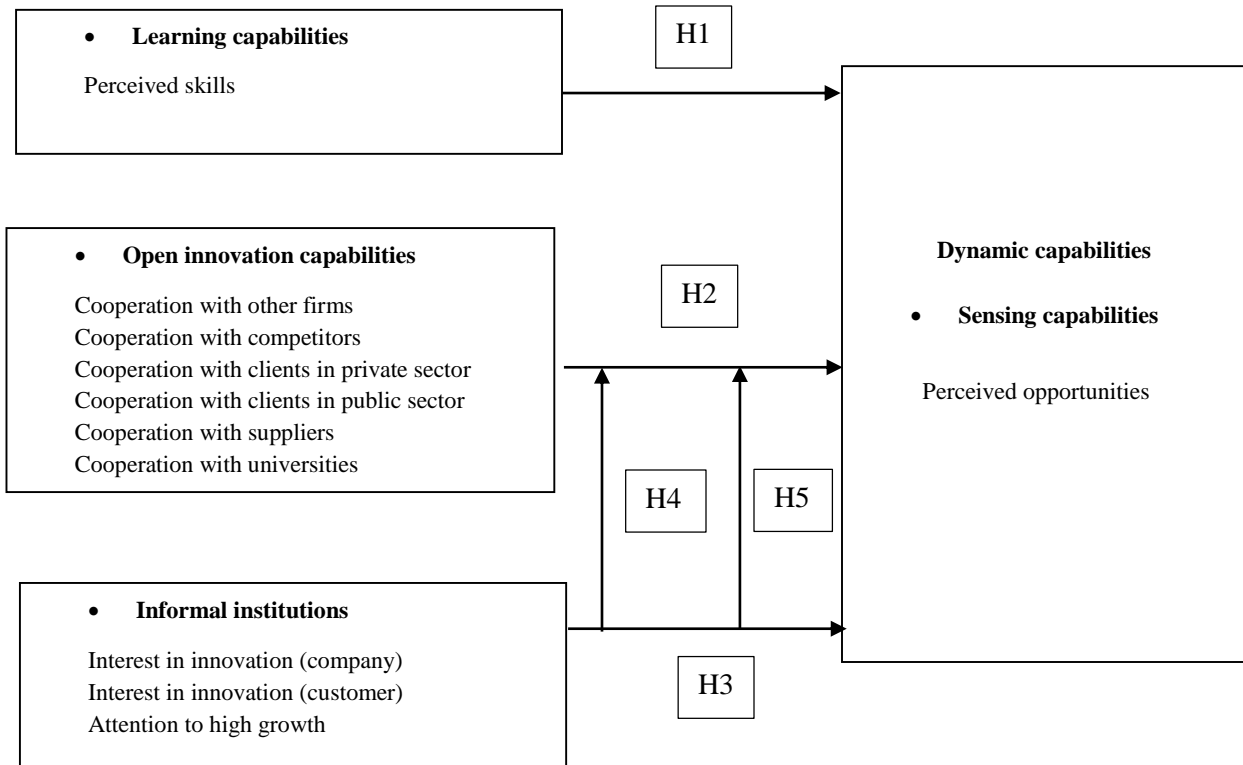
Hypothesis 5a. Interest in innovation (from the company perspective) moderates the relationship between cooperation with other firms and perceived opportunities.

Hypothesis 5b. Interest in innovation (from the customer perspective) moderates the relationship between cooperation with other firms and perceived opportunities.

Hypothesis 5c. Attention to high growth moderates the relationship between cooperation with other firms and perceived opportunities.

Figure 6.1 presents the model showing all the above hypotheses.

Figure 6.1 Model



6.4 Methodology

6.4.1 Data

Regarding the data, this investigation integrates data from the GEM (APS and NES), the IMF, and Eurostat. We acknowledge that the GEM is the biggest yearly study regarding the entrepreneurial movement worldwide. Primarily, it contributes with the description of features related to countries' entrepreneurship (Reynolds et al., 1999). This study utilizes multiple regression analyses for 24 countries (see Appendix 8) for the year 2012. In this work, the DC sensing capabilities are represented by the dependent variable perceived opportunities. Also, the measurements used in this study as independent variables are learning capabilities (perceived skills), cooperation with other firms, cooperation with competitors, cooperation with clients, cooperation with suppliers, cooperation with universities, interest in innovation, and attention to high growth.

6.4.2 Variables

6.4.2.1 Dependent variable

Regarding the dependent variable sensing capabilities, we find that dynamic capabilities have various descriptions (Ambrosini & Bowman, 2009; Augier & Teece, 2009; Danneels, 2011; Eisenhardt & Martin, 2000). Specifically, Pavlou and El Sawy (2011) merged in a model a group of capabilities: sensing, learning, coordinating, and integrating. This model is valuable to reconstruct operational capabilities into new capabilities that better suit the environment. These authors define sensing capability as the ability to recognize, clarify, and go after opportunities in the environment. Also, referring to sensing capabilities, Teece et al. (1997) define sensing as the ability to align the prerequisites for change, and to effectuate basic changes would seem to rely upon the ability to scrutinize the environment, to assess markets and competitors, and rapidly to achieve reconfiguration ahead of competitors. Perceived opportunities may therefore be a precise proxy for the variable sensing capabilities. This measure is obtained from the APS GEM (Barazandeh et al., 2015; Urbano & Alvarez, 2014) at a country level and explains the percentage of the 18–64 year old population that foresees good opportunities to begin a new firm in the area where they live in the coming six months (see Appendix 9).

6.4.2.2 Independent variables

In reference to learning capabilities, Teece (2007) states that learning, new knowledge, and skills can revamp current operational capabilities into learning capabilities when a market opportunity is recognized, and new products have to be designed. Moreover, to exploit market opportunities to launching novel products in an evolving environment, firms need to concentrate on figuring out how to discover new solutions, develop new knowledge, and reconfigure current operational abilities (Pavlou & El Sawy, 2011). Zollo and Winter (2002) suggest that learning capabilities are facilitators for reconfiguration that revamp current operational capabilities. Thus, learning capabilities in this investigation are represented by the measurement of perceived skills, taken from the APS of the GEM—that is, the percentage of people who believe they have the skills and knowledge to begin a new venture (Monitor, 2017). (See Appendix 9)

The independent variables representing open innovation capabilities were taken from the ECIS. The variable cooperation with other firms represents the percentage of firms cooperating with other enterprises within the enterprise group. The variable cooperation with competitors

reflects the percentage of firms cooperating with competitors or other enterprises in the same sector. The variable cooperation with clients in the private sector illustrates the percentage of firms cooperating with clients or customers from the private sector. In the same way, the variable cooperation with clients in the public sector depicts the percentage of firms cooperating with clients or customers from the public sector. The variable cooperation with suppliers reflects the percentage of firms cooperating with suppliers of equipment, materials, components, or software. Finally, the variable cooperation with universities shows the percentage of firms cooperating with universities or other higher education institutions.

Mostly, the interest in innovation variable represents the perception of interest in innovation in entrepreneurial activity—for example, whether companies like to experiment with new technologies and with new ways of doing things; whether consumers like to try out new products and services; whether innovation is highly valued by companies and consumers; whether established companies are open to using new entrepreneurial companies as suppliers; and whether consumers are open to buying products and services from new entrepreneurial companies. This variable taken from the NES of the GEM therefore assesses the perception of the national condition regarding interest in innovation influencing entrepreneurial activity and is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true. (See Appendix 9, Topic R: Interest in innovation).

Essentially, the attention to high growth variable represents the perception of attention to growth within the entrepreneurial activity—for instance, whether there are many support initiatives that are specially tailored for high-growth entrepreneurial activity; whether policymakers are aware of the importance of high-growth entrepreneurial activity; whether people working in entrepreneurship-supporting initiatives have sufficient skills and competence to support high-growth firms; whether the potential for rapid growth is often used as a selection criterion when choosing recipients of entrepreneurship support; and whether supporting rapid firm growth is a high priority in entrepreneurship policy. This variable is assessed at a country level in the NES of the GEM and it measures the perceptions of the national condition regarding attention to high growth affecting entrepreneurship; it is represented by the average of the summary blocks by principal components on a nominal scale where 1 = completely false and 5 = completely true (see Appendix 9, Topic Q: Attention to high growth).

6.4.2.3 Control variable

We utilize the gross domestic product (GDP) per capita reported by the IMF, given that it has been used as control variable or dependent variable in studies related to the GEM database analysis (Acs & Amorós, 2008; Bosma, 2013; Urbano & Alvarez, 2014; Levie & Autio, 2008). Table 6.2 defines the variables used in this research.

Table 6.2 Description of variables

| Construct | Measures | Description | Source ^a |
|------------------------------|--|--|----------------------------|
| Dependent variable | | | |
| Dynamic capabilities | Sensing capabilities (perceived opportunities) | Percentage of the 18–64-year old population that sees good opportunities to start a firm in the area where they live. | APS GEM 2012 |
| Independent variables | | | |
| Learning capabilities | Learning capabilities (perceived skills) | Percentage of the 18–64-year old population that has the knowledge, skills, and experience required to start a new business. | APS GEM 2012 |
| Open innovation capabilities | Dynamic view of cooperation | | |
| | Cooperation with other firms | Percentage of firms cooperating with other enterprises within the enterprise group. | ECIS 2012 |
| | Cooperation with competitors | Percentage of firms cooperating with competitors or other enterprises in the same sector. | ECIS 2012 |
| | Cooperation with clients in private sector | Percentage of firms cooperating with clients or customers from the private sector. | ECIS 2012 |
| | Cooperation with clients in public sector | Percentage of firms cooperating with clients or customers from the public sector. | ECIS 2012 |

| | | | |
|-------------------------|-------------------------------------|---|-------------------|
| | Cooperation with suppliers | Percentage of firms cooperating with suppliers of equipment, materials, components, or software. | ECIS 2012 |
| | Cooperation with universities | Percentage of firms cooperating with universities or other higher education institutions. | ECIS 2012 |
| Informal institutions | Interest in innovation (company) | Average of summary blocks of interest in innovation regarding entrepreneurship from the company point of view. | NES GEM 2006–2013 |
| | Interest in innovation (customer) | Average of summary blocks of interest in innovation regarding entrepreneurship from the customer point of view. | NES GEM 2006–2013 |
| | Attention to high growth | Average of summary blocks of attention to high growth related to entrepreneurship. | NES GEM 2006–2013 |
| Control variable | GDP per capita (constant 2005 US\$) | Gross domestic product divided by midyear population. | IMF 2012 |

^aGlobal Entrepreneurship Monitor (GEM): <http://www.gemconsortium.org>; Eurostat Community Innovation Survey (ECIS): <https://ec.europa.eu/eurostat/web/microdata/community-innovation-survey>; International Monetary Fund (IMF) <https://www.imf.org/external/index.htm>

6.4.3 Data analysis and model

As stated, we propose that dynamic capabilities are influenced by learning capabilities, open innovation capabilities, and informal institutions. Considering this, we determine the first equation in its general form as follows:

$$DC_i = \alpha + \beta_1 LC_i + \beta_2 OI_i + \beta_3 II_i + \beta_4 VC_i + \varepsilon_i \quad (1)$$

$i = 1, 2, \dots, 24 \text{ countries}$

where LC is the vector that represents learning capabilities; OI is the vector representing open innovation capabilities (cooperation with other firms, cooperation with competitors, cooperation with clients in the private sector, cooperation with clients in the public sector, cooperation with suppliers, and cooperation with universities); II represents the informal institutions' interest in innovation from the company point of view, interest in innovation from the customer point of view, and attention to high growth, respectively; and VC represents the control vector GDP per capita that influences dynamic capabilities DC in country i .

Additionally, to explore whether informal institutions have a moderating effect in the relationship between learning capabilities and open innovation capabilities with dynamic capabilities, we propose the second equation:

$$DC_i = \alpha + \beta_1 LC_i + \beta_2 OI_i + \beta_3 II_i + \beta_4 VC_i + \beta_5 (LC_i \times II_{bi}) + \beta_6 (OI_i \times II_{di}) + \epsilon_i \quad (2)$$

$i = 1, 2, \dots, 24 \text{ countries}$

where $LC \times II$ represents the interaction between learning capabilities and interest in innovation from the company point of view, the interaction between learning capabilities and interest in innovation from the customer point of view, and the interaction between learning capabilities and attention to high growth. Meanwhile, $OI \times II$ represents the interaction between cooperation with other firms and interest in innovation from the company point of view, the interaction between cooperation with other firms and interest in innovation from the customer point of view, and the interaction between cooperation with other firms and attention to high growth. Thus, we estimate this set of equations using multiple regression for the year 2012.

6.5 Results

In Table 6.3, the means and standard deviations of the variables are detailed. This table reveals the mean of the dependent variable sensing capabilities (42.44%). Referring to the independent variable learning capabilities, countries indicate a low average (32.53%). Similarly, open innovation capabilities in countries are characterized by low levels of cooperation with other firms (15.84), cooperation with competitors (11.71), cooperation with clients in the private sector (18.62), cooperation with clients in the public sector (8.68), cooperation with suppliers (23.55), and cooperation with universities (14.06). Likewise, the informal institution variables show an

average—for instance, interest in innovation from the company point of view (3.20), interest in innovation from the customer point of view (3.53), and attention to high growth (3.10).

Table 6.3 Descriptive statistics

| Variable | Mean | Std. Dev. | Min | Max |
|--|----------|-----------|-------|-------|
| Sensing capabilities | 42.444 | 6.8211 | 29.97 | 53.89 |
| Learning capabilities | 32.5324 | 15.5873 | 10.95 | 66.48 |
| Cooperation with other firms | 15.848 | 6.5886 | 3 | 31.6 |
| Cooperation with competitors | 11.712 | 6.3420 | 3.4 | 25.9 |
| Cooperation with clients in private sector | 18.6291 | 9.5382 | 4.3 | 44.8 |
| Cooperation with clients in public sector | 8.6833 | 5.6675 | 0 | 22.1 |
| Cooperation with suppliers | 23.552 | 9.4174 | 6.8 | 40.1 |
| Cooperation with universities | 14.064 | 6.0988 | 4.8 | 26.1 |
| Interest in innovation (company) | 3.2052 | 0.3102 | 2.47 | 3.78 |
| Interest in innovation (customer) | 3.5372 | 0.2219 | 3.16 | 3.9 |
| Attention to high growth | 3.1088 | 0.5306 | 2.06 | 4.16 |
| GDP per capita (constant 2005 US\$) | 27609.68 | 16782.57 | 5837 | 66825 |

Notes: $N=24$

Table 6.4 reports the correlation coefficients of the variables under study. The results show that sensing capabilities are significantly negatively correlated with learning capabilities, interest in innovation (company), and GDP per capita. Sensing capabilities are significantly positively correlated with interest in innovation (company), attention to high growth, and GDP per capita. Interest in innovation (company) is significantly positively correlated with interest in innovation (customer). Likewise, interest in innovation is significantly positively correlated with attention to high growth. GDP per capita has a significant negative correlation with sensing capabilities and a significant positive correlation with learning capabilities and attention to high growth. Cooperation with other firms, cooperation with competitors, cooperation with clients in the private sector, cooperation with clients in the public sector, cooperation with suppliers, and cooperation with universities are significantly positively correlated among themselves.

We conducted a diagnostic test for multicollinearity and found that this data set has few multicollinearities for learning capabilities and interest in innovation (customer). We found high multicollinearity for cooperation with other firms, cooperation with universities, interest in innovation (company), attention to high growth, and GDP per capita. Furthermore, we found

excessive multicollinearity for cooperation with clients in the private sector, cooperation with competitors, cooperation with clients in the public sector, and cooperation with suppliers. We estimated the inflation factor of the variance.

Table 6.4 Correlation matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--|----------|----------|-----------|-----------|-----------|-----------|-----------|---------|-----------|---------|-----------|----|
| 1 Sensing capabilities | 1 | | | | | | | | | | | |
| 2 Learning capabilities | -0.4723* | 1 | | | | | | | | | | |
| 3 Cooperation with other firms | 0.1423 | 0.2187 | 1 | | | | | | | | | |
| 4 Cooperation with competitors | 0.0997 | 0.1832 | 0.6747*** | 1 | | | | | | | | |
| 5 Cooperation with clients in private sector | 0.193 | 0.1161 | 0.8139*** | 0.8545*** | 1 | | | | | | | |
| 6 Cooperation with clients in public sector | 0.1706 | 0.194 | 0.6776*** | 0.9303*** | 0.8787*** | 1 | | | | | | |
| 7 Cooperation with suppliers | 0.1025 | -0.0009 | 0.8414*** | 0.7960*** | 0.8901*** | 0.7337*** | 1 | | | | | |
| 8 Cooperation with universities | 0.0362 | 0.1408 | 0.6358*** | 0.8450*** | 0.8126*** | 0.7717*** | 0.7739*** | 1 | | | | |
| 9 Interest in innovation (company) | -0.3787* | 0.5375** | 0.2325 | -0.1121 | -0.0513 | -0.0589 | -0.0674 | -0.0443 | 1 | | | |
| 10 Interest in innovation (customer) | -0.222 | 0.2087 | -0.0541 | -0.2335 | -0.0307 | -0.1005 | -0.1976 | -0.2921 | 0.4653* | 1 | | |
| 11 Attention to high growth | -0.19 | 0.4298* | 0.3841* | 0.0584 | 0.1819 | 0.1374 | 0.1035 | 0.1876 | 0.7634*** | 0.3500* | 1 | |
| 12 GDP per capita (constant 2005 US\$) | -0.4503* | 0.5776** | 0.2153 | -0.0124 | 0.1235 | 0.0151 | -0.0022 | 0.2193 | 0.4288* | 0.1823 | 0.6277*** | 1 |

Notes: *p<0.1; **p<0.01; ***p<0.001

The multi-regression results of the models are in Table 6.5. Regression coefficients, standard errors, and significance levels are shown in this table.

Table 6.5 Estimating dynamic capabilities

| | Model 1 | | Model 2 | | Model 3 | |
|---|------------|--------|------------|---------|-------------|----------|
| | Coef. | Std. E | Coef. | Std. E | Coef. | Std. E |
| <i>Learning capabilities</i> | | | | | | |
| Perceived skills | -0.1961* | 0.1031 | -0.1080 | 0.1221 | 0.9964 | 1.7765 |
| <i>Open innovation capabilities</i> | | | | | | |
| Cooperation with other firms | 0.8793** | 0.3795 | 0.8705* | 0.4296 | 16.8336*** | 4.0510 |
| Cooperation with competitors | 0.3394 | 0.6920 | 0.1280 | 0.7168 | -1.3931* | 0.60610 |
| Cooperation with clients of private sector | 0.5616 | 0.4346 | 0.7816 | 0.5010 | 0.7448* | 0.3465 |
| Cooperation with clients of public sector | -0.5329 | 0.7285 | -0.5913 | 0.7367 | 1.0903 | 0.5657 |
| Cooperation with suppliers | -0.9791** | 0.3936 | -1.0404** | 0.3951 | -1.2569*** | 0.2907 |
| Cooperation with universities | 0.2018 | 0.4437 | 0.0637 | 0.4905 | -0.0685 | 0.3025 |
| <i>Informal Institutions</i> | | | | | | |
| Interest in innovation (company) | | | -7.2213 | 8.1254 | -114.9141** | 37.6773 |
| Interest in innovation (customer) | | | -8.1587 | 7.4994 | 136.5731** | 48.8170 |
| Attention to high growth | | | 4.1375 | 4.4906 | 38.1951*** | 8.9004 |
| <i>Moderating effects</i> | | | | | | |
| Learning capabilities X Interest in innovation (company) | | | | | 2.9239** | 0.8100 |
| Learning capabilities X Interest in innovation (customers) | | | | | -2.1683* | 1.0704 |
| Learning capabilities X Attention to high growth | | | | | -0.6155 | 0.3481 |
| Cooperation with other firms X Interest in innovation (company) | | | | | -0.0085 | 1.3346 |
| Cooperation with other firms X Interest in innovation (customers) | | | | | -3.7744*** | 0.9838 |
| Cooperation with other firms X Attention to high growth | | | | | -0.0151 | 0.0117 |
| <i>Control variable</i> | | | | | | |
| GDP per capita (constant 2005 US\$) | -0.0001 | 0.0001 | -0.0002* | 0.0001 | -0.0003*** | 0.0000 |
| <i>Dynamic capabilities</i> | | | | | | |
| Sensing capabilities coefficient | 49.9099*** | 4.2989 | 90.3228*** | 23.4839 | -214.4691 * | 102.3884 |
| R ² | 0.5386 | | 0.6416 | | 0.9374 | |
| Number of observations | 24 | | 24 | | 24 | |

Notes *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Standard errors are shown in parentheses. The estimates for country and time fixed effects dummies are not presented but can be supplied upon request.

Learning capabilities and open innovation capabilities are considered in Model 1. This model explains 53 percent of sensing capabilities across the studied countries. Model 2 includes learning capabilities and open innovation capabilities, including cooperation with other firms, cooperation with competitors, cooperation with clients in the private sector, cooperation with clients in the public sector, cooperation with suppliers, and cooperation with universities, together with informal institutions. This model explains 64 percent of sensing capabilities across the countries. Model 3 includes learning capabilities, open innovation capabilities, informal institutions, and the moderating effects of interest in innovation (company and customer) and attention to high growth in the relationship between open innovation capabilities and dynamic capabilities. This model explains 93 percent of sensing capabilities across the countries.

In Hypothesis 1, we propose that learning capabilities will positively influence sensing capabilities in new ventures. Specifically, Hypothesis 1a suggests that perceived skills will positively influence perceived opportunities. The results from Model 1 show that the coefficient for learning capabilities is statistically significant and negative. Therefore, the results do not support Hypothesis 1, in that learning capabilities do not positively influence sensing capabilities in new ventures.

In Hypothesis 2, we propose that open innovation capabilities will positively influence sensing capabilities in new ventures. Specifically, Hypothesis 2a proposes that cooperation with other firms will positively influence perceived opportunities. The results in Models 1, 2, and 3 show that the coefficient for cooperation with other firms is statistically significant and positive. On the other hand, Hypotheses 2c and 2e propose that cooperation with clients in the public sector and cooperation with universities, respectively, will positively influence the development of perceived opportunities. However, in Model 3, the coefficients for cooperation with clients in the public sector and cooperation with universities are not statistically significant. Hypotheses 2b and 3d propose that cooperation with competitors and with suppliers, respectively, will positively influence the development of perceived opportunities. The results in Model 3 show that the coefficients for cooperation with competitors and for cooperation with suppliers are statistically significant and negative. Therefore, Hypothesis 2 is partially supported in that open innovation capabilities will positively influence sensing capabilities.

In Hypothesis 3, we propose that informal institutions will positively influence sensing capabilities in new ventures. Specifically, Hypothesis 3a proposes that interest in innovation will

positively influence perceived opportunities. On the other hand, Hypothesis 3b proposes that attention to high growth will positively influence perceived opportunities. The results from Model 3 show that the coefficients for interest in innovation (customers) and attention to high growth are significant and positive. However, Model 3 also shows that the coefficient for interest in innovation (company) is significant and negative. Therefore, the results partially support Hypothesis 3, in that informal institutions will sometimes positively influence sensing capabilities in new ventures.

Hypothesis 4 suggests that informal institutions have a moderating effect on the relationship between learning capabilities and sensing capabilities in new ventures. In Model 3, the moderation effect that informal institutions have in the connection between perceived skills and perceived opportunities in new ventures is observed. Regarding Hypothesis 4a, which proposes that interest in innovation (from the company perspective) moderates the relationship between perceived skills and perceived opportunities, the results show the interaction term between interest in innovation (company) and perceived skills, where the coefficient that estimates this interaction is significant and positive. Concerning Hypothesis 4b, which proposes that interest in innovation (from the customer perspective) moderates the relationship between perceived skills and perceived opportunities, the results show the interaction term between interest in innovation (customer) and perceived skills, where the coefficient estimate for this interaction is significant and negative. Regarding Hypothesis 4c, which suggests that attention to high growth moderates the relationship between perceived skills and perceived opportunities, the results show the interaction term between attention to high growth and perceived skills, where the coefficient estimate for this interaction is not significant and positive. Hence, regarding Hypothesis 4, the results show that informal institutions partially moderate the relationship between learning capabilities and sensing capabilities in new ventures.

Hypothesis 5 proposes that informal institutions moderate the relationship between open innovation capabilities and sensing capabilities in new ventures. In Model 3, the moderating effect that informal institutions have in the connection between cooperation with other firms and perceived opportunities in new ventures is observed. Regarding Hypothesis 5a, which proposes that interest in innovation (from the company perspective) moderates the relationship between cooperation with other firms and perceived opportunities, the results show the interaction term between interest in innovation (company) and cooperation with other firms, where the coefficient

that estimates this interaction is not significant and negative. Concerning Hypothesis 5b, which proposes that interest in innovation (from the customer perspective) moderates the relationship between cooperation with other firms and perceived opportunities, the results show the interaction term between interest in innovation (customer) and cooperation with other firms. The coefficient estimate for this interaction is significant and negative. In respect of Hypothesis 5c, which suggests that attention to high growth moderates the relationship between cooperation with other firms and perceived opportunities, the results show the interaction term between attention to high growth and cooperation with other firms. The coefficient estimate for this interaction is not significant and negative. Thus, concerning Hypothesis 5, the results show that informal institutions partially moderate the relationship between open innovation capabilities and sensing capabilities in new ventures.

These results show that the interaction term between perceived skills and interest in innovation (company) is positive and statistically significant, which allows the relationship between perceived skills and sensing capabilities to be different for the entrepreneurs when interest in innovation (company) is below the average versus when interest in innovation (company) is above the average (see Figure 6.2). The interaction term between perceived skills and interest in innovation (consumer) is negative and statistically significant, which allows the relationship between perceived skills and sensing capabilities to be different for the entrepreneurs when interest in innovation (consumer) is below the average versus when interest in innovation (consumer) is above the average (see Figure 6.3). Moreover, the interaction term between cooperation with other firms and interest in innovation (consumer) is negative and statistically significant, which allows the relationship between cooperation with other firms and sensing capabilities to be different for the entrepreneurs when interest in innovation (consumer) is below the average versus when interest in innovation (consumer) is above the average (see Figure 6.4).

Figure 6.2 Interaction between learning capabilities and interest in innovation (company)

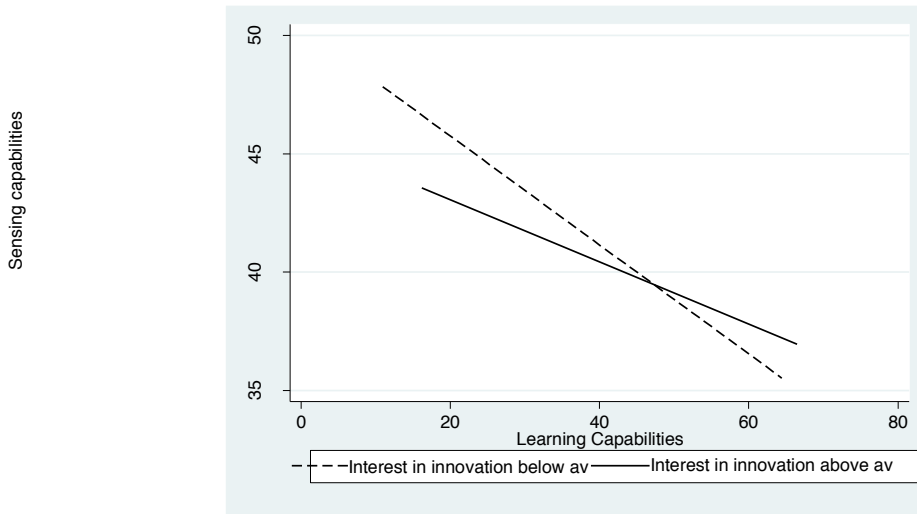


Figure 6.3 Interaction between learning capabilities and interest in innovation (consumer)

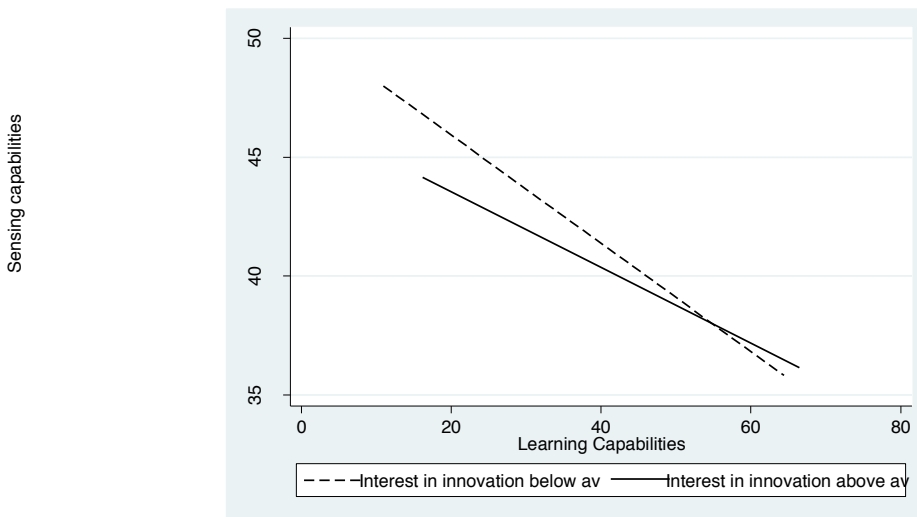
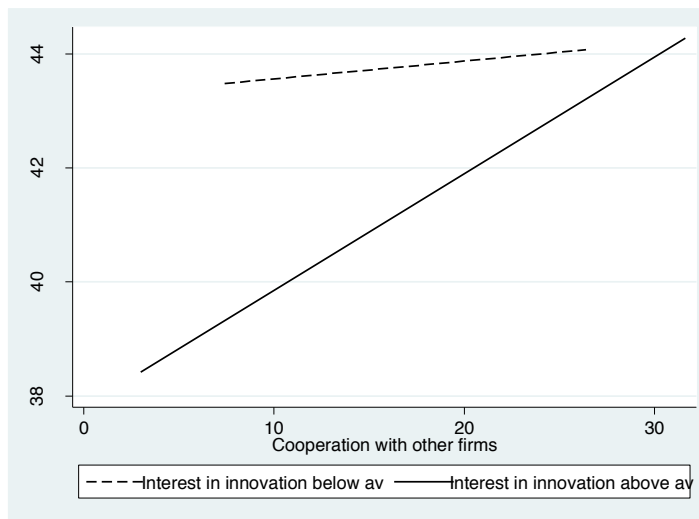


Figure 6.4 Interaction between cooperation with other firms and interest in innovation (consumer)

6.6 Discussion and conclusions

In relation to the results that do not support Hypothesis 1, that learning capabilities will positively influence the development of sensing capabilities in new ventures, we can argue that the negative relationship between learning capabilities and sensing capabilities might be directly or indirectly affected by other variables, including formal institutions, informal institutions, or human capital variables.

Hypothesis 2 is partially supported in that open innovation capabilities will positively influence sensing capabilities, as the results confirm that cooperation with other firms will positively influence perceived opportunities; on the other hand, cooperation with competitors and with suppliers respectively influences a negative perception of opportunities. The results in Model 3 show that the coefficient for cooperation with other firms is statistically significant and positive. Here we agree with Audretsch (2014) and Iturrioz et al. (2015), in that new ventures can rarely afford to take part in complex, ambitious research projects on their own. Therefore, collaboration is the way to share innovation costs (Arranz & Fdez-de-Arroyabe, 2008); also, it can develop economies of scale (Sakakibara, 2002) and reduce product-to-market time (Sakakibara, 1997, 2002). In the same way, cooperation also permits firms to rationalize their risks (Bayona, Garcia-Marco & Huerta, 2001; Sakakibara, 1997) and decreases the investment needed by each firm, which is particularly important for new ventures and SMEs. Furthermore, the advantage of new

relationships (and cooperation) is that they can be important sources of learning and development (Wilkinson & Young, 2002). On the other hand, the results in Model 3 show that the coefficients for cooperation with competitors and with suppliers are statistically significant and negative. In this regard, some concerns exist about the development of closer and longer-term relations (Håkansson & Snehota, 1998). Among these difficulties are the lock-in effects that limit a firm's vision and ability to develop alternative relationships (Wilkinson & Young, 2002). For these reasons, some degree of change and confusion in relationships is inevitable (Anderson, Håkansson, & Johanson, 1994).

According to the results, Hypothesis 3, that informal institutions will positively influence sensing capabilities in new ventures, is partially supported. Where interest in innovation (company) is concerned, our results show that informal institutions negatively influence sensing capabilities in new ventures. This research also shows that interest in innovation (customers) and attention to high growth positively influence sensing capabilities in new ventures. In this respect, Van de Vrande et al. (2009)—whose research is in line with Lichtenthaler (2008)—demonstrated that medium-sized and large manufacturers practice open innovation activities. They also found that external networking to acquire knowledge is an important open innovation activity. However, those activities related to intellectual property licensing, venturing activities, and external participation are only practiced by the minority of SMEs. Moreover, the most practiced activities include customer involvement and external networking, primarily because they are unstructured and required no substantial investments. In contrast, intellectual property licensing, venturing, and external participation require financial resources, formalized agreements, and an innovation portfolio. These findings are equally in line with previous studies about innovation in SMEs (Vossen, 1998).

Furthermore, the moderating effect that interest in innovation (company) has in the relationship between learning capabilities and sensing capabilities in new ventures is presented, given that the coefficient estimate for the interaction is significant and positive. The interaction term is positive and statistically significant, which allows the relationship between learning capabilities and sensing capabilities to be different when there are different levels of interest in innovation (company). When learning capabilities are perceived as the best to affect sensing capabilities, the immediate interest in innovation (company) increases the sensing capabilities in the population—that is, the perception of good opportunities to start a new business. What is more,

the moderating effect that interest in innovation (customer) has in the relationship between learning capabilities and sensing capabilities in new ventures is presented, given that the coefficient estimate for the interaction is significant and negative. The interaction term is negative and statistically significant, which allows the relationship between learning capabilities and sensing capabilities to be different when there are different levels of interest in innovation (customer). When learning capabilities are perceived to be the best to affect sensing capabilities, the immediate interest in innovation (customer) decreases the sensing capabilities in the population—that is, the perception of good opportunities to start a new business.

The moderating effect that interest in innovation (customers) has in the relationship between open innovation capabilities and sensing capabilities is shown. The coefficient estimate for this interaction is significant and negative; this allows the relationship between cooperation with other firms and sensing capabilities to be dissimilar when there are different levels of interest in innovation (customers). When cooperation with other firms is perceived as the best to affect sensing capabilities, the immediate interest in innovation (customer) decreases the sensing capabilities in the population—that is, the perception of good opportunities to start a new business. Therefore, it is shown through this study that interest in innovation (from the company and the customer point of view) moderates the relationship between learning capabilities and sensing capabilities in new ventures, and that interest in innovation (from the customer point of view) moderates the relationship between cooperation with other firms and sensing capabilities in new ventures. Other research seems to validate the view that entrepreneurial self-efficacy has positive moderating effects in the relationship between entrepreneurial education and entrepreneurial intention (Yun, 2010). Other investigation defines how internal and external variables have a moderating influence on the arrangement and performance of dynamic capabilities (Ambrosini & Bowman, 2009); these authors also reveal that the external surroundings have a moderating effect on the arrangement of dynamic capabilities and competitive advantage. Moreover, they explain the essential external environment effects: complexity, uncertainty, generosity, and features of the country. Likewise, Schilke (2014) assessed the indirect effect of environmental dynamism on the connection between dynamic capabilities and competitive advantage, proposing that dynamic capabilities have a complicated influence on achievement depending on the dynamism of the environment.

6.6.1 Theoretical implications

This work contributes to the literature in the following ways. Firstly, it expands new empirical insights into the impact of learning capabilities and open innovation capabilities on dynamic capabilities in new ventures, utilizing a sample of 24 economies, employing the GEM data, the IMF indicator, and the ECIS for the year 2012. Secondly, this research helps to advance the application of the Open Innovation theory (Chesbrough, 2003), the knowledge management capacity framework (Lichtenthaler & Lichtenthaler, 2009), and institutional economics theory (North, 2005) in the study of dynamic capabilities (Teece et al., 1997).

6.6.2 Policy implications

Lastly, this work may benefit the advancement of policies to increase the effect of dynamic capabilities in new ventures. This impact may reflect significant relevance of open innovation theory and the knowledge management capacity framework for entrepreneurial ecosystems. Schumpeter (1942) considered the prediction of innovation outcomes in new venture collaborations to be of great importance, given the outstanding role of new ventures in the creative-destruction process. Similarly, Teece (2007) proposes through market co-creation (actions of the firm and other participants, such as customers, suppliers, competitors, or potential entrants) the formation of eco-systems to co-create social value with the objective of private allocation.

6.6.3 Limitations and future research lines

Further investigation is recommended, firstly by increasing the size of the sample through widening both the number of years and the number of countries to be studied, though the sample might be conditional on the collaboration of countries in APS and NES GEM surveys and the participation of firms in the Eurostat survey. Secondly, given that inter-firm collaborations allow innovation projects to be divided among several participants who can coordinate and join forces (Kim & Vonortas, 2014; Tether & Tajar, 2008), more investigation should be done to consider the role that each firm plays in the collaboration arena—whether they are coordinators, leaders, or followers—and measure the outputs from these roles. Thirdly, cooperation helps new ventures focus on what they can do best rather than dissipating their energies across a broad range of innovation activities: therefore, future investigation might consider the degree of specialization of firms or the level of expertise in collaborative issues with the purpose of knowing how to achieve greater efficiency in firms' collaborations. In addition, new ventures share with other new ventures

and SMEs a cost-rationalizing and risk-sharing view of collaboration; in this regard, the cost and risk associated with open innovation activities could be taken into consideration with the purpose of being more structured in the decision-making process when deciding when, how, or who to collaborate with when participating in open innovation activities. Finally, Wilkinson and Young (2002) comment that in the development of new collaborations with other organizations, there are costs and burdens that reflect the potential gains from exploitation. Further investigation should therefore include not only the positive impact of cooperation among firms, but also the negative.

6.6.4 Conclusions

The purpose of this work was to study the connection between open innovation and learning capabilities with dynamic capabilities in new ventures. Through three multi-regression models, the research demonstrates that the learning capabilities in new ventures, represented by the variable perceived skills, will negatively impact sensing capabilities. The first hypothesis, that learning capabilities will positively impact dynamic capabilities, is not supported. Our second hypothesis, that open innovation capabilities will positively influence sensing capabilities, is partially supported. The study further shows that cooperation with other firms will positively impact sensing capabilities. Contrary to what was expected, cooperation with competitors and cooperation with suppliers have a negative influence on sensing capabilities in new ventures. Subsequently, our hypothesis is partially supported in that open innovation capabilities will positively influence the development of dynamic capabilities in new ventures. Additionally, interactions are studied. The first group of interactions shows that informal institutions moderate the relationship between learning capabilities and dynamic capabilities in new ventures. One interaction demonstrates that when learning capabilities are perceived as the best to affect sensing capabilities, the immediate interest in innovation (company) increases the sensing capabilities in the population—that is, the perception of good opportunities to start a new business. The other interaction demonstrates that when learning capabilities are identified as the best to impact sensing capabilities, the interest in innovation (customer) reduces the sensing capabilities in the population—that is, the perception of good opportunities to start a new business. Within the second group of interactions, it is shown that informal institutions moderate the relationship between open innovation capabilities and dynamic capabilities in new ventures. This interaction reveals that when cooperation with other firms is perceived as the best to affect sensing capabilities, the

immediate interest in innovation (customer) decreases the sensing capabilities in the population—
that is the perception of good opportunities to start a new business.

CHAPTER 7

EFFECT OF DYNAMIC CAPABILITIES AND INSTITUTIONS ON COMPETITIVENESS

7. EFFECT OF DYNAMIC CAPABILITIES AND INSTITUTIONS ON COMPETITIVENESS

7.1 Introduction

Entrepreneurship is defined as the foundation of new businesses (Gartner, 1989). The research focus on this phenomenon is not only on the creation of new ventures, but also on the entrepreneurial process that comprises the gestation, birth, and growth of new ventures (Reynolds, Camp, Bygrave, Autio, & Hay, 2002). For instance, Agarwal, Audretsch, and Sarkar (2010) consider that it is of value to analyze the causes and consequences of entrepreneurial actions that have the objective of creating and/or appropriating value through knowledge investments. In this way, many studies have included cross-sectoral, cross-national, and longitudinal analyses to link the entrepreneurship activity with economic growth (Rocha, 2004). On the other hand, there is research on how entrepreneurs face changing market requirements or new competitive situations, applying dynamic capabilities (Boccardelli & Magnusson, 2006). Dynamic capabilities are higher-order capabilities that help to create, to re-configure, and to leverage organizational resources and capabilities (Teece et al., 1997). Busenitz, Gomez, and Spencer (2000) show how specific country-level institutional differences contribute differently to the levels and types of entrepreneurship; they explain why entrepreneurs in one country may have a competitive advantage over entrepreneurs in other countries. Given the importance of entrepreneurship in the economy, the entrepreneurship field would benefit from more research on the role of dynamic capabilities in new ventures on competitiveness.

Overall, the main objective of this investigation is to explore the consequences of dynamic capabilities in new ventures, specifically competitiveness within an international context. In this regard, this research places emphasis on three theoretical frameworks, namely, the resource-based view (Penrose, 1959), institutional economics (North, 1990) and dynamic capabilities (Teece et al., 1997) on an international level. The specific objectives of this research are to investigate the relationship of dynamic capabilities in new ventures and competitiveness; to study the relationship between formal and informal institutions and competitiveness; and to analyze the moderating effect of formal and informal institutions on the relationship between dynamic capabilities and competitiveness in new ventures.

The Global Entrepreneurship Monitor indicators, the World Bank World Development Indicators, the World Economic Forum Global Competitiveness Report, the Worldwide Governance Indicators of the World Bank Group, and the World Economic Outlook data base of the International Monetary Fund are used in a panel data analysis at a national level for the years 2007–2014, considering a sample of 30 countries.

The main contribution of this work is in terms of advancing the knowledge about dynamic capabilities in new ventures by linking them with the entrepreneurship field and by conducting empirical research within an international context. Zahra et al. (2006) determined a gap in the literature referring to research and theory-building around dynamic capabilities in new ventures and SMEs.

Following the findings in previous research, the following hypotheses are proposed: innovation capability (market innovation) is positively related to competitiveness; dynamic capabilities (sensing capabilities) are positively related to competitiveness; formal institutions (government effectiveness) are positively related to competitiveness; informal institutions (control of corruption) are positively related to competitiveness; and formal and informal institutions moderate the positive effect of innovation capabilities on competitiveness.

The chapter has the following structure. To begin with, after this introduction, we develop the conceptual framework. Afterwards, we construct the hypotheses. We then explain the methodology by describing the data source and explaining the variables, together with the data analysis and model, after which we disclose the results. Next, we expand the discussion. To finish with, we conclude and supply some indications for further research.

7.2 Conceptual framework

Drucker (1985) affirms that the core of entrepreneurship is the constant application of systematic innovation. Also, Drucker specifies the existence of innovation opportunities inside and outside a company. Hence, the key to success for entrepreneurs is innovation. Furthermore, Schumpeter (1934) established the connection between entrepreneurship and innovation, identifying in entrepreneurs the key characteristic of being innovators. Chesbrough (2003) developed the open innovation model, where access to market and technology integration is developed by others. Similarly, Teece (2007) argues that dynamic capabilities enable new firms to enhance intangible assets that permit higher and longer business achievements in an open economy

typified by accelerated innovation. Teece explains that, together with dynamic capabilities, there are skills, processes, procedures, structures, decision rules, and disciplines that support sensing (opportunity recognition), seizing, and reconfiguring capabilities. According to Kraaijenbrink et al. (2010), dynamic capabilities provide stepping-stones to introduce more dynamic variants of the resource-based framework. Basically, the dynamic capabilities approach contends that competitive success is accomplished from the constant development, alignment, and reconfiguration of firm assets (Augier & Teece, 2009; Teece & Pisano, 1994; Teece et al., 1997). The dynamic capabilities theory helps to recognize the factors that influence firm performance.

Teece (2010) affirms that this framework is gradually evolving into an interdisciplinary theory of the modern organization. Likewise, Teece (2009) asserts that dynamic capabilities empirical research comprehends regional and national competitiveness among emerging and transition economies. In this matter, Boschma (2004) concludes that firms need dynamic capabilities to guarantee the implementation of novel ideas to achieve competitiveness. Likewise, Teece (2014a) suggests that to maintain competitiveness in diverse and changing business environments, multinational enterprises must develop and maintain internal and external asset alignment, referring to strategies and dynamic capabilities. Boschma (2004) argues that regions' competitiveness is dissimilar and that different environments affect firms' and regions' development of new economic activities. Additionally, González-Pernía, Peña-Legazkue, and Vendrell-Herrero (2012) study the extent to which differences in dynamic capabilities are associated with regional development.

This research will include empirical research that addresses the effect of dynamic capabilities in new ventures on competitiveness. In terms of the conceptual point of view, this investigation will be framed in the resource-based view (RBV), institutional economics (IE), and dynamic capabilities theories.

7.2.1 Resource-based view (RBV)

According to Barney (2001), the RBV establishes that firms are required to foster distinctive capabilities to gain long-lasting advantages over their competitors. Therefore, the RBV has been adopted by researchers to focus on entrepreneurial capabilities as decisive factors in firms' competitive advantage (Alvarez & Barney, 2000). The RBV relies on both resource heterogeneity (resources and capabilities possessed by SMEs may differ) and resource immobility

(these differences may endure over time) (Raymond, St-Pierre, Uwizeyemungu, & Le Dinh, 2014). The RBV helps to understand how the firm achieves a competitive advantage and how to maintain that advantage over time. For Eisenhardt and Martin (2000), firms obtain sustainable competitive advantage if they utilize new value creation strategies that are not easy for their rivals to develop Teece et al. (1997) expanded the RBV to dynamic markets. Thus, according to Teece et al. (1997), dynamic capabilities are the core of sustained competitive advantage when the competitive environment is changing.

7.2.2 Dynamic capabilities

Eisenhardt and Martin (2000) characterize dynamic capabilities as a group of specific and identifiable processes. Dynamic capabilities fall into three main groups. The first group comprises the capabilities of sensing unknown futures, including the identification, development, co-development, and assessment of technological opportunities and threats about customer needs. The second group refers to the seizing capabilities, or the operation of resources to meet needs and opportunities and value creation. The third group relates to the continuous transformation of capabilities (Teece et al., 2016). Sensing capacities are the capabilities most easily acknowledged as entrepreneurial. For instance, Baron and Ensley (2006) affirm that sensing capabilities are very like the concept of opportunity recognition.

Recent investigation provides a basis for future research in the empirical literature and allows us to dig deeper into the linkages between managerial actions, dynamic capabilities, and long-run firm performance (Teece, 2016). For instance, Agwunobi and Osborne (2016), identified that dynamic capabilities were enhanced to generate improved performance and competitive advantage. Additionally, Eisenhardt and Martin (2000) connected dynamic capabilities to the competitive advantage of the firm or performance. However, no investigation has been conducted that comprises generalized outputs. For this reason, we suggest investigating the effect of dynamic capabilities on competitiveness.

Dynamic capabilities determine how firms integrate, build, and reconfigure internal and external competences to handle changing business environments (Teece et al., 1997). When business environments are uncertain and dynamic, the firms require organizational agility, good strategies, entrepreneurial administration, and strong dynamic capabilities to be able to pursue growth and financial performance (Teece, 2014a). Therefore, strong dynamic capabilities are

required to support the organizational agility in facing uncertainty provoked by the external environment, like innovation and competition (Teece et al., 2016).

7.2.3 Institutional economics (IE)

Institutional economics theory (North, 2005) is described as the constraints that structure how the society interacts. North (1990) suggested that institutions can be classified into formal and informal. On the one hand, formal institutions include constitutions, regulations, and contracts; on the other hand, informal institutions include attitudes, values, norms of behavior, and conventions. Bruton et al. (2010) consider IE useful for understanding which factors boost opportunity entrepreneurship; these authors affirm the lack of research that examines informal institutions in the entrepreneurial context. Besides, Bruton et al. (2010) mention that the IE framework is relevant in the entrepreneurship research field. Veciana and Urbano (2008) classified formal and informal institutions in entrepreneurship, wherein formal conditions include agencies, policies and procedures, and informal conditions comprise networks, roles, models, and attitudes. Urbano and Alvarez (2014) maintained that informal conditions have a stronger impact on entrepreneurial activity.

However, for Acs et al. (2008) the entrepreneurial capability of an economy can also be interpreted by the formal institutional environment combining political, economic, and legal structures. As the environments become more complex and diversified for entrepreneurship across countries, study of the institutional context of a country and its relationship with entrepreneurship becomes critical (Veciana & Urbano, 2008). North (1990) clarifies that formal institutions represent a stable construction of informal ones, and that both institutions evolve and adapt through the driving of, for example, informal and formal social associations like households, villages, networks, firms, parties, and governments (Casson et al., 2010). For North in 1990, formal institutions represent structures of codified and explicit rules and standards that model interaction among societal members. Also, formal institutions foster order and stability by providing authoritative behavioral guidelines and enabling the formation of expectations regarding behavior (Holmes, Miller, Hitt, & Salmador, 2013). Therefore, this study focuses on the informal and formal institutions of the institutional approach.

7.3 Hypotheses development

As mentioned before, the main objective of this investigation is to explore the consequences of dynamic capabilities in new ventures, specifically competitiveness within an international context. Therefore, the grounding of the research in the RBV, IE, and DC will be one of its contributions, because this study will provide quantitative research in this field through the operationalization of variables related to these theories that support the following hypotheses. Considering that competitiveness is considered in the literature as an expression of performance, productivity, or development, we develop the following hypotheses.

7.3.1 Innovation capabilities and competitiveness

To evaluate the conditions under which innovation capabilities contribute to firm performance, we consider the research done by Jeng and Pak (2016), who argue that innovation contributes positively to a firm's performance. Innovations can involve operations or products, and by modifying production and operations firms can increase their efficiency; by expanding the characteristics of the products or services they are offering, firms can increase demand among their existing customers; and by introducing novel offers, firms can attract new customers (Fosfuri & Giarratana, 2009). In sum, innovation is considered a critical determinant of performance, mainly because it enables firms to be competitive and to respond to rapidly changing markets (Helfat & Peteraf, 2003; Hult, Hurley, & Knight, 2004; Teece, 2007). Considering Teece's (2007) dynamic capability perspective, existing capabilities are deployed by innovation activities and new capabilities are created more effectively, which supports long-term performance. Zhang and Liu (2010) conclude that greater innovation capabilities result in higher innovation results and higher sales growth. Other studies show that innovation is a critical determinant of firm performance, mainly because it leads to a competitive edge and anticipation of rapidly changing markets (Helfat & Peteraf, 2003). Also, Keskin's (2006) findings suggest that firm innovation capabilities positively affect firm performance in SMEs. In the same way, Saunila (2014) concludes that three aspects of innovation capability—ideation and organizing structures, participatory leadership culture, and know-how development—have an effect on firm performance in SMEs. Likewise, Aparicio et al. (2016), find that innovative entrepreneurs are positively related to economic growth. The World Economic Forum (WEF) defines competitiveness as the institutions, policies and factors that dictates the level of productivity of a country (World Economic Forum, 2018). To calculate the Global Competitiveness Index, the World Economic Forum assumes that countries

move from the factor-driven to the efficiency-driven and, finally, to the innovation-driven stage, so factors are weighted based on the development level of country (World Economic Forum, 2014). Based on these arguments, the proposed hypothesis is as follows:

Hypothesis 1. Innovation capabilities are positively related to competitiveness.

Hypothesis 1a. Market innovation is positively related to competitiveness.

7.3.2 Dynamic capabilities and competitiveness

The research done by Drnevich and Kriauciunas (2011) suggests that dynamic capabilities contribute to a firm's performance, considering it as a relationship relative to competition: in other words, the more a firm uses dynamic capabilities more than its competitors, the higher the relative performance. These authors explain that dynamic capabilities enable the firm to change, among others, its processes, products, and services. Other authors suggest that dynamic capabilities positively affect firm performance by allowing firms to identify and respond to opportunities through the development of new processes, products, and services (Chmielewski & Paladino, 2007; Makadok, 2001, 2010; Zou, Fang, & Zhao, 2003), which also has the potential to increase revenue. Besides, dynamic capabilities can improve the speed, effectiveness, and efficiency with which firms operate and respond to changes in their environment (Chmielewski & Paladino, 2007; Hitt, Bierman, Shimizu & Kochhar, 2001; Tallon, 2008). These improvements with respect to dealing with environmental changes positively affect firm performance by allowing the firm to take advantage of revenue-enhancing opportunities and, at the same time, to adjust its operations to reduce costs. Also, dynamic capabilities offer firms intangible decision options, and therefore provide the potential for higher performance contributions (Eisenhardt & Martin, 2000; Zhu, 2004)—that is, increased revenues or profits. For Zapata-Cantu, Cantu Delgado, and Gonzalez (2016), dynamic capabilities represent a strong base for obtaining an enduring competitive advantage. Wu (2007) demonstrates that dynamic capabilities mediate between entrepreneurial resources and performance. Also, Lin and Wu (2014) argues that dynamic capabilities are considered as a transformer, converting resources into improved performance; in this way, Lin confirms that dynamic capabilities can mediate the firm's valuable, rare, inimitable, and non-substitutable resources to improve performance. Furthermore, Pezeshkan, Fainshmidt, Nair, Frazier, and Markowski (2016) identify dynamic capabilities examined independently or in interaction with contextual or organizational variables. Morrell and Learmonth (2015) consider among the consequences for management learning and education that is needed to bring into play

diverse bodies of knowledge, and use various points of view, including exploring with other parts different ways of arranging problems and determining intentions. Given these arguments, we thus propose that:

Hypothesis 2. Dynamic capabilities are positively related to competitiveness

Hypothesis 2a. Sensing capabilities are positively related to competitiveness.

7.3.3 Formal institutions and competitiveness

The levels of competitiveness among countries have been measured by several institutions that have developed different indices. However, two indices stand out: the World Competitiveness Rankings (WCR), developed by the International Institute of Management and Development (IMD); and the Global Competitiveness Indicators (GCI), constructed by the World Economic Forum (WEF) (Im & Choi, 2018). Mainly, these indicators consider national competitiveness related to how a country can be friendly to business, considering at the same time economic and market measurements. However, these authors argue that competitiveness needs to include not only business climate, but also other dimensions like government regulations. Based on these arguments, we propose that:

Hypothesis 3. Formal institutions are positively related to competitiveness.

Hypothesis 3a. Government effectiveness is positively related to competitiveness.

7.3.4 Informal institutions and competitiveness

Socio-cultural factors (shared values, norms, and attitudes) are identified as factors that affect international competitiveness in small open economies (Apsalone & Šumilo, 2015). Throsby (2001) considers the relationship between economics and culture and concludes that culture affects productivity through social processes, attitudes, and abilities. According to Javidan and House (2002), since organizational cultural differences and similitudes affect the way of doing business globally, cross-cultural studies related to negotiations, mergers, and leadership have provided meaningful ideas to business representatives to overcome international challenges. Furthermore, Kogut and Singh (1988) find effects of national culture on the choice of entry mode: in this way, the investment of companies overseas is affected by cultural differences among countries. Based on these arguments, the proposed hypothesis is as follows:

Hypothesis 4. Informal institutions are positively related to competitiveness.

Hypothesis 4a. Control of corruption is positively related to competitiveness.

7.3.5 Moderating effects of formal institutions

Innovation capabilities or dynamic capabilities alone in the model might not show their effect on the competitiveness of a country. Alternatively, interaction with formal institutions like government effectiveness may influence the relationship of innovation capabilities or dynamic capabilities with national competitiveness. In previous research, environmental variables have been used as moderators between government indicators and competitiveness, like in the study by Srivastava and Teo (2008), who analyze the moderating effect of complementary resources like the quality of public institutions and macro-economic conditions in the relationship between e-government and national business competitiveness. Based on these arguments, we propose that:

Hypothesis 5. Formal institutions have a moderating effect on the relationship between innovation capabilities and competitiveness.

Hypothesis 5a. Government effectiveness has a moderating effect on the relationship between market innovation and competitiveness

Hypothesis 6. Formal institutions have a moderating effect on the relationship between dynamic capabilities and competitiveness.

Hypothesis 6a. Government effectiveness has a moderating effect on the relationship between sensing capabilities and competitiveness.

7.3.6 Moderating effects of informal institutions

In the same way, Srivastava and Teo (2008) analyze other environmental variables that act as moderators between government indicators and competitiveness. For example, the quality of human capital in the relationship of e-government and national business competitiveness. Lewellyn (2014) explored the direct effects of formal institutions on initial public offerings and the indirect effects of informal institutions represented by national culture. Other research has suggested that there are moderating effects of country-specific factors like the owner identification prevalence in the relationship between country exports and foreign direct investment with competitiveness drivers (Carney, Duran, van Essen, & Shapiro, 2017). Belitski, Chowdhury, and Desai (2016) investigate the effects that corporate tax rates have on firm entry and the interaction effect of corruption in that relationship. Based on these arguments, the proposed hypothesis is as follows:

Hypothesis 7. Informal institutions have a moderating effect on the relationship between innovation capabilities and competitiveness.

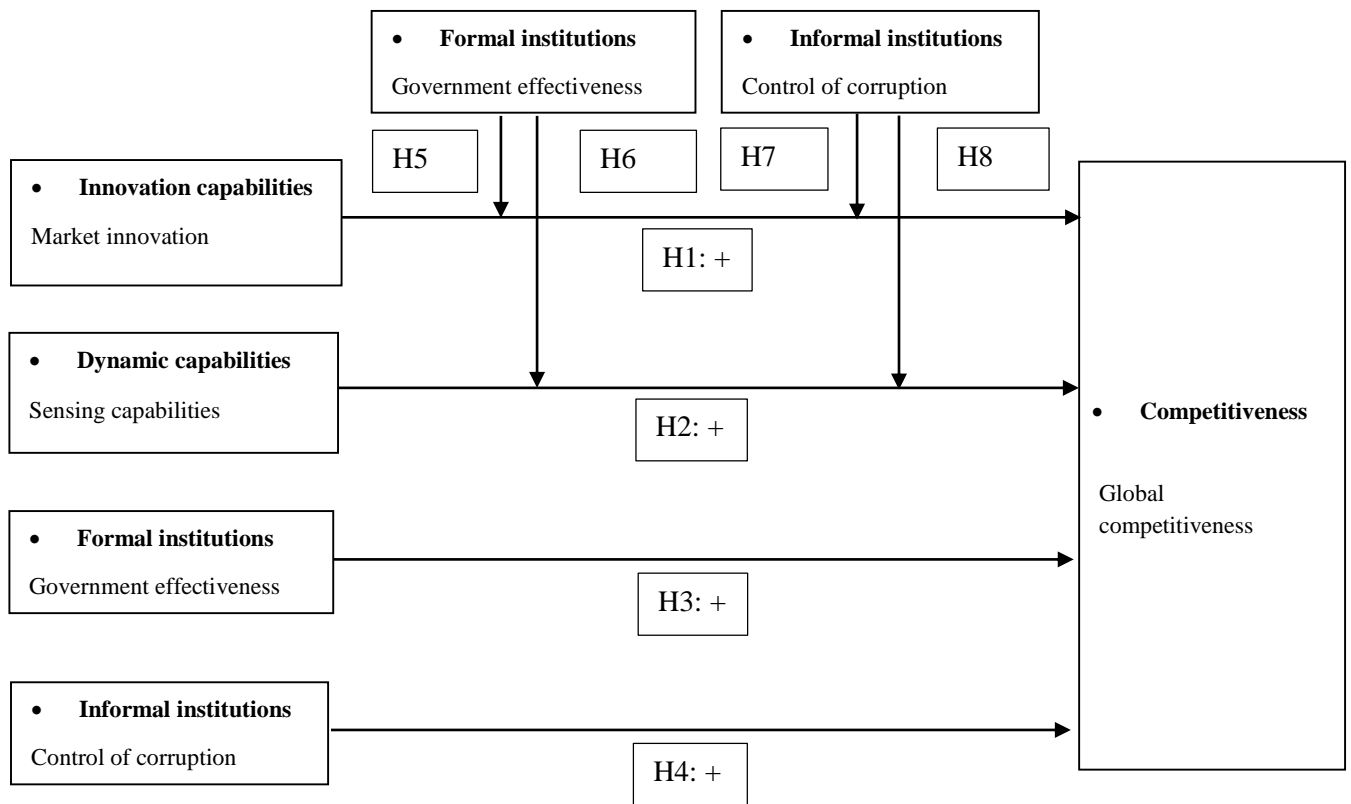
Hypothesis 7a. Control of corruption has a moderating effect on the relationship between market innovation and competitiveness.

Hypothesis 8. Informal institutions have a moderating effect on the relationship between dynamic capabilities and competitiveness.

Hypothesis 8a. Control of corruption has a moderating effect on the relationship between sensing capabilities and competitiveness.

Figure 7.1 illustrates each of the hypotheses previously explained.

Figure 7.1 Model



7.4 Methodology

7.4.1 Data

Explicit use is made of the RBV, IE, and DC approaches to test a model with panel data at the national level that investigates how innovation capabilities, dynamic capabilities, formal institutions, and informal institutions are related to competitiveness, and to study how formal and

informal institutions moderate the effect of innovation capabilities and dynamic capabilities in competitiveness.

This research is done using besides the APS of the GEM, the WDI, the GCR, the WGI, and the World Economic Outlook data base of the IMF for the years 2007–2014 and including 30 countries (see Appendix 10).

In this research, the competitiveness of a country is represented by the dependent variable global competitiveness. The measurements to be used as independent variables are market innovation, sensing capabilities, government effectiveness, and control of corruption.

7.4.2 Variables

7.4.2.1 Dependent variable

For this research, we study the Global Competitiveness Index competitiveness variable to indicate the level of productivity in a country, where the scale ranges from 1 (worst) to 7 (best). This measurement is taken from the GER for the span of eight years, being 2007 to 2014. The Global Competitiveness Index is calculated by the WEF for around 140 economies and combines 114 indicators that are grouped in 12 pillars: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation. These pillars are organized in sub-indices: basic requirements, efficiency enhancers, and innovation and sophistication factors. Furthermore, these sub-indexes have different weights according to the level of development of each economy, calculated by GDP and share of exports (World Economic Forum, 2018). Hessels, Van Gelderen, and Thurik (2008) used country level data from the GEM and included socioeconomic variables to estimate their model. In this investigation, we include the economic variable competitiveness as the dependent variable.

7.4.2.2 Independent variables

Some independent variables come from the GEM data base, specifically from the APS, which measures the level and nature of entrepreneurial activity around the world (Monitor, 2017). Total early-stage entrepreneurial activity (TEA) is reflected within the measurement of the independent variables. TEA is one of the GEM's most well-known indices and represents the

percentage of the adult population (18–64) that is either a nascent entrepreneur or an owner-manager of a new business (up to 3.5 years). Other independent variables were taken from the WGI.

Innovation capabilities

For Chen, Zhu, and Yuan Xie (2004), the development of innovation capabilities depends on the human capital of the firm. In fact, this human capital has a positive influence on the social and intellectual capital of the firm. For Raymond et al. (2014), the more competent the employees are, the better their ability to develop a relationship with their customers, to understand their needs, and to satisfy them to guarantee their loyalty. In the GEM report, innovation is conceptualized as the intensity at which entrepreneurs offer products to the market that are new to the customers, and that are not offered by competitors (Monitor, 2017). For the purposes of this research, we consider innovation capabilities as a multidimensional construct including product innovation, market innovation, process innovation, and technological orientation. In this regard, we use the measurement market innovation, which reflects the percentage within the TEA in a new market (few businesses offer the same product). This measurement is obtained from the question: ‘Right now, are there many, few, or no other businesses offering the same products or services to your potential customers?’

Sensing capabilities

Teece et al. (1997, p. 521) define sensing capabilities as “the ability to calibrate the requirements for change and to effectuate the necessary adjustments”, contending that they “would appear to depend on the ability to scan the environment, to evaluate markets and competitors, and to quickly accomplish reconfiguration ahead of competition.” Pavlou and El Sawy (2011) describe sensing capabilities as the abilities to recognize, comprehend, and search for opportunities in the surroundings. In this way, following Pavlou and El Sawy (2011) and Teece (1997), sensing capabilities resemble opportunities perceived by entrepreneurs. Therefore, the measurement we use as a proxy of sensing capabilities is perceived opportunities, which represents the portion of people who foresee good conditions to start a business in the next six months, found in the GEM APS. (See Appendix 11).

Government effectiveness (formal institution)

The measurement we use for the independent variable government effectiveness is an estimate of governance taken for a period from 2007 to 2014 from the Worldwide Governance Indicators developed by the World Bank Group. This estimate of governance expresses perceptions of the conditions of public services, the capacity of the civil service and the magnitude of its autonomy from political adversities, the condition of policy formulation and implementation, and the believableness of the government's commitment to corresponding policies. Bénassy-Quéré, Coupet, and Mayer (2007) study government efficiency among other formal and informal institutions to review the impact of institutional quality on foreign direct investment. Lewellyn (2014) studies the relationship between the quality of formal institutions and initial public offerings, considering among the formal institutions government effectiveness.

Control of corruption (informal institution)

We also used the estimate of governance for the years 2007 to 2014 from the Worldwide Governance Indicators built up by the World Bank Group. This captures perceptions of the extent to which public function is exercised for private benefit, including both trivial and major forms of corruption. At the same time, it reflects the state behavior by a selective group and private affairs. Alvarez and Urbano (2011a) demonstrate that informal institutions like political stability, control of corruption, and role models have a relationship with entrepreneurial activity. Also, Aparicio et al. (2016) identify control of corruption as an informal institution in their study regarding opportunity entrepreneurship and economic growth.

7.4.2.3 Control variables

Socioeconomic variables for indicating the level of economic development and the rate of economic growth at the country level are considered as control variables in this research. Some of these were obtained from the World Economic Outlook data base (GDP per capita and GDP per capita growth), from the World Development Indicators (population, labor force, and total unemployment), from the Worldwide Governance Indicators (voice and accountability, political stability and absence of violence/terrorism, regulatory quality, and rule of law), and from the GEM APS (self-efficacy).

Reynolds et al. (2005) embrace the World Economic Outlook as the main source of measures of economic growth. Thus, we include GDP per capita as a control variable employed in analogous research using the GEM database analysis (Acs & Amorós, 2008; Bosma, 2013; Levie & Autio, 2008; Urbano, Aparicio and Audretsch; 2018). Self-efficacy is a measure representing the proportion of people who have the knowledge/skills and experience required to start a business. Fernandes, Ferreira, Raposo, Hernández, and Diaz-Casero (2017) study how self-efficacy affects the creation of new ventures. Also, Bohlmann, Rauch, and Zacher (2017) propose that perceived skills (self-efficacy) increase entrepreneurial activity, acknowledging Bandura’s (1993) remarks and determining that perceived skills for entrepreneurship mirror entrepreneurial self-efficacy. (See Appendix 11).

Table 7.1 presents the description of the variables used in this study, including their sources.

Table 7.1 Description of variables

| Description of Variables | Construct | Measure | Description | Source |
|------------------------------|--------------------------|--|--|-------------------|
| Dependent variable | Competitiveness | Global competitiveness index | Level of the productivity of an economy. | GCR 2007–2014 |
| Independent variables | Innovation capability | Market innovation | Percentage within the TEA in a new market (few businesses offer the same product). | APS GEM 2007–2014 |
| | Dynamic capability | Sensing capabilities (perceived opportunities) | Percentage of the 18–64-year old population that foresees good conditions to start a business within the next six months in their living area. | APS GEM 2007–2014 |
| | Government effectiveness | Estimate of governance | Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2007–2014 |
| | Control of corruption | Estimate of governance | Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as capture of the state by | WGI 2007–2014 |

| | | | | |
|-----------------|---|--|---|---------------|
| | | | elites and private interests. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | |
| Controls | GDP per capita | GDP per capita (constant 2005 US\$) | Gross domestic product divided by midyear population. | IMF 2007–2014 |
| | GDP per capita growth | GDP growth (annual %) | Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 US dollars. | IMF 2007–2014 |
| | Population | Population, total | Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates. | WDI 2007–2014 |
| | Labor force | Labor force, total | Labor force comprises people aged 15 and older who supply labor for the production of goods and services during a specified period. It includes people who are currently employed and people who are unemployed but seeking work as well as first-time job-seekers. | WDI 2007–2014 |
| | Unemployment, total | Unemployment, total (% of total labor force) (national estimate) | Unemployment refers to the percentage of the labor force that is without work but available for and seeking employment. Definitions of labor force and unemployment differ by country. | WDI 2007–2014 |
| | Voice and accountability | Estimate of governance | Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2007–2014 |
| | Political stability and absence of violence/terrorism | Estimate of governance | Political stability and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2007–2014 |
| | Regulatory quality | Estimate of governance | Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Values range from -2.5 (weak) to 2.5 (strong) governance performance. | WGI 2007–2014 |
| | Rule of law | Estimate of governance | Captures 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, | WGI 2007–2014 |

and the courts, as well as the likelihood of crime and violence. Values range from -2.5 (weak) to 2.5 (strong) governance performance.

| | | | |
|---------------|------------------|--|-------------------|
| Self-efficacy | Perceived skills | Percentage of the 18–64–year old population that has the knowledge, skills, and experience required to start a new business. | APS GEM 2007–2014 |
|---------------|------------------|--|-------------------|

^aGlobal Competitiveness Report (GCR) of the World Economic Forum (WEF): <https://es.weforum.org/reports/>; Global Entrepreneurship Monitor (GEM): <http://www.gemconsortium.org>; International Monetary Fund (IMF): <https://www.imf.org/external/index.htm>; World Development Indicators (GDI) by World Bank: <http://databank.worldbank.org/data/home.aspx>; Worldwide Governance Indicators (WGI) by World Bank Group: <http://info.worldbank.org/governance/wgi/#home>

7.4.3 Data analysis and model

In this empirical investigation, emphasis is placed on the effect of innovation capabilities, dynamic capabilities, and formal and informal institutions on competitiveness. According to Teece (2016), future research should study the connection between managerial actions, dynamic capabilities, and long-run firm performance. In this way, this study will provide quantitative research on the field through the operationalization of variables related to the RBV, IE, and DC theories that support the following equation:

$$C_i = \alpha + \beta_1 K_{it} + \beta_2 S_{it} + \beta_3 F_{it} + \beta_4 I_{it} + \beta_5 VC_{it} + \epsilon_{it} \quad (1)$$

$i = 1, 2, 3, \dots, 30$ countries

$t = \text{year } 2007, \text{ year } 2008, \dots, \text{ year } 2014$

where K represents the innovation capabilities measurement, market innovation; S represents the dynamic capabilities measurement, sensing capabilities; F represents the formal institutions (government efficiency) and I the informal institutions (control of corruption); VC represents the control vector that influences competitiveness C in country at time t . The vector of control comprises GDP per capita, GDP growth, population, labor force, unemployment, voice and accountability, political stability and absence of violence/terrorism, regulatory quality, rule of law, and self-efficacy. Data analysis is performed by applying panel data using GEM at the national level; the GDP per capita reported by the IMF; the Competitiveness Report from the World Economic Forum; the population, labor force, and unemployment reported by the World Development Indicators from the World Bank; and the voice and accountability, political stability

and absence of violence/terrorism, regulatory quality, and rule of law reported by the Worldwide Governance Indicators from the World Bank Group.

To determine whether formal institutions and informal institutions moderate the relationship of innovation capabilities and dynamic capabilities with competitiveness, we consider the second equation in the form:

$$C_i = \alpha + \beta_1 Kit + \beta_2 Sit + \beta_3 Fit + \beta_4 Iit + \beta_5 VCit + \beta_6 KFit + \beta_7 Klit + \beta_8 SFit + \beta_9 SIit + \epsilon_{it} \quad (2)$$

$$i = 1, 2, 3, \dots, 30 \text{ countries}$$

$$t = \text{year 2007, year 2008, } \dots, \text{ year 2014}$$

where $K \times F$ represents the interaction between market innovation and formal institutions; $K \times I$ represents the interaction between market innovation and informal institutions; $S \times F$ represents the interaction between dynamic capabilities and formal institutions; and $S \times I$ represents the interaction between dynamic capabilities and informal institutions.

Therefore, we estimate this set of equations using the unbalanced panel data for the period 2007–2014. The final sample consists of 240 observations and 30 countries.

The dependent variable competitiveness, represented by the global competitiveness index, is the main indicator of the GCR, and indicates productivity. With respect to the independent variables, the questions included in the APS questionnaire are also detailed (see Appendix 11).

7.5 Results

Table 7.2 indicates the means and standard deviations of all the variables that are studied in this investigation. The dependent variable competitiveness shows an average of 4.68. Regarding the dependent variables, countries are characterized by medium levels of innovation capability (37.39) and dynamic capability (35.94).

The correlation matrix illustrates the correlation coefficients of the same variables. It reports that competitiveness is significantly correlated with GDP per capita, rule of law, government effectiveness, and control of corruption. Also, innovation capability is significantly correlated with voice and accountability, and the dynamic capability sensing capability is significantly correlated with self-efficacy. GDP per capita is significantly correlated with voice and accountability, political stability and absence of violence/terrorism, regulatory quality, rule of

law, government effectiveness, and control of corruption. Furthermore, government effectiveness is significantly correlated with voice and accountability, political stability and absence of violence/terrorism, regulatory quality, and rule of law. Finally, control of corruption is significantly correlated with voice and accountability, political stability and absence of violence/terrorism, regulatory quality, rule of law, and government effectiveness.

A diagnostic test of multicollinearity was performed, and we found that this data set was unlikely to have this problem. In the same way, to address any possibility of heterogeneity, heteroskedasticity, contemporary correlation, and autocorrelation among observations regarding the sample of countries, correlated PCSEs were estimated.

Table 7.2 Descriptive statistics and correlation matrix

| | Mean | Std. Dev. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|------------|------------|------------|------------|--------|
| 1. Competitiveness | 4.6879 | 0.5913 | 1.0000 | | | | | | | | | | | | | | |
| 2. Innovation capability (market innovation) | 37.3936 | 8.0634 | 0.1533** | 1.0000 | | | | | | | | | | | | | |
| 3. Dynamic capability (sensing capabilities) | 35.9407 | 15.9951 | 0.0173 | 0.1762** | 1.0000 | | | | | | | | | | | | |
| 4. GDP per capita | 29508 | 22237 | 0.8173*** | 0.1700** | 0.0145 | 1.0000 | | | | | | | | | | | |
| 5. GDP per capita growth | 1.2556 | 3.8697 | -0.1328** | -0.2070** | 0.3295*** | -0.2914*** | 1.0000 | | | | | | | | | | |
| 6. Population | 91100000 | 242000000 | 0.0847 | -0.3768*** | -0.031 | -0.1973** | 0.3631*** | 1.0000 | | | | | | | | | |
| 7. Labor force | 49100000 | 140000000 | 0.081 | -0.3767*** | -0.0286 | -0.1971** | 0.3672*** | 0.9992*** | 1.0000 | | | | | | | | |
| 8. Unemployment, total | 9.4350 | 6.0430 | -0.4603*** | 0.1562** | -0.2683*** | -0.3788*** | -0.1462** | -0.1996** | -0.2009** | 1.0000 | | | | | | | |
| 9. Voice and accountability | 0.8000 | 0.7437 | 0.5602*** | 0.4150*** | 0.0234 | 0.7199*** | -0.3957*** | -0.6341*** | -0.6358*** | -0.1342** | 1.0000 | | | | | | |
| 10. Political stability and absence of violence/terrorism | 0.3757 | 0.7192 | 0.6258*** | 0.2507*** | -0.1147* | 0.7078*** | -0.2478*** | -0.2814*** | -0.2767*** | -0.3194*** | 0.7924*** | 1.0000 | | | | | |
| 11. Regulatory quality | 0.8858 | 0.7150 | 0.7857*** | 0.3275*** | 0.0135 | 0.7576*** | -0.2855*** | -0.3110*** | -0.3074*** | -0.2620*** | 0.8165*** | 0.7080*** | 1.0000 | | | | |
| 12. Rule of law | 0.8096 | 0.9048 | 0.8276*** | 0.3320*** | -0.0462 | 0.8350*** | -0.3100*** | -0.2742*** | -0.2720*** | -0.2625*** | 0.8625*** | 0.8189*** | 0.9409*** | 1.0000 | | | |
| 13. Government effectiveness | 0.8647 | 0.8241 | 0.8840*** | 0.3175*** | -0.0011 | 0.8476*** | -0.2760*** | -0.1801** | -0.1772** | -0.3319*** | 0.7906*** | 0.8029*** | 0.8961*** | 0.9607*** | 1.0000 | | |
| 14. Control of corruption | 0.8119 | 0.9943 | 0.8336*** | 0.3296*** | 0.106 | 0.8273*** | -0.2204*** | -0.2651*** | -0.2611*** | -0.3359*** | 0.8481*** | 0.8094*** | 0.8896*** | 0.9587*** | 0.9462*** | 1.0000 | |
| 15. Self-efficacy | 45.3408 | 13.3158 | -0.4440*** | 0.3223*** | 0.5267*** | -0.3818*** | 0.1227* | -0.1198* | -0.1186* | 0.1802** | -0.0839 | -0.3182*** | -0.2377*** | -0.2824*** | -0.3213*** | -0.2154*** | 1.0000 |

Notes: $N=22$ with 174 observations. *** $p<0.01$; ** $p<0.05$; * $p<0.10$

Table 7.3 Estimating competitiveness

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|---|-----------------------|------------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|
| Competitiveness | Coef. | Coef. | Coef. | Coef. | Coef. | Coef. | Coef. | Coef. |
| <i>Independent variables</i> | | | | | | | | |
| Market innovation | 0.0011** (0.0005) | 0.0007 (0.0006) | 0.0008 (0.0006) | 0.0012** (0.0005) | 0.0011** (0.0005) | 0.0010 (0.0007) | 0.0008 (0.0006) | 0.0014 (0.0009) |
| Dynamic capability (Sensing capabilities) | 0.0015** (0.0006) | 0.0015** (0.0006) | 0.0015** (0.0006) | 0.0004 (0.0012) | 0.001455 (0.0010) | 0.0004 (0.0012) | 0.0014 (0.0009) | 0.0001 (0.0012) |
| Government Effectiveness | 0.2291*** (0.0521) | 0.2098*** (0.0490) | 0.2248*** (0.0476) | 0.1929*** (0.0584) | 0.2292*** (0.0519) | 0.1817** (0.0555) | 0.2250*** (0.0473) | 0.0393 (0.0964) |
| Control of Corruption | 0.0576*** (0.0876) | 0.0602 (0.0878) | 0.0456 (0.0858) | 0.0477 (0.0891) | 0.0517 (0.1025) | 0.0495 (0.0901) | 0.0408 (0.1014) | 0.2220* (0.1342) |
| <i>Interactions</i> | | | | | | | | |
| Market innovationXGovernment Efficiency | | 0.0004 (0.0008) | | | | 0.0002 (0.0008) | | -0.0003 (0.0028) |
| Market innovationXControl of Corruption | | | 0.0004 (0.0006) | | | | 0.0004 (0.0006) | 0.0002 (0.0022) |
| Sensing capabilityXGovernment Efficiency | | | | 0.0010 (0.0009) | | 0.0010 (0.0009) | | 0.0058** (0.0017) |
| Sensing capabilityXControl of Corruption | | | | | 0.0001 (0.0006) | | 0.0001 (0.0006) | -0.0044 (0.0011) |
| <i>Controls</i> | | | | | | | | |
| GDPpercapita | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) |
| GDPpercapitagrowth | 0.0031 (0.0025) | 0.0031 (0.0025) | 0.0031 (0.0024) | 0.0038 (0.0024) | 0.0032 (0.0024) | 0.0037 (0.0024) | 0.0032 (0.0024) | 0.0027 (0.0024) |
| Population, total | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) |
| Labor force, total | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) | 0.0000 (0.0000) |
| Unemployment, total | 0.0018 (0.0021) | 0.0018 (0.0021) | 0.0018 (0.0020) | 0.0014 (0.0021) | 0.0017 (0.0020) | 0.0014 (0.0021) | 0.0018 (0.0020) | 0.0019 (0.0020) |
| Voice and Accountability | -0.0900 (0.1142) | -0.0961 (0.1168) | -0.0967 (0.1140) | -0.0782 (0.1147) | -0.0888 (0.1148) | -0.0822 (0.1185) | -0.0955 (0.1147) | -0.0732 (0.1187) |
| Political Stability and Absence of Violence/Terrorism | 0.0085 (0.0191) | 0.0081 (0.0189) | 0.0087 (0.0195) | 0.0066 (0.0187) | 0.0086 (0.0196) | 0.0063 (0.0184) | 0.0088 (0.0199) | -0.0057 (0.0192) |
| Regulatory Quality | 0.0056 (0.0499) | 0.0080 (0.0516) | 0.0096 (0.0515) | 0.0035 (0.0495) | 0.0060 (0.0500) | 0.0050 (0.0516) | 0.0098 (0.0516) | -0.0221 (0.0468) |
| Rule of Law | 0.0714 (0.0787) | 0.0750 (0.0747) | 0.0739 (0.0754) | 0.0756 (0.0817) | 0.0716 (0.0793) | 0.0777 (0.0781) | 0.0740 (0.0760) | 0.0851 (0.0732) |
| Self-efficacy | -0.0029* (0.0007) | -0.0029*** (0.0007) | -0.0029*** (0.0007) | -0.0022** (0.0007) | -0.0028*** (0.0007) | -0.0022** (0.0007) | -0.0028*** (0.0007) | -0.0025*** (0.0006) |
| Constant | 2.3082 (1.2367) | 0.0000 (omitted) | 2.3265* (1.2365) | 2.0805* (1.2501) | 0.0000*** (omitted) | 0.0000*** (omitted) | 2.2919* (1.1705) | 0.0000*** (omitted) |
| N of observations | 203 | 203 | 203 | 203 | 203 | 203 | 203 | 203 |
| N of groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| R ² | 0.9935 | 0.9935 | 0.9935 | 0.9937 | 0.9935 | 0.9937 | 0.9935 | 0.9938 |

Notes *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Table 7.3 contains the results of eight data panel models. Furthermore, fixed-effects coefficients, corrected standard errors, and significance levels are presented. Model 1 includes the innovation capabilities, dynamic capabilities, and formal and informal variables that are related to competitiveness. All the variables are significant ($p < 0.01$ and $p < 0.05$) and they explain more than 99 percent of competitiveness variation across countries. Model 2 combines, besides innovation capabilities, dynamic capabilities, and formal and informal variables, the interaction between market innovation and government efficiency. Some variables are significant ($p < 0.01$ and $p < 0.05$) and they explain more than 99 percent of competitiveness variation across countries. Model 3 comprises innovation capabilities, dynamic capabilities, formal and informal variables, and the

interaction between market innovation and control of corruption. Some variables are significant ($p < 0.1$ and $p < 0.05$) and the percentage predicted is 99 percent. Model 4 consists of innovation capabilities, dynamic capabilities, formal and informal variables, and the interaction between sensing capabilities and government efficiency. Some variables are significant ($p < 0.01$ and $p < 0.05$) and this model explains more than 99 percent of competitiveness variation across countries. Model 5 includes, besides innovation capabilities, dynamic capabilities, and formal and informal variables, the interaction between sensing capability and control of corruption. Some variables are significant ($p < 0.01$ and $p < 0.05$) and they explain more than 99 percent of competitiveness variation across countries. Model 6 combines innovation capabilities, dynamic capabilities, formal and informal variables, and two interactions—the interaction between market innovation and government effectiveness, and the interaction between sensing capabilities and government effectiveness. One variable is significant ($p < 0.1$) and the percentage predicted is 99 percent. Model 7 comprises innovation capabilities, dynamic capabilities, formal and informal variables, and two interactions—the interaction between market innovation and control of corruption, and the interaction between sensing capabilities and control of corruption. One variable is significant ($p < 0.1$) and the percentage predicted is 99 percent. Model 8 consists of innovation capabilities, dynamic capabilities, formal and informal variables, and four interactions (the interaction between market innovation and government effectiveness, the interaction between sensing capabilities and government effectiveness, the interaction between market innovation and control of corruption, and the interaction between sensing capabilities and control of corruption). Some variables are significant ($p < 0.01$ and $p < 0.05$) and the model explains more than 99 percent of competitiveness variation across countries.

Hypothesis 1 proposes that innovation capabilities are positively related to competitiveness. Specifically, Hypothesis 1a suggests that market innovation is positively related to competitiveness. The results from Models 1, 4, and 5 show that the coefficient estimate for market innovation is statistically significant and positive.

Hypothesis 2 proposes that dynamic capabilities are positively related to competitiveness. Specifically, Hypothesis 2a suggests that sensing capabilities are positively related to competitiveness. The results from Models 1, 2, and 3 show that the coefficient estimate for sensing capabilities is statistically significant and positive. Therefore, the results support Hypothesis 2 in that dynamic capabilities are positively related to competitiveness.

Hypothesis 3 proposes that formal institutions are positively related to competitiveness. Specifically, Hypothesis 3a suggests that government effectiveness is positively related to competitiveness. The results from Models 1, 2, 3, 4, 5, 6, and 7 show that the coefficient estimate

for government effectiveness is statistically significant and positive. Therefore, the results support Hypothesis 3 in that formal institutions are positively related to competitiveness.

Hypothesis 4 proposes that informal institutions are positively related to competitiveness. Specifically, Hypothesis 4a suggests that control of corruption is positively related to competitiveness. The results from Models 1 and 8 show that the coefficient estimate for control of corruption is statistically significant and positive. Therefore, the results support Hypothesis 4 in that informal institutions are positively related to competitiveness.

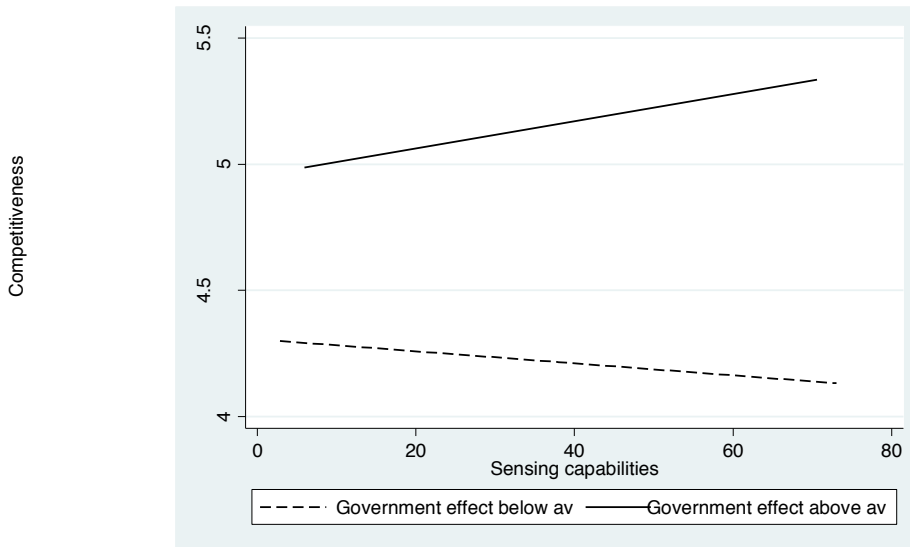
Hypothesis 5 proposes that formal institutions moderate the relationship between innovation capabilities and competitiveness. Specifically, it is proposed in Hypothesis 5a that government effectiveness moderates the relationship between market innovation and competitiveness. The results in Models 2, 6, and 8 indicate the interaction term where the coefficient is not significant. Hence, regarding Hypothesis 5, the results indicate that formal institutions do not moderate the relationship between innovation capabilities and competitiveness.

Hypothesis 6 proposes that formal institutions moderate the relationship between dynamic capabilities and competitiveness. Specifically, it is proposed in Hypothesis 6a that government effectiveness moderates the relationship between sensing capabilities and competitiveness. The results in Models 4 and 6 indicate the interaction term where the coefficient is not significant. However, the results in Model 8 indicate the interaction between sensing capabilities and government effectiveness with a coefficient that is significant and positive. Hence, regarding Hypothesis 6, the results indicate that formal institutions moderate the relationship between dynamic capabilities and competitiveness. The moderating effect that government effectiveness has in this relationship is then demonstrated. Therefore, the relationship between sensing capabilities and competitiveness is different when there are different levels of government effectiveness. Hence, when sensing capabilities are perceived as the best to affect competitiveness, the immediate government effectiveness increases the competitiveness. This moderating effect allows the relationship between sensing capabilities and competitiveness to be different when government efficiency is below the average, in contrast with when government effectiveness is above the average (see Figure 7.2).

Hypothesis 7 proposes that informal institutions moderate the relationship between innovation capabilities and competitiveness. Specifically, it is proposed in Hypothesis 7a that control of corruption moderates the relationship between market innovation and competitiveness. The results in Models 3, 7, and 8 indicate the interaction term where the coefficient is not significant. Hence, regarding Hypothesis 7, the results indicate that informal institutions do not moderate the relationship between innovation capabilities and competitiveness.

Hypothesis 8 proposes that informal institutions moderate the relationship between dynamic capabilities and competitiveness. Specifically, it is proposed in Hypothesis 8a that control of corruption moderates the relationship between sensing capabilities and competitiveness. The results in Models 5, 7, and 8 indicate the interaction term where the coefficient is not significant. Hence, regarding Hypothesis 8, the results indicate that informal institutions do not moderate the relationship between sensing capabilities and competitiveness.

Figure 7.2 Interaction between sensing capabilities and government effectiveness



7.6 Discussion and conclusions

The results support Hypothesis 1 in that innovation capability is positively related to competitiveness. This finding provides evidence that concurs with Schwab and Sala-i-Martin (2015) on the theoretical model for the GCI in which competitiveness integrates business sophistication indicators such as firm innovation, control of international distribution in firms, firm reliance on professional management, and the level of cluster development. Also, this relationship is explicit in the case of technological innovation capabilities, which have a significant influence on product competitiveness of Chinese manufacturing enterprises (Liu & Jiang, 2016). It was observed, too, that dynamic capabilities, through sensing capabilities, have a positive relationship with competitiveness. This finding confirms the link between innovation and competitiveness at the national level studied previously by Nelson and Rosenberg (1993) and Porter (1990). Furthermore, government effectiveness is positively related to competitiveness, so we confirm Im and Choi's (2018) conclusions that competitiveness must comprise other factors besides business factors related to government measurements. Likewise, control of corruption has a positive relationship with competitiveness. Following Aparicio et al. (2016), who study how the informal

institution control of corruption influences opportunity entrepreneurship, which leads to economic growth, employment, and competitiveness, we find that control of corruption has a positive influence on competitiveness. Regarding the moderating effects, the results indicate that formal institutions moderate the relationship between dynamic capabilities and competitiveness. Current research similarly concurs in that informal institutions moderate the relationship of government indicators and national competitiveness (Srivastava & Teo, 2008).

7.6.1 Theoretical implications

This investigation contributes to the literature in several ways. Firstly, it advances knowledge on the entrepreneurial environment regarding the resource-based view framework (Penrose, 1959) and institutional economics theory (North, 1990) in the analysis of dynamic capabilities (Teece et. al 1997). In this respect, other investigations have found it valuable to integrate use of the IE theory, such as Peng, Sun, Pinkham, and Chen (2009), who utilized this theory to overcome criticisms of the industry-based and resource-based views and to support the movement focused on new institutionalism.

Secondly, this research contributes to knowledge of dynamic capabilities in new ventures, by associating them with the entrepreneurship field, and by applying empirical research within an international context, following the suggestion of Zahra et al. (2006), by using a sample of 30 countries using the APS of the GEM, the GCI of the WEF, the WGI of the WBG, and the WEO data base of the IIMF. Lastly, we contribute to a deep understanding of the complicated interaction between formal and informal institutions by including informal institutions together with the formal institutions, which is not common in the literature (Lewellyn, 2014).

7.6.2 Policy implications

Concerning policy implications, Teece (2016) affirms that the dynamic capabilities theory can offer the structure to improve economic study of essential aspects regarding firm performance in innovation economies. For policymakers who pursue higher competitiveness, we suggest the improvement of government effectiveness: this action may boost competitiveness when it moderates the relationship between sensing capabilities and competitiveness. Therefore, this research may assist policymakers with the objective of developing competitiveness in new ventures, considering the importance of formal and informal institutions together with dynamic capabilities and innovation capabilities for national advancement.

7.6.3 Limitations and future research lines

It is suggested that research be done on the following lines. Firstly, it is recommended to increase the number of countries and years to be investigated to broaden the sample so that richer

results can be obtained than those in this study. However, the sample may depend on the participation of countries in the GEM survey administration. Secondly, this investigation already considers three theories: RBV, IE, and DC. Nevertheless, drawing on the competitive advantage of nations from Porter (1990), more national level complementary resources together with the three mentioned theories and the moderator effects of formal and informal institutions may lead to a deeper analysis of national competitiveness, as in Srivastava and Teo (2008). Thirdly, Apsalone and Šumilo (2015) link socio-cultural factors and international competitiveness by analyzing the impact of socio-cultural factors on entrepreneurship. Therefore, further research might assess the five cultural dimensions developed and studied by Hofstede (2001) to obtain more knowledge of how competitiveness is influenced by culture when moderated by formal and/or informal institutions. Finally, following Lewellyn (2014), further investigations could examine the moderating effect of socio-cultural factors, such as collectivism (Hofstede, 2001), on the relationship between sensing capabilities and competitiveness, since the dimensions of culture might affect entrepreneurs' perceptions of opportunities to start a new venture.

7.6.4 Conclusions

The main objective of this research is to study the consequences of dynamic capabilities in new ventures, specifically competitiveness within an international context. The specific objectives of the investigation are to analyze the relationship between dynamic capabilities in new ventures and competitiveness, to investigate the relationship between formal and informal institutions and competitiveness, and to examine the moderating effect of formal and informal institutions on the relationship between dynamic capabilities in new ventures and competitiveness. Through eight unbalanced panel data models, the research demonstrates that the innovation capability market innovation is positively related to competitiveness. Also, we find that the dynamic capabilities sensing capabilities have a positive relationship with competitiveness. Furthermore, we determine that formal institutions are positively related to competitiveness—specifically, government effectiveness is positively related to competitiveness. Moreover, we determine that control of corruption, as an informal institution, has a positive relationship with competitiveness. Additionally, interactions are analyzed. One group of interactions shows that informal institutions do not moderate the relationship between innovation capabilities and competitiveness; nor do informal institutions moderate the relationship between sensing capabilities and competitiveness. In the other group of interactions, we find that formal institutions do not moderate the relationship between innovation capabilities and competitiveness. However, we find one interaction that confirms the moderating effect of the formal institution government effectiveness in the relationship between dynamic capabilities and competitiveness.

CHAPTER 8
CONCLUSIONS

8. CONCLUSIONS

8.1 Main conclusions

Because of the limited investigation in the literature concerning the precedents and effects of dynamic capabilities in new firms, the main objective of this research has been to study the antecedents and consequences of the dynamic capabilities in new ventures. Specifically, the objectives of this thesis were to examine the institutional environment that affects the dynamic capabilities (formal and informal institutions) in new ventures; to examine the antecedents of the dynamic capabilities (human capital and both formal and informal institutions) in new ventures; to analyze the effect of open innovation on dynamic capabilities (open innovation capabilities and informal institutions); and to study the effect of dynamic capabilities on competitiveness. Overall, considering institutional economics theory, resource-based theory, human capital theory, and open innovation theory, the results of this research show the significant effect of antecedents on dynamic capabilities, as well as effect of dynamic capabilities on competitiveness.

The hypotheses have been tested in a global context. In that respect, the research has used mainly the Global Entrepreneurship Monitor data from both the Adult Population Survey and the National Expert Survey, the Global Competitiveness Report, the World Development Indicators, Worldwide Governance Indicators, the Eurostat Community Innovation Survey, and the International Monetary Fund, specifically the World Economic Outlook data base. Additionally, the research techniques that have been used throughout the thesis are systematic literature review, unbalanced data panel, and multi-regression analysis. Table 8.1 summarizes the primary findings of the investigation.

Table 8.1 Summary of the main results of the research

| | Chapter | Theoretical Framework | Dependent Variable | Independent Variables | Methodology | Main results |
|---------------------------------------|---------|-----------------------|------------------------------|--|--|--|
| Phase 1: Literature Review | 2 | - | | - | Literature review of 99 articles published in the top business economics journals in the fields of business and entrepreneurship | The results show the current state of the art in the dynamic capabilities literature. Additionally, it highlights two main streams of research: antecedents of DC and consequences of DC in new ventures. |
| Phase 2: Antecedents | 3 | DC, IE | Entrepreneurial capabilities | Finance, Government Policies, Governmental programs, Market openness, Physical Infrastructure, Intellectual Property Rights, Abilities and knowledge to start-up, Entrepreneur social image, and Women's support to start up | Unbalanced Panel data, 2006- 2012 GEM data for 22 countries (131 observations) | The results show that formal and informal institutions influence DC in new ventures. Also, an interaction was identified, the relationship between formal institutions and DC in new ventures is moderated by informal institutions. |
| | 4 | DC, HC, IE | Sensing capabilities | Education Training Research and development transfer Physical infrastructure | Unbalanced Panel data, 2006-2013 GEM data for 21 countries (147 observations) | The findings demonstrate that human capital and formal institutions influence DC in new ventures. Furthermore, the influence of human capital over DC is stronger when formal institutions moderate their relationship. |
| | 5 | DC, HC, IE | Learning capabilities | Abilities and knowledge to start-up, Education (entrepreneurial education at school stage), Training (entrepreneurial education at post school stage), Entrepreneur social image, Women's support to start up, and Attention to high growth | Unbalanced Panel data, 2006-2013 GEM data for 21 countries (147 observations) | The fundamental results determine, that human capital and informal institutions have a direct relationship with DC in new ventures. Moreover, there were identified indirect stronger relationships between human capital and DC when moderated by informal institutions. |
| | 6 | DC, IE, OI | Sensing capabilities | Learning capabilities, Cooperation with other firms, Cooperation with competitors, Cooperation with clients of private sector, Cooperation with clients of public sector, Cooperation with suppliers, Cooperation with universities, Interest in innovation and Attention to high growth | Multiple-regression, 2012 GEM and ECIS data for 24 countries (24 observations) | The main findings suggest that learning capabilities negatively influence sensing capabilities. Nevertheless, the relationship between learning capabilities and sensing capabilities become stronger when informal institutions act as moderators. |
| Phase 3: Consequences | 7 | DC, RBV, IE | Competitiveness | Innovation capabilities Dynamic capabilities Government effectiveness Control of corruption | Panel data, 2007-2014 GEM data and WGI indicators for 30 countries (203 observations) | The results determine that dynamic capabilities have a positive relationship with competitiveness. In addition, it was identified a moderating effect of the formal institution government effectiveness in the relationship between dynamic capabilities and competitiveness. |

8.2 Implications

As pointed out in Chapter 2, this thesis can contribute both theoretically and practically. We confirmed in that chapter that there is a gap in the literature regarding research and theory-building of dynamic capabilities in new ventures and SMEs. A further area of contribution is the development of research in the field of dynamic capabilities that combines the dynamic capabilities perspective with other theories such as the human capital theory and institutional economics approach. Regarding the type of research in the field, this research contributes by suggesting that the literature review should be updated in accordance with the latest investigations. Furthermore, this investigation contributes by engaging the application of other techniques in the empirical research that could include, for instance, logit, probit, and panel data. In the same way, this thesis contributes by pointing out that the analysis regarding the antecedents and consequences of dynamic capabilities in new ventures and SMEs should provide space for more investigation in an international context.

In Chapter 3, considering the dynamic capabilities and institutional economics frameworks, the relationship between institutional conditions (formal and informal) and dynamic capabilities in new ventures was examined. Hypotheses were assessed through unbalanced panel data models on a sample of 131 observations (22 countries) for the period 2006–2012. Using data from the Global Entrepreneurship Monitor, the International Monetary Fund, World Development Indicators, and Worldwide Governance Indicators, we find that formal and informal institutions influence dynamic capabilities (entrepreneurial capabilities) in new ventures. However, the relationship between formal institutions and dynamic capabilities (entrepreneurial capabilities) is strengthened when informal institutions are introduced as moderators. Specifically, it was observed that the formal institutions represented by finance, government programs, market openness 2, and physical infrastructure influence dynamic capabilities negatively while the formal institutions represented by government policies, market openness 1, and intellectual property rights influence dynamic capabilities positively. Furthermore, the informal institutions abilities-knowledge to start up, and women's support to start up influence dynamic capabilities positively, and entrepreneur social image influences dynamic capabilities positively. However, abilities-knowledge to start up, and entrepreneur social image influence dynamic capabilities negatively when interactions are included in the model. The negative moderation effects of informal institutions on the relationship between formal institutions and dynamic capabilities are represented by the interaction terms government policies and abilities-knowledge to start up, government policies and entrepreneur social image, and market openness 1 and entrepreneur social image. Furthermore, the positive moderation effects of informal institutions on the relationship

between formal institutions and dynamic capabilities are represented by the interaction terms market openness 1 and abilities-knowledge to start up, physical infrastructure, and entrepreneur social image, and physical infrastructure and women's support to start up. Our findings may serve to discuss implications on the enhancement of dynamic capabilities throughout improved institutional conditions.

Referring to Chapter 4, the study of the direct relationship of human capital and formal institutions with dynamic capabilities in new ventures was developed based on the dynamic capabilities, human capital, and institutional economics theories. Data were obtained from the Global Entrepreneurship Monitor, the International Monetary Fund, World Development Indicators, and Worldwide Governance Indicators for the years 2006 to 2013, considering a sample of 147 observations (21 countries). Through unbalanced panel data, the findings demonstrate that human capital and formal institutions influence dynamic capabilities (sensing capabilities) in new ventures. Furthermore, the influence of human capital on dynamic capabilities (sensing capabilities) is stronger when formal institutions moderate their relationship. Specifically, it was found that the human capital represented by education influences dynamic capabilities negatively and the human capital represented by training influences dynamic capabilities positively. Also, we observed that formal institutions represented by research and development transfer have a positive influence and those represented by physical infrastructure have a negative influence on dynamic capabilities. Furthermore, the negative moderation effect of formal institutions on the relationship between human capital and dynamic capabilities is represented by the interaction term training and research and development transfer, while the positive moderation effect of formal institutions on the relationship between human capital and dynamic capabilities is represented by the interaction term education and physical infrastructure. This research may be considered for the improvement of formal institutions with the objective to boost dynamic capabilities in new ventures..

Chapter 5 examined the direct influence of human capital and informal institutions on dynamic capabilities in new ventures derived from the human capital, institutional economics, and dynamic capabilities frameworks. Data from the Global Entrepreneurship Monitor, the International Monetary Fund, World Development Indicators, and Worldwide Governance Indicators were aggregated for the period 2006–2013, including a sample of 147 observations (21 countries). The basic results determine, through unbalanced panel data, that human capital and informal institutions have a direct relationship with dynamic capabilities (learning capabilities) in new ventures. Moreover, indirect stronger relationships between human capital and dynamic capabilities (learning capabilities) were identified when moderated by informal institutions. Specifically, it was identified that the human capital represented by abilities-knowledge to start

up, and education influence dynamic capabilities negatively, while the human capital represented by training influences dynamic capabilities positively. Also, we identified that the informal institution represented by entrepreneur social image has a negative influence on dynamic capabilities. On the other hand, the informal institutions represented by women's support to start up and attention to high growth have a positive influence on dynamic capabilities. The negative moderation effect of informal institutions on the relationship between human capital and dynamic capabilities is illustrated by the interaction term training and entrepreneur social image, while the positive moderation effects of informal institutions on the relationship between human capital and dynamic capabilities are depicted by the interaction terms education and entrepreneur social image, and abilities-knowledge to start up, and entrepreneur social image. This investigation may contribute to acknowledge the enhancement of informal institutions to stimulate dynamic capabilities in new ventures.

Referring to Chapter 6, this investigation explores the direct relationship of learning capabilities and open innovation capabilities with dynamic capabilities (sensing capabilities) in new ventures, considering the open innovation, the knowledge management capacity, and the institutional economics frameworks in the research on dynamic capabilities theory. Hypotheses were proposed and multi-regression analysis was applied to analyze the year 2012, considering a sample of 24 countries. Utilizing data from the Global Entrepreneurship Monitor, the International Monetary Fund, and the Eurostat Community Innovation Survey, the main findings suggest that learning capabilities negatively influence dynamic capabilities (sensing capabilities). Nevertheless, the relationship between learning capabilities and sensing capabilities becomes stronger when informal institutions act as moderators. In particular, it was determined that learning capabilities influence dynamic capabilities negatively. Also, we observed that the open innovation capabilities represented by cooperation with other firms and cooperation with clients in the private sector influence dynamic capabilities positively. Moreover, the open innovation capabilities represented by cooperation with competitors and cooperation with suppliers have a negative influence on dynamic capabilities, while the open innovation capabilities represented by cooperation with clients in the public sector and cooperation with universities do not influence dynamic capabilities. We also described that the informal institutions represented by interest in innovation (company) negatively influence dynamic capabilities and the informal institutions depicted as interest in innovation (customer) and attention to high growth influence dynamic capabilities positively. Moreover, the negative and positive moderation effects of informal institutions on the relationship between learning capabilities and dynamic capabilities are illustrated by the interaction terms learning capabilities and interest in innovation (customer), and

learning capabilities and interest in innovation (company), respectively. Similarly, the negative moderation effect of informal institutions on the relationship between open innovation capabilities and dynamic capabilities is illustrated by the interaction term cooperation with other firms and interest in innovation (customer). This work can illuminate discussions regarding the improvement of dynamic capabilities through strengthening the innovation processes in new ventures.

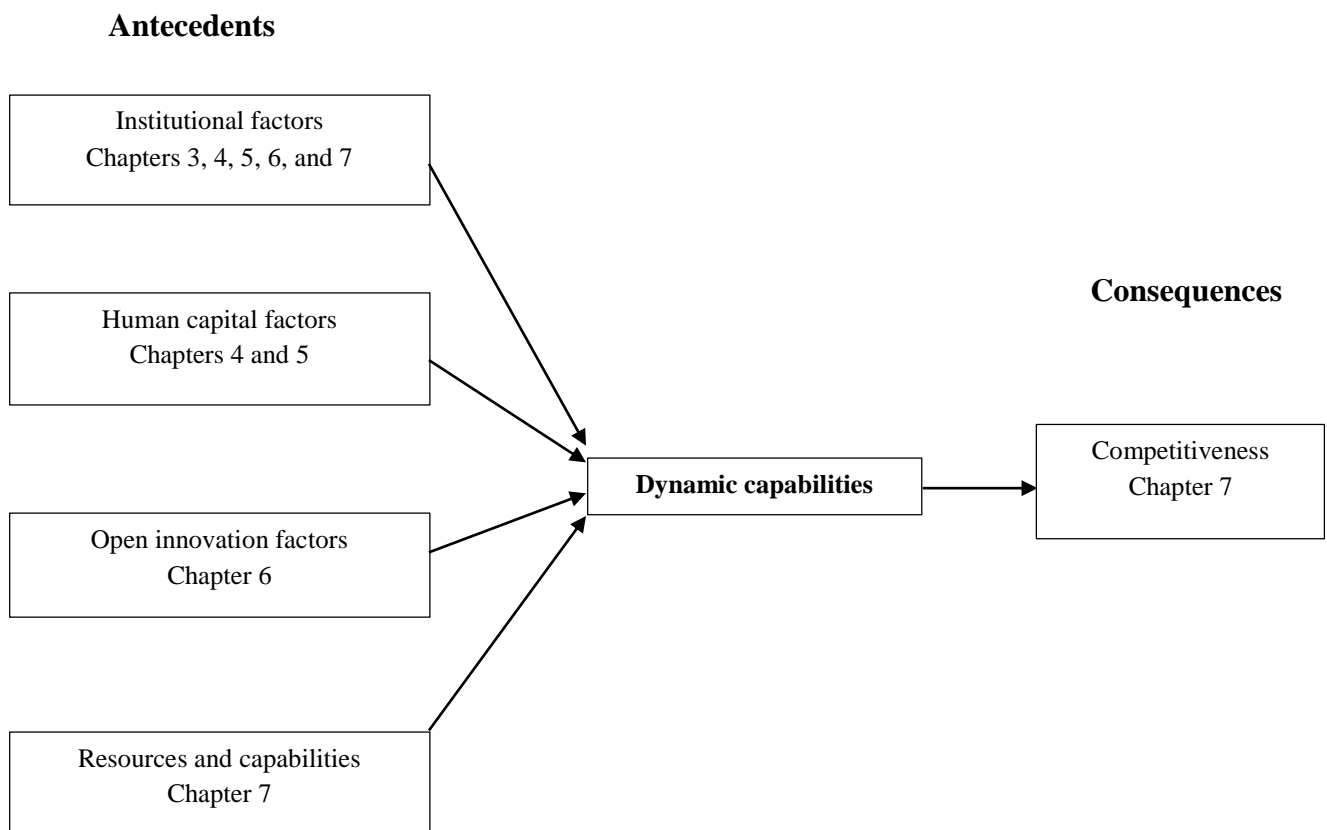
Regarding Chapter 7, this research examines the effects of dynamic capabilities in new ventures on competitiveness within an international context considering the dynamic capabilities, resource-based view, and institutional economics theories. The proposed hypotheses were evaluated through unbalanced panel data analysis for the years 2007–2014, including 203 observations (30 countries) in the sample. The results determine that dynamic capabilities (sensing capabilities) have a positive relationship with competitiveness by using data from the Global Competitiveness Report of the World Economic Forum, the Global Entrepreneurship Monitor, the International Monetary Fund, World Development Indicators, and Worldwide Governance Indicators. Moreover, we find that there is a moderating effect of the formal institution government effectiveness in the relationship between dynamic capabilities (sensing capabilities) and competitiveness. Principally, it was identified that the innovation capability represented by market innovation positively influences competitiveness and that the dynamic capabilities described as sensing capabilities positively influence competitiveness. The formal institution illustrated by government effectiveness also has a positive influence on competitiveness, and the informal institution depicted by control of corruption positively influences competitiveness. The positive moderation effect of formal institutions on the relationship between dynamic capabilities and competitiveness is explained by the interaction term sensing capabilities and government effectiveness. Thus, this work can be used as the trigger for a discussion on strengthening the impact of formal institution factors as moderators between dynamic capabilities in new ventures and national competitiveness.

Additionally, we point out some interrelated findings of the studied variables among the chapters of this thesis. For example, we observe that the formal institution represented by physical infrastructure reflects a similar positive relationship with dynamic capabilities (entrepreneurial capabilities) in Chapters 3 and 4. On the other hand, while the informal institution women's support to start up has a positive relationship with dynamic capabilities (entrepreneurial capabilities and learning capabilities, respectively) in Chapters 3 and 5, the informal institution attention to high growth has a positive relationship with dynamic capabilities (learning capabilities and sensing capabilities) in Chapters 5 and 6. Regarding the human capital variables, we showed that the human capital variable training has a positive relationship with both dynamic capabilities,

sensing capabilities and learning capabilities, in Chapters 4 and 5 respectively. In contrast, we found that the human capital variable education has a negative relationship with both dynamic capabilities, sensing capabilities and learning capabilities, in Chapters 4 and 5 respectively. Lastly, the informal institution variable entrepreneur social image has both a positive and a negative relationship with dynamic capabilities (entrepreneurial capabilities) when an interaction term is included in the model in Chapter 3, while entrepreneur social image has a negative relationship with dynamic capabilities (learning capabilities) with or without the interaction terms included in the model in Chapter 5.

Overall, based on previous research, this thesis contributes a general model for analyzing and comprehending the antecedents and consequences of dynamic capabilities. Figure 8.1 exhibits the structure of this model.

Figure 8.1 Theoretical model for the antecedents and consequences of dynamic capabilities



8.3 Limitations and future research lines

This research has both theoretical and empirical limitations, and recommends some future research lines. A theoretical limitation of this thesis is related to the decision concerning which variables should be included in the analysis, given the limited previous research in the field relating

to new ventures. In this instance, the main purpose of the investigation is to use variables (proxies) that are consistent with the extant literature. In future studies, better proxies could be utilized to avoid unambiguity, and factor analysis could be applied to the data before performing regressions. One of the empirical limitations is related to the fact that the lack of entrepreneurship data bases has limited the applicability of research on dynamic capabilities in entrepreneurship research papers, including this work. Therefore, future research could consider applying instruments that better measure dynamic capabilities in new ventures worldwide.

Another empirical limitation relates to the scope of the research. It is focused on countries that have participated in the GEM reports, leaving out other countries of the world. Consequently, further research should seek to overcome this shortcoming, and even to perform a comparative study between developing and developed countries or among regions of the world that facilitates a better understanding of dynamic capabilities in new ventures. In this sense, the participation of international research teams could benefit not only the production of high-quality reports but also the international level of the analysis. Also, there are limitations regarding the data size in Chapters 3, 4, 5, 6, and 7: it is therefore suggested that future research be done to improve the size of the sample by augmenting either the number of years or the number of countries to be analyzed.

This thesis is also limited to the study of the effects of institutional conditions on dynamic capabilities. Future research could consider besides the effects of the institutional conditions studied in Chapters 3, 4, 5, and 6, or the effects of dynamism on the dynamic capabilities themselves (Zahra et al., 2006), considering that managerial choices (King & Tucci, 2002) may play a role in the development of dynamic capabilities. Moreover, this research, even though it contributes with quantitative analysis, is limited to one construct related to dynamic capabilities. Thus, future quantitative research could employ multidimensional constructs of dynamic capabilities, including the component factors (adaptive capability, absorptive capability, and innovative capability) of the model proposed in Wang and Ahmed (2007). In this way, multidimensional constructs may include those from the definition offered by Barreto et al. (2010).

Another limitation is that this work does not consider the study of specific regions in Chapters 2, 3, 4, 5, and 7, while Chapter 6 considers the European context. For that reason, we suggest that future investigation considers specific contexts such as Latin America (Alvarez & Urbano, 2011a; Aparicio et al., 2016). Likewise, location, self-employment, or size of the business are not considered in this research, given the GEM conceptual framework (Kelley et al., 2015). Therefore, future research may consider the influence of these characteristics on dynamic capabilities (Jeng & Pak, 2016). Regarding education and training as part of the human capital factors, the main limitation in Chapters 4 and 5 is that the study does not consider the overall

educative programs of entrepreneurship and the greatest impact of repeated exposure to education on entrepreneurship (Gorman et al., 1997). Thus, further research should take into account the cumulative impact of both education and training in terms of their effectiveness and influence on dynamic capabilities in new ventures.

Referring to the study in Chapter 4 of how infrastructure as a formal institution affects dynamic capabilities, this research is limited, as Singh and Belwal (2008), in their research in Ethiopia, indicate that infrastructure needs to be supplemented by education and training to lead women entrepreneurs from small and micro enterprises to medium and large businesses. In this way, further investigation should consider the interaction among these three variables with the purpose of measuring the impact on dynamic capabilities in new ventures in several countries that share similar economic, political, or geographical environments.

Low et al. (2005) conclude that the development of infrastructure allows entrepreneurs to facilitate a connection with markets and suppliers in alternative locations and, by expanding communications, new ventures have access to new resources, assets, and information from other regions. For that reason, future research should examine the differences in infrastructure, communications, and utilities separately among different global regions—for instance, urban and rural areas. Moreover, in Chapter 4 the effects of formal institutions on dynamic capabilities are studied. However, the investigation is limited because it analyzes all the countries together without considering dissimilar environments in which the new ventures develop dynamic capabilities. In this regard, the Cuba Study Group (2011) and Hingtgen et al. (2015) point out that further analysis must be done of the entrepreneurial climate or external conditions conducive to the creation of new private ventures. Hence, future research should include quantitative comparative studies among groups of countries with similar external environments that measure the interventions of policymakers in formal institutions that directly or indirectly affect the dynamic capabilities in new ventures.

Regarding the effects of informal institution variables such as interest in high growth on dynamic capabilities in new ventures, the investigation in Chapter 5 is limited because it lacks interactions among the parties acting outside the firm (stakeholders). Kazadi et al. (2016) suggest investigating stakeholder co-creation capabilities and their outcomes. That is to say, the innovation process can be held either solely in the firm or co-created with external stakeholders with dissimilar dynamic capabilities. Therefore, further research should consider the effects of the interaction between stakeholders and the purpose to measure the impact on the dynamic capabilities in new ventures when innovation includes multiple stakeholders simultaneously. Future research should also examine differences of interest in high growth among countries that have factor-driven,

efficiency-driven, or innovation-driven economies so that this informal institution can be measured separately to contrast the effects on dynamic capabilities in new ventures. In addition, further investigation should include quantitative comparative studies among groups of countries that foster similar attention to high growth so that policymakers can act promptly on those variables that directly or indirectly affect the dynamic capabilities in new ventures.

In Chapter 6, this research does not consider the role that each firm plays during collaborations: this is indeed a limitation. Inter-firm collaborations allow innovation projects to be divided among several participants who can coordinate and join forces (Kim & Vonortas, 2014; Tether & Tajar, 2008). More investigation should therefore be done to consider the role that each firm plays in the collaboration arena—whether they are coordinators, leaders, or followers—by measuring the outputs from the roles these firms play. Moreover, cooperation helps new ventures focus on what they can do best rather than dissipating their energies across a broad range of innovation activities. Hence, further research might consider the degree of specialization of the firms, or the level of expertise on collaborative issues, with the purpose of knowing how to achieve greater efficiency of firms' collaborations. Additionally, new ventures share with other new ventures and SMEs a cost-rationalizing and risk-sharing view of collaboration; in this matter, the cost and risk associated with the open innovation activities could be taken into consideration in future research with the purpose of enhancing structure in the decision-making process when deciding when, how, or whom to collaborate with in open innovation activities. Wilkinson and Young (2002) consider the costs and burdens in the development of new collaborations with other organizations, which reflect the potential gains from exploitation. Hence, further research should include the negative impact of cooperation among firms.

Regarding Chapter 7, this research does not consider socio-cultural factors or cultural dimensions. Apsalone and Šumilo (2015) connect socio-cultural factors to international competitiveness by studying the influence of socio-cultural factors on entrepreneurship. In this vein, future research may measure the five cultural dimensions proposed by Hofstede (2001) to gather new insights into the influence of culture on competitiveness when moderated by formal or informal institutions. Lewellyn (2014) also suggests future research on the moderating effect of socio-cultural factors like collectivism (Hofstede, 2001): this effect may be studied in relation to the connection between sensing capabilities and competitiveness, given that dimensions of culture may affect entrepreneurs' capabilities regarding the starting of a new venture.

Finally, future research could utilize other research techniques to study dynamic capabilities: for instance, the use of structural equation modeling may offer further insights in this field. No previous studies have used this methodological approach for new ventures.

REFERENCES

REFERENCES

- Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of Political Economy*, 113(5), 949–995.
- Ackerman, P. L., & Humphreys, L. G. (1990). Individual differences theory in industrial and organizational psychology. *Handbook of Industrial and Organizational Psychology*, 1, 223–282.
- Acs, Z. J., & Amorós, J. E. (2008). Entrepreneurship and competitiveness dynamics in Latin America. *Small Business Economics*, 31(3), 305–322.
- Acs, Z. J., & Audretsch, A. (1991). *Innovation and small firms*. Cambridge, MA: MIT Press.
- Acs, Z. J., Desai, S., & Hessels, J. (2008). Entrepreneurship, economic development and institutions. *Small Business Economics*, 31(2–3), 219–234.
- Agarwal, R., Audretsch, D., & Sarkar, M. B. (2010). Knowledge spillovers and strategic entrepreneurship. *Strategic Entrepreneurship Journal*, 4(4), 271–283.
- Agwunobi, A., & Osborne, P. (2016). Dynamic capabilities and healthcare. *California Management Review*, 58(4), 141–161.
- Ahlstrom, D., & Bruton, G. D. (2002). An institutional perspective on the role of culture in shaping strategic actions by technology-focused entrepreneurial firms in China. *Entrepreneurship Theory and Practice*, 26(4), 53–70.
- Aidis, R., Estrin, S., & Mickiewicz, T. (2008). Institutions and entrepreneurship development in Russia: A comparative perspective. *Journal of Business Venturing*, 23(6), 656–672.
- Alvarez, S. & J. Barney (2000), “Entrepreneurial Capabilities: A Resource-Based View,” in *Entrepreneurship as Strategy: Competing on Entrepreneurial Edge* (ed., by G. D. Meyer & K. A. Heppard, Thousand Oaks, London, New Delhi: Sage Publications), pp.63-81.
- Alvarez, S. A., & Busenitz, L. W. (2001). The entrepreneurship of resource-based theory. *Journal of Management*, 27(6), 755–775.
- Alvarez, C., & Urbano, D. (2011a). Environmental factors and entrepreneurial activity in Latin America. *Academia Revista Latinoamericana de Administración*, 48, 126–139.
- Alvarez, C., & Urbano, D. (2011b). Una Década de Investigación basada en el GEM: Logros y Retos (A decade of GEM research: Achievements and challenges). *Academia Revista Latinoamericana de Administración*, 46, 16–37.
- Alvarez, C., & Urbano, D. (2012a). Cultural-cognitive dimension and entrepreneurial activity: A cross-country study. *Revista de Estudios Sociales*, 44, 146–157.

- Alvarez, C., & Urbano, D. (2012b). Environmental factors and entrepreneurial activity: An institutional approach (Factores del entorno y creación de empresas: Un análisis institucional). *Revista Venezolana de Gerencia*, 17(57), 9–38.
- Alvarez, C., Urbano, D., & Amorós, J. E. (2014). GEM research: Achievements and challenges. *Small Business Economics*, 42(3), 445–465.
- Alvarez, C., Urbano, D., Corduras, A., & Ruiz-Navarro, J. (2011). Environmental conditions and entrepreneurial activity: A regional comparison in Spain. *Journal of Small Business and Enterprise Development*, 18(1), 120–140.
- Ambrosini, V., & Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management? *International Journal of Management Review*, 11(1), 29–49.
- Ambrosini, V., Bowman, C., & Collier, N. (2009). Dynamic capabilities: An exploration of how firms renew their resource base. *British Journal of Management*, 20(s1), S9–S24.
- Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic management journal*, 14(1), 33–46.
- Anand, G., Ward, P. T., Tatikonda, M. V., & Schilling, D. A. (2009). Dynamic capabilities through continuous improvement infrastructure. *Journal of Operations Management*, 27(6), 444–461.
- Anderson, J. C., Håkansson, H., & Johanson, J. (1994). Dyadic business relationships within a business network context. *The Journal of Marketing*, 58(4), 1–15.
- Antolin-Lopez, R., Martinez-del-Rio, J., Cespedes-Lorente, J. J., & Perez-Valls, M. (2015). The choice of suitable cooperation partners for product innovation: Differences between new ventures and established companies. *European Management Journal*, 33(6), 472–484.
- Aparicio, S., Urbano, D., & Audretsch, D. B. (2016). Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological Forecasting and Social Change*, 102, 45–61.
- Apsalone, M., & Šumilo, Ě. (2015). Socio-cultural factors and international competitiveness. *Business, Management and Education*, 13(2), 276–291.
- Arend, R. J. (2013). Ethics-focused dynamic capabilities: A small business perspective. *Small Business Economics*, 41(1), 1–24.
- Arend, R. J. (2014). Entrepreneurship and dynamic capabilities: How firm age and size affect the ‘capability enhancement–SME performance’ relationship. *Small Business Economics*, 42(1), 33–57.

- Arenius, P., & De Clercq, D. (2005). A network-based approach on opportunity recognition. *Small Business Economics*, 24(3), 249–265.
- Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small Business Economics*, 24(3), 233–247.
- Arranz, N., & de Arroyabe, J. C. F. (2008). The choice of partners in R&D cooperation: An empirical analysis of Spanish firms. *Technovation*, 28(1-2), 88-100.
- Arthurs, J. D., & Busenitz, L. W. (2006). Dynamic capabilities and venture performance: The effects of venture capitalists. *Journal of Business Venturing*, 21(2), 195–215.
- Ashourizadeh, S., Rezaei, S., Schott, T., & Vang, J. (2014). Entrepreneurs' human and social capital: direct and reinforcing benefits for export. *International Journal of Entrepreneurship and Small Business*, 21(2), 246-267.
- Audretsch, D. B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *The Journal of Technology Transfer*, 39(3), 313-321.
- Augier, M., & Teece, D. J. (2006). Understanding complex organization: the role of know-how, internal structure, and human behavior in the evolution of capabilities. *Industrial and Corporate Change*, 15(2), 395-416.
- Augier, M., & Teece, D. J. (2008). Strategy as evolution with design: The foundations of dynamic capabilities and the role of managers in the economic system. *Organization Studies*, 29(8–9), 1187–1208.
- Augier, M., & Teece, D. J. (2009). Dynamic capabilities and the role of managers in business strategy and economic performance. *Organization Science*, 20(2), 410–421.
- Autio, E., & Acs, Z. J. (2010). Intellectual property protection and the formation of entrepreneurial growth aspirations. *Strategic Entrepreneurship Journal*, 4(3), 234–251.
- Autio, E., George, G., & Alexy, O. (2011). International entrepreneurship and capability development: Qualitative evidence and future research directions. *Entrepreneurship Theory and Practice*, 35(1), 11–37.
- Autio, E., Pathak, S., & Wennberg, K. (2013). Consequences of cultural practices for entrepreneurial behaviors. *Journal of International Business Studies*, 44(4), 334–362.
- Ayuso, S., Ángel Rodríguez, M., & Enric Ricart, J. (2006). Using stakeholder dialogue as a source for new ideas: A dynamic capability underlying sustainable innovation. *Corporate Governance: The International Journal of Business in Society*, 6(4), 475–490.
- Backes-Gellner, U., & Werner, A. (2007). Entrepreneurial signaling via education: A success factor in innovative start-ups. *Small Business Economics*, 29(1–2), 173–190.

- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117–148.
- Bantel, K. A., & Jackson, S. E. (1989). Top management and innovation in banking: Does the composition of the top management team make a difference? *Strategic Management Journal, 10*, 107–124.
- Barazandeh, M., Parvizian, K., Alizadeh, M., & Khosravi, S. (2015). Investigating the effect of entrepreneurial competencies on business performance among early stage entrepreneurs. Global Entrepreneurship Monitor (GEM 2010 survey data). *Journal of Global Entrepreneurship Research, 5*(1), 1–12.
- Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management, 27*(6), 643–650.
- Baron, R. A., & Ensley, M. D. (2006). Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management Science, 52*(9), 1331–1344.
- Barrales-Molina, V., Bustinza, Ó. F., & Gutiérrez-Gutiérrez, L. J. (2013). Explaining the causes and effects of dynamic capabilities generation: A multiple-indicator multiple-cause modelling approach. *British Journal of Management, 24*(4), 571–591.
- Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management, 36*(1), 256–280.
- Baručić, A., & Umihanić, B. (2016). Entrepreneurship education as a factor of entrepreneurial opportunity recognition for starting a new business. *Management: Journal of Contemporary Management Issues, 21*(2), 27–44.
- Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive and destructive. *Journal of Political Economy, 98*(5), 892–921.
- Bayona, C., García-Marco, T., & Huerta, E. (2001). Firms' motivations for cooperative R&D: an empirical analysis of Spanish firms. *Research Policy, 30*(8), 1289–1307.
- Becker, G. S. (1975). *Human capital*. Chicago, IL: Chicago University Press.
- Becker, G. S. (2009). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press.
- Belitski, M., Chowdhury, F., & Desai, S. (2016). Taxes, corruption, and entry. *Small Business Economics, 47*(1), 201–216.
- Belso-Martinez, J. A., Molina-Morales, F. X., & Mas-Verdu, F. (2013). Combining effects of internal resources, entrepreneur characteristics and KIS on new firms. *Journal of Business Research, 66*(10), 2079–2089.

- Bénassy-Quéré, A., Coupet, M., & Mayer, T. (2007). Institutional determinants of foreign direct investment. *World Economy*, 30(5), 764–782.
- Benner, M. J. (2009). Dynamic or static capabilities? Process management practices and response to technological change. *Journal of Product Innovation Management*, 26(5), 473–486.
- Beske, P. (2012). Dynamic capabilities and sustainable supply chain management. *International Journal of Physical Distribution & Logistics Management*, 42(4), 372–387.
- Beske, P., Land, A., & Seuring, S. (2014). Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature. *International Journal of Production Economics*, 152, 131–143.
- Bingham, C. B., Heimeriks, K. H., Schijven, M., & Gates, S. (2015). Concurrent learning: How firms develop multiple dynamic capabilities in parallel. *Strategic Management Journal*, 36(12), 1802–1825.
- Birkinshaw, M. M. J. (2006). How management innovation happens. *MIT Sloan Management Review*, 47(4), 81–88.
- Bjørnskov, C., & Foss, N. J. (2016). Institutions, entrepreneurship, and economic growth: What do we know and what do we still need to know? *Academy of Management Perspectives*, 30(3), 292–315.
- Blyler, M., & Coff, R. W. (2003). Dynamic capabilities, social capital, and rent appropriation: Ties that split pies. *Strategic Management Journal*, 24(7), 677–686.
- Boccardelli, P., & Magnusson, M. G. (2006). Dynamic capabilities in early-phase entrepreneurship. *Knowledge and Process Management*, 13(3), 162–174.
- Bohlmann, C., Rauch, A., & Zacher, H. (2017). A lifespan perspective on entrepreneurship: Perceived opportunities and skills explain the negative association between age and entrepreneurial activity. *Frontiers in Psychology*, 8, 2015.
- Boschma, R. A. (2004). Competitiveness of regions from an evolutionary perspective. *Regional Studies*, 38:9, 1001-1014.
- Bosma, N. (2013). The Global Entrepreneurship Monitor (GEM) and its impact on entrepreneurship research. *Foundations and Trends® in Entrepreneurship*, 9(2), 143–248.
- Bosma, N. S., & Levie, J. (2010). Global Entrepreneurship Monitor 2009 Executive Report.
- Bosma, N., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*. In press. doi:10.1007/s11187-018-0012-x
- Bowman, C., & Ambrosini, V. (2003). How the resource-based and the dynamic capability views of the firm inform corporate-level strategy. *British Journal of Management*, 14(4), 289–303.

- Bruton, G. D., Ahlstrom, D., & Li, H.-L. (2010). Institutional theory and entrepreneurship: Where are we now and where do we need to move in the future? *Entrepreneurship: Theory and Practice*, 34(3), 421–440.
- Busenitz, L. W., Gomez, C., & Spencer, J. W. (2000). Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management Journal*, 43(5), 994–1003.
- Butler, B., & Soontiens, W. (2015). Offshoring of higher education services in strategic nets: A dynamic capabilities perspective. *Journal of World Business*, 50(3), 477–490.
- Cabanelas, P., Omil, J. C., & Vázquez, X. H. (2013). A methodology for the construction of dynamic capabilities in industrial networks: The role of border agents. *Industrial Marketing Management*, 42(6), 992–1003.
- Camisón, C., & Monfort-Mir, V. M. (2012). Measuring innovation in tourism from the Schumpeterian and the dynamic-capabilities perspectives. *Tourism Management*, 33(4), 776–789.
- Camisón, C., & Villar-López, A. (2011). Non-technical innovation: Organizational memory and learning capabilities as antecedent factors with effects on sustained competitive advantage. *Industrial Marketing Management*, 40(8), 1294–1304.
- Carney, M., Duran, P., van Essen, M., & Shapiro, D. (2017). Family firms, internationalization, and national competitiveness: Does family firm prevalence matter? *Journal of Family Business Strategy*, 8(3), 123–136.
- Casson, M. C., Della Giusta, M., & Kambhampati, U. S. (2010). Formal and informal institutions and development. *World Development*, 38(2), 137–141.
- Castaño, M. S., Méndez, M. T., & Galindo, M. Á. (2015). The effect of social, cultural, and economic factors on entrepreneurship. *Journal of Business Research*, 68(7), 1496–1500.
- Cavusgil, S. T., & Knight, G. (2015). The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *Journal of International Business Studies*, 46(1), 3–16.
- Cetindamar, D., Gupta, V. K., Karadeniz, E. E., & Egrican, N. (2012). What the numbers tell: The impact of human, family and financial capital on women and men's entry into entrepreneurship in Turkey. *Entrepreneurship & Regional Development*, 24(1-2), 29-51.
- Chang, Y. C. (2003). Benefits of co-operation on innovative performance: Evidence from integrated circuits and biotechnology firms in the UK and Taiwan. *R&D Management*, 33(4), 425–437.
- Chell, E., & Allman, K. (2003). Mapping the motivations and intentions of technology orientated entrepreneurs. *R&D Management*, 33(2), 117–134.

- Chen, R. S., Sun, C. M., Helms, M. M., & Jih, W. J. K. (2008). Aligning information technology and business strategy with a dynamic capabilities perspective: A longitudinal study of a Taiwanese semiconductor company. *International Journal of Information Management*, 28(5), 366–378.
- Chen, J., Zhu, Z., & Yuan Xie, H. (2004). Measuring intellectual capital: A new model and empirical study. *Journal of Intellectual Capital*, 5(1), 195–212.
- Cheng, J. H., Chen, M. C., & Huang, C. M. (2014). Assessing inter-organizational innovation performance through relational governance and dynamic capabilities in supply chains. *Supply Chain Management: An International Journal*, 19(2), 173–186.
- Chesbrough, H. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Boston, MA: Harvard Business School Press.
- Chirico, F., & Nordqvist, M. (2010). Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture. *International Small Business Journal*, 28(5), 487–504.
- Chirico, F., Nordqvist, M., Colombo, G., & Mollona, E. (2012). Simulating dynamic capabilities and value creation in family firms: Is paternalism an ‘asset’ or a ‘liability’? *Family Business Review*, 25(3), 318–338.
- Chmielewski, D. A., & Paladino, A. (2007). Driving a resource orientation: Reviewing the role of resource and capability characteristics. *Management Decision*, 45(3), 462–483.
- Choo, S., & Wong, M. (2006). Entrepreneurial intention: Triggers and barriers to new venture creations in Singapore. *Singapore Management Review*, 28(2), 47–64.
- Chung, C. C., & Beamish, P. W. (2005). Investment mode strategy and expatriate strategy during times of economic crisis. *Journal of International Management*, 11(3), 331–355.
- Clarysse, B., Tartari, V., & Salter, A. (2011). The impact of entrepreneurial capacity, experience and organizational support on academic entrepreneurship. *Research Policy*, 40(8), 1084–1093.
- Cohen, W. M., & Levinthal, D. A. (1990). The implications of spillovers for R&D investment and welfare: A new perspective. *Administrative Science Quarterly*, 35(1990), 128–152.
- Cuba Study Group. (2011). *Supporting small business in Cuba: Recommendations for private and public sector leaders* (Position Paper No. 2). Retrieved from http://www.cubastudygroup.org/index.cfm/files/serve?File_id!4c4f6d607-ee50-45bbae2b-548c91531ae1
- Cunha, F., & Heckman, J. (2007). The technology of skill formation. *The American Economic Review*, 97(2), 31–47.

- D'Aveni, R. A. (1994). *Hypercompetition—Managing the Dynamics of Strategic Maneuvering*, New York/Toronto.
- Daniel, E. M., Ward, J. M., & Franken, A. (2014). A dynamic capabilities perspective of IS project portfolio management. *The Journal of Strategic Information Systems*, 23(2), 95–111.
- Daniel, E. M., & Wilson, H. N. (2003). The role of dynamic capabilities in e-business transformation. *European Journal of Information Systems*, 12(4), 282–296.
- Danneels, E. (2011). Trying to become a different type of company: Dynamic capability at Smith Corona. *Strategic Management Journal*, 32(1), 1–31.
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18, 301–331.
- Day, G. S. (1994). The capabilities of market-driven organizations. *Journal of marketing*, 58(4), 37-52.
- Day, G. S., & Wensley, R. (1988). Assessing advantage: A framework for diagnosing competitive superiority. *The Journal of Marketing*, 52(2), 1–20.
- Deeds, D. L., DeCarolis, D., & Coombs, J. (2000). Dynamic capabilities and new product development in high technology ventures: An empirical analysis of new biotechnology firms. *Journal of Business Venturing*, 15(3), 211–229.
- Delmas, M. A. (2002). Innovating against European rigidities: institutional environment and dynamic capabilities. *The Journal of High Technology Management Research*, 13(1), 19-43.
- DeTienne, D. R., & Chandler, G. N. (2004). Opportunity identification and its role in the entrepreneurial classroom: A pedagogical approach and empirical test. *Academy of Management Learning & Education*, 3(3), 242–257.
- Díaz-Casero, J. C., Hernández-Mogollón, R., & Roldán, J. L. (2011). A structural model of the antecedents to entrepreneurial capacity. *International Small Business Journal*, 29, 1–23.
- Dimov, D. P., & Shepherd, D. A. (2005). Human capital theory and venture capital firms: Exploring ‘home runs’ and ‘strike outs’. *Journal of Business Venturing*, 20(1), 1–21.
- Dixon, S. E., Meyer, K. E., & Day, M. (2010). Stages of organizational transformation in transition economies: A dynamic capabilities approach. *Journal of Management Studies*, 47(3), 416–436.
- Dollinger, M. J. (2003). *Entrepreneurship: Strategies and resources*. 3rd edn. Upper Saddle River, NJ: Prentice Hall.
- Døving, E., & Gooderham, P. N. (2008). Dynamic capabilities as antecedents of the scope of related diversification: The case of small firm accountancy practices. *Strategic Management Journal*, 29(8), 841–857.

- Drnevich, P. L., & Kriauciunas, A. P. (2011). Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance. *Strategic Management Journal*, 32(3), 254–279.
- Drucker, P. (1985). *Innovation and entrepreneurship practice and principles*. New York, NY: Harper and Row.
- Easterby-Smith, M., Lyles, M. A., & Peteraf, M. (2009). Dynamic capabilities: Current debates and future directions. *British Journal of Management*, 20(Special Issue), S1–S8.
- Easterby-Smith, M., & Prieto, I. M. (2008). Dynamic capabilities and knowledge management: An integrative role for learning? *British Journal of Management*, 19(3), 235–249.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10–11), 1105–1121.
- El Akremi, A., Perrigot, R., & Piot-Lepetit, I. (2015). Examining the drivers for franchised chains performance through the lens of the dynamic capabilities approach. *Journal of Small Business Management*, 53(1), 145–165.
- Eriksson, T. (2014). Processes, antecedents and outcomes of dynamic capabilities. *Scandinavian journal of management*, 30(1), 65-82.
- Estrin, S., Mickiewicz, T., & Stephan, U. (2016). Human capital in social and commercial entrepreneurship. *Journal of Business Venturing*, 31(4), 449–467.
- Estrin, S., & Prevezer, M. (2011). The role of informal institutions in corporate governance: Brazil, Russia, India, and China compared. *Asia Pacific Journal of Management*, 28(1), 41–67.
- Fainshmidt, S., Pezeshkan, A., Lance Frazier, M., Nair, A., & Markowski, E. (2016). Dynamic capabilities and organizational performance: A meta-analytic evaluation and extension. *Journal of Management Studies*, 53(8), 1348–1380.
- Fang, E. E., & Zou, S. (2009). Antecedents and consequences of marketing dynamic capabilities in international joint ventures. *Journal of International Business Studies*, 40(5), 742–761.
- Fawcett, S. E., Wallin, C., Allred, C., Fawcett, A. M., & Magnan, G. M. (2011). Information technology as an enabler of supply chain collaboration: A dynamic-capabilities perspective. *Journal of Supply Chain Management*, 47(1), 38–59.
- Fernandes, C., Ferreira, J., Raposo, M., Hernández, R., & Diaz-Casero, J. C. (2017). Knowledge and entrepreneurship creation: What is the connection? *World Journal of Entrepreneurship, Management and Sustainable Development*, 13(1), 2–15.
- Fischer, T., Gebauer, H., Gregory, M., Ren, G., & Fleisch, E. (2010). Exploitation or exploration in service business development? Insights from a dynamic capabilities perspective. *Journal of Service Management*, 21(5), 591–624.

- Fosfuri, A., & Giarratana, M. S. (2009). Masters of war: Rivals' product innovation and new advertising in mature product markets. *Management Science*, 55(2), 181–191.
- Fox, S. (2014). Third wave do-it-yourself (DIY): Potential for prosumption, innovation, and entrepreneurship by local populations in regions without industrial manufacturing infrastructure. *Technology in Society*, 39, 18–30.
- Galunic, D. C., & Rodan, S. (1998). Resource recombinations in the firm: Knowledge structures and the potential for Schumpeterian innovation. *Strategic management journal*, 19(12), 1193-1201.
- Gartner, W. C. (1989). Tourism image: Attribute measurement of state tourism products using multidimensional scaling techniques. *Journal of Travel Research*, 28(Fall), 16–20.
- Gebauer, H. (2011). Exploring the contribution of management innovation to the evolution of dynamic capabilities. *Industrial Marketing Management*, 40(8), 1238–1250.
- George, G. (2005). Learning to be capable: patenting and licensing at the Wisconsin Alumni Research Foundation 1925–2002. *Industrial and corporate change*, 14(1), 119-151.
- Ghani, E., Kerr, W. R., & O'Connell, S. (2014). Spatial determinants of entrepreneurship in India. *Regional Studies*, 48(6), 1071–1089.
- Global Entrepreneurship Monitor. (2017). *GEM 2016/2017 global report*. London: Global Entrepreneurship Research Association.
- González-Pernía, J. L., Peña-Legazkue, I., & Vendrell-Herrero, F. (2012). Innovation, entrepreneurial activity and competitiveness at a sub-national level. *Small Business Economics*, 39(3), 561–574.
- Gorman, G., Hanlon, D., & King, W. (1997). Some research perspectives on entrepreneurship education, enterprise education and education for small business management: A ten-year literature review. *International Small Business Journal*, 15(3), 56–77.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17(S2), 109–122.
- Griffith, D. A., & Harvey, M. G. (2001). A resource perspective of global dynamic capabilities. *Journal of International Business Studies*, 32(3), 597–606.
- Griffith, D. A., Noble, S. M., & Chen, Q. (2006). The performance implications of entrepreneurial proclivity: A dynamic capabilities approach. *Journal of Retailing*, 82(1), 51–62.
- Gruber, M., Heinemann, F., Brettel, M., & Hungeling, S. (2010). Configurations of resources and capabilities and their performance implications: an exploratory study on technology ventures. *Strategic Management Journal*, 31(12), 1337-1356.

- Gruber, M., & Henkel, J. (2006). New ventures based on open innovation-an empirical analysis of start-up firms in embedded Linux. *International Journal of Technology Management*, 33(4), 356-372.
- Håkansson, H., & Snehota, I. (1998). The burden of relationships: Who is next? *Naudé, P. & Turnbull, P.W.*
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193–207.
- Hamel, G. (2009). Management innovation. *Leadership Excellence*, 26(5), 5.
- Helfat, C. E. (1997). Know-how and asset complementarity and dynamic capability accumulation: The case of R&D. *Strategic Management Journal*, 18(5), 239–260.
- Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. G. (2009). *Dynamic capabilities: Understanding strategic change in organizations*. John Wiley & Sons.
- Helfat, C. E., & Lieberman, M. B. (2002). The birth of capabilities: Market entry and the importance of pre-history. *Industrial and Corporate Change*, 11(4), 725–760.
- Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24(10), 997–1010.
- Helfat, C. E., & Peteraf, M. A. (2009). Understanding dynamic capabilities: Progress along a developmental path. *Strategic Organization*, 7(1), 91–102.
- Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, 36(6), 831–850.
- Helfat, C. E., & Winter, S. G. (2011). Untangling dynamic and operational capabilities: Strategy for the (n)everchanging world. *Strategic Management Journal*, 32(11), 1243–1250.
- Henderson, R., & Cockburn, I. (1994). Measuring competence? Exploring firm effects in pharmaceutical research. *Strategic Management Journal*, 15(S1), 63–84.
- Hessels, J., Van Gelderen, M., & Thurik, R. (2008). Entrepreneurial aspirations, motivations, and their drivers. *Small Business Economics*, 31(3), 323–339.
- Hingtgen, N., Kline, C., Fernandes, L., & McGehee, N. G. (2015). Cuba in transition: Tourism industry perceptions of entrepreneurial change. *Tourism Management*, 50, 184–193.
- Hitt, M. A., Bierman, L., Shimizu, K., & Kochhar, R. (2001). Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management journal*, 44(1), 13-28.

- Hodgkinson, G. P., & Healey, M. P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, 32(13), 1500–1516.
- Hofstede, G. (2001). Culture's recent consequences: Using dimension scores in theory and research. *International Journal of Cross-Cultural Management*, 1(1), 11–17.
- Holmes, R. M., Miller, T., Hitt, M. A., & Salmador, M. P. (2013). The interrelationships among informal institutions, formal institutions, and inward foreign direct investment. *Journal of Management*, 39(2), 531–566.
- Hrebiniak, L. G., & Joyce, W. F. (1985). Organizational adaptation: Strategic choice and environmental determinism. *Administrative Science Quarterly*, 30(3), 336–349.
- Huang, L., Wagner, B., & Fain, N. (2016, December). Open innovation adoption from strategy to practice: Implications from organizational ambidexterity and dynamic capabilities. In *3rd Annual World Open Innovation Conference*.
- Huber, L. R., Sloof, R., & Van Praag, M. (2014). The effect of early entrepreneurship education: Evidence from a field experiment. *European Economic Review*, 72, 76–97.
- Hughes, B., & Wareham, J. (2010). Knowledge arbitrage in global pharma: A synthetic view of absorptive capacity and open innovation. *R&D Management*, 40(3), 324–343.
- Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management*, 33(5), 429–438.
- Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: An integration and empirical examination. *The Journal of Marketing*, 42–54.
- Huston, L., & Sakkab, N. (2006). Inside Procter & Gamble's new model for innovation. *Harvard Business Review*, 84(3), 58-66.
- Iansiti, M., & Clark, K. B. (1994). Integration and dynamic capability: Evidence from product development in automobiles and mainframe computers. *Industrial and Corporate Change*, 3(3), 557–605.
- Im, T., & Choi, Y. (2018). Rethinking national competitiveness: A critical assessment of governmental capacity measures. *Social Indicators Research*, 135(2), 515–532.
- Iturrioz, C., Aragón, C., & Narvaiza, L. (2015). How to foster shared innovation within SMEs' networks: Social capital and the role of intermediaries. *European Management Journal*, 33(2), 104-115.
- Jantunen, A., Puumalainen, K., Saarenketo, S., & Kyläheiko, K. (2005). Entrepreneurial orientation, dynamic capabilities and international performance. *Journal of International Entrepreneurship*, 3(3), 223–243.

- Javidan, M., & House, R. J. (2002). Leadership and cultures around the world: Findings from GLOBE: An introduction to the special issue. *Journal of World Business*, 37 (1): 1–2.
- Jeng, D. J. F., & Pak, A. (2016). The variable effects of dynamic capability by firm size: The interaction of innovation and marketing capabilities in competitive industries. *International Entrepreneurship and Management Journal*, 12(1), 115–130.
- Kale, P., & Singh, H. (2009). Managing strategic alliances: What do we know now, and where do we go from here? *Academy of Management Perspectives*, 23(3), 45–62.
- Karra, N., Phillips, N., & Tracey, P. (2008). Building the born global firm: developing entrepreneurial capabilities for international new venture success. *Long Range Planning*, 41(4), 440–458.
- Kazadi, K., Lievens, A., & Mahr, D. (2016). Stakeholder co-creation during the innovation process: Identifying capabilities for knowledge creation among multiple stakeholders. *Journal of Business Research*, 69(2), 525–540.
- Keen, C., & Etemad, H. (2012). Rapid growth and rapid internationalization: The case of smaller enterprises from Canada. *Management Decision*, 50(4), 569–590.
- Kelley, D. J., Brush, C. G., Green, P. G., & Litovski, Y. (2011). *Global Entrepreneurship Monitor 2010 women's report*. GERA/GEM. <http://www.gemconsortium.org>, 2011
- Kelley, D. J., Singer, S., & Herrington, M. (2015). *Global Entrepreneurship Monitor 2011 global report*. London: Global Entrepreneurship Research Association, London Business School.
- Keskin, H. (2006). Market orientation, learning orientation, and innovation capabilities in SMEs: An extended model. *European Journal of Innovation Management*, 9(4), 396–417.
- Kevill, A., Trehan, K., & Easterby-Smith, M. (2017). Perceiving ‘capability’ within dynamic capabilities: The role of owner-manager self-efficacy. *International Small Business Journal*, 35(8), 883–902.
- Kim, Y., & Vonortas, N. S. (2014). Cooperation in the formative years: Evidence from small enterprises in Europe. *European Management Journal*, 32(5), 795–805.
- King, A. A., & Tucci, C. L. (2002). Incumbent entry into new market niches: The role of experience and managerial choice in the creation of dynamic capabilities. *Management Science*, 48(2), 171–186.
- Knight, G. A., & Cavusgil, S. T. (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies*, 35(2), 124–141.
- Koch, H. (2010). Developing dynamic capabilities in electronic marketplaces: A cross-case study. *The Journal of Strategic Information Systems*, 19(1), 28–38.

- Koellinger, P., Minniti, M., & Schade, C. (2004, April). 'I think I can, I think I can': A cross-country study of entrepreneurial motivation. In *First GEM Research Conference* (pp. 1–3).
- Kogut, B., & Singh, H. (1988). The effect of national culture on the choice of entry mode. *Journal of International Business Studies*, *19*(3), 411–432.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, *3*(3), 383–397.
- Kogut, B., & Zander, U. (1996). What firms do? Coordination, identity, and learning. *Organization science*, *7*(5), 502–518.
- Kor, Y. Y., & Mahoney, J. T. (2005). How dynamics, management, and governance of resource deployments influence firm-level performance. *Strategic Management Journal*, *26*(5), 489–496.
- Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, *36*(1), 349–372.
- Krueger, N., & Dickson, P. R. (1994). How believing in ourselves increases risk taking: Perceived self-efficacy and opportunity recognition. *Decision Sciences*, *25*(3), 385–400.
- Lazear, E. (2005). Entrepreneurship. *Journal of Labor Economics*, *23*, 649–680.
- Lazonick, W., & Prencipe, A. (2005). Dynamic capabilities and sustained innovation: Strategic control and financial commitment at Rolls-Royce plc. *Industrial and Corporate Change*, *14*(3), 501–542.
- Lee, P. Y., Lin, H. T., Chen, H. H., & Shyr, Y. H. (2011). Dynamic capabilities exploitation of market and hierarchy governance structures: An empirical comparison of Taiwan and South Korea. *Journal of World Business*, *46*(3), 359–370.
- Lee, J. H., & Venkataraman, S. (2006). Aspirations, market offerings, and the pursuit of entrepreneurial opportunities. *Journal of Business Venturing*, *21*(1), 107–123.
- Lenox, M., & King, A. (2004). Prospects for developing absorptive capacity through internal information provision. *Strategic Management Journal*, *25*(4), 331–345.
- Leonidou, L. C., Leonidou, C. N., Fotiadis, T. A., & Aykol, B. (2015). Dynamic capabilities driving an eco-based advantage and performance in global hotel chains: The moderating effect of international strategy. *Tourism Management*, *50*, 268–280.
- Lessard, D., Teece, D. J., & Leih, S. (2016). The dynamic capabilities of meta-multinationals. *Global Strategy Journal*, *6*(3), 211–224.
- Levie, J., & Autio, E. (2008). A theoretical grounding and test of the GEM model. *Small Business Economics*, *31*(3), 235–263.

- Lewellyn, K. B. (2014). A cross-national investigation of IPO activity: The role of formal institutions and national culture. *International Business Review*, 23(6), 1167–1178.
- Liao, J. J., Kickul, J. R., & Ma, H. (2009). Organizational dynamic capability and innovation: An empirical examination of internet firms. *Journal of Small Business Management*, 47(3), 263–286.
- Lichtenthaler, U. (2008). Open innovation in practice: an analysis of strategic approaches to technology transactions. *IEEE transactions on engineering management*, 55(1), 148-157.
- Lichtenthaler, U. (2011). Open innovation: Past research, current debates, and future directions. *The Academy of Management Perspectives*, 25(1), 75–93.
- Lichtenthaler, U., & Lichtenthaler, E. (2009). A capability-based framework for open innovation: Complementing absorptive capacity. *Journal of Management Studies*, 46(8), 1315–1338.
- Lin, Y., & Wu, L. Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of business research*, 67(3), 407-413.
- Liu, P. L., Chen, W. C., & Tsai, C. H. (2005). An empirical study on the correlation between the knowledge management method and new product development strategy on product performance in Taiwan's industries. *Technovation*, 25(6), 637-644.
- Liu, L., & Jiang, Z. (2016). Influence of technological innovation capabilities on product competitiveness. *Industrial Management & Data Systems*, 116(5), 883–902.
- Low, S., Henderson, J., & Weiler, S. (2005). Gauging a region's entrepreneurial potential. *Economic Review: Federal Reserve Bank of Kansas City*, 90(3), 61–89.
- Luo, Y. (2000). Dynamic capabilities in international expansion. *Journal of World Business*, 35(4), 355–378.
- Macher, J. T., & Mowery, D. C. (2009). Measuring dynamic capabilities: Practices and performance in semiconductor manufacturing. *British Journal of Management*, 20(s1), S41–S62.
- Macpherson, A., Jones, O., & Zhang, M. (2004). Evolution or revolution? Dynamic capabilities in a knowledge-dependent firm. *R&D Management*, 34(2), 161–177.
- Madhok, A., & Osegowitsch, T. (2000). The international biotechnology industry: A dynamic capabilities perspective. *Journal of International Business Studies*, 31(2), 325–335.
- Mai, Y., & Gan, Z. (2007). Entrepreneurial opportunities, capacities and entrepreneurial environments: Evidence from Chinese GEM data. *Chinese Management Studies*, 1(4), 216–224.
- Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic capability views of rent creation. *Strategic Management Journal*, 22(5), 387–401.

- Makadok, R. (2010). The interaction effect of rivalry restraint and competitive advantage on profit: Why the whole is less than the sum of the parts. *Management Science*, *56*(2), 356–372.
- Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research*, *67*(1), 2707–2719.
- Malik, O. R., & Kotabe, M. (2009). Dynamic capabilities, government policies, and performance in firms from emerging economies: Evidence from India and Pakistan. *Journal of Management Studies*, *46*(3), 421–450.
- Maresch, D., Harms, R., Kailer, N., & Wimmer-Wurm, B. (2016). The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. *Technological Forecasting and Social Change*, *104*, 172–179.
- Marsh, S. J., & Stock, G. N. (2003). Building dynamic capabilities in new product development through intertemporal integration. *Journal of Product Innovation Management*, *20*(2), 136–148.
- McDougall, P. P., & Oviatt, B. M. (1996). New venture internationalization, strategic change, and performance: A follow-up study. *Journal of Business Venturing*, *11*(1), 23–40.
- McKelvie, A., & Davidsson, P. (2009). From resource base to dynamic capabilities: An investigation of new firms. *British Journal of Management*, *20*(s1), S63–S80.
- Meek, W. R., Pacheco, D. F., & York, J. G. (2010). The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context. *Journal of Business Venturing*, *25*(5), 493–509.
- Metaxas, T. (2011). The entrepreneurial capacity of local authorities in South-Eastern Europe: An enterprise perspective. *Romanian Economic and Business Review*, *6*(1), 18–36.
- Michailova, S., & Zhan, W. (2015). Dynamic capabilities and innovation in MNC subsidiaries. *Journal of World Business*, *50*(3), 576–583.
- Mintzberg, H. (1994). *The rise and fall of strategic planning*. Englewood Cliffs, NJ: Prentice-Hall.
- Mitchell, M., & Skrzypacz, A. (2015). A theory of market pioneers, dynamic capabilities, and industry evolution. *Management Science*, *61*(7), 1598–1614.
- Monitor, G. E. (2017). Global Report 2016/17. *Babson College (MA)*, USA.
- Moorman, C. (1995). Organizational market information processes: cultural antecedents and new product outcomes. *Journal of marketing research*, *32*(3), 318–335.
- Morrell, K., & Learmonth, M. (2015). Against evidence-based management, for management learning. *Academy of Management Learning & Education*, *14*(4), 520–533.

- Mosey, S., & Binks, M. (2011). Developing opportunity identification capabilities in the classroom: Visual evidence for changing mental frames. *Academy of Management Learning & Education, 10*(2), 277–295.
- Muralidharan, E., & Pathak, S. (2017). Informal institutions and international entrepreneurship. *International Business Review, 26*(2), 288–302.
- Nair, A., Rustambekov, E., McShane, M., & Fainshmidt, S. (2014). Enterprise risk management as a dynamic capability: A test of its effectiveness during a crisis. *Managerial and Decision Economics, 35*(8), 555–566.
- Narayanan, V. K., Colwell, K., & Douglas, F. L. (2009). Building organizational and scientific platforms in the pharmaceutical industry: A process perspective on the development of dynamic capabilities. *British Journal of Management, 20*(s1), S25–S40.
- Nelson, R. R., & Rosenberg, N. (1993). Technical innovation and national systems. In R.R.Nelson (Ed.), *National innovation systems: A comparative analysis*, New York, Oxford: Oxford University Press.
- Newbert, S. L. (2005). New firm formation: A dynamic capability perspective. *Journal of Small Business Management, 43*(1), 55–77.
- Nicolaou, N., Shane, S., Cherkas, L., Hunkin, J., & Spector, T. D. (2008). Is the tendency to engage in entrepreneurship genetic? *Management Science, 54*(1), 167.
- Nicolaou, N., Shane, S., Cherkas, L., & Spector, T. D. (2009). Opportunity recognition and the tendency to be an entrepreneur: A bivariate genetics perspective. *Organizational Behavior and Human Decision Processes, 110*(2), 108–117.
- Nieves, J., & Haller, S. (2014). Building dynamic capabilities through knowledge resources. *Tourism Management, 40*, 224–232.
- Nonaka, I., Hirose, A., & Takeda, Y. (2016). ‘Meso’-foundations of dynamic capabilities: Team-level synthesis and distributed leadership as the source of dynamic creativity. *Global Strategy Journal, 6*(3), 168–182.
- North, D. C. (1990). A transaction cost theory of politics. *Journal of theoretical politics, 2*(4), 355–367.
- North, D. C. (2005). *Understanding the process of economic change*. Princeton, NJ: Princeton University Press.
- O'Connor, G. C., Paulson, A. S., & DeMartino, R. (2008). Organisational approaches to building a radical innovation dynamic capability. *International Journal of Technology Management, 44*(1–2), 179–204.

- Oosterbeek, H., Van Praag, M., & Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review*, 54(3), 442–454.
- Pablo, A. L., Reay, T., Dewald, J. R., & Casebeer, A. L. (2007). Identifying, enabling and managing dynamic capabilities in the public sector. *Journal of Management Studies*, 44(5), 687–708.
- Pandza, K., & Thorpe, R. (2009). Creative search and strategic sense-making: Missing dimensions in the concept of dynamic capabilities. *British Journal of Management*, 20(s1), S118–S131.
- Pavlou, P. A., & El Sawy, O. A. (2011). Understanding the elusive black box of dynamic capabilities. *Decision Sciences*, 42(1), 239–273.
- Peng, M. W., Sun, S. L., Pinkham, B., & Chen, H. (2009). The institution-based view as a third leg for a strategy tripod. *Academy of Management Perspectives*, 23(3), 63–81.
- Penrose, E. T. (1959). *The theory of the growth of the firm*. New York, NY: Wiley.
- Peteraf, M., Di Stefano, G., & Verona, G. (2013). The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic Management Journal*, 34(12), 1389–1410.
- Peterman, N. E., & Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129–144.
- Petroni, A. (1998). The analysis of dynamic capabilities in a competence-oriented organization. *Technovation*, 18(3), 179–189.
- Petti, C., & Zhang, S. (2011). Factors influencing technological entrepreneurship capabilities: Towards an integrated research framework for Chinese enterprises. *Journal of Technology Management in China*, 6(1), 7–25.
- Pezeshkan, A., Fainshmidt, S., Nair, A., Frazier, M. L., & Markowski, E. (2016). An empirical assessment of the dynamic capabilities–performance relationship. *Journal of Business Research*, 69(8), 2950–2956.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32(1), 80–97.
- Pisano, G. P. (1994). Knowledge, integration, and the locus of learning: An empirical analysis of process development. *Strategic Management Journal*, 15(S1), 85–100.
- Porter, M. E. (1990). *The competitive advantage of nations*. New York, NY: Free Press.
- Prange, C., & Verdier, S. (2011). Dynamic capabilities, internationalization processes and performance. *Journal of World Business*, 46(1), 126–133.

- Ramachandran, V. (2011). Strategic corporate social responsibility: A 'dynamic capabilities' perspective. *Corporate Social Responsibility and Environmental Management*, 18(5), 285–293.
- Ramírez, R., Österman, R., & Grönquist, D. (2013). Scenarios and early warnings as dynamic capabilities to frame managerial attention. *Technological Forecasting and Social Change*, 80(4), 825–838.
- Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M. (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, 33(3), 761–787.
- Ravishankar, M. N., & Pan, S. L. (2013). Examining the influence of modularity and knowledge management (KM) on dynamic capabilities: Insights from a call center. *International Journal of Information Management*, 33(1), 147–159.
- Raymond, L., St-Pierre, J., Uwizeyemungu, S., & Le Dinh, T. (2014). Internationalization capabilities of SMEs: A comparative study of the manufacturing and industrial service sectors. *Journal of International Entrepreneurship*, 12(3), 230–253.
- Regnér, P. (2008). Strategy-as-practice and dynamic capabilities: Steps towards a dynamic view of strategy. *Human Relations*, 61(4), 565–588.
- Reuter, C., Foerstl, K. A. I., Hartmann, E. V. I., & Blome, C. (2010). Sustainable global supplier management: The role of dynamic capabilities in achieving competitive advantage. *Journal of Supply Chain Management*, 46(2), 45–63.
- Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., ... & Chin, N. (2005). Global entrepreneurship monitor: Data collection design and implementation 1998–2003. *Small Business Economics*, 24(3): 205–231.
- Reynolds, P. D., Bygrave, W. D., & Autio, E. (2004). *Global Entrepreneurship Monitor. 2003 executive report*. Babson Park, MA and London: Babson College and London Business School.
- Reynolds, P., Camp, S., Bygrave, W., Autio, E., & Hay, M. (2001). *Global Entrepreneurship Monitor. 2001 executive report*. Babson Park, MA and London: Kauffman Center for Entrepreneurial Leadership, Babson College and London Business School.
- Reynolds, P. D., Camp, S. M., Bygrave, W. D., Autio, E., & Hay, M. (2002). *Global Entrepreneurship Monitor (GEM) 2001 summary report*. Babson Park, MA and London: London Business School and Babson College.
- Reynolds, P., Hay, M., & Camp, S. (1999). *Global Entrepreneurship Monitor. 1999 executive report*. Babson Park, MA and London: Babson College, London Business School.

- Rice, J., Liao, T. S., Galvin, P., & Martin, N. (2015). A configuration-based approach to integrating dynamic capabilities and market transformation in small and medium-sized enterprises to achieve firm performance. *International Small Business Journal*, 33(3), 231–253.
- Rindova, V. P., & Kotha, S. (2001). Continuous ‘morphing’: Competing through dynamic capabilities, form, and function. *Academy of Management Journal*, 44(6), 1263–1280.
- Ritala, P., Armila, L., & Blomqvist, K. (2009). Innovation orchestration capability—Defining the organizational and individual level determinants. *International Journal of Innovation Management*, 13(04), 569-591.
- Rocha, H. O. (2004). Entrepreneurship and development: The role of clusters. *Small Business Economics*, 23(5), 363–400.
- Rodríguez-Serrano, M., & Martín-Armario, E. (2017). Born-global SMEs, performance, and dynamic absorptive capacity: Evidence from Spanish firms. *Journal of Small Business Management*, 57(2), 298–326.
- Rothaermel, F. T., & Deeds, D. L. (2006). Alliance type, alliance experience and alliance management capability in high-technology ventures. *Journal of Business Venturing*, 21(4), 429–460.
- Rothaermel, F. T., & Hess, A. M. (2007). Building dynamic capabilities: Innovation driven by individual-, firm-, and network-level effects. *Organization Science*, 18(6), 898–921.
- Russo, M. V. (2009). Explaining the impact of ISO 14001 on emission performance: A dynamic capabilities perspective on process and learning. *Business Strategy and the Environment*, 18(5), 307–319.
- Sakakibara, M. (1997). Heterogeneity of firm capabilities and cooperative research and development: an empirical examination of motives. *Strategic management journal*, 18(S1), 143-164.
- Sakakibara, M. (2002). Formation of R&D consortia: Industry and company effects. *Strategic Management Journal*, 23(11), 1033-1050.
- Salunke, S., Weerawardena, J., & McColl-Kennedy, J. R. (2011). Towards a model of dynamic capabilities in innovation-based competitive strategy: Insights from project-oriented service firms. *Industrial Marketing Management*, 40(8), 1251–1263.
- Sapienza, H. J., Autio, E., George, G., & Zahra, S. A. (2006). A capabilities perspective on the effects of early internationalization on firm survival and growth. *Academy of Management Review*, 31(4), 914–933.
- Saunila, M. (2014). Innovation capability for SME success: Perspectives of financial and operational performance. *Journal of Advances in Management Research*, 11(2), 163–175.

- Sawers, J. L., Pretorius, M. W., & Oerlemans, L. A. (2008). Safeguarding SMEs' dynamic capabilities in technology innovative SME-large company partnerships in South Africa. *Technovation*, 28(4), 171–182.
- Schilke, O. (2014). On the contingent value of dynamic capabilities for competitive advantage: The nonlinear moderating effect of environmental dynamism. *Strategic Management Journal*, 35(2), 179–203.
- Schreyögg, G., & Kliesch-Eberl, M. (2007). How dynamic can organizational capabilities be? Toward a dual process model of capability dynamization. *Strategic Management Journal*, 28(9), 913–933.
- Schumpeter, J. A. (1950). *Capitalism, socialism, and democracy*. 3rd edn. New York, NY: Harper.
- Schumpeter, J. A. 2000. Entrepreneurship as innovation. In Swedberg, R. (Ed.), *Entrepreneurship: The social science view*: 51–75. Oxford: Oxford University Press.
- Schwab, K., & Sala-i-Martin, X. (2015). *World Economic Forum's Global Competitiveness Report*, 2014-2015. Retrived from.
http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf
- Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities, *Organization Science*, 11, 448–469.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226.
- Shinnar, R. S., Hsu, D. K., & Powell, B. C. (2014). Self-efficacy, entrepreneurial intentions, and gender: Assessing the impact of entrepreneurship education longitudinally. *The International Journal of Management Education*, 12(3), 561–570.
- Schumpeter, J. A. (1934). Change and the Entrepreneur. *Essays of JA Schumpeter*.
- Schumpeter, J. (1942). Creative destruction. *Capitalism, socialism and democracy*, 825, 82-85.
- Singh, G., & Belwal, R. (2008). Entrepreneurship and SMEs in Ethiopia: Evaluating the role, prospects and problems faced by women in this emergent sector. *Gender in Management: An International Journal*, 23(2), 120–136.
- Sinkula, J. M. (1994). Market information processing and organizational learning. *Journal of marketing*, 58(1), 35-45.
- Sirmon, D. G., & Hitt, M. A. (2009). Contingencies within dynamic managerial capabilities: Interdependent effects of resource investment and deployment on firm performance. *Strategic Management Journal*, 30(13), 1375–1394.

- Smith, B. R., Matthews, C. H., & Schenkel, M. T. (2009). Differences in entrepreneurial opportunities: The role of tacitness and codification in opportunity identification. *Journal of Small Business Management*, 47(1), 38–57.
- Srivastava, S. C., & Teo, T. S. (2008). The relationship between e-government and national competitiveness: The moderating influence of environmental factors. *Communications of the Association for Information Systems*, 23(1), 73–94.
- Stephan, U., & Uhlaner, L. M. (2010). Performance-based vs. socially supportive culture: A cross-national study of descriptive norms and entrepreneurship. *Journal of International Business Studies*, 41(8), 1347–1364.
- Storey, D. (1994). *Understanding the small business sector*. London: Routledge.
- Stuetzer, M., Obschonka, M., Brixy, U., Sternberg, R., & Cantner, U. (2014). Regional characteristics, opportunity perception and entrepreneurial activities. *Small Business Economics*, 42(2), 221–244.
- Styhre, A., Josephson, P. E., & Knauseder, I. (2004). Learning capabilities in organizational networks: Case studies of six construction projects. *Construction Management and Economics*, 22(9), 957–966.
- Swoboda, B., & Olejnik, E. (2016). Linking processes and dynamic capabilities of international SMEs: The mediating effect of international entrepreneurial orientation. *Journal of Small Business Management*, 54(1), 139–161.
- Tallman, S. B. (1992). A strategic management perspective on host country structure of multinational enterprises. *Journal of Management*, 18(3), 455–471.
- Tallon, P. P. (2008). Inside the adaptive enterprise: An information technology capabilities perspective on business process agility. *Information Technology and Management*, 9(1), 21–36.
- Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research policy*, 15(6), 285–305.
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.
- Teece, D. J. (2009). *Dynamic capabilities and strategic management: Organizing for innovation and growth*. New York, NY: Oxford University Press.
- Teece, D. J. (2010). Technological innovation and the theory of the firm: the role of enterprise-level knowledge, complementarities, and (dynamic) capabilities. In *Handbook of the Economics of Innovation* (Vol. 1, pp. 679–730). North-Holland.

- Teece, D. J. (2012). Dynamic capabilities: Routines versus entrepreneurial action. *Journal of Management Studies*, 49(8), 1395–1401.
- Teece, D. J. (2014a). A dynamic capabilities-based entrepreneurial theory of the multinational enterprise. *Journal of International Business Studies*, 45(1), 8–37.
- Teece, D. J. (2014b). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *Academy of Management Perspectives*, 28(4), 328–352.
- Teece, D. J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, 86, 202–216.
- Teece, D. J. (2018). Managing the university: Why ‘organized anarchy’ is unacceptable in the age of massive open online courses. *Strategic Organization*, 16(1), 92–102.
- Teece, D. J., Peteraf, M. A., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty and entrepreneurial management in the innovation economy. *California Management Review*, 58(4), 13-35.
- Teece, D. J., & Pisano, G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change*, 3(3), 537–556.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Tether, B. S., & Tajar, A. (2008). The organisational-cooperation mode of innovation and its prominence amongst European service firms. *Research policy*, 37(4), 720-739.
- Thornton, P. H., Ribeiro-Soriano, D., & Urbano, D. (2011). Socio-cultural factors and entrepreneurial activity: An overview. *International Small Business Journal*, 29(2), 105–118.
- Throsby, D. (2001). *Economics and culture*. Cambridge: Cambridge University Press.
- Townsend, D. M., & Busenitz, L. W. (2015). Turning water into wine? Exploring the role of dynamic capabilities in early-stage capitalization processes. *Journal of Business Venturing*, 30(2), 292–306.
- Unger, J. M., Rauch, A., Frese, M., & Rosenbusch, N. (2011). Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing*, 26(3), 341–358.
- Urbano, D., & Alvarez, C. (2014). Institutional dimensions and entrepreneurial activity: An international study. *Small Business Economics*, 42(4), 703–716.
- Urbano, D., Alvarez, C., & Turró, A. (2013). Organizational resources and intrapreneurial activities: An international study. *Management Decision*, 51(4), 854–870.

- Urbano, D., & Aparicio, S. (2016). Entrepreneurship capital types and economic growth: International evidence. *Technological Forecasting and Social Change*, *102*, 34–44.
- Urbano, D., Aparicio, S., & Audretsch, D. (2018). Twenty-five years of research on institutions, entrepreneurship, and economic growth: what has been learned?. *Small Business Economics*, 1-29.
- Vaghely, I. P., & Julien, P. A. (2010). Are opportunities recognized or constructed? An information perspective on entrepreneurial opportunity identification. *Journal of Business Venturing*, *25*(1), 73–86.
- Van Den Bosch, F. A., Volberda, H. W., & De Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization Science*, *10*(5), 551–568.
- Van de Vrande, V., De Jong, J. P., Vanhaverbeke, W., & De Rochemont, M. (2009). Open innovation in SMEs: Trends, motives and management challenges. *Technovation*, *29*(6–7), 423–437.
- Vanhaverbeke, W., & Peeters, N. (2005). Embracing innovation as strategy: Corporate venturing, competence building and corporate strategy making. *Creativity and Innovation Management*, *14*(3), 246-257.
- Vanhaverbeke, W., Van de Vrande, V., & Cloudt, M. (2008). Connecting absorptive capacity and open innovation. Available at SSRN 1091265.
- Vanpoucke, E., Vereecke, A., & Wetzels, M. (2014). Developing supplier integration capabilities for sustainable competitive advantage: A dynamic capabilities approach. *Journal of Operations Management*, *32*(7), 446–461.
- Veciana, J. M., & Urbano, D. (2008). The institutional approach to entrepreneurship research. Introduction. *International Entrepreneurship and Management Journal*, *4*, 365–379.
- Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in Entrepreneurship, Firm Emergence and Growth*, *3*(1), 119–138.
- Vergne, J. P., & Durand, R. (2011). The path of most persistence: An evolutionary perspective on path dependence and dynamic capabilities. *Organization Studies*, *32*(3), 365–382.
- Verona, G., & Ravasi, D. (2003). Unbundling dynamic capabilities: An exploratory study of continuous product innovation. *Industrial and Corporate Change*, *12*(3), 577–606.
- Vossen, R. W. (1998). Relative strengths and weaknesses of small firms in innovation. *International small business journal*, *16*(3), 88-94.
- Wach, K. (2015). Impact of cultural and social norms on entrepreneurship in the EU: Cross-country evidence based on GEM survey results. *Zarządzanie w Kulturze*, *16*(1), 15–29.

- Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: A review and research agenda. *International Journal of Management Reviews*, 9(1), 31–51.
- Wang, C. L., Senaratne, C., & Rafiq, M. (2015). Success traps, dynamic capabilities and firm performance. *British Journal of Management*, 26(1), 26–44.
- Weerawardena, J., Mort, G. S., Liesch, P. W., & Knight, G. (2007). Conceptualizing accelerated internationalization in the born global firm: A dynamic capabilities perspective. *Journal of World Business*, 42(3), 294–306.
- Weerawardena, J., Mort, G. S., Salunke, S., Knight, G., & Liesch, P. W. (2015). The role of the market sub-system and the socio-technical sub-system in innovation and firm performance: A dynamic capabilities approach. *Journal of the Academy of Marketing Science*, 43(2), 221–239.
- Welter, F. (2011). Contextualizing entrepreneurship: Conceptual challenges and ways forward. *Entrepreneurship Theory and Practice*, 35(1), 165–184.
- Welter, F., & Smallbone, D. (2011). Institutional perspectives on entrepreneurial behavior in challenging environments. *Journal of Small Business Management*, 49(1), 107–125.
- Wennekers, S., & Thurik, R. (1999). Linking entrepreneurship and economic growth. *Small Business Economics*, 13, 27–55.
- Wennekers, S., Van Stel, A., Thurik, R., & Reynolds, P. (2005). Nascent entrepreneurship and the level of economic development. *Small Business Economics*, 24(3), 293–309.
- Westhead, P., Ucbasaran, D., & Wright, M. (2005). Decisions, actions, and performance: Do novice, serial, and portfolio entrepreneurs differ? *Journal of Small Business Management*, 43, 393–417.
- Wheeler, B. C. (2002). NEBIC: A dynamic capabilities theory for assessing net-enablement. *Information Systems Research*, 13(2), 125–146.
- Wilden, R., & Gudergan, S. P. (2015). The impact of dynamic capabilities on operational marketing and technological capabilities: Investigating the role of environmental turbulence. *Journal of the Academy of Marketing Science*, 43(2), 181–199.
- Wilhelm, H., Schlömer, M., & Maurer, I. (2015). How dynamic capabilities affect the effectiveness and efficiency of operating routines under high and low levels of environmental dynamism. *British Journal of Management*, 26(2), 327–345.
- Wilkinson, I., & Young, L. (2002). On cooperating: Firms, relations and networks. *Journal of Business Research*, 55(2), 123–132.
- Williamson, P. J. (2016). Building and leveraging dynamic capabilities: Insights from accelerated innovation in China. *Global Strategy Journal*, 6(3), 197–210.

- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991–995.
- Woldesenbet, K., Ram, M., & Jones, T. (2012). Supplying large firms: The role of entrepreneurial and dynamic capabilities in small businesses. *International Small Business Journal*, 30(5), 493–512.
- World Economic Forum. (2014). *Global competitiveness report 2013–2014*. World Bank.
- World Economic Forum. (2018). *Global competitiveness report 2017–2018*. World Bank.
- Wu, L. Y. (2007). Entrepreneurial resources, dynamic capabilities and start-up performance of Taiwan's high-tech firms. *Journal of Business Research*, 60(5), 549–555.
- Yiu, D. W., & Lau, C. M. (2008). Corporate entrepreneurship as resource capital configuration in emerging market firms. *Entrepreneurship Theory and Practice*, 32(1), 37–57.
- Zhang, Y., & Liu, D. Public R&D Subsidies, Firm Innovation and Firm Performance-Empirical Evidence from Listed Companies in China's SME Board. In *2010 International Conference on E-Business and E-Government*.
- Yun, C. (2010, December). Does entrepreneurship education matter students' entrepreneurial intention? A Chinese perspective. In *Information Science and Engineering (ICISE), 2010 2nd International Conference* (pp. 2776–2779). IEEE.
- Zahra, S. A. (2008). The virtuous cycle of discovery and creation of entrepreneurial opportunities. *Strategic Entrepreneurship Journal*, 2(3), 243-257.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885–897.
- Zahra, S. A., & George, G. (2002a). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2), 185–203.
- Zahra, S. A., & George, G. (2002b). The net-enabled business innovation cycle and the evolution of dynamic capabilities. *Information Systems Research*, 13(2), 147–150.
- Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: A review, model and research agenda. *Journal of Management Studies*, 43(4), 917–955.
- Zander, U., & Kogut, B. (1995). Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization Science*, 6(1), 76–92.
- Zapata-Cantu, L., Cantu Delgado, J. H., & Gonzalez, F. R. (2016). Resource and dynamic capabilities in business excellence models to enhance competitiveness. *The TQM Journal*, 28(6), 847–868.

- Zhu, K. (2004). The complementarity of information technology infrastructure and e-commerce capability: A resource-based assessment of their business value. *Journal of Management Information Systems*, 21(1), 167–202.
- Zhu, Q., Cordeiro, J., & Sarkis, J. (2013). Institutional pressures, dynamic capabilities and environmental management systems: Investigating the ISO 9000–environmental management system implementation linkage. *Journal of Environmental Management*, 114, 232–242.
- Zollo, M., Bettinazzi, E. L., Neumann, K., & Snoeren, P. (2016). Toward a comprehensive model of organizational evolution: Dynamic capabilities for innovation and adaptation of the enterprise model. *Global Strategy Journal*, 6(3), 225–244.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339–351.
- Zott, C. (2003). Dynamic capabilities and the emergence of intra-industry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, 24(2), 97–125.
- Zou, S., Fang, E., & Zhao, S. (2003). The effect of export marketing capabilities on export performance: an investigation of Chinese exporters. *Journal of International Marketing*, 11(4), 32–55.

APPENDIX

APPENDIX

Appendix 1. Tables of reviewed articles

1.1 Full list of reviewed articles (Chapter 2)

| Author(s) | Title | Journal | Theoretical Framework | Objective | Research type | Methodology | Research technique | Level of analysis/firm | Cites |
|--|--|------------------------------|--|--|---------------|-------------------|---|------------------------|-------|
| Teece, DJ; Pisano, G; Shuen, A (1997), | Dynamic capabilities and strategic management | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities and Resourced-based view approaches | To analyze the source and methods of wealth creation by private enterprise when operating in rapid technological change environments | Theoretical | Grounded theory | Building the dynamic capabilities framework | Firm | 6428 |
| Petroni, A (1998), | The analysis of dynamic capabilities in a competence-oriented organization | TECHNOVATION | Competence analysis | To understand and explore the nature of interactions between component and architectural dynamic competences | Empirical | Qualitative study | Case study. Structured and unstructured interviews to scientists, managers and technicians at different levels of the company to propose a Process of building NPD capabilities | Healthcare Industry | 24 |

| | | | | | | | | | |
|--|--|---|--|--|-------------|---|---|---------------------------|------|
| Deeds, DL; DeCarolis, D; Coombs, J (2000), | Dynamic capabilities and new product development in high technology ventures: An empirical analysis of new biotechnology firms | JOURNAL OF BUSINESS VENTURING | Dynamic capabilities and Resourced-based view approaches | To develop a model of new product development | Empirical | Quantitative quadratic model on 94 pharmaceutical biotechnology companies | OSL regression | Biotechnological Industry | 98 |
| Eisenhardt, KM; Martin, JA (2000), | Dynamic capabilities: What are they? | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities and Resourced-based view approaches | To extend the understanding of dynamic capabilities and to enhance RBV, examining the nature of dynamic capabilities, how those capabilities are influenced by market dynamism, and their evolution over time. | Theoretical | Grounded theory | Building a new perspective on the resource-based view | NA | 3158 |
| Madhok, A; Osegowitsch, T (2000), | The international biotechnology industry: A dynamic | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | Dynamic capabilities perspective | To extend the understanding of the diffusion of | Empirical | Quantitative study | Descriptive statistics | Biotechnological Industry | 50 |

| | | | | | | | | | |
|----------------------------------|---|---|--|--|-------------|--------------------|--|---------|-----|
| | capabilities perspective | | | technology across firms and nations | | | | | |
| Luo, YD (2000), | Dynamic capabilities in international expansion | JOURNAL OF WORLD BUSINESS | Dynamic capabilities perspective | To articulate a dynamic capability perspective on international business | Theoretical | Grounded theory | Building an integrated model of dynamic capabilities in international expansion | NA | 132 |
| Rindova, VP; Kotha, S (2001), | Continuous morphing: Competing through dynamic capabilities, form, and function | ACADEMY OF MANAGEMENT JOURNAL | Organizational form | To extend the knowledge on new organizational forms in competitive environment, and how organizational form, function and competitive advantage coevolve in such environment | Empirical | Qualitative study | Case study. Inductive inquiry in Yahoo and Excite to build a model of the relationship between continuous morphing and competitive advantage | Firm | 254 |
| Griffith, DA; Harvey, MG (2001), | A resource perspective of global dynamic capabilities | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | Dynamic capabilities and Resourced-based view approaches | To integrate the resourced-based assets and market-based assess into a single model of global dynamic capabilities | Empirical | Quantitative study | 130 questionnaires using Hofstede's cultural dimensions using correlation and regression analysis | Country | 95 |

| | | | | | | | | | |
|------------------------------|---|------------------------------|--|--|-------------|-----------------|---|---------------------------|------|
| Zollo, M; Winter, SG (2002), | Deliberate learning and the evolution of dynamic capabilities | ORGANIZATION SCIENCE | Dynamic capabilities and Organizational learning | To investigate the mechanisms that organizations use to develop dynamic capabilities | Theoretical | Grounded theory | Building a generic model of the organizational processes linking learning mechanisms, dynamic capabilities and operating routines | NA | 1615 |
| Wheeler, BC (2002), | NEBIC: A dynamic capabilities theory for assessing net-enablement | INFORMATION SYSTEMS RESEARCH | Dynamic capabilities perspective | To propose a Net-enabled Business Innovation Cycle as an applied dynamic capabilities theory | Theoretical | Grounded theory | Building a cycle with critical capabilities such as sense, innovate, execute and learn | Digital networks industry | 141 |
| Zahra, SA; George, G (2002), | The net-enabled business innovation cycle and the evolution of dynamic capabilities | INFORMATION SYSTEMS RESEARCH | Dynamic capabilities perspective, Information System and Strategy research | To extend the Net-enabled Business Innovation Cycle highlighting the links among strategy (advantage seeking), IS, and entrepreneurship (opportunity seeking behavior) | Theoretical | Grounded theory | Building the interplay between entrepreneurship, IT and competitive strategy | NA | 59 |

| | | | | | | | | | |
|-----------------------------|--|------------------------------|---|---|-------------|--------------------|---|-------------------|-----|
| King, AA; Tucci, CL (2002), | Incumbent entry into new market niches: The role of experience and managerial choice in the creation of dynamic capabilities | MANAGEMENT SCIENCE | Dynamic capabilities perspective | To extend knowledge in dynamic capabilities literature by testing how experience influences value and probability of market entry | Empirical | Quantitative study | Random effects logistic regression to a panel data of the computer industry | Computer industry | 183 |
| Winter, SG (2003), | Understanding dynamic capabilities | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To reduce the mystery around dynamic capabilities, to identify some key concepts, and to propose new terminology | Theoretical | Grounded theory | Building new terminology regarding dynamic capabilities | NA | 951 |
| Zott, C (2003), | Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective and firm performance | To explore how dynamic capabilities are linked to differential firm performance within an industry | Empirical | Quantitative study | Simulation analysis with case base scenario | NA | 342 |

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|-----------------------------------|--|--|---|---|-------------|-------------------|---|----------------------------------|-----|
| Blyler, M; Coff, RW (2003), | Dynamic capabilities, social capital, and rent appropriation: Ties that split pies | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective and social capital | To identify the specific role of social capital in dynamic capabilities and rent appropriation patterns | Theoretical | Grounded theory | Linking social capital to dynamic capabilities and explaining how social capital influences who reaps the gains, and finally who appropriates that rent | NA | 152 |
| Marsh, SJ; Stock, GN (2003), | Building dynamic capabilities in new product development through intertemporal integration | JOURNAL OF PRODUCT INNOVATION MANAGEMENT | Dynamic capabilities, strategy and product innovation | To develop a conceptual model of dynamic integration process in product development (Intemporal Integration: Collecting, interpreting and internalizing technological and marketing capabilities) | Theoretical | Grounded theory | Building the model considering intemporal integration, project-level performance, product-level performance, and firm-level performance | NA | 75 |
| Daniel, EM; Wilson, HN (2003), | The role of dynamic capabilities in e-business transformation | EUROPEAN JOURNAL OF INFORMATION SYSTEMS | Dynamic capabilities perspective | To identify the necessary dynamics capabilities for e-business | Empirical | Qualitative study | Case study. Identifying principles using analytic induction approach in five cases within e-business | Firm across different industries | 55 |

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|---|--|-------------------------------|---|--|-------------------|--------------------|--|----------|-----|
| | | | | transformation and to identify best practices | | | transformation domain | | |
| Zahra, SA; Sapienza, HJ; Davidsson, P (2006), | Entrepreneurship and dynamic capabilities: A review, model and research agenda | JOURNAL OF MANAGEMENT STUDIES | dynamic capabilities perspective and Learning theory, behavioral theory of the firm | To offer a definition of dynamic capabilities, separated from substantive capabilities, antecedents and consequences and to highlight key differences in dynamic capabilities between new ventures and established companies | Literature Review | Grounded theory | Building a model regarding the evolutionary and path dependent processes in dynamic capability development | NA | 471 |
| Arthurs, JD; Busenitz, LW (2006), | Dynamic capabilities and venture performance: The effects of venture capitalists | JOURNAL OF BUSINESS VENTURING | Dynamic capabilities, entrepreneurial capabilities and Resourced-based theory | To study how venture capitalists endure their ventures with greater dynamic capabilities | Empirical | Quantitative study | Posthoc analysis and linear regression are used to examine the relationship between Venture Capitalist characteristics and new venture performance in 268 firms (VC backed and non-VC-backed) ventures from the prospectus IPOs data | National | 70 |

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| | | | | | | | base of the Securities and Exchange Commission | | |
| Griffith, DA; Noble, SM; Chen, QM (2006), | The performance implications of entrepreneurial proclivity: A dynamic capabilities approach | JOURNAL OF RETAILING | Dynamic capabilities perspective | To show that the management orientation of entrepreneurial proclivity aids in the accumulation of knowledge resources as well as aids and hinders the conversion of these resources into dynamic capabilities. | Empirical | Quantitative study | Structural Modelling was applied in 269 observations of smaller retailers | Retailer industry | 43 |
| Wang, Catherine L.; Ahmed, Pervaiz K. (2007), | Dynamic capabilities: A review and research agenda | INTERNATIONAL JOURNAL OF MANAGEMENT REVIEWS | Dynamic capabilities and Resourced-based view approaches | To clarify the concept of dynamic capabilities and to identify three component factors which reflect the common features of dynamic capabilities across firms. | Literature Review | Grounded theory | Building a research model of dynamic capabilities | NA | 319 |
| Pablo, Amy L.; Reay, Trish; Dewald, James R.; Casebeer, Ann L. (2007), | Identifying, enabling and managing | JOURNAL OF MANAGEMENT STUDIES | Dynamic capabilities theories, resource-based view and Competition-based strategy | To examine how a public sector organization | Empirical | Qualitative study | Case study. Building phases of developing a dynamic capability | Six innovation projects at the | 67 |

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| | dynamic capabilities in the public sector | | | developed a new strategic approach based on the identification and use of an internal dynamic capability (learning through experimenting). | | | as a strategic approach, based on 'constant comparison' incorporating longitudinal and processual dimensions. Sources: direct observation of meetings, semi-structured interviews, and archival materials. | Calgary Health Region | |
| Rothaermel, Frank T.; Hess, Andrew M. (2007), | Building dynamic capabilities: Innovation driven by individual-, firm-, and network-level effects | ORGANIZATION SCIENCE | Dynamic capabilities perspective | To assess the different levels of antecedents at the individual, firm and network levels on innovation output. | Empirical | Quantitative study | Multilevel model in 35 pharmaceutical firms worldwide. Regression of random effects negative binomial. | Global pharmaceutical industry | 222 |
| Teece, David J. (2007), | Explicating dynamic capabilities: The nature and microfoundations | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To describe the nature and micro foundations of the capabilities. | Theoretical | Grounded theory | NA | NA | 1446 |

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| | of (sustainable) enterprise performance | | | | | | | | |
| Weerawardena, Jay; Mort, Gillian Sullivan; Liesch, Peter W.; Knight, Gary (2007), | Conceptualizing accelerated internationalization in the born global firm: A dynamic capabilities perspective | JOURNAL OF WORLD BUSINESS | Dynamic capabilities, Born global firms, knowledge-based approach to internationalization frameworks | To present a conceptual model of born global firm internationalization. | Theoretical | Grounded theory | Building the proposed dynamic capability model of born global firm accelerated internationalization combining the dynamic capabilities view of competitive strategy with the organizational learning theory. | NA | 163 |
| Doving, Erik; Gooderham, Paul N. (2008), | Dynamic capabilities as antecedents of the scope of related diversification: The case of small firm accountancy practices | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To propose that differences in the scope of related diversification in firms can be accounted for by differences in their dynamic capabilities. | Empirical | Quantitative study | Linear regression analysis in authorized accountancy practices | Authorized accountancy practices | 69 |

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|---|--|----------------------|--|--|-------------|--------------------|---|----------------------------|----|
| Augier, Mie; Teece, David J. (2008), | Strategy as evolution with design: The foundations of dynamic capabilities and the role of managers in the economic system | ORGANIZATION STUDIES | Dynamic capabilities and Strategic management and framework. Behavioral Theory of the Firm, Transaction Cost Theory, Evolutionary Theories of the Firm and Strategy, Dynamic Capabilities as a Theory of Entrepreneurial Management. | To discuss the intellectual roots of the dynamic capabilities framework. | Theoretical | Grounded theory | Building on Strategy as Evolution with Design | NA | 52 |
| Sawers, Jill L.; Pretorius, Marthinus W.; Oerlemans, Leon A. G. (2008), | Safeguarding SMEs dynamic capabilities in technology innovative SME-large company partnerships in South Africa | TECHNOVATION | Dynamic capabilities perspective | To examine to what extent is the number of dynamic capabilities of SMEs associated with partnership success and to what extent is this relationship influenced by the number of safeguards used by the SMEs. | Empirical | Quantitative study | Binary logistic regression in 43 technology innovative SMEs | Technology innovative SMEs | 26 |
| Regner, Patrick (2008), | Strategy-as-practice and dynamic capabilities: Steps towards a | HUMAN RELATIONS | Dynamic capabilities and Strategy-as-practice approach perspectives | To examine how the strategy-as-practice approach may complement the perspective on strategy dynamics, which | Theoretical | Grounded theory | Building in the comparison and identification of processes characteristics the strategy-as-practice and dynamic | NA | 41 |

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| | dynamic view of strategy | | | emphasizes dynamic capabilities. | | | capabilities perspectives | | |
| Chen, Ruey-Shun; Sun, Chia-Ming; Helms, Marilyn M.; Jih, Wen-Jang (Kenny) (2008), | Aligning information technology and business strategy with a dynamic capabilities perspective: A longitudinal study of a Taiwanese semiconductor company | INTERNATIONAL JOURNAL OF INFORMATION MANAGEMENT | Dynamic capabilities perspective | To analyze the strategic information system alignment process by applying the dynamic capabilities perspective | Empirical | Qualitative study | Single longitudinal case study | IT industry firm | 24 |
| Easterby-Smith, Mark; Prieto, Isabel M. (2008), | Dynamic capabilities and knowledge management: an integrative role for learning? | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities and Knowledge management approaches | To ascertain the conceptual connection between dynamic capabilities and knowledge management as a basis for future research. | Theoretical | Grounded theory | Building the boundaries and overlaps of the dynamic capabilities and knowledge management fields and linking knowledge management and dynamic capabilities | NA | 98 |

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| Anand, Gopesh; Ward, Peter T.; Tatikonda, Mohan V.; Schilling, David A. (2009), | Dynamic capabilities through continuous improvement infrastructure | JOURNAL OF OPERATIONS MANAGEMENT | Dynamic capabilities perspective and organizational learning theory | To present a framework of infrastructure based on continuous improvement as a dynamic capability when including a comprehensive organizational context. | Empirical | Qualitative study | Case study. Considering continuous improvement as dynamic capability conducted in 5 companies from different industries. | Midwestern US | 62 |
| Ambrosini, Veronique; Bowman, Cliff (2009), | What are dynamic capabilities and are they a useful construct in strategic management? | INTERNATIONAL JOURNAL OF MANAGEMENT REVIEWS | Dynamic capabilities perspective | To extend the concept of dynamic capabilities | Theoretical | Grounded theory | Building on how firms renew their resource base | NA | 219 |
| Malik, Omar R.; Kotabe, Masaaki (2009), | Dynamic Capabilities, Government Policies, and Performance in Firms from Emerging Economies: Evidence from | JOURNAL OF MANAGEMENT STUDIES | Dynamic capabilities perspective | To develop a model of the dynamic capability development mechanisms in Emerging Market manufacturing Firms. | Empirical | Quantitative study | Confirmatory factor analysis, correlation and OLS in 93 firms | Manufacturing industry | 36 |

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| | India and Pakistan | | | | | | | | |
| Augier, Mie; Teece, David J. (2009), | Dynamic Capabilities and the Role of Managers in Business Strategy and Economic Performance | ORGANIZATION SCIENCE | Dynamic capabilities perspective | To discuss some developments in the theory of the organizational capabilities of the business enterprise | Theoretical | Grounded theory | Building on the role of the manager as entrepreneur | NA | 102 |
| Fang, Eric (Er); Zou, Shaoming (2009), | Antecedents and consequences of marketing dynamic capabilities in international joint ventures | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | Dynamic capabilities and Marketing dynamic capabilities | To develop a conceptualization of marketing dynamic capabilities, to investigate their development in international joint ventures, and to explore their effect in their performance and competitive advantage. | Empirical | Quantitative study | Building a model of marketing dynamic capabilities in international joint ventures | International Joint Ventures | 47 |
| Russo, Michael V. (2009), | Explaining the Impact of ISO 14001 on Emission | BUSINESS STRATEGY AND THE ENVIRONMENT | Dynamic capabilities perspective | To explore how new process standards influence the ability of manufacturing | Empirical | Quantitative study | NA | Electronic manufacturing industry | 48 |

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| | Performance: a Dynamic Capabilities Perspective on Process and Learning | | | facilities to improve environmental performance by reducing toxic emissions | | | | | |
| Easterby-Smith, Mark; Lyles, Marjorie A.; Peteraf, Margaret A. (2009), | Dynamic Capabilities: Current Debates and Future Directions | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To discuss the evolution of the concept, and identify two major current debates around the nature of dynamic capabilities and their consequences, to review recent progress, to discuss the relative merits of qualitative and quantitative studies, and conclude with recommendations for future research. | Theoretical | Grounded theory | Building upon debate analysis | NA | 96 |
| Ambrosini, Veronique; Bowman, Cliff; Collier, Nardine (2009), | Dynamic Capabilities: An Exploration of How Firms | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To extend the concept of dynamic capabilities | Theoretical | Grounded theory | Building on how firms renew their resource base | NA | 88 |

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|--|--|-------------------------------|----------------------------------|--|-------------|--------------------|---|-------------------------------------|----|
| | Renew their Resource Base | | | | | | | | |
| Macher, Jeffrey T.; Mowery, David C. (2009), | Measuring Dynamic Capabilities: Practices and Performance in Semiconductor Manufacturing | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To examine one type of dynamic capability: the development and introduction of new process technologies in semiconductor manufacturing | Empirical | Quantitative study | Principal component analysis | Semi conduct manufacturing industry | 38 |
| McKelvie, Alexander; Davidsson, Per (2009), | From Resource Base to Dynamic Capabilities: an Investigation of New Firms | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To examine founder human capital, access to employee human capital, access to technological expertise, access to other specific expertise, and access to two types of tangible resources | Empirical | Quantitative study | Hierarchical regression | New firms | 37 |
| Pandza, Krsto; Thorpe, Richard (2009), | Creative Search and Strategic Sense-making: Missing Dimensions in the Concept of | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To discuss the role of managerial agency in creating and shaping dynamic capabilities | Theoretical | Grounded theory | Identifying cognitive processes called creative search and strategic sense-making | NA | 27 |

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| | Dynamic Capabilities | | | | | | | | |
| Narayanan, V. K.; Colwell, Ken; Douglas, Frank L. (2009), | Building Organizational and Scientific Platforms in the Pharmaceutical Industry: A Process Perspective on the Development of Dynamic Capabilities | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To examine the process of dynamic capability development in a large pharmaceutical firm | Empirical | Qualitative study | Case study | Major pharmaceutical firm | 22 |
| Barreto, Ilidio (2010), | Dynamic Capabilities: A Review of Past Research and an Agenda for the Future | JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To review the diverse research streams on dynamic capabilities, to identify main limitations and challenges, to suggest a new conceptualization of dynamic capability, and to provide guidance for future research | Literature Review | Grounded theory | Building a new conceptualization of dynamic capabilities | NA | 211 |

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| Dixon, Sarah E. A.; Meyer, Klaus E.; Day, Marc (2010), | Stages of Organizational Transformation in Transition Economies: A Dynamic Capabilities Approach | JOURNAL OF MANAGEMENT STUDIES | Dynamic capabilities and Organizational transformation approaches | To develop a theoretical framework of organizational transformation that explains the processes by which organizations learn and develop dynamic capabilities in transition economies. | Theoretical | Grounded theory | Build a three-stage integrative framework of organizational transformation | NA | 21 |
| Reuter, Carsten; Foerstl, Kai; Hartmann, Evi; Blome, Constantin (2010), | SUSTAINABLE GLOBAL SUPPLIER MANAGEMENT: THE ROLE OF DYNAMIC CAPABILITIES IN ACHIEVING COMPETITIVE ADVANTAGE | JOURNAL OF SUPPLY CHAIN MANAGEMENT | Dynamic capabilities perspective | To propose that profound sustainable global supplier management capabilities are a source of competitive advantage. | Empirical | Qualitative study | Multiple case study | Chemical industry | 96 |
| Fischer, Thomas; Gebauer, Heiko; Gregory, Mike; Ren, Guangjie; Fleisch, Elgar (2010), | Exploitation or exploration in service business development? Insights from a dynamic | JOURNAL OF SERVICE MANAGEMENT | Dynamic capabilities perspective | To explore how dynamic capabilities of sensing, seizing and reconfiguring shape the way in which service business is developed in a broad | Empirical | Qualitative study | Multiple-case studies | Capital goods industries | 33 |

| | capabilities perspective | | | range of capital goods industries | | | | | |
|--|--|--|----------------------------------|--|-------------|-------------------|------------------------------------|--|----|
| Koch, Hope (2010), | Developing dynamic capabilities in electronic marketplaces: A cross-case study | JOURNAL OF STRATEGIC INFORMATION SYSTEMS | Dynamic capabilities perspective | To identify the capabilities necessary to develop Electronic Market Places that generate and sustain participant contributions, and to discuss how to develop these capabilities | Empirical | Qualitative study | Multiple-case studies | Electronic industry | 13 |
| Chirico, Francesco; Nordqvist, Mattias (2010), | Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture | INTERNATIONAL SMALL BUSINESS JOURNAL | Dynamic capabilities perspective | To understand how transgenerational value is created, through the lens of dynamic capabilities, which are created by knowledge and in turn generate entrepreneurial performance and value creation | Empirical | Qualitative study | Longitudinal Multiple-case studies | Family business from beverage industry | 43 |
| Hodgkinson, Gerard P.; Healey, Mark P. (2011), | PSYCHOLOGICAL FOUNDATIONS OF | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To demonstrate how the fundamental capabilities of sensing, seizing, and | Theoretical | Grounded theory | NA | NA | 88 |

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| | DYNAMIC CAPABILITIES: REFLEXION AND REFLECTION IN STRATEGIC MANAGEMENT | | | transforming each require firms to harness the cognitive and emotional capacities of individuals and groups with the skilled utilization of less deliberative, intuitive processes. | | | | | |
| Drnevich, Paul L.; Kriauciunas, Aldas P. (2011), | CLARIFYING THE CONDITIONS AND LIMITS OF THE CONTRIBUTIONS OF ORDINARY AND DYNAMIC CAPABILITIES TO RELATIVE FIRM PERFORMANCE | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To examine the positive and negative contributions of capabilities to relative firm performance as well as the effects of environmental dynamism, and the degree of capability heterogeneity | Empirical | Quantitative | Confirmatory factor analysis, exploratory factor analysis, regression analysis, and sensibility analysis | NA | 76 |

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|--|--|------------------------------------|---|---|-------------|--------------------------------------|---|----|----|
| Fawcett, Stanley E.; Wallin, Cynthia; Allred, Chad; Fawcett, Amydee M.; Magnan, Gregory M. (2011), | INFORMATION TECHNOLOGY AS AN ENABLER OF SUPPLY CHAIN COLLABORATION: A DYNAMIC-CAPABILITIES PERSPECTIVE | JOURNAL OF SUPPLY CHAIN MANAGEMENT | Dynamic capabilities and Resourced-based view approaches | To ascertain how IT can be exploited to obtain a distinctive supply chain advantage | Empirical | Qualitative and quantitative studies | Case study and survey applying structural equation model to propose a process for exploiting IT investments for collaborative advantage | NA | 60 |
| Vergne, Jean-Philippe; Durand, Rodolphe (2011), | The Path of Most Persistence: An Evolutionary Perspective on Path Dependence and Dynamic Capabilities | ORGANIZATION STUDIES | Dynamic capabilities perspective and organizational path dependence | To extend the dynamic capability view and research on organizational path dependence by arguing that path dependence can be a property of capabilities when a contingently-triggered capability path is subject to self-reinforcement | Theoretical | Grounded theory | NA | NA | 28 |

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| Ramachandran, Venugopal (2011), | Strategic Corporate Social Responsibility: A 'Dynamic Capabilities' Perspective | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | Dynamic capabilities perspective and organizational path dependence | To propose two kinds of dynamic capabilities as the precursors to strategic corporate social responsibility success | Theoretical | Grounded theory | Building a model of strategic corporate social responsiveness by the association of dynamic capabilities to processes | NA | 18 |
| Prange, Christiane; Verdier, Sylvie (2011), | Dynamic capabilities, internationalization processes and performance | JOURNAL OF WORLD BUSINESS | Dynamic capabilities perspective | To introduce the notion of third-order capabilities to balance trade-offs and maximize internationalization performance | Theoretical | Grounded theory | Arguing that there are two opposing classes of explorative and exploitative capabilities differentially linked to output variables | NA | 42 |
| Lee, Po-Yen; Lin, Hui-Tzu; Chen, Hung-Hsin; Shyr, Yi-Hwan (2011), | Dynamic capabilities exploitation of market and hierarchy governance structures: An empirical comparison of Taiwan and South Korea | JOURNAL OF WORLD BUSINESS | Dynamic capabilities perspective and dynamic learning mechanisms | To differentiate the role of drivers of dynamic learning mechanisms to provide more robust insights into dynamic capabilities exploitation in polar governance structures | Empirical | Grounded theory | Learning intent and embedded learning are important primary antecedent drivers of dynamic capabilities exploitation | 5 | |

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|---|---|---------------------------------------|---|--|-------------|-------------------|----------------------------------|---|----|
| Salunke, Sandeep; Weerawardena, Jay; McColl-Kennedy, Janet R. (2011), | Towards a model of dynamic capabilities in innovation-based competitive strategy: Insights from project- oriented service firms | INDUSTRIAL MARKETING MANAGEMENT | Dynamic capabilities perspective and service innovation theory of competitive strategy | To develop a model that suggests that entrepreneurial service firms pursuing innovation select and use dynamic capabilities that enable them to achieve greater innovation and sustained competitive advantage | Empirical | Qualitative study | Multiple-case studies | Project oriented service firms | 25 |
| Gebauer, Heiko (2011), | Exploring the contribution of management innovation to the evolution of dynamic capabilities | INDUSTRIAL MARKETING MANAGEMENT | Dynamic capabilities perspective | To study how management innovation contributes to dynamic capabilities | Empirical | Qualitative study | Multiple-case studies | Capital goods manufacturing companies | 16 |
| Chirico, Francesco; Nordqvist, Mattias; Colombo, Gianluca; Mollona, Edoardo (2012), | Simulating Dynamic Capabilities and Value Creation in Family Firms: Is Paternalism an | FAMILY BUSINESS REVIEW | Dynamic capabilities perspective | To interpret how and when paternalism affects dynamic capabilities and ultimately value creation in family firms | Theoretical | Simulation study | Using system dynamics methods | NA | 6 |

| | Asset or a Liability? | | | | | | | | |
|--|--|--|---|--|-------------|-------------------|---|---|----|
| Camison, Cesar; Monfort-Mir, Vicente M. (2012), | Measuring innovation in tourism from the Schumpeterian and the dynamic-capabilities perspectives | TOURISM MANAGEMENT | Dynamic-capabilities and Schumpeterian perspectives | To offer a diagnosis of the “state of the issue” related to the measurement of innovation in the tourism industry at the company level | Theoretical | Grounded theory | Proposing how existing secondary databases of innovative activity define the boundaries of the tourism industry, and the degree to which these databases reflect the particular characteristics of this economic activity | NA | 37 |
| Woldesenbet, Kassa; Ram, Monder; Jones, Trevor (2012), | Supplying large firms: The role of entrepreneurial and dynamic capabilities in small businesses | INTERNATIONAL SMALL BUSINESS JOURNAL | Dynamic capabilities perspective and entrepreneurial capabilities | To examine the capabilities that allow small firms to operate as suppliers to large organizations in the public and private sectors | Empirical | Qualitative study | Multiple-case studies | Small firms suppliers to large purchasing organizations | 14 |
| Beske, Philip (2012), | Dynamic capabilities and sustainable | INTERNATIONAL JOURNAL OF PHYSICAL DISTRIBUTION & | Dynamic Capabilities and Sustainable Supply Chain Management theories | To discuss the complementarities of Dynamic Capabilities and Sustainable | Theoretical | Grounded theory | Dynamic Capabilities and Sustainable Supply Chain Management are | NA | 31 |

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| | supply chain management | LOGISTICS MANAGEMENT | | Supply Chain Management research; and to develop a framework which integrates Dynamic Capabilities in Sustainable Supply Chain Management practices | | | linked through similar environmental and organizational conditions | | |
| Peteraf, Margaret; Di Stefano, Giada; Verona, Gianmario (2013), | THE ELEPHANT IN THE ROOM OF DYNAMIC CAPABILITIES: BRINGING TWO DIVERGING CONVERSATIONS TOGETHER | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To show that there are ways to unify the dynamic capabilities approach, by integrating the two contradictory views and preserving the assumptions that led to their differences. | Theoretical | Grounded theory | Author cocitation analysis and contingency-based approach, and an historiography of the core papers within the dynamic capabilities research field | NA | 48 |
| Zhu, Qinghua; Cordeiro, James; Sarkis, Joseph (2013), | Institutional pressures, dynamic capabilities and environmental management systems: | JOURNAL OF ENVIRONMENTAL MANAGEMENT | Organizational management systems | To propose a model where domestic and international institutional pressures lead to the successful implementation of ISO 9000 and can in turn | Empirical | Quantitative analysis | Common method bias (variance) | NA | 33 |

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| | Investigating the ISO 9000 - Environmental management system implementation linkage | | | lead to the successful implementation of environmental management systems such as ISO 14001 environmental certification systems or total quality environmental management systems. | | | | | |
| Ravishankar, M. N.; Pan, Shan L. (2013), | Examining the influence of modularity and knowledge management (KM) on dynamic capabilities: Insights from a call center | INTERNATIONAL JOURNAL OF INFORMATION MANAGEMENT | Dynamic capabilities perspectives and modular management | To study how modular management of information technology, project teams and front-line personnel in concert with knowledge management interventions influence the creation and development of dynamic capabilities at a large Asia-based call center | Empirical | Qualitative study | Case study | Asia speak call center | 5 |

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| <p>Cabanelas, Pablo; Cabanelas Omil, Jose; Vazquez, Xose H. (2013),</p> | <p>A methodology for the construction of dynamic capabilities in industrial networks: The role of border agents</p> | <p>INDUSTRIAL MARKETING MANAGEMENT</p> | <p>Dynamic capabilities and industrial network perspectives</p> | <p>To develop a methodology for the formation and functioning of industrial networks that allows the development of dynamic capabilities with regard to the creation, integration, transfer and absorption of knowledge.</p> | <p>Empirical</p> | <p>Qualitative study</p> | <p>Case study</p> | <p>Wood industry</p> | <p>2</p> |
| <p>Barrales-Molina, Vanesa; Bustanza, Oscar F.; Gutierrez-Gutierrez, Leopoldo J. (2013),</p> | <p>Explaining the Causes and Effects of Dynamic Capabilities Generation: A Multiple- Indicator Multiple-Cause Modelling Approach</p> | <p>BRITISH JOURNAL OF MANAGEMENT</p> | <p>Dynamic capabilities perspective</p> | <p>To develop a multiple- indicator multiple- cause model to explain dynamic capabilities generation</p> | <p>Empirical</p> | <p>Quantitative analysis</p> | <p>Structural equation modeling</p> | <p>Sample from the Dun and Bradstreet's Spain Database</p> | <p>7</p> |

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|--|--|---|----------------------------------|--|-----------|-----------------------|--|---------------------|----|
| Ramirez, Rafael; Osterman, Riku; Gronquist, Daniel (2013), | Scenarios and early warnings as dynamic capabilities to frame managerial attention | TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE | Dynamic capabilities perspective | To propose that relating scenario planning with early warning scanning provides firms with synergic capabilities | Empirical | Qualitative study | Case study, constant comparative method | Large companies | 13 |
| Arend, Richard J. (2013), | Ethics-focused dynamic capabilities: a small business perspective | SMALL BUSINESS ECONOMICS | Dynamic capabilities perspective | To study whether firms have 'dynamic' capabilities that change their ethics-focused operational capabilities; what effects those dynamic capabilities have on both ethical and competitive performance; and, whether those effects are contingent on a firm's entrepreneurial characteristics. | Empirical | Quantitative | Hierarchical OLS | 215 for profit SMEs | 7 |
| Vanpoucke, Evelyne; Vereecke, Ann; Wetzels, Martin (2014), | Developing supplier integration capabilities for sustainable | JOURNAL OF OPERATIONS MANAGEMENT | Dynamic capabilities perspective | To identify integration sensing, seizing and transforming as sub-capabilities that together form a | Empirical | Quantitative analysis | Structural equation modelling and confirmatory factor analysis, for building | Global industry | 11 |

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|-------------------------|---|---|--|--|-------------|---------------------------------------|---|--|----|
| | competitive advantage: A dynamic capabilities approach | | | dynamic capability, referred as supplier integrative capability. | | | a supplier integrative capability model | | |
| Schilke, Oliver (2014), | THE CONTINGENT VALUE OF DYNAMIC CAPABILITIES FOR COMPETITIVE ADVANTAGE: THE NONLINEAR MODERATING EFFECT OF ENVIRONMENTAL DYNAMISM | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To identify and inverse U-shaped moderation between dynamic capabilities and competitive advantage, strongest under intermediate levels of dynamism but comparatively weaker when dynamism is low or high. | Empirical | Qualitative and quantitative analyses | Ordinary least squares and Interviews and surveys | Chemicals, machinery, and motor vehicle industries | 58 |
| Teece, David J. (2014), | A dynamic capabilities-based entrepreneurial theory of the | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | Dynamic capabilities and Multinational enterprise theories | To develop a dynamic capabilities-based theory of the multinational enterprise | Theoretical | Grounded theory | Entrepreneurial management and transformational leadership are incorporated into a capabilities theory of | NA | 61 |

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| | multinational enterprise | | | | | | the multinational enterprise. | | |
| Cheng, Jao-Hong; Chen, Mu-Chung; Huang, Chung-Ming (2014), | Assessing inter-organizational innovation performance through relational governance and dynamic capabilities in supply chains | SUPPLY CHAIN MANAGEMENT-AN INTERNATIONAL JOURNAL | Dynamic capabilities and Relational governance perspectives | To examine the factors that influence innovation performance and implementation in inter-organizational relationships. | Empirical | Quantitative study | Structural equation modeling applying surveys as instrument | Manufacturing industry | 5 |
| Nieves, Julia; Haller, Sabine (2014), | Building dynamic capabilities through knowledge resources | TOURISM MANAGEMENT | Dynamic capabilities perspective | To investigate the possible antecedents of dynamic capabilities in the hotel industry | Empirical | Quantitative study | Exploratory factor analysis and multiple regression analysis | Tourism industry | 24 |
| Beske, Philip; Land, Anna; Seuring, Stefan (2014), | Sustainable supply chain management practices and dynamic capabilities in the food industry: A | INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS | Dynamic capabilities and sustainable supply chain management perspectives | To describe how sustainable supply chain management practices allow companies to maintain control over their supply chain and | Theoretical | Grounded theory | NA | Food industry | 41 |

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|--|---|--|--|---|-----------|-------------------|---|--|---|
| | critical analysis of the literature | | | achieve a competitive advantage with the implementation of dynamic capabilities | | | | | |
| Daniel, Elizabeth M.; Ward, John M.; Franken, Arnoud (2014), | A dynamic capabilities perspective of IS project portfolio management | JOURNAL OF STRATEGIC INFORMATION SYSTEMS | Dynamic capabilities and Information Systems Project Portfolio Management perspectives | To investigate how firms developed and adapted Information Systems Project Portfolio Management to match the turbulent recessionary conditions witnessed after 2008–2009. | Empirical | Qualitative study | Multiple case study approach of five firms | Different sizes and different industry sectors | 9 |
| Arend, Richard J. (2014), | Entrepreneurship and dynamic capabilities: how firm age and size affect the 'capability enhancement-SME performance' relationship | SMALL BUSINESS ECONOMICS | Dynamic capabilities and entrepreneurship views | To study how strategic change can drive firm performance | Empirical | Quantitative | Proportions test and hierarchical ordinary least squares regression (OLS) | 220 SMEs | 5 |

| | | | | | | | | | |
|--|---|--|---|--|------------------|---------------------------|---|-----------------------------------|-----------|
| <p>Townsend, David M.; Busenitz, Lowell W. (2015),</p> | <p>Turning water into wine? Exploring the role of dynamic capabilities in early-stage capitalization processes</p> | <p>JOURNAL OF BUSINESS VENTURING</p> | <p>Dynamic capabilities perspective</p> | <p>To examine the extent to which various trade-offs among the quality of a venture's management team, radicalness of the firm's technological resources, and demand uncertainty in focal markets impact the ability of ventures to resolve capitalization challenges.</p> | <p>Empirical</p> | <p>Quantitative study</p> | <p>Single-limit tobit regression</p> | <p>Seed/early-stage companies</p> | <p>1</p> |
| <p>Wilden, Ralf; Gudergan, Siegfried P. (2015),</p> | <p>The impact of dynamic capabilities on operational marketing and technological capabilities: investigating the role of environmental turbulence</p> | <p>JOURNAL OF THE ACADEMY OF MARKETING SCIENCE</p> | <p>Dynamic capabilities perspective</p> | <p>To propose a model of how frequent dynamic capability utilization, assessed through its underlying processes of sensing and reconfiguring, relates to marketing and technological capabilities, as well as how market, technological, and competitor turbulence</p> | <p>Empirical</p> | <p>Quantitative study</p> | <p>Conceptual model of dynamic capabilities, environmental turbulence, operational capabilities, and organizational performance using partial least squares structural equation modeling and finite mixture partial least squares</p> | <p>All industries large firms</p> | <p>19</p> |

| | | | | | | | | | |
|---|--|---|----------------------------------|--|-------------|-------------------|--------------------------------------|--------------------------------|----|
| | | | | might affect these relationships | | | | | |
| Weerawardena, Jay; Mort, Gillian Sullivan; Salunke, Sandeep; Knight, Gary; Liesch, Peter W. (2015), | The role of the market sub-system and the socio-technical sub-system in innovation and firm performance: a dynamic capabilities approach | JOURNAL OF THE ACADEMY OF MARKETING SCIENCE | Dynamic capabilities perspective | To develop a more complete explanation of learning, its relationship to innovation, and their joint effect on early internationalization | Empirical | Qualitative study | Case study | Early internationalizing firms | 0 |
| Helfat, Constance E.; Peteraf, Margaret A. (2015), | MANAGERIAL COGNITIVE CAPABILITIES AND THE MICROFOUNDATIONS OF DYNAMIC CAPABILITIES | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To introduce the concept of “managerial cognitive capability,” which highlights the fact that capabilities involve the capacity to perform not only physical but also mental activities. | Theoretical | Grounded theory | NA | NA | 43 |
| Bingham, Christopher B.; Heimeriks, Koen H.; | Concurrent learning: How firms develop | STRATEGIC MANAGEMENT JOURNAL | Dynamic capabilities perspective | To show how multiple dynamic capabilities | Empirical | Qualitative study | Case study using in-depth historical | One firm | 3 |

| | | | | | | | | | |
|---|---|---------------------------|----------------------------------|---|-------------|--------------------|--|-----------------------|---|
| Schijven, Mario; Gates, Stephen (2015), | multiple dynamic capabilities in parallel | | | might be developed in parallel | | | analysis of a single firm | | |
| Leonidou, Leonidas C.; Leonidou, Constantinos N.; Fotiadis, Thomas A.; Aykol, Bilge (2015), | Dynamic capabilities driving an eco-based advantage and performance in global hotel chains: The moderating effect of international strategy | TOURISM MANAGEMENT | Dynamic capabilities perspective | To test a model of organizational capabilities driving an eco-based competitive advantage and performance in the global hotel industry. | Empirical | Quantitative study | Partial Least Square Structural Equations Modeling | Global hotel industry | 3 |
| Michailova, Snejina; Zhan, Wu (2015), | Dynamic capabilities and innovation in MNC subsidiaries | JOURNAL OF WORLD BUSINESS | Dynamic capabilities perspective | To develop a framework that differentiates between generative, sourcing and integrative capabilities in multinational corporations subsidiaries, proposes the new construct of subsidiary dynamic knowledge capability and establishes direct | Theoretical | Grounded theory | NA | NA | 1 |

| | | | | | | | | | |
|---|---|---------------------------|--|--|-------------|-------------------|------------|------------------------|---|
| | | | | and non-direct links between dynamic knowledge capability and subsidiary innovation. | | | | | |
| Butler, Bella; Soontiens, Werner (2015), | Offshoring of higher education services in strategic nets: A dynamic capabilities perspective | JOURNAL OF WORLD BUSINESS | Dynamic capabilities and strategic nets perspectives | To examine the process of the intentional transformation of a loose organic network into a strategic net within the context of offshoring higher education services over time. | Empirical | Qualitative study | Case study | Educational university | 0 |
| Mitchell, Matthew; Skrzypacz, Andrzej (2015), | A Theory of Market Pioneers, Dynamic Capabilities, and Industry Evolution | MANAGEMENT SCIENCE | Dynamic capabilities perspective | To analyze a model of industry evolution and to describe how competition, free entry, and the dynamic capability of incumbents drive the evolution of an industry | Theoretical | Grounded theory | NA | NA | 0 |

| | | | | | | | | | |
|---|--|--|----------------------------------|--|-----------|--------------------|--|---|---|
| Piening, Erk P.; Salge, Torsten Oliver (2015), | Understanding the Antecedents, Contingencies, and Performance Implications of Process Innovation: A Dynamic Capabilities Perspective | JOURNAL OF PRODUCT INNOVATION MANAGEMENT | Dynamic capabilities perspective | To examine the capability of firms to introduce process innovations | Empirical | Quantitative study | Tobit regression model with robust standard errors | European Union's Community Innovation Survey | 4 |
| Rice, John; Liao, Tung-Shan; Galvin, Peter; Martin, Nigel (2015), | A configuration-based approach to integrating dynamic capabilities and market transformation in small and medium-sized enterprises to achieve firm performance | INTERNATIONAL SMALL BUSINESS JOURNAL | Dynamic capabilities perspective | To develop and test a model integrating dynamic organizational capabilities, market transformation arrangements and firm performance | Empirical | Quantitative study | Structural equation modelling | Business Longitudinal Survey with sample of 444 SME's manufacturing firms | 2 |
| Wang, Catherine L.; Senaratne, Chaminda; | Success Traps, Dynamic Capabilities and | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To examine the effects of success traps on dynamic capabilities and consequently firm | Empirical | Quantitative study | Structural equation modelling and | 113 UK high tech SME's | 7 |

| | | | | | | | | | |
|---|--|--------------------------------------|----------------------------------|--|-----------|--------------------|--|---|---|
| Rafiq, Mohammed (2015), | Firm Performance | | | performance, taking into account firm strategy and market dynamism | | | multigroup structural equation modelling | | |
| Wilhelm, Hendrik; Schloemer, Maren; Maurer, Indre (2015), | How Dynamic Capabilities Affect the Effectiveness and Efficiency of Operating Routines under High and Low Levels of Environmental Dynamism | BRITISH JOURNAL OF MANAGEMENT | Dynamic capabilities perspective | To underscore the overall importance of dynamic capabilities as a way to understand differences in operating-routine performance | Empirical | Quantitative study | Structural equation modelling using maximum-likelihood estimation | 200 SME's of engineering, rubber & plastics, and paper processing | 5 |
| El Akremi, Assaad; Perrigot, Rozenn; Piot-Lepetit, Isabelle (2015), | Examining the Drivers for Franchised Chains Performance through the Lens of the Dynamic Capabilities Approach | JOURNAL OF SMALL BUSINESS MANAGEMENT | Dynamic capabilities perspective | To explore why and how several characteristics of franchised chains influence sales performance | Empirical | Quantitative study | Three-stage hierarchical regressions for linear and quadratic effects. | 189 retail and service chains | 2 |

| | | | | | | | | | |
|---|---|-------------------------------------|-------------------------------------|---|-------------|-----------------------|--|------------------|---|
| Fainshmidt, Stav; Pezeshkan, Amir; Frazier, M. Lance; Nair, Anil; Markowski, Edward (2016), | Dynamic Capabilities and Organizational Performance: A Meta-Analytic Evaluation and Extension | JOURNAL OF MANAGEMENT STUDIES | Dynamic capabilities perspective | To evaluate that dynamic capabilities are positively related to performance, and that this relationship is stronger in industries with higher levels of technological dynamism. Second, to theorize and demonstrate empirically that higher-order dynamic capabilities are more strongly related to performance than lower-order dynamic capabilities. | Empirical | Quantitative study | Meta-analysis and Meta-regression for moderator analysis | Empirical papers | 1 |
| Lessard, Donald; Teece, David J.; Leih, Sohvi (2016), | The Dynamic Capabilities of Meta- Multinationals | GLOBAL STRATEGY JOURNAL | Dynamic capabilities perspective | To draw contrasts between the meta- MNE and the traditional, home- centric MNE regarding strong dynamic capabilities. | Theoretical | Grounded theory | Country case | NA | 0 |

| | | | | | | | | | |
|--|---|-------------------------------|-------------------------------------|---|-------------|-------------------|------------|----|---|
| Nonaka, Ikujiro; Hirose, Ayano; Takeda, Yusaku (2016), | Meso'- Foundations of Dynamic Capabilities: Team-Level Synthesis and Distributed Leadership as the Source of Dynamic Creativity | GLOBAL STRATEGY JOURNAL | Dynamic capabilities perspective | To examine the theoretical foundations of an organization's dynamic capabilities and to make a distinction between the creative and adaptive aspects of dynamic capabilities, | Empirical | Qualitative study | Case study | NA | 0 |
| Williamson, Peter J. (2016), | Building and Leveraging Dynamic Capabilities: Insights from Accelerated Innovation in China | GLOBAL STRATEGY JOURNAL | Dynamic capabilities perspective | To examine how the nature of dynamic capabilities, their antecedents, and how they can underpin sustainable competitive advantage | Empirical | Qualitative study | Case study | NA | 0 |
| Zollo, Maurizio; Bettinazzi, Emanuele L. M.; Neumann, Kerstin; Snoeren, Peter (2016), | Toward a Comprehensive Model of Organizational Evolution: Dynamic Capabilities for | GLOBAL STRATEGY JOURNAL | Dynamic capabilities perspective | To study the evolutionary change processes that MNCs go through as they strive to innovate and adapt to societal pressures related to | Theoretical | Grounded theory | NA | NA | 0 |

| | | | | | | | | | |
|---|---|---|--|---|-----------|--------------------|----------------------------------|---|---|
| | Innovation and Adaptation of the Enterprise Model | | | corporate sustainability. | | | | | |
| Swoboda, Bernhard; Olejnik, Edith (2016), | Linking Processes and Dynamic Capabilities of International SMEs: The Mediating Effect of International Entrepreneurial Orientation | JOURNAL OF SMALL BUSINESS MANAGEMENT | Dynamic capabilities perspective | To argue that SMEs can capitalize on scanning and planning processes because of their international entrepreneurial orientation | Empirical | Quantitative study | Simultaneous Equation Modeling | 604 SMEs | 0 |
| Don Jyh-Fu Jeng (2016), | The variable effects of dynamic capability by firm size | INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL | Dynamic capabilities and Resource advantage theory perspective | To draw the relationships among capabilities and performance under conditions of high industry competitiveness | Empirical | Quantitative | Hierarchical regression analysis | 692 Small, medium and large enterprises | 0 |
| Rodríguez-Serrano, M., Martín-Armario, E. (2017), | Born-Global SMEs, Performance, and Dynamic Absorptive | JOURNAL OF SMALL BUSINESS MANAGEMENT | Dynamic capabilities perspective | To study the role of dynamic absorption capacity in small businesses that internationalize from | Empirical | Quantitative study | Partial least squares | 102 born-global SMEs | 0 |

| | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|
| | Capacity: Evidence from Spanish Firms | | | start-up and show positive performance, and the influence of an entrepreneurial market-oriented culture | | | | | |
|--|---|--|--|--|--|--|--|--|--|

1.2 Classification of variables, main findings and level of analysis (Chapter2)

| Classification of Dependent Variable | Dependent variable (s) | Independent variable (s) | Control variable (s) | Main findings | Origin of data base | Level of analysis | Author(s) |
|--------------------------------------|------------------------|---|--|---|---------------------|--------------------------------|---|
| 1. Performance | Firm performance | Age, size, quality | Resources, locus of control, entrepreneurial orientation, outcome focus, industry hostility, industry turbulence | Most entrepreneurial ventures report having dynamic capabilities and that their differences in age and size lead to differences in how dynamic capabilities affect firm performance | USA | 220 SMEs | Arend, Richard J. (2014), |
| | Firm performance | Innovation capability and marketing capability | Industry and revenue | Large firms prospered from building dynamic capabilities under conditions of high industry competitiveness, while investments in innovation and marketing individually diminished small firms' performance. The effect was mixed for medium-size firms. | USA, CANADA | 692 SMEs and large enterprises | Don Jyh-Fu Jeng (2016), |
| | Firm performance | Entrepreneurial proclivity, knowledge of customers, knowledge of competitors, knowledge of suppliers, knowledge of regulatory agencies, and market responsiveness | | Entrepreneurial proclivity | USA | Retailer industry | Griffith, DA; Noble, SM; Chen, QM (2006), |

| | | | | | | | |
|--|----------------------------|--|---|---|-----------------|-----------------------------|---|
| | | | | | | | |
| | Performance | | | Three dynamic capability development mechanisms: organizational learning, reverse engineering, and manufacturing flexibility. | INDIA, PAKISTAN | Manufacturing industry | Malik, Omar R.; Kotabe, Masaaki (2009), |
| | Performance | Reconfiguring, sensing, operational capabilities, environmental turbulence, | Firm size, firm age, and industry membership | | AUSTRALIA | All industries, large firms | Wilden, Ralf; Gudergan, Siegfried P. (2015), |
| | Organizational Performance | Higher Order Dynamic Capability (and Lower Order Dynamic Capability). Moderators: Technological dynamism, Higher-order dynamic capability, and Developed economy | Recent publication, Dynamic capability perceptual, Performance perceptual, Data source dependence, Non-appropriable performance, Proximal outcome | The study illustrates how the nature of the dynamic capability and the economic context in which it is utilized shape its value | Worldwide | Empirical papers | Fainshmidt, Stav; Pezeshkan, Amir; Frazier, M. Lance; Nair, Anil; Markowski, Edward (2016), |

| | | | | | | | |
|--|----------------------------|--|---|---|-----------|--|---|
| | Relative firm performance | Ordinary capability, dynamic capability, environmental dynamism, and degree of heterogeneity of the capability. | Firm size, industry, environmental dynamism, extent of change, and business group. | Environmental dynamism negatively affects the contribution of ordinary capabilities and positively affects the contribution of dynamic capabilities to relative firm performance (Building a model of capabilities, dynamism, heterogeneity, and relative firm performance) | CHILE | NA | Drnevich, Paul L.; Kriauciunas, Aldas P. (2011), |
| | Global finance performance | Eco-based competitive advantage: Organizational learning, Relationship building, Shared vision, Cross functional integration, Technology sensing & response. | | Model moderated by: Global market configuration, Foreign market entry mode, Decision making autonomy, Business standardization/adaptation | Worldwide | Global hotel industry | Leonidou, Leonidas C.; Leonidou, Constantinos N.; Fotiadis, Thomas A.; Aykol, Bilge (2015), |
| | Financial performance | Innovation-related activities | Firm size, innovation expenditures, human capital, financial resource constraints, organizational resource constraints, firm location, lagged financial performance | The study sheds light to firms' propensity and effectiveness of implementing new production, supply chain, or administrative processes | GERMANY | European Union's Community Innovation Survey | Piening, Erk P.; Salge, Torsten Oliver (2015), |

| | | | | | | | |
|---------------|---|---|---|---|-----------|--------------------------------|---|
| | Chain performance | Experience before franchising, length of training, chain age, franchising fees, and level of internationalization | Chain size in the domestic market | Findings show that experience before franchising, length of training, chain age, franchising fees, and level of internationalization positively impact performance of franchised chains | USA | 189 retail and service chains | El Akremi, Assaad; Perrigot, Rozenn; Piot-Lepetit, Isabelle (2015), |
| | Competitive performance and ethical performance | Ethics-focused dynamic capability, routinized OC changes, changed operational capabilities and changed ethical stance | Age, size, locus-of-control, and founder influence, resources, capability scarcity, value of ethics, industry effects | The general effect of capabilities (ethics-focused operational capabilities) is positive on an SME's ethical performance, and that the performance effects are contingent on an SME's degree of entrepreneurial orientation and sensitivity to changes in the business context. | USA | 215 for profit SMEs | Arend, Richard J. (2013), |
| 2. Innovation | Innovative output | Intellectual human capital and star scientists, R&D capability, Biotech alliances, Biotech acquisitions. | Lagged biotech patents, non-biotech patents, firm merged, pharmaceutical firm, firm nationality, firm performance and firm size, time to first Cohen-Boyer patent citation, year fixed effects. | | Worldwide | Global pharmaceutical industry | Rothaermel, Frank T.; Hess, Andrew M. (2007), |
| | Innovation performance | Information technology, infrastructure flexibility, and institutional orientation, | | The success of born-global firms is determined by their ability to assimilate and | SPAIN | 102 born-global SMEs | Rodríguez-Serrano, M., Martín- |

| | | | | | | | |
|--|-------------------------|--|---|---|--------|----------------------------------|--|
| | | | | to use knowledge in accordance with the demands of the market | | | Armario, E. (2017), |
| | Innovation performance | Market orientation, entrepreneurial orientation, and dynamic absorptive capacity | | Linking inter-organizational innovation performance with relational governance and dynamic capabilities | TAIWAN | Manufacturing industry SMEs | Cheng, Jao-Hong; Chen, Mu-Chung; Huang, Chung-Ming (2014), |
| | New product development | Location, firm citations, Alliances, CEO R&D experience, R&D productivity/% PhD | Age, number of employees, R&D intensity | | USA | Biotechnological Industry | Deeds, DL; DeCarolis, D; Coombs, J (2000), |
| | Number of new services | Percentage of front-line staff with an accounting diploma and percentage of front-line staff with a bachelor's degree. Number of industries in which the practice had alliance partners. | Number of staff in practice. | | NORWAY | Authorized accountancy practices | Doving, Erik; Gooderham, Paul N. (2008), |

| | | | | | | | |
|-----------------|--|--|--|---|---------|--|---------------------------------------|
| | | Proportion of relatively large client firms served by the practice. Intention of seeking out new markets or launching new services. | | | | | |
| 3. Capabilities | Sensing capability, learning capability, integrating capability, and coordinating capability | Human capital, declarative knowledge, procedural knowledge | Firm size | Firms can develop dynamic capabilities if they have high levels of knowledge at both the individual and the collective level. | SPAIN | Tourism industry | Nieves, Julia; Haller, Sabine (2014), |
| | Alliance management capability and new product development capability | Environmental dynamism | Industry effects, firm age, firm size, alliance portfolio size, product and market scope, process innovation, firm unit of analysis, same respondent | | GERMANY | Chemicals, machinery, and motor vehicle industries | Schilke, Oliver (2014), |
| | Idea generation capability, Market disruptiveness | Age and size of the firm | Access to employee human capital, access to other specific expertise, access to technological expertise, access to tangible resources | | SWEDEN | New firms | McKelvie, Alexander; |

| | | | | | | | |
|---------------|--|--|--------------------------------------|--|-----------|---|---|
| | capability, new product development capability, new process development capability | | | | | | Davidsson, Per (2009), |
| 4. Operations | Successful ISO 14001 or TQEM Adoption | Domestic or International pressure | Foreign-owned/JV, large firm, SOE | | CHINA | NA | Zhu, Qinghua; Cordeiro, James; Sarkis, Joseph (2013), |
| | Die yield and cycle time | | R&D organization and IT practices | Accumulation of experience and articulation and codification of knowledge leads to performance improvement | Worldwide | Semiconduct manufacturing industry | Macher, Jeffrey T.; Mowery, David C. (2009), |
| | Operating-routine effective | Sensing, learning and reconfiguring dynamic capabilities | Company size, company age, and sales | Dynamic capabilities have different performance effects in high-dynamic and low-dynamic environments | GERMANY | 200 SME's of engineering, rubber & plastics, and paper processing | Wilhelm, Hendrik; Schloemer, Maren; Maurer, Indre (2015), |

| | | | | | | | |
|-------------------------------|---|---|--|--|-----|----------------------------|---|
| 5. Finance | 1-year Sharpe's measure (measure for calculating risk-adjusted return) | Product-related risk factor, management-related risk factor, legal liability-related risk factor, and government regulation-related risk factor | Firm size, firm age, underpricing, R&D intensity, NP intensity, VC backing, product intensity, R&D expenditure/employees, and new products/employees | Dynamic capabilities vs entrepreneurial capabilities | USA | National | Arthurs, JD; Busenitz, LW (2006), |
| | Early-stage capital raised | Managerial capabilities, radical innovation, demand uncertainty | Early-stage funding targets, non-local investors, VC funded, angel funded, and analytic strategy | Dynamic capabilities theory and early-stage capitalization processes | USA | Seed/early-stage companies | Townsend, David M.; Busenitz, Lowell W. (2015), |
| 6. Alliances/ partnerships | Home country embeddedness of technology creation, host country embeddedness of technology commercialization, extent of interaction required, absorptive | | | | | Biothechnological Industry | Madhok, A; Osegowitsch, T (2000), |

| | | | | | | | |
|-----------|--|--|--|--|-------------------------------|----------------------------|---|
| | capacity, number of alliances | | | | | | |
| | Partnerships success | Strategic capabilities possessed by SMEs, internal capabilities of SMEs, external capabilities of SMEs | | Formal and informal safeguards | SOUTH AFRICA | Technology innovative SMEs | Sawers, Jill L.; Pretorius, Marthinus W.; Oerlemans, Leon A. G. (2008), |
| 7. Others | Production and sales experience, prior transition experience, and cumulative industry experience | Position, market share, competitors, | | Static experience and transformational experience | USA | Computer industry | King, AA; Tucci, CL (2002), |
| | Firm's Power | Asset specificity, predictability, market knowledge gap, type of market | | Internal assets (assets specificity and predictability) and external assets (market knowledge gap and market type) | CANADA, CHILE, UK, PHILIPINAS | Country | Griffith, DA; Harvey, MG (2001), |

Appendix 2. List of countries (Chapter 3)

| | Country |
|----|----------------|
| 1 | Argentina |
| 2 | Brazil |
| 3 | Chile |
| 4 | Colombia |
| 5 | Croatia |
| 6 | Denmark |
| 7 | Finland |
| 8 | Germany |
| 9 | Greece |
| 10 | Ireland |
| 11 | Italy |
| 12 | Jamaica |
| 13 | Norway |
| 14 | Peru |
| 15 | Russia |
| 16 | Slovenia |
| 17 | South Africa |
| 18 | Spain |
| 19 | Turkey |
| 20 | United Kingdom |
| 21 | United States |
| 22 | Uruguay |

Appendix 3. Questions included in the 2012 GEM National Expert Survey (NES) and Adult Population Survey (APS) Questionnaires (Chapter 3)

Questions included in the 2012 GEM National Expert Survey Questionnaire

The following statements assess national conditions influencing entrepreneurial activity in your country. Please circle the most appropriate option. All refer to your country.

| | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|--|--|----|----|
| Not Applicable (NA) | | | | | | | | | | |
| Do Not Know (DK) | | | | | | | | | | |
| Completely True (5) | | | | | | | | | | |
| Somewhat True (4) | | | | | | | | | | |
| Neither True nor False (3) | | | | | | | | | | |
| Somewhat False (2) | | | | | | | | | | |
| Completely False (1) | | | | | | | | | | |
| Topic A: Finance In my country... | | | | | | | | | | |
| | | | | | | | | | | |
| A01 | There is sufficient equity funding available for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| A02 | There is sufficient debt funding available for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| A03 | There are sufficient government subsidies available for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| A04 | There is sufficient funding available from private individuals (other than founders) for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| A05 | There is sufficient venture capitalist funding available for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| A06 | There is sufficient funding available through initial public offerings (IPOs) for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|--|--|--------|----|
| Topic B: Government policies In my country... | | | | | | | | | | |
| B01 | Government policies (e.g., public procurement) consistently favor new firms. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| B02 | The support for new and growing firms is a high priority for policy at the national government level. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| B03 | The support for new and growing firms is a high priority for policy at the local government level. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|--|--|--------|----|
| Topic C: Governmental programs In my country... | | | | | | | | | | |
| C01 | A wide range of government assistance for new and growing firms can be obtained through contact with a single agency. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| C02 | Science parks and business incubators provide effective support for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| C03 | There are an adequate number of government programs for new and growing businesses. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| C04 | The people working for government agencies are competent and effective in supporting new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| C05 | Almost anyone who needs help from a government program for a new or growing business can find what they need. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |
| C06 | Government programs aimed at supporting new and growing firms are effective. | 1 | 2 | 3 | 4 | 5 | | | D K | NA |

| | | | | | | | | | | |
|---|--|---|---|---|---|---|--|--|----|----|
| Topic G: Market openness In my country... | | | | | | | | | | |
| G01 | The markets for consumer goods and services change dramatically from year to year. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| G02 | The markets for business-to-business goods and services change dramatically from year to year. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| G03 | New and growing firms can easily enter new markets. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| G04 | The new and growing firms can afford the cost of market entry. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| G05 | New and growing firms can enter markets without being unfairly blocked by established firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| G06 | The anti-trust legislation is effective and well enforced. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|--|--|----|----|
| Topic H: Physical Infrastructure In my country... | | | | | | | | | | |
| H01 | The physical infrastructure (roads, utilities, communications, water disposal) provides good support for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| H02 | It is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.). | 1 | 2 | 3 | 4 | 5 | | | DK | NA |

| | | | | | | | | | |
|-----|--|---|---|---|---|---|--|----|----|
| H03 | A new or growing firm can get good access to communications (telephone, internet, etc.) in about a week. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| H04 | New and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer). | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| H05 | New or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | |
|--|---|---|---|---|---|---|--|----|----|
| Topic L: Abilities, Knowledge to start up In my country... | | | | | | | | | |
| L01 | Many people know how to start and manage a high-growth business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L02 | Many people know how to start and manage a small business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L03 | Many people have experience in starting a new business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L04 | Many people can react quickly to good opportunities for a new business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L05 | Many people have the ability to organize the resources required for a new business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | |
|---|--|---|---|---|---|---|--|----|----|
| Topic M: Entrepreneur social image In my country... | | | | | | | | | |
| M01 | The creation of new ventures is considered an appropriate way to become rich. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M02 | Most people consider becoming an entrepreneur as a desirable career choice. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M03 | Successful entrepreneurs have a high level of status and respect. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M04 | You will often see stories in the public media about successful entrepreneurs. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M05 | Most people think of entrepreneurs as competent, resourceful individuals. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | |
|--|---|---|---|---|---|---|--|----|----|
| Topic N: Intellectual Property Rights In my country... | | | | | | | | | |
| N01 | The Intellectual Property Rights (IPR) legislation is comprehensive. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| N02 | The Intellectual Property Rights (IPR) legislation is efficiently enforced. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| N03 | The illegal sales of 'pirated' software, videos, CDs, and other copyrighted or trademarked products is not extensive. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| N04 | New and growing firms can trust that their patents, copyrights, and trademarks will be respected. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| N05 | It is widely recognized that inventors' rights for their inventions should be respected. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | |
|---|---|---|---|---|---|---|--|----|----|
| Topic P: Women's support to start up In my country... | | | | | | | | | |
| P01 | There are sufficient social services available so that women can continue to work even after they start a family. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P02 | Starting a new business is a socially acceptable career option for women. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P03 | Women are encouraged to become self-employed or start a new business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P04 | Men and women get equally exposed to good opportunities to start a new business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P05 | Men and women are equally able to start a new business. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | |
|---|---|---|---|---|---|---|--|----|----|
| Topic K: Opportunities to start-up In my country... | | | | | | | | | |
| K01 | There are plenty of good opportunities for the creation of new firms. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| K02 | There are more good opportunities for the creation of new firms than there are people able to take advantage of them. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| K03 | Good opportunities for new firms have considerably increased in the past five years. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| K04 | Individuals can easily pursue entrepreneurial opportunities. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| K05 | There are plenty of good opportunities to create truly high growth firms. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

Questions included in the 2012 GEM Adult Population Survey Questionnaire related to perceived opportunities

| Perceived opportunities (entrepreneurial opportunities) | | Yes | No | Don't know | Refused |
|---|--|-----|----|------------|---------|
| i2. | In the next six months, will there be good opportunities for starting a business in the area where you live? | 1 | 2 | -1 | -2 |

Appendix 4. List of countries (Chapter 4)

| | Country |
|----|----------------|
| 1 | Argentina |
| 2 | Brazil |
| 3 | Chile |
| 4 | Colombia |
| 5 | Croatia |
| 6 | Denmark |
| 7 | Finland |
| 8 | Germany |
| 9 | Greece |
| 10 | Ireland |
| 11 | Italy |
| 12 | Norway |
| 13 | Peru |
| 14 | Russia |
| 15 | Slovenia |
| 16 | South Africa |
| 17 | Spain |
| 18 | Turkey |
| 19 | United Kingdom |
| 20 | United States |
| 21 | Uruguay |

Appendix 5. Questions included in the 2012 GEM National Expert Survey (NES) and Adult Population Survey (APS) Questionnaires (Chapter 4)

Questions included in the 2012 GEM National Expert Survey Questionnaire

The following statements assess national conditions influencing entrepreneurial activity in your country. Please circle the most appropriate option. All refer to your country.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|--|--|----|----|
| Not Applicable (NA) | | | | | | | | | | |
| Do Not Know (DK) | | | | | | | | | | |
| Completely True (5) | | | | | | | | | | |
| Somewhat True (4) | | | | | | | | | | |
| Neither True Nor False (3) | | | | | | | | | | |
| Somewhat False (2) | | | | | | | | | | |
| Completely False (1) | | | | | | | | | | |
| Topic D: Education (Entrepreneurial Education at School Stage) & Training (Entrepreneurial Education at Post School Stage) In my country... | | | | | | | | | | |
| D01 | Teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| D02 | Teaching in primary and secondary education provides adequate instruction in market economic principles. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| D03 | Teaching in primary and secondary education provides adequate attention to entrepreneurship and new firm creation. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| D04 | Colleges and universities provide good and adequate preparation for starting up and growing new firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| D05 | The level of business and management education provide good and adequate preparation for starting up and growing new firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| D06 | The vocational, professional, and continuing education systems provide good and adequate preparation for starting up and growing new firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |

| | | | | | | | | | | |
|---|--|---|---|---|---|---|--|--|----|----|
| Topic E: Research & Development Transfer In my country... | | | | | | | | | | |
| F | | | | | | | | | | |
| T | | | | | | | | | | |
| E01 | New technology, science, and other knowledge are efficiently transferred from universities and public research centers to new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| E02 | New and growing firms have just as much access to new research and technology as large, established firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| E03 | New and growing firms can afford the latest technology. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| E04 | There are adequate government subsidies for new and growing firms to acquire new technology. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| E05 | The science and technology base efficiently support the creation of world-class new technology-based ventures in at least one area. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| E06 | There is good support available for engineers and scientists to have their ideas commercialized through new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|--|--|----|----|
| Topic H: Physical Infrastructure In my country... | | | | | | | | | | |
| H01 | The physical infrastructure (roads, utilities, communications, water disposal) provides good support for new and growing firms. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| H02 | It is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.). | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| H03 | A new or growing firm can get good access to communications (telephone, internet, etc.) in about a week. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| H04 | New and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer). | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| H05 | New or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |

Questions included in the 2012 GEM Adult Population Survey Questionnaire related to dynamic capabilities

| | Yes | No | Don't know | Refused |
|--|-----|----|------------|---------|
| Perceived opportunities (sensing capabilities) | | | | |
| i2. In the next six months, will there be good opportunities for starting a business in the area where you live? | 1 | 2 | -1 | -2 |
| | | | | |

Appendix 6. List of countries (Chapter 5)

| Country |
|-------------------|
| 1 Argentina |
| 2 Brazil |
| 3 Chile |
| 4 Colombia |
| 5 Croatia |
| 6 Denmark |
| 7 Finland |
| 8 Germany |
| 9 Greece |
| 10 Ireland |
| 11 Italy |
| 12 Norway |
| 13 Peru |
| 14 Russia |
| 15 Slovenia |
| 16 South Africa |
| 17 Spain |
| 18 Turkey |
| 19 United Kingdom |
| 20 United States |
| 21 Uruguay |

Appendix 7. Questions included in the 2012 GEM National Expert Survey (NES) and Adult Population Survey (APS) Questionnaires (Chapter 5)

Questions included in the 2012 GEM National Expert Survey Questionnaire

The following statements assess national conditions influencing entrepreneurial activity in your country. Please circle the most appropriate option. All refer to your country.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|--|----|----|
| Not Applicable (NA) | | | | | | | | | | |
| Do Not Know (DK) | | | | | | | | | | |
| Completely True (5) | | | | | | | | | | |
| Somewhat True (4) | | | | | | | | | | |
| Neither True Nor False (3) | | | | | | | | | | |
| Somewhat False (2) | | | | | | | | | | |
| Completely False (1) | | | | | | | | | | |
| Topic D: Education (Entrepreneurial Education at School Stage) & Training (Entrepreneurial Education at Post School Stage) In my country... | | | | | | | | | | |
| D01 | Teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative. | 1 | 2 | 3 | 4 | 5 | | | DK | NA |
| D02 | Teaching in primary and secondary education provides adequate instruction in market economic principles. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| D03 | Teaching in primary and secondary education provides adequate attention to entrepreneurship and new firm creation. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| D04 | Colleges and universities provide good and adequate preparation for starting up and growing new firms. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| D05 | The level of business and management education provide good and adequate preparation for starting up and growing new firms. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| D06 | The vocational, professional, and continuing education systems provide good and adequate preparation for starting up and growing new firms. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | | |
|--|---|--|---|---|---|---|---|--|----|----|
| Topic L: Abilities, Knowledge to start up In my country... | | | | | | | | | | |
| L01 | Many people know how to start and manage a high-growth business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L02 | Many people know how to start and manage a small business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L03 | Many people have experience in starting a new business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L04 | Many people can react quickly to good opportunities for a new business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| L05 | Many people have the ability to organize the resources required for a new business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | | |
|---|--|--|---|---|---|---|---|--|----|----|
| Topic M: Entrepreneur social image In my country... | | | | | | | | | | |
| M01 | The creation of new ventures is considered an appropriate way to become rich. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M02 | Most people consider becoming an entrepreneur as a desirable career choice. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M03 | Successful entrepreneurs have a high level of status and respect. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M04 | You will often see stories in the public media about successful entrepreneurs. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| M05 | Most people think of entrepreneurs as competent, resourceful individuals. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | | |
|---|---|--|---|---|---|---|---|--|----|----|
| Topic P: Women's support to start up In my country... | | | | | | | | | | |
| P01 | There are sufficient social services available so that women can continue to work even after they start a family. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P02 | Starting a new business is a socially acceptable career option for women. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P03 | Women are encouraged to become self-employed or start a new business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P04 | Men and women get equally exposed to good opportunities to start a new business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| P05 | Men and women are equally able to start a new business. | | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| Topic Q: Attention to High Growth In my country... | | | | | | | | |
|--|---|---|---|---|---|--|----|----|
| There are many support initiatives that are specially tailored for high-growth entrepreneurial activity. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Policy-makers are aware of the importance of high-growth entrepreneurial activity. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| People working in entrepreneurship support initiatives have sufficient skills and competence to support high-growth firms. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Potential for rapid growth is often used as a selection criterion when choosing recipients of entrepreneurship support. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Supporting rapid firm growth is a high priority in entrepreneurship policy. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

Questions included in the 2012 GEM Adult Population Survey Questionnaire related to dynamic capabilities

| | Yes | No | Don't know | Refused |
|---|-----|----|------------|---------|
| Perceived skills (learning capabilities) | | | | |
| i3. Do you have the knowledge, skill and experience required to start a new business? | 1 | 2 | -1 | -2 |

Appendix 8. List of countries (Chapter 6)

| | Country |
|----|----------------|
| 1 | Austria |
| 2 | Belgium |
| 3 | Croatia |
| 4 | Denmark |
| 5 | Estonia |
| 6 | Finland |
| 7 | France |
| 8 | Germany |
| 9 | Greece |
| 10 | Hungary |
| 11 | Ireland |
| 12 | Italy |
| 13 | Latvia |
| 14 | Lithuania |
| 15 | Netherlands |
| 16 | Norway |
| 17 | Portugal |
| 18 | Romania |
| 19 | Slovakia |
| 20 | Slovenia |
| 21 | Spain |
| 22 | Sweden |
| 23 | Turkey |
| 24 | United Kingdom |

Appendix 9. Questions included in the 2012 GEM National Expert Survey (NES) and Adult Population Survey (APS) Questionnaires (Chapter 6)

Questions included in the 2012 GEM National Expert Survey Questionnaire

The following statements assess national conditions influencing entrepreneurial activity in your country. Please circle the most appropriate option. All refer to your country.

| | | | | | | | | | |
|--|--|---|---|---|---|---|--|----|----|
| Not Applicable (NA) | | | | | | | | | |
| Do Not Know (DK) | | | | | | | | | |
| Completely True (5) | | | | | | | | | |
| Somewhat True (4) | | | | | | | | | |
| Neither True Nor False (3) | | | | | | | | | |
| Somewhat False (2) | | | | | | | | | |
| Completely False (1) | | | | | | | | | |
| Topic Q: Attention to High Growth In my country... | | | | | | | | | |
| Q01 | There are many support initiatives that are specially tailored for high-growth entrepreneurial activity. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Q02 | Policy-makers are aware of the importance of high-growth entrepreneurial activity. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Q03 | People working in entrepreneurship support initiatives have sufficient skills and competence to support high-growth firms. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Q04 | Potential for rapid growth is often used as a selection criterion when choosing recipients of entrepreneurship support. | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| Q05 | Supporting rapid firm growth is a high priority in entrepreneurship policy. | 1 | 2 | 3 | 4 | 5 | | DK | NA |

| | | | | | | | | | |
|--|---|---|---|---|---|---|--|----|----|
| Topic R: Interest in Innovation In my country... | | | | | | | | | |
| R01 | Companies like to experiment with new technologies and with new ways of doing things.* | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| R02 | Consumers like to try out new products and services.** | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| R03 | Innovation is highly valued by companies.* | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| R04 | Innovation is highly valued by consumers.** | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| R05 | Established companies are open to using new, entrepreneurial companies as suppliers.* | 1 | 2 | 3 | 4 | 5 | | DK | NA |
| R06 | Consumers are open to buying products and services from new, entrepreneurial companies.** | 1 | 2 | 3 | 4 | 5 | | DK | NA |

*Valuation of innovation from the company point of view (summary)

**Valuation of innovation from the consumer point of view (summary)

Questions included in the 2012 GEM Adult Population Survey Questionnaire related to dynamic capabilities

| Perceived opportunities (sensing capabilities) | | Yes | No | Don't know | Refused |
|--|--|-----|----|------------|---------|
| i2. | In the next six months, will there be good opportunities for starting a business in the area where you live? | 1 | 2 | -1 | -2 |

| Perceived skills (learning capabilities) | | Yes | No | Don't know | Refused |
|--|---|-----|----|------------|---------|
| i3. | Do you have the knowledge, skill and experience required to start a new business? | 1 | 2 | -1 | -2 |

Appendix 10. List of countries (Chapter 7)

| Country | Country type | Income group (World Bank, July 2016) | Region (IMF, April 2016) | Forum classification |
|------------------------|--------------|--------------------------------------|------------------------------------|---------------------------------|
| Argentina | Economy | Not classified | Latin America and the Caribbean | Latin America and the Caribbean |
| Belgium | Economy | High income | Advanced economies | Europe and North America |
| Bosnia and Herzegovina | Economy | Upper middle income | Emerging and Developing Europe | Europe and North America |
| Brazil | Economy | Upper middle income | Latin America and the Caribbean | Latin America and the Caribbean |
| Chile | Economy | High income | Latin America and the Caribbean | Latin America and the Caribbean |
| China | Economy | Upper middle income | Emerging and Developing Asia | East Asia and Pacific |
| Colombia | Economy | Upper middle income | Latin America and the Caribbean | Latin America and the Caribbean |
| Croatia | Economy | High income | Emerging and Developing Europe | Europe and North America |
| Denmark | Economy | High income | Advanced economies | Europe and North America |
| Finland | Economy | High income | Advanced economies | Europe and North America |
| France | Economy | High income | Advanced economies | Europe and North America |
| Germany | Economy | High income | Advanced economies | Europe and North America |
| Greece | Economy | High income | Advanced economies | Europe and North America |
| Hungary | Economy | High income | Emerging and Developing Europe | Europe and North America |
| Ireland | Economy | High income | Advanced economies | Europe and North America |
| Italy | Economy | High income | Advanced economies | Europe and North America |
| Japan | Economy | High income | Advanced economies | East Asia and Pacific |
| Latvia | Economy | High income | Advanced economies | Europe and North America |
| Netherlands | Economy | High income | Advanced economies | Europe and North America |
| Norway | Economy | High income | Advanced economies | Europe and North America |
| Peru | Economy | Upper middle income | Latin America and the Caribbean | Latin America and the Caribbean |
| Romania | Economy | Upper middle income | Emerging and Developing Europe | Europe and North America |
| Russian Federation | Economy | Upper middle income | Commonwealth of Independent States | Eurasia |
| Slovenia | Economy | High income | Advanced economies | Europe and North America |
| South Africa | Economy | Upper middle income | Sub-Saharan Africa | Sub-Saharan Africa |
| Spain | Economy | High income | Advanced economies | Europe and North America |
| Switzerland | Economy | High income | Advanced economies | Europe and North America |
| United Kingdom | Economy | High income | Advanced economies | Europe and North America |
| United States | Economy | High income | Advanced economies | Europe and North America |
| Uruguay | Economy | High income | Latin America and the Caribbean | Latin America and the Caribbean |

**Appendix 11. Questions included in the 2012 Adult Population Survey (APS)
Questionnaires (Chapter 7)**

Questions included in the 2012 GEM Adult Population Survey Questionnaire related to dynamic capabilities

| Perceived opportunities (sensing capabilities) | Yes | No | Don't know | Refused |
|--|-----|----|------------|---------|
| i2. In the next six months, will there be good opportunities for starting a business in the area where you live? | 1 | 2 | -1 | -2 |

| Perceived skills (self-efficacy) | Yes | No | Don't know | Refused |
|---|-----|----|------------|---------|
| i3. Do you have the knowledge, skill and experience required to start a new business? | 1 | 2 | -1 | -2 |