



**THE INTERACTION EFFECT OF FORMAL AND
INFORMAL INSTITUTIONS ON THE DEVELOPMENT
OF ENTREPRENEURIAL ACTIVITY
A PANEL DATA ANALYSIS FOR EMERGING ECONOMIES**

A thesis submitted for the degree of Doctor of Philosophy

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March 2019

ABSTRACT

Varying institutional environments have provided the foundation for a great deal of entrepreneurship research; however, relatively little empirical work has examined the interaction effect between formal and informal institutions on the development of entrepreneurial activity in emerging economies. This is surprising given the importance placed on entrepreneurship, and especially new business start-ups, as a key determinant of economic growth, prosperity and sustainable development.

Drawing from entrepreneurial and institutional theories, this doctoral study addresses this gap by examining the effect of formal institutions, such as the number of procedures, education and training, access to credit and firm-level technology absorption, on the rates of entrepreneurial activity in emerging economies. It will test the thesis that this relationship becomes more instrumental when they are accompanied by lower levels of corruption as an informal institution. Moreover, this thesis suggests that entrepreneurs in emerging economies respond differently to the dynamics of the institutional environment depending on the nature of opportunities that arise from the country's stage of development, and whether they are factor-driven, efficiency-driven, or innovation-driven economies.

A review of the theoretical and empirical literature reveals that the dynamics of the institutional environment on the development of entrepreneurial activity in emerging economies is imperfectly understood, and the empirical analysis undertaken in this thesis represents a step towards greater understanding in this area.

The role of the institutional environment is investigated by testing a number of hypotheses reflecting formal and informal institutions, and the extent to which these variables can explain variations in the level of entrepreneurial activity. Panel data models were constructed for 44 emerging economies over a nine-year period (2006-2014), from which a variety of hypotheses will be tested, and conclusions drawn.

On the basis of the quantitative data derived from several global research projects (i.e., the World Bank, UNESCO, and the Global Competitiveness Report), the research findings will show that lower levels of corruption moderates positively the effects of a country's number of procedures, and education and training on the rates

of entrepreneurial activity, whereas it moderates negatively the effects of access to credit and technology absorption on the levels of entrepreneurial activity. Furthermore, in emerging economies, these interaction effects are similar, regardless of the stage of economic development.

This study is among the first to empirically examine the dynamics of institutional variables to predict new business activity; it paints a nuanced picture of how formal institutions might be more significant in contexts characterised by weak institutions if more control of corruption supported them. Regarding the theoretical debate, this thesis may provide empirical evidence for the idea that the variations in rates of entrepreneurial activity cannot be fully understood without giving attention to the context of the institutional environment dynamics in which those variables were observed. In particular, the main results of this thesis will suggest that the interaction effects of formal and informal institutions, rather than direct effects, are useful in explaining systematic variations in new business prevalence in emerging economies.

On the basis of the results reported in this study, entrepreneurship policy should attempt to address the entrepreneurial deficit and focus on developing an attractive institutional environment towards entrepreneurship in order to promote economic growth, job creation and higher levels of investment in emerging economies.

Keywords

Entrepreneurship; Institutions; economic growth; economic development; emerging economies

DECLARATION

I hereby declare that no portion of the work in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or institution of learning.

ACKNOWLEDGMENTS

First and foremost, I would like to thank **Allah Almighty** for giving me the opportunity and ability to pursue a doctorate and for giving me the perseverance to achieve my goals at every stage of my life.

I would like to express my special appreciation and thanks to my supervisors, Dr **Xiaoqing Li** and Dr **Allam Hamdan** for their continuous support and guidance in all the time of research. I want to gratefully acknowledge the assistance of Dr **Nick Huntington-Klein** from California State University, Fullerton for being an excellent tutor in econometrics and STATA software. Also, I would like to express my appreciation to all the academic and administrative staff in Ahlia and Brunel Universities for all their support during my PhD programme. Special thanks go to Dr **Tillal Eldabi** for providing a solid platform for learning and an enriching program of study.

I am grateful also to Professor **Ali Arifa** and Dr **Arezou Harraf** from Box Hill College Kuwait who inspired and encouraged me to complete my doctoral studies, and who always provided a helping hand in the process. I also thank the anonymous reviewers and editors who, through their insightful comments and suggestions, have improved the articles that are part of this thesis.

To my dear parents **Suhail** and **Etemad**, I am who I am today because of you, and I am forever grateful for all your sacrifices and everything you have always done for me, I love you.

Finally, I would like to thank my beloved wife **Heba** and her parents for their great support, patience, and tolerance. To my dear sons **Abdulrahman** and **Ibrahim**, I pray that one day you will read these words and get inspired to continue your education to such an academic level, I love you.

Hasan Ghura

PUBLICATIONS AND PRESENTATIONS DURING PHD

- Ghura, H., Li, X. and Hamdan, A. (2016), *The relationship between entrepreneurship and economic development in emerging economies: A systematic literature review*, PhD without Residence Symposium, Brunel University, Bahrain.
- Ghura, H., Li, X. and Hamdan, A. (2017), *Towards a theoretical framework between opportunity entrepreneurship, institutions and economic development*, PhD without Residence Symposium, Brunel University, Bahrain.
- Ghura, H., Li, X. and Hamdan, A. (2018), *Does control of corruption matter for entrepreneurship in emerging economies: evidence from post-communist countries*, PhD without Residence Symposium, Brunel University, Bahrain.
- Ghura, H., Harraf, A. and Li, X. (2016), *The relationship between entrepreneurship and economic development in emerging economies: a systematic literature review*, the 4th International Conference on Accounting, Business and Economics, University Malaysia Terengganu, Malaysia.
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- Harraf, A., Ghura, H., Li, X. and Hamdan, A. (2018), The interaction effect of formal and informal institutions on the development of entrepreneurial activity: Evidence from emerging economies, (submitted to) *Small Business Economics*.

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LIST OF ACRONYMS AND ABBREVIATIONS

(UNESCO) Institute for Statistics	UIS
Access to Credit	AC
Control of Corruption	CC
Control of Corruption Index	CCI
Corruptions Perception Index	CPI
Doing Business project	DB
Ease of Doing Business	EDB
Entrepreneurship Indicators Programme	EIP
Firm-level Technology Absorption	TA
Fixed Effects Model	FEM
Foreign Direct Investments	FDI
GDP Per Capita purchasing power parity	GDPpc
Global Competitiveness Report	GCR
Global Entrepreneurship Index	GEI
Global Entrepreneurship Monitor	GEM
Gross Domestic Product Growth	GDPg
High Growth Firms	HGF
Information and Communication Technologies	ICT
Initial Public Offering	IPO
Instrumental Variable	IV
International Monetary Fund	IMF
International Social Survey Programme	ISSP
Lagrange Multiplier	LM
Limited Liability Companies	LLCs
National System of Entrepreneurship	NSE
New Entry Rate	NER
Ordinary Least Squares	OLS
Organisation for Economic Co-operation and Development	OECD
Penalty for Bottleneck	PFB
Procedures for starting a business	PRO
Purchasing Power Parity	PPP
Random Effects Model	REM
Research and Development	R&D
Small and Medium-sized Enterprises	SMEs
Tertiary Education	TEDU

The United Nations, Educational, Scientific and Cultural Organisation	UNESCO
Total Entrepreneurial Activity	TEA
Variance Inflation Factor	VIF
World Bank Enterprise Surveys	ES
World Bank Entrepreneurship Group Survey	WBEGS
World Development Indicators	WDI
World Economic Forum	WEF
Worldwide Governance Indicators	WGI

CHAPTER ONE: INTRODUCTION

1.1 Research Overview

In the new global economy, both developed and developing countries are facing different economic growth challenges. According to the Global Entrepreneurship Index (GEI) report, developed countries tend to be more concerned with increasing their economic productivity to sustain the current living standards, despite growing ageing rates. At the same time, developing countries will have to create more than three billion new jobs for their young populations by 2050 (Acs *et al.*, 2014b).

There is a growing body of literature that recognises the importance of entrepreneurship as a key in addressing the challenges of sustainable productivity in developed economies while developing economies struggle to find the most productive way of integrating their fast-growing populations into their economies (Acs *et al.*, 2014b). In this context, entrepreneurship is defined as “opportunity-driven agents who drive economic change through innovative new firms” (Naudé, 2011, p. 7).

Therefore, for the purpose of this study, the concept of entrepreneurship used considers other terms such as strategic, high growth, productive or opportunity entrepreneurship as synonymous (see also Section 2.2 for entrepreneurship’s key concepts and definitions).

Entrepreneurship has been considered recently as a driving force for economic growth and development through employment, innovation, and prosperity. However, it does not appear like “manna from heaven” as a country moves through the stages of economic development. Instead, the above relationship is contingent upon the level of institutional development in a given country. Where institutions are effective, entrepreneurs are more likely to focus their energies towards productive activities that contribute to economic growth and development. Therefore, researchers and policymakers have renewed their interest in investigating the environments and determinants that ameliorate entrepreneurial activity, particularly given that the stages of economic development in countries appear to be gradually

more linked to the rates of entrepreneurial activity (Baumol, 1990; Acs *et al.*, 2008a, 2014a, b).

1.2 Research Problem

In consideration of the earlier discussion, examining the effect of the institutional environment for entrepreneurship poses a challenge for both theoretical and empirical research (Bjørnskov and Foss, 2016). The above phenomenon arises because the theoretical background regarding individual choices to become entrepreneurs with the institutional environment remains understudied (Aidis *et al.*, 2012). While most studies have only focused on the relationship between formal institutions (e.g., regulations, formal laws and rules) and entrepreneurship (Carlos Díaz Casero *et al.*, 2013; Fuentelsaz *et al.*, 2015), the link between informal institutions (e.g., social norms and culture) and entrepreneurship remains underdeveloped (Hayton and Cacciotti, 2013). Moreover, despite the constant interactions between formal and informal institutions (North, 1990; Williamson, 2000), the literature lacks consensus regarding such interactions and their influence on entrepreneurial activity (Bjørnskov and Foss, 2016; Ghura *et al.*, 2017; Urbano *et al.*, 2018).

In line with prior theoretical challenges, still missing from the empirical literature is a large longitudinal panel study of country-level rates of entrepreneurship. Such panel data analysis is worth pursuing to enhance the validity of the research while considering sufficient controls to account for institutional differences in the context of emerging economies (Bruton *et al.*, 2008; Levie and Autio, 2011).

1.3 Research Needs

Recent trends in entrepreneurship research have heightened the need for understanding the variations of entrepreneurial activity through the lens of institutional theory in the case of emerging economies. However, the review of both the theoretical and empirical literature has revealed that most studies addressing the development of entrepreneurial activity have failed to consider the interaction effect of formal and informal institutions in emerging economies that are located at different stages of development (Acs *et al.*, 2014a, b; Aparicio *et al.*, 2016; Urbano *et al.*, 2018).

al., 2018). Therefore, considering the institutions mentioned above independently could be misleading researchers and policymakers in emerging economies as the joint effect of the formal and informal institutions might offer different outcomes on enhancing the rates of “productive” entrepreneurship (North, 1990; Baumol, 1990).

For that reason, we need to offer a new institutional framework that allows the development of entrepreneurial activity based on the interplay between the formal and informal institutions.

1.4 The Applicability of the Conceptual Model to the Study

Theoretically, this study is built on Gnyawali and Fogel’s (1994) entrepreneurial framework, and follows North’s (1990, 2005) propositions on institutional dynamics in addition to Williamson’s (2000) model of the hierarchy of institutions. Gnyawali and Fogel (1994) offered a conceptual framework where the rates of entrepreneurial activity rely on different factors, such as the socio-economic and political context. In this respect, North (1990) suggested that these factors can be related to the interplay between the formal and informal institutions of a particular society. He further argued that informal institutions that are culturally derived might constrain or support the reforms of formal institutions and, therefore, produce outcomes that have a significant effect on increasing “productive” entrepreneurial activity (Baumol, 1990). This idea was supported by Williamson (2000) who considered that informal institutions at the top of the hierarchy of institutions affect lower levels, such as formal institutions, because they are the deepest rooted and the slowest changing. The findings from examining this theory should make an essential contribution to this growing area of research by examining how the dynamics of institutional variables may explain variations in the level of entrepreneurial activity (Estrin *et al.*, 2013; Belitski *et al.*, 2016; Fuentelsaz *et al.*, 2018).

The application of this theory is particularly important in the case of emerging economies. Despite distinct differences in levels of entrepreneurial activity between these countries, relatively little empirical work has explicitly examined the causes of entrepreneurship or attempted to give an explanation as to why some emerging economies have higher (or lower) levels of entrepreneurial activity than others (Bruton *et al.*, 2010; Acs *et al.*, 2014a, b). For this study, emerging economies are

described as low-income countries that go through encouraging private enterprise development and increased economic liberalisation (Hoskisson *et al.*, 2000). While emerging economies consist of both developing (i.e., low and middle income) and post-communist transition countries, developed economies are high-income countries where most people have a high standard of living (World Bank, 2017). In comparison with established firms, entrepreneurs who start new businesses play a crucial role in emerging economies as they operate as engines of structural change and economic growth (De Clercq *et al.*, 2010a; Naudé, 2010; Aparicio *et al.*, 2016). However, entrepreneurs in emerging economies face different institutional challenges when starting their new ventures. These institutional obstacles are derived from immature or an absence of institutional infrastructures, which can discourage ambitious entrepreneurs from exploiting new opportunities in the market (Aidis *et al.*, 2008; Tonoyan *et al.*, 2010; Smallbone *et al.*, 2014). Therefore, such economies offer a natural laboratory to study the evolution of institutions that can create an hospitable environment for the development of entrepreneurial activity (Bruton *et al.*, 2009) (see also Section 4.2 for more discussion regarding the context of emerging economies).

As discussed earlier, institutional burdens are different, and they can be grouped into formal and informal institutions (North, 1990, 2005). In emerging economies, formal regulatory burdens might involve inconsistent or unpredictable government regulations or higher costs of taxes (Klapper *et al.*, 2006). In addition, these countries share common histories concerning their pervasive corruption problems in comparison to developed countries, and entrepreneurs often lack respect and social status (Bruton *et al.*, 2008; De Clercq *et al.*, 2010a; Kiss *et al.*, 2012). The latter are examples of informal institutional burdens. In the same vein, different studies suggested that the impact of these institutional burdens (formal and informal) on entrepreneurship was found to be conditional on that country's level of economic development (Aidis *et al.*, 2012; Carlos Díaz Casero *et al.*, 2013). For example, the impact of corruption on entrepreneurial activity is more explained in developing countries than in developed countries (Aidis *et al.*, 2012). Hence, this study also takes into account the fact that the effect of key institutions on entrepreneurship plays a different role at different stages of economic development.

1.5 Research Aim and Objectives

The principal aim and contribution of this research is to examine the effect of institutional dynamics on the development of entrepreneurial activities in the context of emerging economies given the importance placed on entrepreneurship, and especially new business start-ups, as a key driver to economic growth and development. This study suggests that the differences in rates of entrepreneurial activity in emerging economies are shaped by the influence of formal and informal institutions, and this effect may vary based on the stage of development of a specific country. It specifically argues that the impact of formal institutions presented by the number of procedures, education and training, access to credit, and technology absorption on the rates of entrepreneurial activity is stronger in the presence of lower levels of corruption, and this impact may vary under the level of development of a particular emerging economy.

Although the selected institutions in this study do not represent all the aspects of the institutional conditions, they are, nevertheless, significant for improving countries' entrepreneurial productivity by facilitating knowledge and encouraging resource allocation (Gnyawali and Fogel, 1994; Álvarez and Urbano, 2011; Stenholm *et al.*, 2013; Aparicio *et al.*, 2016). Moreover, this study was able to extend the current literature, which only addressed these institutional variables separately (e.g., Stenholm *et al.*, 2013; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016).

To achieve the research aim, the following objectives are established:

- to explore the intricate relationship between entrepreneurship, economic growth and development, and institutions, and how the latter is linked to the development of entrepreneurial activity;
- to investigate the impact of the institutional dynamics on the development of entrepreneurial activity in emerging economies;
- to develop a framework that can be applied in addressing the interaction effect of formal and informal institutions on the rates of entrepreneurial activity in emerging economies that are located at different stages of development. A number of hypotheses are developed based on the conceptual framework;

- to validate the proposed framework through using panel (longitudinal) data supported by statistical analysis.

As a result, this research can provide a better understanding about the interaction effect of formal and informal institutions on developing entrepreneurial activity, as well as contributing to the limited body of existing research analysing entrepreneurship in the context of emerging economies located at different stages of development.

Hopefully, the results of the study can offer guidance for governments and policymakers concerned with the design and implementation of entrepreneurship policy, within the framework of encouraging an hospitable environment to increase new business activity in emerging economies.

1.6 Research Design

A quantitative (longitudinal) analysis was employed to examine the interaction effect of formal and informal institutions on the development of entrepreneurial activity across 44 emerging economies over the years 2006-2014. In the panel (longitudinal) data analysis of the study, a series of econometric models were examined, based on the conceptual model developed in Chapter 3, to determine any statistical relationships between the selected variables of the formal and informal institutions and their influence on the rates of entrepreneurial activity. In this respect, government procedures, education and training, access to credit and technology absorption are considered as formal institutions, whereas control of corruption is regarded as an informal institution in this study (see Figure 3.1). The findings from the panel data analysis of the study were then synthesised to offer a more comprehensive and comparative understanding of the dynamics of the institutional environment and their impact on the development of entrepreneurial activity in the context of emerging economies.

The panel (longitudinal) data analysis allows the researcher to examine the validity of the conceptual framework. It also supports the significant statistical results to obtain a more in-depth understanding about the dynamics of those institutional variables and their influence on the rates of entrepreneurial activity through a

specific period of time; this is not possible in other quantitative approaches, such as panel surveys or cross-national analysis (Williamson, 2000; Levie and Autio, 2011; Stenholm *et al.*, 2013) (see Section 4.10 for the rationale for using a panel data model for this study).

1.7 Thesis Outline

This thesis is structured in seven chapters. The order and the details of each chapter are outlined below.

Chapter 1 provides an overview of the thesis, research problem, research aims and objectives, research needs, the applicability of the conceptual model to the study, research design, and thesis structure.

Chapter 2 is a review of the literature. Since the definition of entrepreneurial adopted in this study is about entrepreneurs who are motivated by opportunity and contribute to economic growth and development through innovation and starting new firms, the review concentrates on the main definitions and types that address entrepreneurial activity. After that, the role of entrepreneurship in economic growth, development and prosperity, and its relationship to the institutional theory at different stages of economic development is studied. The next section explores the theoretical foundations of the interaction effect between formal and informal institutions. Then, the overview of the theory is followed by a review of the empirical studies addressing the institutional variables linked to entrepreneurial activity. Finally, we introduce the emerging research gaps between the institutional theory and entrepreneurial activity.

Chapter 3 is the conceptual model developed to suggest the interaction effect of formal and informal institutions on the development of entrepreneurial activity. Hypotheses are conducted based on the conceptual framework and are examined and validated in the following chapters.

Chapter 4 is the research methodology chapter, and describes the research context of the study. Also, it provides an overview of the research paradigms and the rationale for choosing the positivism approach. This is followed by presenting the study hypotheses and the research design. The data sources and the description of the

dependent, independent and control variables will be discussed thoroughly in this chapter. Finally, the rationale for using a panel data analysis approach to examine the conceptual framework will be discussed; this will be followed by an explanation of the different models of panel data analysis.

Chapter 5 presents the descriptive statistics and the dynamics of the institutional variables used in this study. This is followed by the model specification and estimation tests of the panel data analysis and the empirical results concerning the research hypotheses.

Chapter 6 contains a discussion and interpretation of the research findings reported in Chapter 5. The quantitative results are discussed to confirm or contradict the developed framework drawn from the theoretical and empirical literature in Chapters 2 and 3.

Chapter 7 provides the conclusions and policy recommendations based on the main findings reported in Chapters 5 and 6. The study contributions are also discussed and outlined here. Finally, this chapter provides the study limitations and suggests some recommendations for future work.

CHAPTER TWO: REVIEW OF THE LITERATURE

2.1 Introduction

The previous chapter attempted to provide a brief introduction of the literature relating to the relationship between entrepreneurship, economic growth and institutions. The outcomes of Chapter 1 highlighted the urgent need for a new institutional framework where the interaction effect of both formal and informal institutions on the development of entrepreneurial activity may offer a better understanding of this relationship.

This chapter aims to review the theoretical and empirical literature addressing the relationship between the fields of entrepreneurship and development economics in order to highlight the emerging research of the effect of institutions in both fields. As will be discussed and underscored throughout this chapter, there is a growing body of literature that recognised the role of entrepreneurship in economic development. However, the variation rates of entrepreneurial activity cannot be explained only through the characteristics of individuals (e.g., risk taker), but take place among a wide range of the institutional variables that regulate the market structure. Therefore, this study takes stock of the body of knowledge on the impact of the institutional environment on entrepreneurship, and underlines the challenges that will keep on driving the research. This discussion will provide the theoretical basis of the conceptual model developed in Chapter 3 to explain the interplay between formal and informal institutions and their effect on the development of entrepreneurial activity in emerging economies.

Investigating the field of entrepreneurship and its relationship to the theory of economic development and institutions can be grouped into three themes. These themes provide the structure for this chapter, which is organised as follows.

The first theme gives a brief overview of the history of entrepreneurship definitions and theories through the lens of economic perspective, as outlined in Section 2.2. As the definition of entrepreneurship adopted in this study is about entrepreneurs who are motivated by opportunity and contribute to economic growth and development through innovation and starting new firms, the review concentrates on the three key

topics that address entrepreneurial activity from an occupational, a behavioural, or an outcome point of view. The following Section 2.3 discusses the most common types of entrepreneurship existing in the research of entrepreneurial economies. This review is necessary to make a clear distinction between different types of entrepreneurship that exist in the literature.

The second theme deals with describing the relationship between entrepreneurship and global prosperity (Section 2.4), and provides a theoretical and empirical background on the role of entrepreneurship in economic growth and development (Sections 2.4.1 and 2.4.2). By reviewing the nature of economic development and its relationship with different types of entrepreneurship, Section 2.4.3 mainly addresses how entrepreneurship based on knowledge can contribute positively to the knowledge economy. However, the empirical research between measures of economic development and measures of entrepreneurship has attracted conflicting interpretations from different stages of economic development (Section 2.4.4). These interpretations will be discussed within the field of the institutional theory that can explain the differences in entrepreneurship rates across countries located at different levels of development. In the context of our study, emerging economies should develop favourable environmental conditions to increase entrepreneurship in the form of new start-ups and consequently contribute to economic growth and development, as highlighted in Section 2.4.5.

The third theme begins by laying out the theoretical dimensions of the research and looks at how institutional theory is particularly relevant in explaining the variation rates of entrepreneurial activity among emerging economies (Section 2.5.1). Section 2.5.2 of this study provides a more detailed account of the institutional types. The contributions here describe the relationship between formal and informal institutions and their effect on the development of entrepreneurial activity. Building on the interaction effect between formal and informal institutions in the previous section, Section 2.5.3 interrogates the possible causes of inefficient institutions and their impact on entrepreneurship outcomes in emerging economies. The most common institutional dimensions that are relevant to entrepreneurship have been reviewed in Section 2.5.4. Our review of both the theoretical and empirical literature showed that the vast majority of studies addressing the development of entrepreneurial activity

had not considered the interaction effects of formal and informal institutions. Therefore Section 2.5.5 sheds more light on the recent research gaps discussed concerning institutional theory and entrepreneurship fields. Finally, the chapter ends with conclusions derived from reviewing the literature (Section 2.6).

2.2 The Development of Entrepreneurship Theories and Definitions

The following sections provide an overview of the theories and definitions that are related to the research of entrepreneurship and entrepreneurial activity. This review is crucial because it forms the starting point for the study regarding the historical context of entrepreneurship study, and therefore clarifies different underlying assumptions and definitions being used in this thesis.

Several studies have suggested that the theories and definitions (Table 2.1) of entrepreneurship have been a matter of on-going discussion among different academic disciplines in psychology, economics and management (Wennekers and Thurik, 1999; Ahmed and McQuaid, 2005; Davis, 2006; Avanzini, 2011; Parker, 2013; Álvarez *et al.*, 2014). Therefore, given the orientation of the study's work, most of the literature in this thesis deals with entrepreneurship from an economic perspective (macro-level) and the institutional factors related to it. In the field of entrepreneurial economics, theories and definitions of entrepreneurship can be grouped into three themes: (1) an occupational, (2) a behavioural, and (3) an outcome perspective (Naudé, 2011). These three key themes will allow the author to offer an initial context for the thesis by highlighting and explaining the critical role of institutions in shaping and developing entrepreneurial activity in a particular country.

2.2.1 The occupational perspective

From an occupational perspective, entrepreneurs are those who are business owners and/or self-employed (Naudé, 2008, 2011). Occupational definitions are attributed to the notion that a person can either be in waged employment, self-employed, or unemployed (Naudé, 2008, 2011). However, many of these entrepreneurs are self-employed due to the lack of waged employment. Therefore, the Global Entrepreneurship Monitor (GEM) offered a distinction in the measurement of entrepreneurship based on the motivation of the individual to be an entrepreneur. In the GEM report, necessity-driven entrepreneurs are self-employed because they have

no other options in the labour market, while opportunity-driven entrepreneurs are independent by choice to exploit some perceived opportunity in the market (for more details, see GEM in Section 4.7.1) (Singer *et al.*, 2015).

While the occupation concept of entrepreneurship is broadly used with economic development (Naudé, 2008, 2011), this understanding of entrepreneurship has not managed to identify potential entrepreneurs or explain the variance in self-employment decisions across developing and developed countries (Levie and Autio, 2011). For example, sample data based on 2001 showed that the highest rates of self-employment were in developing countries, such as Colombia (44.8%), Pakistan (43.0%) and Zambia (40.6%), while the rate in developed countries is much lower, such as Sweden (10.0%), Germany (9.9%) and the United Kingdom (9.5%) (Robson, 2007). Moreover, Acs *et al.* (2018b) argued that the Total Entrepreneurial Activity (TEA) from the GEM report, which captures self-employment, is negatively correlated with economic freedom, economic growth, and global competitiveness. In other words, the economy of a specific country is worse when the TEA rates are higher. In that sense, Uganda is more entrepreneurial than the United States because the former has the highest TEA rate in the world (Acs *et al.*, 2018b).

This discrepancy between entrepreneurship measured by self-employment and economic growth may be explained by the fact that the notion of entrepreneurship in the previous decades of the 20th and 21st centuries paid less attention to the individual's context (Acs *et al.*, 2014a, b). Therefore, the TEA does not consider the “productive” entrepreneurship that contributes to economic growth and development, but instead entrepreneurship quantity (Baumol, 1990) (this will be discussed further in the following sections).

2.2.2 The behavioural perspective

Theories of behavioural entrepreneurship have abounded since the seminal work of Richard Cantillon (1680-1734, cited in Ahmed and McQuaid, 2005 and Davis, 2006), who described the entrepreneur as an arbitrageur who bears the risk and allocates the resources to sell a product demanded by the market (Ahmed and McQuaid, 2005; Davis, 2006). In this respect, Joseph Schumpeter (1942) defined entrepreneurs as the coordinators of production and economic agents of “creative

destruction” (for more details about this theory, see Section 2.4.3). He further contended that the behaviour of entrepreneurs consists of creating new methods of production, inventing new goods for customers, entering new markets and developing new business models (Schumpeter, 1942, p. 83). Therefore, this line of thought traditionally related entrepreneurship to the possession of specific attributes, personal or psychological traits that the entrepreneur has to explain why some individuals and not others recognise and choose to seek entrepreneurial opportunities.

Although differences of opinion still exist, there appears to be some agreement in the last decade that entrepreneurship refers to “sources of opportunity; the processes of discovery, evaluation and exploitation of opportunities; and the set of individuals who discover, evaluate and exploit them” (Shane and Venkataraman, 2000, p. 218). What is useful about this definition is that it captures many essential features of activities in which an entrepreneur is involved. Also, it helps to distinguish between the earlier individual-oriented approach of self-employment and the process-oriented one.

However, individuals who have the high capacity to be entrepreneurs may not necessarily become entrepreneurs. This is because individuals’ decisions to seek and exploit opportunities (Kirzner, 1997) are mainly influenced by the institutional context that regulates the market structure (Levie and Autio, 2011). Therefore, Acs *et al.* (2014a, p. 479) defined entrepreneurship as the “the dynamic, institutionally embedded interaction between entrepreneurial attitudes, abilities, and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures”. Acs *et al.*’s (2014a, b) definition explained that institutions have consistent interaction with entrepreneur’s behaviour in which the institutional context can drive entrepreneurs to be more productive to contribute to economic growth.

2.2.3 The outcome perspective

Modern economic theories defined entrepreneurship by the outcomes in which different forms of entrepreneurship can contribute to the economy. These concepts are founded on the understanding that not all types of entrepreneurship are essential

for economic development. In particular, Baumol (1990) suggested that entrepreneurial activity exists in all economies. However, different outcomes of entrepreneurship may appear in a specific marketplace; these include productive, unproductive (e.g., rent-seeking), or destructive (e.g., illegal activities) activity. Baumol (1990) further argued that only the productive form of entrepreneurship is significant to the economy. In this regard, Baumol (1990) described productive entrepreneurs as “persons who are ingenious and creative in finding ways that add to their own wealth, power, and prestige” (Baumol, 1990, p. 987). Therefore, a creative entrepreneur is one who contributes to the economy and “provides a new product or service or that develops and uses new methods to produce or deliver existing goods and services at lower cost” (Baumol *et al.*, 2007, p. 3). In line with the previous argument, different studies proposed different types of entrepreneurship that can contribute to economic growth and development. For example, using GEM data from 37 countries in 2002, Wong *et al.* (2005) found that only high-potential entrepreneurial activity is positively associated with economic growth. There will be further discussion about the types of entrepreneurship and their impact on economic growth and development in Section 2.3.

2.2.4 This study’s definition of entrepreneurship

Based on the previous discussion, the term entrepreneurship is used here to refer to entrepreneurs as “opportunity-driven agents who drive economic change through innovative new firms” (Naudé, 2011, p. 7). This definition coincides with Gartner (1985, p. 697), who defined entrepreneurship as “new venture creation”, and Hart (2003, p. 3), who described entrepreneurship as a “process of starting and continuing to expand new businesses”. However, this thesis adopts a broader view where entrepreneurship is not limited to the actual outcome of new firm formation. Naudé’s (2011) definition leads to a more specific explanation on how the behaviour of “discovery and exploitation of opportunities” (Shane and Venkataraman, 2000, p. 218) has an impact on economic growth and development by exploiting opportunities through the creation of new business firms. Hence, the process of entrepreneurship involves the behaviour of exploiting opportunities as well as the creation of new start-ups, whether successful or not (Ho and Wong, 2007; Levie and Autio, 2011).

This understanding of the adopted definition of entrepreneurship has recently been supported by Acs *et al.* (2018b, p. 17), who defined the entrepreneur as “a person with the vision to see innovation and the ability to bring it to market”. Acs *et al.* (2018b) further argued that entrepreneurs are the bridge between invention and commercialisation. Because innovative ideas without entrepreneurship stay in the university laboratory or the R&D facility, entrepreneurs such as Steve Jobs and Jack Ma are the ones who commercialise other people’s innovative ideas. In reality, entrepreneurs have a vision and try to fill a gap in the market by offering a product or a service to customers (Leibenstein, 1968; Audretsch, 2007; Levie and Autio, 2008).

Moreover, Acs *et al.*’s (2018b) definition helped to distinguish between the small business owners who are driven by necessity (they have no other options in the labour market for making money and replicate what others are doing) and entrepreneurs who are driven by opportunity and generate commercial success (Acs *et al.*, 2018b). While necessity-driven entrepreneurs, such as traders or shop owners who perform a sort of small business management, are essential for creating jobs and income for their families, this study is more concerned with opportunity-driven entrepreneurs who generate high growth commercial success, scalability and serious job creation (Acs *et al.*, 2018b). This distinction between necessity and opportunity-driven entrepreneurship is necessary because only innovative, growth-oriented entrepreneurship can contribute to economic growth and development, unlike the self-employment captured by GEM’s TEA rate (Acs *et al.*, 2018b).

The adopted definition in this study is also in line with other researchers such as Haltiwanger *et al.* (2013, p. 360), who have highlighted the significant role of business start-ups and young businesses in US job creation. These authors further suggested that:

“Measuring and understanding the activities of start-ups and young businesses, the frictions they face, their role in innovation and productivity growth, and how they fare in economic downturns and credit crunches are clearly interesting areas of inquiry given our findings” (Haltiwanger *et al.*, 2013, p. 360).

To this end, in the methodology Section 4.7.2, this thesis looks at Naudé’s definition of measuring entrepreneurial activity.

Table 2.1: The development of entrepreneurship theories and definitions

Author	Period	Definition
Cantillon as cited in Davis, 2006, p. 14	1730	“Self-employment of any sort involved in a process of bearing the risk to organize factors of production to deliver a product or service demanded by the market”
Schumpeter, p. 81-86	1942	Entrepreneurs are coordinators of production and economic agents of “creative destruction”
Leibenstein, p. 75	1968	“Entrepreneur is an individual or group of individuals with four major characteristics: he connects different markets, he is capable of making up for market deficiencies (gap-filling), he is an “input-completer,” and he creates or expands time-binding, input-transforming entities (i.e., firms)”
Gartner, p. 697	1985	“The creation of a new business”
Baumol, p. 897	1990	“Entrepreneurs are ingenious and creative in finding ways that add to their own wealth, power, and prestige”
Kirzner, p. 70	1997	The identification of market arbitrage opportunities
Shane and Venkataraman, p. 218	2000	“It involves the sources of opportunity; the processes of discovery, evaluation and exploitation of opportunities; and the set of individuals who discover, evaluate and exploit them”
Hart, p. 3	2003	“Process of starting and continuing to expand new businesses”
Baumol <i>et al.</i> , p. 3	2007	“provides a new product or service or that develops and uses new methods to produce or deliver existing goods and services at lower cost”
Bosma <i>et al.</i> , p. 8	2010	“Intrapreneurship or corporate entrepreneurship is a special of entrepreneurship which refers to initiatives by employees in organizations to undertake new business activities”
Naudé, p. 7	2011	“Opportunity-driven agents who drive economic change through innovative new firms”
Acs <i>et al.</i> , p. 479	2014a	“The dynamic, institutionally embedded interaction between entrepreneurial attitudes, abilities, and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures”
Acs <i>et al.</i> , p. 17	2018b	“Entrepreneur is a person with the vision to see an innovation and the ability to bring it to market”

Source: Devised by author

This research acknowledges that adopting the definition of entrepreneurship as new business creation has its limitations in fully reviewing entrepreneurship. Specifically, it does not consider other types of high growth entrepreneurship such as intrapreneurship (or corporate entrepreneurship), which refers to “initiatives by employees in organisations to undertake new business activities” (Bosma *et al.*, 2010, p. 8). In other words, intrapreneurship is a special type of “productive” entrepreneurship and it involves “opportunity perception, idea generation, designing a new product or another recombination of resources, internal coalition building,

persuading management, resource acquisition, planning and organizing” (Bosma *et al.*, 2010, p. 8; Turró *et al.*, 2014).

In line with the previous argument of corporate entrepreneurship, Acs *et al.* (2014a, b) found an S-shaped relationship between entrepreneurial activity and economic development; this relationship indicated that the increasing rate of entrepreneurial activity eventually drops among developed nations. Perhaps entrepreneurs in developed countries are allowed to “behave entrepreneurially” within established organisations, and they receive high compensation for so doing. Therefore individuals in such economies are more likely to choose high-wage employment. As a result, the increasing rates of corporate entrepreneurship (intrapreneurship) might replace new business activity within such economic conditions (Reddy, 2012; Acs *et al.*, 2014a, b). This distinction between new start-ups and corporate entrepreneurship is necessary as there are several types of entrepreneurship that contribute to economic growth and development. In the next section, this study sheds more light on the main types of entrepreneurship that are linked to economic growth and development.

2.3 Types of Entrepreneurship

As discussed in the previous section, entrepreneurship is a complex subject of study, and its features, dynamics, factors and manifestations differ among countries. However, entrepreneurship may take different forms based on the overall level of economic development for a specific country (Desai, 2011). Therefore, this section sheds more light on the most common types of entrepreneurship that exist in the literature.

In general, entrepreneurship is discussed in several dichotomous terms such as formal and informal entrepreneurship (Acs *et al.*, 2008b; Ayyagari *et al.*, 2014), legal and illegal entrepreneurship (Desai, 2011), necessity and opportunity entrepreneurship (Wennekers *et al.*, 2005; Sternberg and Wennekers, 2005; Valliere and Peterson, 2009; Aparicio *et al.*, 2016), local and systematic entrepreneurship (Sautet, 2013), and research-based and imitative entrepreneurship (Minniti and Lévesque, 2010).

2.3.1 Formal and informal entrepreneurship

According to Desai (2011), the distinction between formal and informal entrepreneurship is recognised by registration status. In this regard, the firm is considered a formal entity if it has been registered with the proper government agency. Therefore, the description of a firm as “formal” or “informal” is based on whether the organisation is registered to the formal (taxable) sector or not (informal sector), regardless of the nature of its activities (Desai, 2011).

Developing countries tend to have more informal entrepreneurship than developed countries. Klapper *et al.* (2010) contended that this discrepancy of the size of the informal labour force is due to the incentive structure provided by the institutional environment of a particular country. On the one hand, entrepreneurs who work on a small scale are less motivated to join the formal sector, especially if high taxes and complex regulations accompany it. On the other hand, entrepreneurs are more likely to register in the formal sector to benefit from the advantages of the formal economy, such as better access to export markets. Therefore, entering the formal sector can be a careful decision by entrepreneurs, depending on the trade-off between formalisation advantages and regulatory disadvantages (Klapper *et al.*, 2010; Doing Business, 2018).

With regard to the level of economic development, some studies offered a better understanding of the role of formal and informal entrepreneurship in the context of developed and developing countries. In this regard, different measures of entrepreneurship have led to inconsistent or uncertain empirical findings. Hence, Acs *et al.* (2008b) conducted an empirical study that focused on comparing two common datasets designed to capture entrepreneurial dynamics: the GEM data for TEA, and the World Bank Entrepreneurship Group Survey (WBEGS) dataset for formal business registration. The authors found that rates of entrepreneurship as defined by the GEM database are higher in developing countries, whereas the rates of entrepreneurship defined by the WBEGS are lower in developing countries rather than developed countries.

Acs *et al.* (2008b) suggested that the discrepancy between previous results was because both datasets measure different dynamics of entrepreneurial activity. In

particular, the WBEGS measures the rates of formal entry in the form of a Limited Liability Company (LLC) establishment, while the GEM data include informal entrepreneurship, especially in the case of developing countries. As a result, GEM data might measure the potential supply of entrepreneurship, while WBEGS data could measure the actual rate of entrepreneurship (Acs *et al.*, 2008b). Moreover, the authors found that entrepreneurs are more motivated to start a business formally in developed countries than in developing countries; this is based on the incentives provided by the institutional environment, such as fewer procedures to start the business, better access to formal financing and labour, and improved tax regulations.

While Acs *et al.* (2008b) examined the role of formal and informal entrepreneurship in developing countries, Ayyagari *et al.* (2014) used formally registered firms to investigate the contribution of small and medium sized enterprises (SMEs) on total employment, job creation and economic growth across 104 developing countries. The authors examined this relationship by analysing a comprehensive dataset from the World Bank Enterprise Surveys (ES) regarding types of formal firms (firm size, young versus mature firms) and total employment, labour productivity and labour generation across the entire size distribution.

Ayyagari *et al.* (2014) found that SMEs (<99 employees) generate more jobs than large firms. However, they have less productivity growth in comparison to large firms. Therefore, the authors suggested that policymakers in developing countries should focus not only on creating jobs but also on creating better quality jobs to promote economic growth. Moreover, Ayyagari *et al.* (2014) contended that policymakers should focus on entrepreneurs who are motivated to grow rapidly and become bigger; this is because they are the engine of growth in developing economies. The authors further suggested that in order to increase productivity growth, policymakers should focus on removing the obstacles faced by aspiring entrepreneurs, such as lack of business incubators that provide finance, training and literacy programmes, as well as government taxes, regulations and corruption.

2.3.2 Legal and illegal entrepreneurship

The terms legal and illegal activities have been a source of confusion in the field of entrepreneurship (Desai, 2011). This is because this dichotomy is often used interchangeably and without precision with formal and informal dichotomy, albeit they are not the same. While the terms formal and informal firms are more concerned with their registration status, the terms legal and illegal firms are more concerned with their selected activity. In this sense, legal firms are those who comply with the activities permitted by law and regulatory frameworks in a specific country. On the other hand, illegal firms are those who are involved in illegal activities, whether they are registered formally or informally, such as mining in prohibited areas (Naudé, 2011). In his seminal work, Baumol (1990) named illegal activities as destructive entrepreneurship that has no impact on increasing economic growth. To this end, all informal organisations are not necessarily illegal, and all formal organisations are not necessarily legal, as shown in Table 2.2 (Desai, 2011; Naudé, 2011).

Table 2.2: Formal, informal, legal and illegal entrepreneurship

	Formal	Informal
Legal	<p>“Registered firm that is engaged in legal activities”.</p> <p>“Example: Registered manufacturing firm producing plastic packaging for medical supplies, in compliance with national health, safety, environmental and factory regulations”.</p>	<p>“Unregistered firm that is engaged in legal activities”.</p> <p>“Example: Unregistered private cars in Bangkok, operating as corporate drivers and tourist taxis”.</p>
Illegal	<p>“Registered firm that is engaged in illegal activities”.</p> <p>“Example: Registered foreign law firms in China, operating outside authorized areas of expertise as explicitly defined by Chinese government legal code”.</p>	<p>“Unregistered firm that is engaged in illegal activities”.</p> <p>“Example: Loan sharking that occurs in many slum areas in Mumbai; unregistered entrepreneur lending money at above-market interest rates to borrowers without access to the formal, official banking system”.</p>

Source: Desai (2011)

2.3.3 Necessity and opportunity nascent entrepreneurship

The concept of nascent entrepreneurs (i.e., people actively involved in starting a new venture) can be divided into necessity and opportunity entrepreneurs based on the motivation for starting the business (Wennekers *et al.*, 2005, p. 294). While necessity-driven entrepreneurs are involved in entrepreneurship to avoid

unemployment, opportunity-driven entrepreneurs are motivated by a perceived opportunity in the market for profit maximisation (Singer *et al.*, 2015).

In general, the percentage of necessity entrepreneurs out of TEA is greater in developing countries than in developed countries. According to the GEM report in 2014, rates of necessity entrepreneurship for India, Brazil, Croatia and South Africa ranged between 28% and 46.5% in 2014, compared to 3.5% and 7.9% in Norway and Sweden, respectively (Singer *et al.*, 2015).

Desai (2011) argued that the high levels of necessity entrepreneurship in developing countries are associated with the size of the informal sector. Individuals who become entrepreneurs to avoid unemployment tend to have low skills and sell basic products and services. Hence, necessity entrepreneurs have no incentives to formalise their business activities (Desai, 2011).

On the other hand, opportunity entrepreneurship in developing countries could be both formal and informal. Emerging economies that are increasingly moving to market orientation could offer better opportunities to new entrants (Bruton *et al.*, 2008). However, opportunity entrepreneurs tend to shift their business from the informal sector to the formal sector once they perceive better benefits from the institutional environment (Desai, 2011; Klapper *et al.*, 2010).

2.3.4 Local and systematic entrepreneurship

Sautet (2013) conducted a conceptual study with a different perspective on the relationship between entrepreneurship and economic development, by offering a possible explanation of how productive entrepreneurship can contribute to economic growth.

According to Sautet (2013), the current types of entrepreneurship, such as necessity and opportunity entrepreneurship from GEM data, do not provide a clear picture to explain the relationship between entrepreneurship and economic development. Instead, Sautet (2013) suggested that local and systematic entrepreneurship offer a better understanding of this relationship. Sautet (2013, p. 392) described local entrepreneurship as a

“socially productive entrepreneurial activity that is limited to a small number of market transactions (i.e., the exploitation of local gains from trade); does not entail a complex division of labour; does not involve a deep accumulation of capital; and primarily rests on personal and informal relations.”

He further argued that local entrepreneurship is based on the opportunity in the market that limits the growth of the business, whereas necessity entrepreneurship from GEM data is based on the motivation of the individual.

In addition, Sautet (2013, p. 393) described systemic entrepreneurship as a

“socially productive entrepreneurial activity that is based on large volumes of market transactions exploiting large gains from trade and innovation entails a complex organizational structure that enables economies of scale and scope to be captured, involves a deep accumulation of capital, rests on impersonal and formal relations, and generates entrepreneurial momentum”.

He also contended that systematic entrepreneurship is based on the opportunities available in the market, unlike opportunity entrepreneurship from GEM data that is based on the individual’s motivation. To this end, Sautet (2013) suggested that firms in developing countries tend to focus their opportunities locally; therefore, they limit the growth of productive entrepreneurship and economic growth.

2.3.5 Research-based and imitative entrepreneurship

Minniti and Lévesque (2010) presented a theoretical model to analyse the relationship between entrepreneurship and economic growth. The authors suggested that entrepreneurship plays a vital role in developed and emerging economies. However, there may be different types of entrepreneurship depending on the level of the economic development of each country. Minniti and Lévesque (2010, p. 306) described entrepreneurs as “arbitragers who are willing to incur upfront costs in the hope of realizing profit expectations”.

Furthermore, the authors suggested that entrepreneurial activity has two types; research-based entrepreneurs (i.e., those who commercialise technological inventions and incur R&D expenditure), or imitative entrepreneurs (i.e., those who increase product supply and competition by copying technologies established in a different place, and consequently do not incur R&D expenditure). The results showed that there is a dynamic role of imitative and research-based entrepreneurship in economic

growth. In this regard, both research-based and imitative entrepreneurs have a positive effect on economic growth. However, imitative entrepreneurs contribute significantly to economic growth, especially in the case of emerging economies, as they increase competition and product availability when the revenues to R&D expenditure are low (Minniti and Lévesque, 2010).

In summary, the reviewed literature regarding the types of entrepreneurship revealed that entrepreneurship is a complex phenomenon, and its relationship to economic growth and development is subject to a great debate among scholars and policymakers. Thus, in the following section, we will try to offer a more in-depth analysis of the intersection of the fields of entrepreneurship and economic development.

2.4 The Intersection of the Field of Entrepreneurship and Economic Development

According to Naudé (2011, p. 3),

“The intersection of the fields of entrepreneurship and development economics is a challenging and potentially rewarding area of research for social scientists, with important implications for policymakers, donors, development agencies as well as business owners and managers”.

However, only a few scholars in economics (e.g., Schumpeter, 1942; Leibenstein, 1968) have been able to draw on any systematic research into the role of entrepreneurship in economic growth and development.

Recently, there has been renewed interest in the relationship between entrepreneurship and economic development (Ahmed and McQuaid, 2005; Audretsch *et al.*, 2008; Minniti and Lévesque, 2010; Acs *et al.*, 2014a, b; among others). In this respect, Naudé (2011, p. 3) stated that this:

“Interest was reignited by the improved availability of relevant cross-country data, by the resurgence of entrepreneurship after the fall of communism and the gradual reforms initiated by China since the late 1970s, by the emerging recognition of the role of institutions in both fields, and by the increasing emphasis on private sector development by donors and international development agencies”.

Therefore, in light of recent events in the new global economy, it is becoming extremely difficult to ignore the contribution of entrepreneurship in economic growth and development (e.g., Acs *et al.*, 2014a, b; Aparicio *et al.*, 2016). This section reviews the evidence for the role of entrepreneurship in global prosperity, economic growth and development, and underlines the importance of institutions in offering a better understanding of this relationship.

2.4.1 The role of entrepreneurship in global prosperity

Early scholars in economics such as Schumpeter (1942) considered entrepreneurial innovations as the engine of economic welfare and prosperity. In recent years, entrepreneurship has been widely recognised as a means of “growing the pie” by increasing economic activity to create more jobs and generate more income for more people, instead of simply redistributing the wealth from one group to another (Baumol *et al.*, 2007; Acs *et al.*, 2008a; Acs *et al.*, 2016). However, the literature on entrepreneurship lacks clarity regarding how entrepreneurship is accurately correlated with human wellbeing and a global prosperity (Acs *et al.*, 2016). In this regard, Ahmed and McQuaid (2005, p. 8) stated that:

“Entrepreneurs and entrepreneurship play important roles in today’s global business environment. Even though entrepreneurship has been an important part of society for many years, there are still many different perceptions and misconceptions about it”.

Therefore, Baumol (1990) suggested that entrepreneurs can contribute effectively to the general welfare and prosperity of an economy based on the institutions that prevail in a certain society (Baumol and Storm, 2007). This is because institutional environment that encourages “productive” entrepreneurial activities becomes the ultimate determinant of economic growth and prosperity (Sobel, 2008; Carlos Díaz Casero *et al.*, 2013).

A good summary of the role of entrepreneurship, combined with institutional quality, in global prosperity has been provided in the work of the Global Entrepreneurship Index (GEI). The findings of GEI’s report showed that the role played by entrepreneurship is correlated positively with different aspects of human well-being. This section offers some evidence to that outcome.

In Table 2.3, Acs *et al.* (2016) explored the relationship between GEI data in comparison with six variables across the social, economic and environmental fields to demonstrate how these variables might work in tandem, or whether there is no correlation between each other. These factors are

“GDP per capita (PPP); income equality (GINI); digital evolution (The Digital Evolution Index, Tufts); environmental performance (Yale Environmental Performance Index); economic freedom (Heritage Foundation Index of Economic Freedom); and peace (Institute for Economics and Peace Global Peace Index)” (Acs *et al.*, 2016, p. 7).

Table 2.3: Entrepreneurship correlated variables with R-squared coefficients

GEI-Correlated Variable	R-Squared
GDP per capita	0.58
Income equality	0.13
Digital evolution	0.72
Environmental performance	0.72
Economic freedom	0.51
Peace	0.34

Source: Acs *et al.* (2016)

Acs *et al.* (2016) found that entrepreneurship correlates relatively highly with the most common economic measure, GDP per capita (0.58), although many other factors may contribute to GDP growth. In another common economic measure, income equality correlates weakly positively with entrepreneurship (0.13). Other significant aspects of prosperity are digital evolution and environmental performance, where both have the highest correlations with entrepreneurship (both 0.72). Lastly, economic freedom (0.51) and peace (0.34) have less close correlations with entrepreneurship.

As Table 2.3 shows, there is a significant relationship between entrepreneurship and the digital revolution. This strong relationship could be explained by the fact that entrepreneurs create new firms by adopting digital technologies and innovations to transform every industry around the world (e.g., Uber, Google, Amazon and Facebook). Therefore, to have a better understanding of economic development forces in the 21st century, it is crucial to include digital technologies as it is not useful

to explain the 19th century industrial revolution without focusing on the role of steam engines (Acs *et al.*, 2017).

In this realm, the Internet is the core competency for entrepreneurs who adopt new technologies for both factor market inputs and product market outcomes. For example, Carrefour without the Internet may not be efficient, but it would function since it has a physical outlet. On the other hand, Uber could not survive without the Internet because it has no physical location. Therefore, these new young, only a few years old in some cases, firms have strong potential growth regarding the number of users and market share (Acs *et al.*, 2017).

The results in this section indicated that entrepreneurship could broadly be recognised as a “global good” as it is correlated positively with all six of these indicators. Hence, entrepreneurship is likely to contribute to different facets of human welfare and prosperity. The next section, therefore, moves on to discuss specifically the role of entrepreneurship in economic growth and development.

2.4.2 The role of entrepreneurship in economic growth and development

Research into economic development has a long history. Since Adam Smith’s (2003) (original work published in 1776) seminal work, *The Wealth of Nations*, several theories have contributed to the explanation of economic development. In the literature, economic development is considered a complex and multifaceted process that includes interactions among different designed goals and policies over time in a specific country (Dang and Pheng, 2015). This process of economic development may require structural changes leading to an overall higher growth trajectory on different cultural, social, political systems and institutional levels. Therefore, the concept of economic development goes beyond the definition of economic growth (GDP, GNP or GNI) per capita, as the latent is considered one of the dimensions of development (Naudé, 2010; Dang and Pheng, 2015). However, Dang and Pheng (2015) argued that economic development objectives could not be achieved without understanding the sources of economic growth as the country needs resources to accomplish other long-term goals. To this end, for the purpose of this study, we are going to discuss the role of entrepreneurship in both economic growth and economic development, as growth underlies an essential requirement for development.

While development theories abound, many of the theories to date have not considered the role of entrepreneurship in economic growth and development (Dang and Pheng, 2015). Solow (1956), in his neoclassical growth model, contended that the nuances and dynamics of economic growth among countries come to higher productivity in a population; therefore, rich countries have better factors of production. While Solow (1956) considered physical and human capital as driving forces in achieving economic growth, Romer (1990) developed Solow's (1956) model by emphasising the importance of knowledge capital as an endogenous factor, whereby human capital and technological innovations are the key drivers to economic growth. Romer (1990) further argued that new ideas, and most research and development (R&D), are produced by well-educated entrepreneurs who create and exploit new technological advances and ultimately drive economic growth.

Although Romer's (1990) economic growth model helped to explain the divergence in growth rates among countries, Acemoglu *et al.* (2014) contended that institutions could play a pivotal role in producing and organising the factors of production (i.e., physical capital, human capital, and technological innovations). Building on previous research, other studies suggested that these institutions create appropriate incentives for entrepreneurs to be more productive and eventually contribute to economic growth and development (e.g., Acs *et al.*, 2014a, b; Aparicio *et al.*, 2016; Urbano *et al.*, 2018).

In line with this argument, different studies developed theoretical models by offering possible explanations of how entrepreneurship can contribute to economic growth (see Minniti and Lévesque, 2010; Sautet, 2013 in Section 2.3). Moreover, a considerable amount of empirical studies have analysed the role of entrepreneurship in economic growth (e.g., Audretsch and Keilbach, 2004a, b, 2005, 2008; Acs *et al.*, 2018a).

In their study, Audretsch and Keilbach (2004a) analysed the association between different measures of entrepreneurship capital and regional economic performance, measured as per-capita income for Germany. In this regard, entrepreneurship capital is defined as “those factors influencing and shaping an economy's milieu of agents in such a way as to be conducive to the creation of new firms” (Audretsch and Keilbach, 2004a, p. 419). The results showed that entrepreneurship capital has a

positive relationship with regional economic performance (Audretsch and Keilbach, 2004a).

Similarly, Audretsch and Keilbach (2004b) have suggested expanding Solow's (1956) model of the production function to include entrepreneurship capital as a factor for economic growth. The results indicated that entrepreneurship capital is a significant factor shaping output and productivity in German regions (Audretsch and Keilbach, 2004b).

In addition to the importance of the traditional factors of economic growth, such as human capital and R&D, Audretsch and Keilbach (2005) empirically analysed 327 West German regions and found that entrepreneurial activity also plays a significant role in generating economic productivity. In the same vein, using country level data from West Germany, Audretsch *et al.* (2008) found empirical evidence that entrepreneurship could be a mediator between innovation efforts and economic performance. Moreover, they contended that this indirect effect is ignored in previous empirical studies that examined the direct impact of innovation on economic performance.

In consideration of this, Acs *et al.* (2018a) contributed to this relationship by exploring the role of entrepreneurship and institutions, in combination in an ecosystem, in economic growth. In this regard, Acs *et al.* (2018a) found empirical evidence for the role of the entrepreneurial ecosystem in economic growth by using GEM data and institutional sources for 46 countries over the period 2002-2011. Overall, these recent articles suggested that entrepreneurship plays a vital role in economic growth and development. In the next section, we will discuss how entrepreneurship can contribute to the knowledge economy.

2.4.3 Linking between entrepreneurship and knowledge economy

Building on the knowledge spillover theory, entrepreneurs who exploit knowledge spillovers via new venture creation can contribute significantly to the knowledge economy by commercialising new products and services to the market (Acs and Szerb, 2007). According to the World Bank (2007, p. 14):

“[The] knowledge economy ...meaning is broader than that of high technology or the new economy, which are closely linked to the Internet, and even broader than the often-used information society. Its foundations are the creation, dissemination, and use of knowledge. A knowledge economy is one in which knowledge assets are deliberately accorded more importance than capital and labour assets, and where the quantity and sophistication of the knowledge pervading economic and societal activities reaches very high levels”.

Historically, Schumpeter (1942) first introduced the significant role of entrepreneurship in economic growth. He contended that innovative entrepreneurs are described as “agents of creative destruction”. These “agents” destroy the value of existing markets by creating new markets with new products, services and technological innovations that offer a higher rate of return than that provided by existing firms. Contrary to growth models discussed in the previous section, Schumpeter (1942) concluded that creative destruction is the ultimate source of economic growth.

In general, entrepreneurship is considered a key driver to economic growth in which

“entrepreneurs create new businesses, and new businesses, in turn, create jobs, intensify competition, and may even increase productivity through technological change. High measured levels of entrepreneurship will thus translate directly into high levels of economic growth” (Acs, 2006, p. 97).

In reality, however, this treatment of the relationship between entrepreneurship and economic growth is more complicated. Mainly, if the relationship includes a measurement of entrepreneurial activity such as informal self-employment, which occurs due to high levels of bureaucratic barriers that complicate the process of formal business creation, then entrepreneurship may be seen as negatively correlated with economic growth (Acs, 2006).

Therefore, with economic growth and development in mind, it would be best to focus on “productive” entrepreneurship that can lead to economic growth (Baumol, 1990; Acs, 2006; Ayyagari *et al.*, 2014). Recent studies have clearly indicated that entrepreneurship based on knowledge makes a more significant contribution to economic growth in comparison to other types of entrepreneurship, such as necessity entrepreneurship (i.e., individuals who feel obliged to start their own business because all other work alternatives are either absent or insufficient) (Audretsch and

Keilbach, 2004a, b, 2005, 2007, 2008; Audretsch, 2007; Audretsch *et al.*, 2008; Acs *et al.*, 2012). In particular, Reynolds *et al.* (2005) argued that entrepreneurship based on knowledge could be positively related to transforming an opportunity into a real start-up that has an added value to the market.

In this regard, Reynolds *et al.* (2005) contended that entrepreneurship could be considered the result of an individual's decision to create a new business opportunity based on knowledge. However, questions have been raised about the usefulness of entrepreneurship in economic growth (Wong *et al.*, 2005). Specifically, Acs *et al.* (2012) recommended that entrepreneurship should be examined with its capacity to initiate new start-ups and stimulate knowledge in the country simultaneously. Together, some studies suggested that entrepreneurship serves as a conduit to transfer knowledge capacity and, consequently, produce spillover dynamics that contribute to economic growth for a specific society (Audretsch and Keilbach, 2008; Acs *et al.*, 2012).

In the same vein, Acs *et al.* (2012) challenged Romer's (1990) conclusions, arguing that knowledge may not automatically be associated with economic growth as presumed in models of endogenous growth. Thus, there has been an increasing amount of literature that has investigated the effects of entrepreneurship as a conduit of knowledge (Audretsch, 2007; Audretsch and Keilbach, 2008; Noseleit, 2013; Aparicio *et al.*, 2016). In this sense, previous research has considered the importance of entrepreneurs' abilities and motivation to innovate and grow businesses that contribute to economic growth (Audretsch, 2007; Aparicio *et al.*, 2016). In particular, Audretsch *et al.* (2008) contended that innovative entrepreneurs who are motivated by business opportunity bring the benefit of new knowledge to economic growth by creating new products and services that lead to a continuous increment of knowledge spillovers. Therefore, entrepreneurship is considered a key driver in transforming the new knowledge into economic growth (Audretsch *et al.*, 2008).

Several studies supported Audretsch *et al.*'s (2008) conclusions, arguing that increasing entrepreneurship rates are positively linked to the creation of knowledge and technology that could contribute to economic growth (Wong *et al.*, 2005; Acs *et al.*, 2012; Noseleit, 2013; Aparicio *et al.*, 2016). Based on a panel of entrepreneurship data from 18 countries, Acs *et al.* (2012) provided empirical

evidence that entrepreneurial activity serves to encourage economic growth in addition to the measures of R&D and human capital. Moreover, Noseleit (2013) analysed the role of entrepreneurship for adjustments of the structural change from industrial to the knowledge economy, and its relevance for regional economic development in Germany over the years 1975 to 2002. Noseleit's (2013) empirical results suggested that structural change produced by entrepreneurial activity is positively associated with economic growth. A recent study by Aparicio *et al.* (2016) found that opportunity entrepreneurship impacts economic growth positively by using unbalanced panel data of 43 countries (2004-2012).

To conclude, although there are other mechanisms where knowledge spillovers are exploited, such as corporate entrepreneurship (Bosma *et al.*, 2010; Parker, 2013; Turró *et al.*, 2014) (see Section 2.2.4 for more discussion about corporate entrepreneurship), through new start-ups entrepreneurship seems to play an essential role in the knowledge economy. According to Acs and Szerb (2007, p. 112),

“Entrepreneurship can contribute to economic growth by serving as a mechanism that permeates the knowledge filter. It is a virtual consensus that entrepreneurship revolves around the recognition of opportunities along with the cognitive decision to commercialise those opportunities by starting a new firm. Thus, according to the Knowledge Spillover Theory of Entrepreneurship, by serving as a conduit for knowledge spillovers that might otherwise not exist, entrepreneurship permeates the knowledge filter and provides the missing link to economic growth”.

Considering all of this evidence, it seems that entrepreneurship plays a significant role in promoting economic growth and development. However, such studies remained narrow in focus, dealing only with developed countries such as Germany. Therefore, questions have been raised about the role of entrepreneurship in developing countries and whether it has the same effects in regards to its relationship to employment, job creation and innovation.

Let us now turn to consider the different effects of entrepreneurship on economic growth and development among developed and developing economies.

2.4.4 The divergent effects of entrepreneurship on economic growth

Although entrepreneurship has been commonly recognised as a key driver to economic growth and development, the relationship between entrepreneurship and

economic development has attracted conflicting interpretations from different stages of economic development. In particular, some studies found that there is a U-shaped relationship between entrepreneurship and the level of economic development (Sternberg and Wennekers, 2005; Wennekers *et al.*, 2005; Thurik, 2009).

For example, Wennekers *et al.* (2005) conducted an empirical study to examine the determinants of entrepreneurship and the macro-level of nations by using GEM data from 36 countries for the year 2002. The authors yielded that there is a U-shaped relationship between nascent entrepreneurship (i.e., people actively involved in starting a new venture) and the level of economic development (see Figure 2.1). Specifically, opportunity-based nascent entrepreneurial activity has a U-shaped relationship with economic development. When the country develops economically, the entrepreneurial activity decreases. However, from a certain level of economic development onwards, the entrepreneurial activity levels off, or even tends to increase again. Also, the authors suggested that the differences in nascent entrepreneurship rates were mainly affected by “laws” related to the level of economic development (Wennekers *et al.*, 2005).

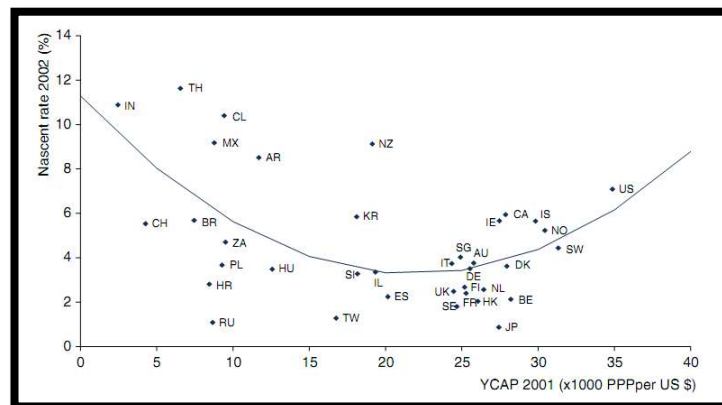


Figure 2.1: The U-curve of entrepreneurship and economic development

Source: Wennekers *et al.* (2005)

In the same vein, Sternberg and Wennekers (2005) reviewed seven papers presented at the First GEM Research Conference in Germany in 2004. The authors focused on their review to explore the determinants of nascent entrepreneurship and new business start-ups. The main findings showed that the role of entrepreneurial activity differs across the levels of development. In particular, there is a U-shaped

relationship between the rate of entrepreneurship and stage of development; this relationship is negative in developing economies but positive in developed countries. Building on these findings, Sternberg and Wennekers (2005) suggested that entrepreneurship may have a different effect on a country's innovation and economic growth rate based on its type, and only high growth business start-ups and opportunity entrepreneurship improve knowledge spillovers and economic development.

Comparing between emerging and developed countries, Valliere and Peterson (2009) conducted an empirical study to investigate the effect of entrepreneurship on economic growth by using GEM data of 44 countries for the years 2004 and 2005, and the Global Competitiveness Report (GCR) to measure economic performance. The authors found that entrepreneurship has a vital role in predicting and explaining the economic performance of countries. However, the impact of entrepreneurship on economic growth is more significant in developed economies rather than emerging economies. Therefore, Valliere and Peterson (2009) suggested that emerging economies should prioritise their economic development policies on bringing gazelle firms (i.e., fast-growing firms) into the formal economy to increase productive entrepreneurship and economic growth.

Recently, Chowdhury *et al.* (2015b) analysed the data from 44 countries during 2001 to 2005. They concluded that economic development has a consistent negative relationship with entrepreneurial activities regarding nascent/new firm ownership, self-employment and new firm start-up.

According to Acs *et al.* (2014a, b), the current datasets of measuring entrepreneurship are somewhat controversial, and the vast majority of researchers have not considered the interaction effects of entrepreneurship and institutions. They further argued that entrepreneurs tend to be more productive regarding employment and economic development when operating under an appropriate institutional environment. In addition, Acs *et al.* (2014b) provided evidence in the Global Entrepreneurship Index (GEI) that some emerging economies, such as Estonia and Slovenia, could have an effective national system of entrepreneurship (i.e., institutional environment) where entrepreneurship plays an essential role in economic development. According to the GEI measure, these emerging nations are in

the first 22 out of the 120 countries who lead the world of entrepreneurship (Acs *et al.*, 2014b).

The previous discussion showed that entrepreneurship could play a different role under the stage of economic development and the quality of the institutional environment. The next section offers better explanations about this relationship.

2.4.5 Entrepreneurship and stages of economic development

Currently, developing and developed countries in the global economy face different challenges in aspiring for and sustaining economic development. This being said, there is not a set formula for nations to use in their developmental endeavours. For example, what Ghana needs to increase its competitiveness is not the same as what Argentina needs to do so. This divergence is due to Ghana and Argentina being in different stages of development (Schwab and Sala-i-Martin, 2014). Competitiveness can be defined in this context as “the set of institutions, policies, and factors that determine the level of productivity of an economy, which in turn sets the level of prosperity that the country can achieve” (Schwab and Sala-i-Martin, 2016, p. 4).

In his classical handbook on economic development, Syrquin (1988) suggested that countries go through three stages. The first stage of economy relies mainly on agricultural products and small-scale manufacturing. In the next stage, the economy moves from small-scale production to manufacturing. In the last stage, and due to the increase in wealth among developed countries, the economy starts to shift from manufacturing towards services.

Another well-known study that is often cited in research on understanding the stages of economic development and its effects is that of Rostow (1959). In his historical study, Rostow (1959, p. 1) suggested that countries go through five stages of economic development: “(1) the traditional society (2) the preconditions for take-off (3) the take-off (4) the drive to maturity and (5) the age of high mass-consumption”. While these stages identified critical historical events in the development of modern economies, they could not explain other critical events and discrepancies. One such discrepancy is the failure of the Soviet Union to reach the mass consumption stage, partly due to a lack of total factor productivity. Consequently, Rostow’s (1959)

theory regarding stages of economic development was deemed inadequate in describing economic development preconditions and stages (Acs and Szerb, 2010).

In line with the economic theory of stages of development, Porter *et al.* (2001) made a valuable contribution to Rostow's (1959) and Syrquin's (1988) studies. Porter *et al.* (2001) argued that a country's development is distinguished by three stages of economic development: a factor-driven stage, an efficiency-driven stage, and an innovation-driven stage. Countries are allocated into stages of development based on two criteria: GDP per capita at market exchange rates, and the extent to which countries are factor driven by measuring

“the share of exports of mineral goods in total exports (goods and services), assuming that countries that export more than 70% of mineral resources (measured using a five-year average) are to a large extent factor driven” (Schwab and Sala-i-Martin, 2011, p. 10).

Also, countries in the transition stage fall between two of the three stages. For transitioning countries, “the weights change smoothly as a country develops, reflecting the smooth transition from one stage of development to another” (Schwab and Sala-i-Martin, 2011, p. 10).

While Rostow (1959) was more concerned with the age of high mass consumption, Porter *et al.* (2001) focused on the innovation-driven stage (i.e., the knowledge economy). In particular, Porter *et al.* (2001) contended that countries must embrace technology and innovation to produce higher levels of income and eventually be more competitive.

In accordance with Schumpeter's (1942) historical view that entrepreneurship is a crucial driver for economic growth, entrepreneurship is increasingly considered a driving force for development through creating “new combinations” of economic activity, such as physical, biological and digital systems for the innovation-driven stage of development (Acs and Szerb, 2010; Schwab and Sala-i-Martin, 2016). Economists have contended that entrepreneurship activities serve in the capacity of “input-completing” and “gap-filling” in their contribution to innovation and economic development (Leibenstein, 1968; Audretsch, 2007; Levie and Autio, 2008).

While few emerging countries are in the innovation-driven stage, most emerging economies are in the efficiency-driven or the transition to the innovation-driven stage (Schwab and Sala-i-Martin, 2014). In addition, emerging economies that are in the innovation-driven stage most likely have higher rates of export-oriented entrepreneurship than emerging economies located in lower stages (De Clercq *et al.*, 2008). Therefore, it is critical for emerging economies to promote innovation in order to reach a technological frontier, and consequently become a knowledge-based economy that is particular to the innovation-driven stage (Acs and Amorós, 2008).

In describing entrepreneurship in different stages of economic development (Table 2.4), the factor-driven stage is highlighted by high rates of agricultural self-employment. Countries in this stage compete based on their factor endowments (i.e., primarily natural resources and unskilled labour). The type of business is commonly marked by sole proprietorships (i.e., self-employed) in which they compete on the basis of price and sell basic products. Therefore, these countries at this stage are not able to create knowledge for innovation or exporting. There are precondition requirements that countries must adopt in order to transfer to the second stage (i.e., the efficiency-driven stage). These requirements include increasing production efficiency and educating the workforce in order to adapt to the subsequent technological development phase. In addition, the first transition from factor-driven to efficiency-driven is characterised by improving the quality of institutions (Porter *et al.*, 2001; Acs *et al.*, 2008a; Acs and Szerb, 2010).

As countries become more competitive, they move into the efficiency-driven stage. Countries in this stage compete on efficient production processes and increase product quality in large markets, which allows firms to exploit economies of scale opportunities. Also, industries in this stage primarily produce basic services (Syrquin, 1988). The rates of self-employment in these developing countries decline as individuals tend to prefer working for larger firms (e.g., government ownership, private enterprise or foreign direct investment) over managing small businesses due to higher returns. The second transition is marked by increasing the activity of individual agents (Acs *et al.*, 2008a; Acs and Szerb, 2010).

Finally, as countries move into the innovation-driven stage, there is an increase in knowledge spillover (Romer, 1990). At this stage, knowledge is a crucial input (i.e.,

endogenous) for these countries to increase total productivity. In particular, individual agents tend to compete with firms by producing new knowledge in this stage (Acs *et al.*, 2009).

Table 2.4: The entrepreneurship policy nexus through the stages of a country’s development

Stage of development	Private sector mode	Type of state orientation
<p>Factor-driven: “Production most intensive in unskilled labour and natural resources”</p>	<p>Traditional economy: “Dominance of primary sectors” “Specialisation in cash crops, mineral extraction” “Spatially dispersed production” “Small entrepreneurial base”</p>	<p>Fragile or facilitating: “Establishing authority, capacity and/or legitimacy important to move from fragile to facilitating” “No industrialisation under fragile state conditions” “Facilitating state aims at establishing conducive business environment (property rights, stability, rule of law, accessibility)” “Functional and broad-based industrial and business development policies gradually implemented”</p>
<p>Efficiency-driven: “Production more efficient and movement towards technology frontier starts”</p>	<p>Managerial economy: “Manufacturing sector grows”. “Greater product diversification”. “Larger firms, SOE and MNEs dominate” “‘Fordist’ production by obtaining productivity growth through economies of scale” “Growing clustering”</p>	<p>Development or facilitating: “Development state to use active and selective (industrial) policies to encourage domestic technological capability formation” “As the economy develops, this role may change towards the facilitating role focusing on industrial policies aimed at high technological innovation”</p>
<p>Innovation-driven: “Production of high-tech goods and innovative to expand the technological frontier”</p>	<p>Entrepreneurial economy: “Rise in service sector” “High value-added manufacturing activities dominate with greater specialisation” “High tech clusters stabilise” “Re-emergence of small businesses on both national and international markets”</p>	<p>Facilitating: “The state promotes basic framework conditions” “Substantial focus on innovation, technology” “Market competition, market development through entry of new entrepreneurial firms important”</p>

Source: Naudé (2011)

Acs *et al.* (2008a) contended that entrepreneurial activity increases in the innovation-driven stage due to the development of the services sector over the manufacturing sector. The expansion of the services sector allows more opportunities for individuals

to start new businesses (e.g., USA, Germany and Sweden). In addition, Acs *et al.* (2008a) argued that improvements in information technologies (e.g., telecommunications, photocopying services, express mail services, personal computers, the Internet, mobile phone services and web services) may incentivise individuals to start a new business due to the potential for higher returns (e.g., better exchange information, fewer expenses and less time consuming). Therefore, the innovation-driven stage is marked by high value-added services industries in which entrepreneurial activity is significant (Acs *et al.*, 2008a).

This understanding of entrepreneurship concerning stages of economic development is different from the previous notion that most entrepreneurial countries in the world are those who have a high number of entrepreneurs. In particular, developing countries such as Zambia and Nigeria have the highest rates of self-employment. However, these countries lack the human capital and infrastructure needed to create innovative high-growth start-ups as many individuals sell soft drinks and fruit on street corners. Therefore, quality entrepreneurship matters more than quantity. Entrepreneurial countries need to have more productive entrepreneurs, not necessarily a higher number of entrepreneurs (Acs *et al.*, 2016).

In the same vein, Acs *et al.* (2014b) found that there is an S-shaped relationship between entrepreneurial activity and economic development (see Figure 2.2). Also, Acs *et al.* (2014b) yielded that countries in the factor-driven stage are marked by low entrepreneurial activity, and the opportunity for increased income or wealth is limited. On the other hand, entrepreneurial activity increasingly plays a more important role among countries in the transition from efficiency to the innovation-driven stage (the knowledge-driven stage) until it levels off. This argument was supported by Naudé (2010), who suggested that if the demand for entrepreneurship was established in the context of developing countries, entrepreneurship could make a better contribution to these countries. In line with Galindo and Méndez (2014), Castaño *et al.* (2015) empirically found that higher rates of economic growth create new opportunities for entrepreneurs and stimulate innovation.

This S-shaped relationship between entrepreneurship and economic development is consistent with Baumol's (1990) theory that entrepreneurial activity has existed in all countries, but it is distributed among destructive, unproductive and productive

entrepreneurship forms. Destructive entrepreneurship (e.g., the illegal drug business) tends to happen in developing countries with some degree of political instability, although it happens in some form across most countries. Hence, these unstable countries depend mainly on primary industries and the opportunities for increasing entrepreneurial activity to may not appear immediately.

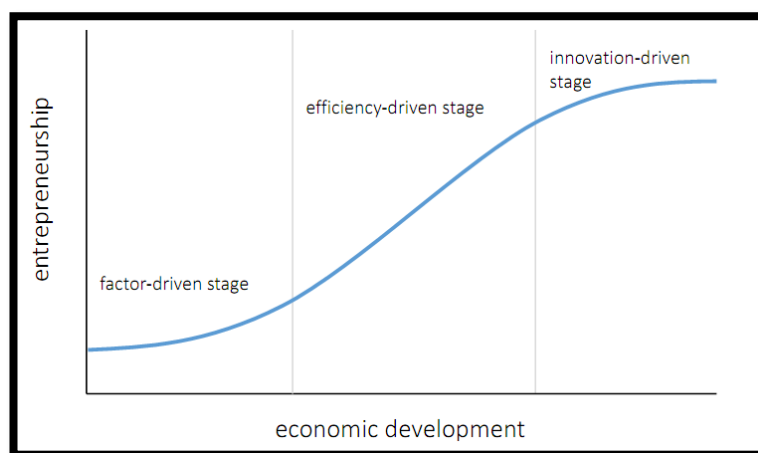


Figure 2.2: The S-curve of entrepreneurship and economic development

Source: Acs *et al.* (2014b)

Another type of entrepreneurship that is prevalent in both developing and developed countries is unproductive entrepreneurship, where wealth is transferred from one group to another. This form of unproductive entrepreneurship is known in academia as rent-seeking (i.e., privilege seeking). When rent-seeking by the government and other groups exists, the opportunity for entrepreneurs to make strategies for long-term investment to sustain productive high-impact firms is limited. As a result, countries with extractive institutions at the expense of others do not have sustainable economic development (Baumol, 1990).

Therefore, destructive and unproductive entrepreneurship could be removed by improving the quality of institutions and changing society's incentive structure. This requires good government and governance that support innovative and high-growth firms (i.e., productive entrepreneurship) through strengthening institutions that are related to better technology, importing skilled employees, building a well-functioning infrastructure, offering specialised advice and support, building business

premises, availability of venture capital, and a supportive regulatory framework in order to contribute mainly to economic development (Acs *et al.*, 2016).

In this realm, Méndez-Picazo *et al.* (2012) conducted an empirical study to examine the relationship between governance, institutions and entrepreneurship using a panel data analysis (such as GEM, World Bank and Gini index) for 11 developed countries. Due to multiple definitions of governance, Méndez-Picazo *et al.* (2012) defined public governance from the perspective of institutions. The authors considered that good governance can only exist if there is a proper set of institutions in which they can affect entrepreneurial activity in a country. Méndez-Picazo *et al.* (2012) yielded that there is a positive association between governance and entrepreneurship. In particular, governments could achieve sustainable economic development by creating a desirable environment where entrepreneurs can change the structure of the economy.

This previous argument was supported by Schwab and Sala-i-Martin (2014), who contended that the first two stages of development are controlled by institutions to support productive entrepreneurship. In particular, innovation has a limited contribution to economic activity of 5% in the factor-driven stage; this increases to 10% in efficiency-driven economies and has a more considerable contribution to economic development of 30% in the innovation-driven stage. In addition, economic development involves change, and entrepreneurs become the best agents for this change (Acs and Szerb, 2010).

However, some studies suggested that the institutional variables influence entrepreneurial activity differently based on the stage of economic development (Bowen and De Clerq, 2008; Carlos Díaz Casero *et al.*, 2013; Acs *et al.*, 2014a; Belitski *et al.*, 2016). In this regard, Bruton *et al.* (2010, p. 433) suggested:

“... to compare different emerging economies that may be at different stages, the time periods studied in the different countries have to be comparable in that they cover similar periods of the countries’ development, but are not overly separated in time to make comparisons difficult”.

In this respect, Carlos Díaz Casero *et al.* (2013) analysed the influence of some institutional variables on entrepreneurship in groups of countries that were classified

based on their economic development. The authors found that the impact of institutions on entrepreneurship is determined by the development stage of a specific economy. In particular, the “size of the business sector” and “health and primary education” were significant for developing countries, while “integrity of the legal system” and “fulfilling contracts” were important variables for transition economies. Finally, the two institutional dimensions of “size of the government” and “credit available to the private sector” were crucial to increase entrepreneurial activity for developed economies (Carlos Díaz Casero *et al.*, 2013).

Similarly, Kuckertz *et al.* (2016) analysed the impact of economic freedom (measured by the rule of law, limited government, regularity efficiency and open markets) on entrepreneurial activity for 63 countries, classified into three groups based on their respective development stage. The authors found that the effects of economic freedom on entrepreneurial activity depend on the development stage of an economy.

To this end, entrepreneurship matters for emerging economies in which entrepreneurs can allocate resources more efficiently than governments, and that market is necessary to respond to these changes through consistent adjustments to “separate actions of different people” and “the conditions of supply of various factors of production” (Acs and Amorós, 2008, p. 310). Many countries have recognised the importance of the markets where entrepreneurs operate by focusing on improving their institutional environment, private sector development and small and medium enterprise policies (Djankov *et al.*, 2002; Klapper *et al.*, 2006; Acs and Amorós, 2008). Therefore, it is necessary for emerging economies that need to move into the innovation-driven stage to develop favourable environmental conditions to increase “productive” entrepreneurship, and consequently contribute to economic growth and development. Few emerging economies have achieved this in the past decade; those that have include the Czech Republic, Estonia and Slovak Republic (Schwab and Sala-i-Martin, 2014). The following section discusses the theoretical background of the institutional theory and its relationship to entrepreneurship and economic development.

2.5 The Intersection between Entrepreneurship, Institutions and Economic Development

2.5.1 Theoretical background

As discussed in the previous sections, scholars have highlighted the importance of entrepreneurship in economic growth and development. However, this relationship is contingent upon the institutional environment. Where institutions are effective, entrepreneurs are more likely to undertake new ventures and focus their energies towards productive activities (Baumol, 1990).

The pioneering work of Douglass North (1990, 2005) remains crucial to our understanding of the pivotal role of institutional structures for entrepreneurship and economic development and forms the foundation of this section. North (1990, 2005) stressed that organisations (i.e., entrepreneurs) are the main agents of change. He further argued that many incentives that drive entrepreneurial behaviour are based on the quality of institutions. Therefore, institutions can be defined as the “rules of the game in a society, or more formally, the constraints that shape human interaction” (North, 1990, p. 3). This definition has been widely appreciated and used in several studies related to entrepreneurship research (e.g., Acs *et al.*, 2014a, b; Aparicio *et al.*, 2016; Urbano *et al.*, 2018). Building on this definition, entrepreneurs, who set up organisations, adjust their activities and strategies to fit the market opportunities and limitations provided by the institutional environment (North, 1990; Gnyawali and Fogel, 1994; Manolova *et al.*, 2008). Hence, improving entrepreneurship in a particular country depends on the business environment that provides positive or negative incentives for entrepreneurs (North, 1990).

This idea was supported recently by Bjørnskov and Foss (2013), who found that the relationship between entrepreneurship and economic growth is positively stronger in the presence of high-quality institutions, such as procedures or the time needed to create a new business, indicating that institutions reduce the uncertainty and transaction costs that entrepreneurs face. In this realm, Baumol and Strom (2007, p. 263) suggested that:

“These institutions and norms, through their impact on the activities of enterprising individuals—have a vital influence on the growth and innovation that characterize their economy, in good part by ensuring that inventions are

transformed into effectively used innovations. We, therefore, have an opportunity to modify these institutions in order to change the incentive structures that move people into productive entrepreneurship that encourages growth”.

Therefore, institutional theory¹ could be useful for understanding which institutional variables encourage entrepreneurial activity that contribute to economic growth in emerging economies (Veciana and Urbano, 2008; Bruton *et al.*, 2010).

Collectively, the prevalence of “productive” entrepreneurial activity that contributes positively to economic growth is mainly based on a strong incentive structure. In contrast, the prevalence of unproductive entrepreneurship that contributes destructively to economic growth is primarily based on a weak incentive structure. Eventually, entrepreneurs will determine which pathway to take based on the incentives in the business environment regarding formal and informal rules. Stated differently, different individuals are involved in productive, unproductive and destructive entrepreneurship based on different incentive structures provided by the institutional environment of a specific country (Baumol, 1990; North, 1990, 2005). In line with the discussion of this section, Urbano *et al.* (2018) suggested a conceptual framework that includes a causal chain running from institutions and entrepreneurship to economic development, as shown in Figure 2.3.

In the context of emerging economies, Thurik (2009, p. 8) stated that:

“The relevance for emerging countries lies in the idea that they have to create incentives for the knowledge embodied in their well-educated citizens to stay in the home country and exploit their knowledge in a (new) business instead of moving abroad. An example of a country which seems to be successful in doing so is India which houses numerous IT specialists doing work for clients across the globe, MBAs involved in number crunching for big investment banks in London and New York and so on. The opposite is true for a country like Poland which has seen a massive exodus of skilled workers which has actually forced local business to in-source labour from countries like Ukraine”.

Having discussed the theoretical background of the institutional theory and its relationship to entrepreneurship and economic development, the next section

¹ Following Urbano *et al.* (2018), this study does not distinguish between institutional approach, institutional perspective, institutional theory, institutional economics, and institutional economic theory.

describes the types of institutions and their interaction effect on the development of entrepreneurial activity.

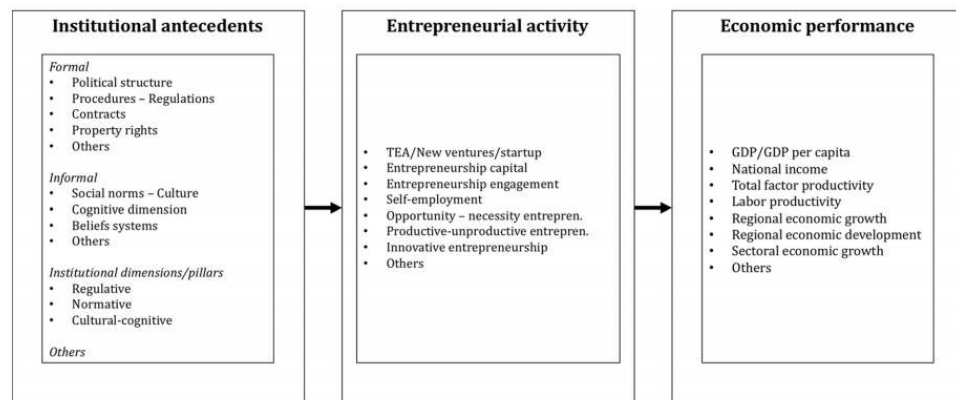


Figure 2.3: Linking institutions, entrepreneurship, and economic growth

Source: Urbano *et al.* (2018)

2.5.2 The interaction effect of formal and informal institutions on entrepreneurship

Despite the importance of institutional theory, there has been little understanding of the role that the institutional environment plays in influencing entrepreneurship (Boettke and Coyne, 2009). Specifically, questions have been raised about the role of institutions in increasing entrepreneurship and the institutional dimensions that are most important for explaining entrepreneurial activity rates (Bruton *et al.*, 2010; Levie and Autio, 2011).

According to North (1990), institutions are classified into formal factors such as laws, contracts and regulations, and informal factors such as values, culture or social norms of a specific country. North (1990, 2005) contended that formal institutions exist to decrease the transactions costs caused by laws, while informal institutions intend to reduce the uncertainties involved in human interaction. Also, North (1990) argued that informal institutions that are culturally derived might constrain the changes and improvements of formal institutions and vice versa. Thus, the interactions between formal and informal institutions produce outcomes that have significant implications for increasing “productive” entrepreneurial activity (Baumol, 1990; North, 1990).

In this respect, North (2005, p. 48) stated that:

“All organised activity by humans entails a structure to define the “way the game is played,” whether it is a sporting activity or the working of an economy. That structure is made up of institutions—formal rules, informal norms, and their enforcement characteristics. Take professional football. The game is played within a set of formal rules, informal norms (such as not deliberately injuring a key player on the opposing team), and the use of referees and umpires to enforce the rules and norms. How the game is actually played depends not only on the formal rules defining the incentive structure for the players and the strength of the informal norms but also on the effectiveness of enforcement of the rules. Changing the formal rules will alter the way the game is played but also, as anyone who has watched professional football knows, it frequently pays to evade the rules (and deliberately injure the quarterback of the opposing team). So it is with the performance characteristics of an economy. To understand performance, we must explore in depth the way institutions “work,” looking at both the consequences of formal incentives and the frequently unanticipated results”.

In line with the team sports illustration, one outcome from the interaction between formal and informal institutions on entrepreneurship was found by Baumol’s (1990) seminal work that described the development of entrepreneurship as a continuous process. He suggested that entrepreneurship comes in three different forms: productive entrepreneurship that generates economic prosperity through innovation and exploiting opportunities in the market, non-productive entrepreneurship, where entrepreneurial talent is not efficiently used by pursuing rents from government agencies such as preferential monopolistic positions, special tax or regulatory exemptions, and destructive entrepreneurship such as the illegal drug business or prostitution.

Baumol (1990) further contended that the combination of incentives that are provided by different institutional structures, formal and informal, direct the behaviour of individuals to use their entrepreneurial talents to choose among different types of entrepreneurship in which they contribute to economic growth. Incentives that encourage productive entrepreneurship have a positive influence on economic growth, while unproductive and destructive entrepreneurship have a neutral or negative influence on economic growth (Baumol, 1990). An example of Baumol’s (1990) study can be seen when productive entrepreneurship created a new technology innovation in Silicon Valley. On the other hand, unproductive

entrepreneurship is viewed when an authoritarian government starts yet another bureaucratic regulation to increase its wealth (Acs *et al.*, 2014b).

Another outcome of the interaction between formal and informal institutions on entrepreneurship was discussed by North (1990), who argued that both formal and informal rules might survive for an extended period even if they are inefficient. In particular, Williamson (2000) contended that formal institutions take a relatively short period to change, while informal institutions take longer to change than formal ones. Williamson (2000) further argued that informal institutions might constrain or foster the changes of formal institutions and vice versa. In this regard, North (1990, p. 91) stated:

“Perhaps, most important of all, the formal rules change, but the informal constraints do not. In consequence, there develops an on-going tension between informal constraints and the new formal rules, as many are inconsistent with each other. The informal constraints had gradually evolved as extensions of previous formal rules. An immediate tendency, as has been described, is to have new formal rules supplant the persisting informal constraints. Such change is sometimes possible, in particular in a partial equilibrium context, but it ignores the deep-seated cultural inheritance that underlies many informal constraints. Although a wholesale change in the formal rules may take place, at the same time there will be many informal constraints that have great survival tenacity because they still resolve basic exchange problems among the participants, be they social, political, or economic. The result over time tends to be a restructuring of the overall constraints – in both directions- to produce a new equilibrium that is far less revolutionary”.

Therefore, building on North’s (1990) argument, the efficiency of formal institutions, such as new laws and regulations, could depend on the cultural values in a particular society. An example of this interaction could be seen in the case of enforcing traffic laws in a specific country. Although traffic laws are generally standard across countries, the effectiveness of these formal laws depends on to what extent large numbers of drivers voluntarily adopt and accept such rules through prolonged self-commitment. Therefore, if the informal norms align with the formal rules, the cost of enforcing the formal laws will be relatively low as violations of traffic laws are rare (North, 1990; Boettke and Coyne, 2009). In other words, effective social norms such as honesty, hard work, and integrity can lower the cost of transactions and make productive outcomes possible (North, 1990).

This idea was examined recently by Krasniqi and Desai (2016), who examined the interaction effect of formal institutions (measured by tax administration, trade and custom regulations, tax rate, and business licensing/permits), and informal institutions (measured by functioning of the judiciary/courts, anti-competitive practices of competitors, policy uncertainty, and corruption) on the rates of high growth firms (HGFs) in 28 emerging economies. The authors found that the interaction effects between formal and informal institutions, rather than direct effects, positively impact the development of HGFs. In particular, informal institutions are positively associated with HGFs in emerging economies where formal institutions have slower reform conditions. This suggests that informal institutions have a slower rate of change and could hinder the development of formal institutions by greasing the wheels. On the other hand, when emerging economies have fast-reforming formal institutions, informal institutions have less influence on the facilitation of transactions (Krasniqi and Desai, 2016).

In the same vein, using the Global Entrepreneurship Monitor (GEM) surveys in 42 countries (including both developed and developing countries) for 2001-2006, Estrin et al. (2013) found that higher levels of corruption (as an informal institution), weaker property rights and larger size of the government significantly hinder the rates of entrepreneurial growth. Simultaneously, local social networks (as an informal institution) alleviate the effects of some of these institutional deficiencies (Estrin et al., 2013). These findings (Estrin et al., 2013; Krasniqi and Desai, 2016) were in line with Thornton *et al.* (2011) and Aparicio *et al.* (2016), who contended that informal institutions, although they are less dynamic, could influence entrepreneurship rather than formal institutions.

In the field of entrepreneurship research, a number of studies have postulated a convergence between the institutional theory and other approaches. Drawing from the psychological approach which suggests that individual factors or psychological traits determine entrepreneurial activity (Álvarez et al., 2014), Pathak et al. (2015) examined the moderating effect of corruption (as an informal institution) on individual-level attributes predicting entrepreneurial intentions in 12 transition economies. The authors found that individual attributes (i.e., self-efficacy, fear of failure and opportunity recognition) are significant determinants of entrepreneurial

intentions but that their effects decrease in the presence of corruption (Pathak et al., 2015).

Another convergence is based on the resource-based approach in which “scholars focus on the characteristics of the organization or specifically on the resources and capabilities of the new firm (e.g., human, physical, financial, technological, etc.) as the main determinant of the entrepreneurial process” (Álvarez et al., 2014, p. 446). For example, using individual and country-level data from multiple sources for 32 developed and emerging economies, De Clercq et al. (2013) explored the cross-level interaction effects between individual-level resources and country-level institutions (formal and informal) on the possibility that a person starts a new business. The results, in general, showed that a country’s institutions moderate positively the effect of individual human capital (i.e., knowledge, skills, and experience) and social capital (i.e., exposure to entrepreneurial role models) on the likelihood to start a new business. However, different institutional settings do not have a significant impact on the relationship between individual financial capital and the decision to start a new business.

To this end, the study of institutional environment’s dynamics with entrepreneurship is necessary to offer a better understanding of the various rates of entrepreneurial activity among emerging economies. The next section will discuss if emerging economies are able to develop a better institutional environment in encouraging productive entrepreneurship.

2.5.3 Institutional change and stability

Building appropriate institutions in emerging economies is challenging (Naudé, 2011). This is because inefficient institutions in emerging economies are characterised by high transaction costs and uncertainty, and can be maintained for long periods of time and thus affect entrepreneurship’s productivity rates (Baumol, 1990; North, 1990; Naudé, 2011). According to Acs *et al.* (2014b), there are a number of factors that complicate the development of the institutional design stemmed from the interaction between formal and informal institutions in a specific society. First, informal institutions that are culturally derived may continue to be

resistant when they clash with formal rules as informal institutions provide a sense of stability (Aidis *et al.*, 2012).

Second, informal institutions may not change instantly in response to changes in the formal institutions because of the impact of historical conditions (North, 1990). While the past cannot be used to precisely predict the future, existing incentive frameworks may help to understand the future role of institutions in entrepreneurship and economic development. This happens due to cultural traits that have “tenacious survival ability”, and because most cultural changes are usually incremental and rarely discontinuous; these include revolutions, military conquest or natural disasters (North, 1990). Therefore, history is important when unproductive pathways may continue. In this respect, North (1990, pp. 36-37) stated:

“What is most striking is the persistence of so many aspects of a society in spite of a total change in the rules. Japanese culture survived the U.S. occupation after World War II; the post-revolutionary U.S. society remained much as it had been in colonial times; Jews, Kurds, and endless other groups have persisted through centuries despite endless changes in their formal status. Even the Russian Revolution, perhaps the most complete formal transformation of a society we know, cannot be completely understood without exploring the survival and persistence of many informal constraints”.

These informal constraints come from “socially transmitted information and are part of the heritage that we call culture” (North, 1990, p. 37). This understanding is particularly important when we discuss corruption as a part of the heritage in emerging economies and especially post-communist countries (Sections 3.4 and 4.2).

Third, organisations that have improved during the presence of the existing institutions are obliged to continue working with the current institutions due to the supportive incentive structure. In particular, when the formal rules change, organisations that benefited from existing informal rules would lose their benefits if they adopt the new informal practices that complement changes to formal rules. Therefore, these organisations continue to practice out-dated informal rules in order to keep their positions of power in the market (Aidis *et al.*, 2012).

Finally, when there is a clash of institutions between new formal rules and existing informal rules, the prevalence of non-compliant behaviours increases and may result in the formation of an informal economy (Aidis *et al.*, 2012).

Having discussed how the interaction effect between formal and informal institutions could lead to inefficient institutional outcomes and thus affect the rates of “productive” entrepreneurial activity, North (1990) suggested that a conceptual framework based on the interaction between formal and informal institutions may increase our understanding of the dynamics of the institutional environment and its effects on the economy. In this regard, North (1990, p. 43) argued that:

“A transaction cost framework equally offers the promise of exploring informal constraints. Although the informal institutional constraints are not directly observable, the contracts that are written, and sometimes the actual costs of transacting, provide us with indirect evidence of changes in informal constraints. The striking decline in interest rates in the Dutch capital markets in the seventeenth century and the English capital market in the early eighteenth century provide evidence of the increasing security of property rights as a consequence of the effective interaction of a variety of both formal and informal institutional constraints. For example, the enforcement of contracts that evolved from merchant codes of behaviour included ostracism of those who violated agreements and the eventual encoding of customary practices into the formal law”.

In that sense, this conceptual framework could be useful to empirically examine what forms of informal institutions (i.e., constraints) are most likely to produce cooperative behaviour to increase or decrease the rates of entrepreneurial activity in emerging economies.

Building on North’s (1990) suggestion, Williamson (2000) designed a conceptual model and categorised institutions into a four-level hierarchy in which each level places constraints on those below. In this model, Williamson (2000) located informal institutions, such as religious norms, traditions, and customs, at the top of the hierarchy under the category of “social embeddedness” because these are “the deepest rooted and the slowest changing” Williamson (2000, p. 597). The second level down is concerned with formal institutions and is described as the “formal rules of the game” such as regulations and property rights. The third level of institutions is related to governance that “shapes the way that individuals interact, aligning the governance structure they adopt with the types of transactions” (Estrin *et al.*, 2013, p. 566). Finally, the three previous levels of institutions all affect the fourth level, which is about resource allocation, including occupational choices such as entrepreneurship (Estrin *et al.*, 2013, p. 566).

Together these studies provide valuable insights into the institutional dynamics and their effect on entrepreneurship. The next section of this study will discuss the most common institutional framework models for entrepreneurship.

2.5.4 Institutional framework models for entrepreneurship

As discussed earlier, the changes in the entrepreneurial process can lead to different outcomes based on the incentive structure within a specific country. In particular, when institutions are functioning effectively, entrepreneurial activity increases towards productive entrepreneurship and ultimately contributes to economic growth and development (Baumol, 1990; North, 1990, 2005). Hence, it is essential to consider the effects of institutions as the rules of the game (such as quality of governance, access to finance and other resources) to show how entrepreneurs recognise opportunities in different stages of economic development (Aidis *et al.*, 2012).

To date, our understanding of how these framework conditions and supporting institutions create a fertile environment for “productive” entrepreneurship remains relatively understudied (Aidis *et al.*, 2012; Stenholm *et al.*, 2013). Therefore, this study attempts to shed light on an entrepreneurial environment (i.e., institutional environment) that is conducive to entrepreneurship by reviewing recent research into the institutional factors that encourage entrepreneurial activity. In broad terms, the entrepreneurial environment refers to the “combination of factors that play a role in the development of entrepreneurship” (Gnyawali and Fogel, 1994, p. 44).

In line with the previous literature, some attempts have been proposed to operationalise the institutional dimensions in the field of entrepreneurship for a particular country. In this regard, Busenitz *et al.* (2000) developed a three-dimensional measure of the institutional environment by adopting Scott’s (1995) categorisation of institutions that could influence entrepreneurial activity in a specific country. In their institutional framework, the regulative dimension is defined as “laws, regulations and government policies relating to new business”. Also, the cognitive dimension is defined as “Knowledge and skills for establishing and operating a new business”, and a normative dimension is defined as the “degree of admiration of entrepreneurial activity, value creative and innovative thinking”

(Busenitz *et al.*, 2000, p. 995). This approach was used to recognise broader socio-cultural factors influencing entrepreneurship (Bruton *et al.*, 2010). Moreover, Manolova *et al.* (2008) empirically validated Busenitz *et al.*'s (2000) instrument to measure a country's institutional environment in the context of three emerging economies in Eastern Europe (Bulgaria, Hungary and Latvia). Finally, several studies used Busenitz *et al.*'s (2000) approach to examine the influence of institutional dimensions on entrepreneurial activity in different countries (Stenholm *et al.*, 2013; Urbano and Alvarez, 2014). However, Busenitz *et al.*'s (2000) approach did not adequately acknowledge the political/economic environment factors, such as economic growth, financial and non-financial assistance, in which they may offer different research findings (Bruton *et al.*, 2010).

In this regard, Gnyawali and Fogel (1994) suggested a conceptual framework that includes five dimensions of the entrepreneurial environment: government policies and procedures, social and economic factors, entrepreneurial and business skills, financial assistance to businesses, and non-financial support (see Table 2.5).

According to Gnyawali and Fogel (1994), governmental policies and procedures include "governmental actions that can influence market mechanisms". These policies and procedures can support the market work more efficiently by removing rigid administrative regulations and market imperfections. Social conditions can be defined as "social attitudes that are conducive to entrepreneurial activity, such as the presence of experienced entrepreneurs and successful role models". Economic conditions are concerned with "the proportion of small businesses in a country and their dynamism, economic growth, and economic activity diversity". Entrepreneurial and business skills are "the skills an individual needs to start a new company". These skills can be learned through "training and education and may focus on skill improvement for business plan development or business management in general". Entrepreneurs also need both financial assistance, such as "funding to launch their businesses and diversify the risk for start-up, growth, and expansion", and non-financial assistance, such as "support for market research, preparing business plans, establishing contacts, networking with other entrepreneurs" (Álvarez *et al.*, 2014, p. 447).

Table 2.5: A framework for entrepreneurial environments

<u>Government Policies and Procedures</u>	<u>Financial Assistance</u>
Restrictions on imports and exports	Venture capital
Provision of bankruptcy laws	Alternative sources of financing
Entry barriers	Low-cost loans
Procedural requirements for registration and licensing	Willingness of financial institutions to finance small entrepreneurs
Number of institutions for entrepreneurs to report to	Credit guarantee programme for start-up enterprises
Rules and regulations governing entrepreneurial activities	Competition among financial institutions
Laws to protect proprietary rights	
<u>Socioeconomic conditions</u>	<u>Non-financial Assistance</u>
Public attitude towards entrepreneurship	Counselling and support services
Presence of experienced entrepreneurs	Entrepreneurial networks
Successful role models	Incubator facilities
Existence of persons with entrepreneurial characteristics	Government procurement programmes for small businesses
Recognition of exemplary entrepreneurial performance	Government support for research and development
Proportion of small firms in the population of firms	Tax incentives and exemptions
Diversity of economic activities	Local and international information networks
Extent of economic growth	Modern transport and communication facilities
<u>Entrepreneurial and Business Skills</u>	
Technical and vocational education	
Business education	
Entrepreneurial training programmes	
Technical and vocational training programmes	
Availability of information	

Source: Gnyawali and Fogel (1994)

In accordance with the previous dimensions, and in light of North's (1990 and 2005) propositions, government policies and procedures, entrepreneurial and business skills, and financial and non-financial assistance to businesses are related to formal institutions, while social conditions are concerned with informal institutions (Álvarez and Urbano, 2011; Álvarez *et al.*, 2014). In contrast to Busenitz *et al.* (2000) study, this institutional framework is clearly distinguishing between formal and informal institutions. Also, a more extensive range of political, economic and social perspectives had been acknowledged and explored to offer more in-depth analysis of an institutional framework (Bruton *et al.*, 2010). Recent empirical studies used Gnyawali and Fogel's (1994) framework to examine the influence of institutional

dimensions on entrepreneurial activity (Álvarez and Urbano, 2011; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016).

2.5.5 Emerging research gaps between institutions and entrepreneurship

While previous studies have highlighted the relevance of entrepreneurship to economic growth and development, the academic literature about the relationship between institutions and entrepreneurship has seen the emergence of several key research themes in addressing the discrepancies in the literature. In this respect, Urbano *et al.* (2018) conducted a systematic literature review on the relationship between institutions, entrepreneurial activity and its impact on economic growth over the last 25 years (1992-2016). Based on their review, the authors suggested that entrepreneurship could be the missing link between the relationship between institutions and economic growth, and therefore future research should focus on what institutional variables are conducive to entrepreneurship, which in turn contributes to economic growth and development. Therefore, our investigation mainly relates to the theoretical and empirical research gaps that deal with institutional factors and their impact on the development of entrepreneurial activity and discuss how these gaps could be filled.

Our literature review (see Appendix 1) reveals that there are several gaps in the understanding of the mechanisms that link institutions to entrepreneurship. Although institutions have been widely recognised as explaining the differences in entrepreneurial activity across countries (e.g., Acs *et al.*, 2014a, b), what remains unclear is how different institutions (i.e., formal and informal) play an essential role in encouraging entrepreneurial activities at different stages of economic development (Bruton *et al.*, 2008; Carlsson *et al.*, 2013; Smallbone *et al.*, 2014; Ahlstrom and Ding, 2014).

The research in the field of entrepreneurship to date has tended to focus on formal rather than informal institutions (Carlos Díaz Casero *et al.*, 2013; Castaño-Martínez *et al.*, 2015; Fuentelsaz *et al.*, 2015). In contrast, very little attention has been paid to the role of informal institutions in the entrepreneurial context (Bruton *et al.*, 2010). In this realm, recent studies showed that these factors have more influence on entrepreneurship than formal ones (Urbano and Alvarez, 2014; Aparicio *et al.*, 2016).

Moreover, much uncertainty still exists about the interactions outcomes between formal and informal institutions on the development of entrepreneurial activity (Bruton *et al.*, 2008; Carlsson *et al.*, 2013; Smallbone *et al.*, 2014; Ahlstrom and Ding, 2014; Chowdhury *et al.*, 2015b). For example, Aparicio *et al.* (2016) assumed in their institutional framework study that both types of formal and informal institutions do not interact with each other.

In this respect, North (1990, p. 53) stated “Looking only at the formal rules themselves, therefore, gives us an inadequate and frequently misleading notion about the relationship between formal constraints and performance”. Therefore, despite the importance of the constant interaction between formal and informal institutions, there remains a paucity of evidence on such interaction effects that could be relevant to the theoretical discussion (North, 1990; Williamson, 2000; Ghura *et al.*, 2017). In particular, there is an urgent need for an analysis of the effect of informal institutions that can impact (direct and indirectly) both formal institutions and the rates of entrepreneurial activity (Urbano *et al.*, 2018).

Concerning the empirical challenges, few studies have examined the impact of institutional variables on entrepreneurial activity using cross-national data. For example, De Clercq *et al.* (2010) included the institutional dimensions of regulative, normative and cognitive as moderating factors on the relationship between associational activity and the level of new business activity in the context of emerging economies. Similarly, Stenholm *et al.* (2013) examined these three dimensions in a cross-national comparison. Moreover, Bruton *et al.* (2010) argued that research consisting of multiple-country databases is the exception, not the rule when employing institutional theory to analyse the variation rates of entrepreneurial activity (Urbano and Alvarez, 2014).

However, this cross-national analysis may not offer a clear picture of the evolution of institutional quality through a specific period (North, 1990; Williamson, 2000). Therefore, future studies would have been more useful if they had focused on longitudinal data for a group of countries (Levie and Autio, 2011; Stenholm *et al.*, 2013). For example, comparing two groups of countries that are located at different stages of development could have led to different insights on the effect of the

institutional environment on entrepreneurial activity (Bruton *et al.*, 2010; Acs *et al.*, 2014a).

In addition to focusing on longitudinal studies, Bjørnskov and Foss (2016) suggested that there are several shortcomings related partly to the theoretical challenges and empirical issues. One of these issues is concerned with how to identify and document causality. Several studies claimed that there is a bidirectional relationship between entrepreneurship and institutions, where entrepreneurship may not just be endogenous to institutions, but institutions may also be endogenous to entrepreneurship (Belitski *et al.*, 2016; Bjørnskov and Foss, 2016; Urbano *et al.*, 2018). Also, given the fact that all studies risk suffering from omitted variable bias, which requires careful robustness analysis, most studies in the field of entrepreneurship have failed to include potentially influential factors and empirical alternatives (Bjørnskov and Foss 2016). Furthermore, previous studies have not explicitly dealt with the heterogeneity problem as they assume that the impact of institutional variables on entrepreneurship is approximately homogeneous across developed and developing countries. This critical assumption can be misleading to policymakers as it can create substantial measurement errors in cases where the actual effects of institutions are heterogeneous (Bjørnskov and Foss 2016). Because the conceptual model that consists of the interaction effect of formal and informal institutions on the development of entrepreneurial activity may lead to statistically biased results, Urbano *et al.* (2018) suggested, therefore, that it is worth considering the impact of the institutional variables (formal and informal) on entrepreneurial activity simultaneously.

In the context of emerging economies, Smallbone *et al.* (2014) provided an introductory study to the special issue of the *International Small Business Journal (ISBJ)* that focused on the role of entrepreneurship and its contribution to economic and social development in emerging economies. The authors reviewed 20 papers and found that there is a need to explore the effectiveness of government policies in supporting entrepreneurial activities. Specifically, future research should focus on how policymakers and institutions can improve the well-being of entrepreneurs and increase their entrepreneurial outcomes (Smallbone *et al.*, 2014). In addition, Bruton *et al.* (2008) examined the special issue of the *Entrepreneurship Theory and Practice*

Journal (ETP) that focused on entrepreneurship in the emerging economies. The authors reviewed the accepted ten papers to this special issue and found that future research should focus on exploring the impact of different institutions in shaping entrepreneurial actions in emerging economies.

In the same vein, Ahlstrom and Ding (2014) reviewed the special issue of the *International Small Business Journal (ISBJ)* that was entitled “Exploring Entrepreneurial Activity and Small Business Issues in the Chinese Economy”. The authors found that there is a need to explore the influence of different institutions (e.g., formal and informal) from the macro level (policy and regulation) to micro level (individual characteristics and attitude) in the success of entrepreneurs and entrepreneurship in China.

The evidence reviewed here seems to suggest a relevant role for the institutional dynamics in promoting a higher quality of entrepreneurship. Thus, new insights could tackle the fact that the interplay between formal and informal institutions on the development of entrepreneurial activity may advance research in entrepreneurship and institutional fields. In this sense, there is a need to propose a model that permits the analysis of the interaction effect of formal and informal institutions on encouraging higher rates of entrepreneurial activity in emerging economies that are located at different stages of development.

2.6 Summary and Conclusions

As pointed out in this chapter, this thesis argues that the contribution of entrepreneurship to economic growth and development will be significantly affected by the quality of the institutional environment and the stage of economic development. There is growing research on this topic that has discussed the significant role of institutions that provide incentives for individuals to become entrepreneurs. In the same vein, the findings from reviewing the literature suggested that the impact of institutions (formal and informal) varies depending on the level of economic development. As a result, emerging economies that are interested in increasing economic and overall welfare through increasing entrepreneurial activity should consider the country’s level of economic development as well as its

institutional environment. In the next chapter, a new conceptual model is developed based on the current research gaps discussed in this chapter.

CHAPTER THREE: CONCEPTUAL FRAMEWORK

3.1 Introduction

Recent developments in entrepreneurship research have highlighted the need for understanding the variations of entrepreneurial activity through the lens of institutional theory (e.g., Acs *et al.*, 2014a, b; Aparicio *et al.*, 2016). However, the review of both the theoretical and empirical literature in the previous chapter has revealed that the vast majority of studies addressing the development of entrepreneurial activity have failed to consider the interaction effect of formal and informal institutions in emerging economies that are located at different stages of development (Acs *et al.*, 2014a, b; Urbano *et al.*, 2018).

Therefore, in this chapter, we can present a new institutional framework that permits the development of entrepreneurial activity based on the interplay between formal and informal institutions. This thesis does not attempt to offer a complete institutional environment for entrepreneurship. It is hoped, however, that this study could contribute to the previous conceptual models of new business activity by developing a conceptual model that can help to explain the variation rates of entrepreneurship in emerging economies located at different stages of development.

The generalised version of the conceptual model is discussed thoroughly in Section 3.5, and illustrated diagrammatically in Figure 3.1. The developed model in this study consists of five institutional factors identified by the theoretical and empirical literature: (1) number of procedures, (2) education and training, (3) access to credit, and (4) technology absorption are considered as formal institutions, while (5) control of corruption is considered as an informal institution. By doing so, this study is able to extend the current literature, which only addresses these institutional variables separately (Stenholm *et al.*, 2013; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016; among others). It does this by designing a model that can help to explain the differences of entrepreneurial activity in emerging economies. This study explicitly argues that the impact of formal institutions on the development of entrepreneurial activity is stronger in the presence of lower levels of corruption, and this impact may vary under the level of development of a particular emerging economy.

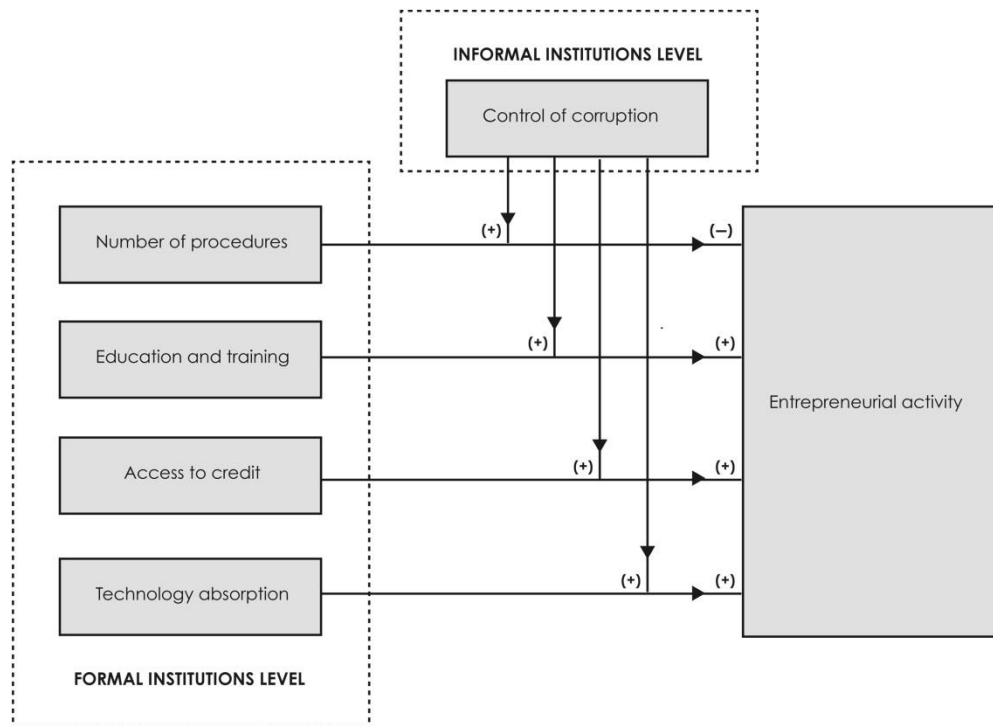


Figure 3.1: The developed conceptual framework of this study

Source: Devised by author

The next section will describe the criteria for developing the conceptual framework based on the literature review in Chapter 2. The remainder of this chapter will outline each of the institutional variables included in the conceptual model, describing and explaining their roles as determinants of increasing the rates of entrepreneurial activity in emerging economies. Hypotheses are presented in Section 3.5.

3.2 Criteria for Developing the Study’s Institutional Framework for Entrepreneurship

The criteria for developing the study’s institutional framework for entrepreneurship were as follows: first, to organise our discussion of the institutional factors included in our model, we rely on the model of Gnyawali and Fogel (1994). Gnyawali and Fogel (1994) suggested an entrepreneurial framework inclusive of five dimensions of the entrepreneurial environment: (1) government policies and procedures, (2) social and economic factors, (3) entrepreneurial and business skills, and (4) financial and (5) non-financial assistance to businesses. In this regard, recent empirical studies found Gnyawali and Fogel’s (1994) framework conducive in examining the impact

of institutional dimensions on entrepreneurial activity (Álvarez and Urbano, 2011; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016).

Therefore, in the government policies and procedures dimension, this study focused specifically on whether and how government procedures affect new business start-ups. Next, the entrepreneurial and business skills dimension is proxied by society's education and training. As regards financial assistance, access to credit in an economy is discussed in this part. In addition, non-financial assistance is identified through the technology absorption by firms. Finally, social conditions are explained through the level of corruption in a specific country. The choice in selecting these institutional variables was informed by considerable evidence that these institutions are significant in shaping "productive" entrepreneurial activity (Álvarez and Urbano, 2011; Stenholm *et al.*, 2013; Aparicio *et al.*, 2016). Moreover, in accordance with the model, economic development related to GDP growth, as well as GDP per capita (purchasing power parity) of a specific country, are included as control variables in this study (Álvarez and Urbano, 2011; Levie and Autio, 2011; Álvarez *et al.*, 2014; Chowdhury *et al.*, 2015b).

Second, the interaction between formal and informal institutions was presented in the framework (North, 1990; Williamson, 2000). Williamson (2000) suggested a hierarchy of institutional frameworks to differentiate the level of formal and informal institutions. Thus, our conceptual framework extends North's (1990, 2005) propositions on institutional dynamics, as well as Williamson's (2000) concept of the hierarchy of institutions. Recent studies used the ideas of North (1990, 2005) and Williamson (2000) to offer a better understanding of the institutional dynamics and their effect on increasing entrepreneurship rates (Aidis *et al.*, 2012; Estrin *et al.*, 2013).

As a result, government procedures, education and training, access to credit and technology absorption are considered as formal institutions, whereas corruption is considered as an informal institution in this study. Moreover, considering that corruption is located in the highest level of the hierarchy of institutions, the study's conceptual framework is designed to analyse the moderating effects of corruption on the relationship between formal institutions and entrepreneurial activity in emerging economies located at different stages of economic development.

Finally, this framework attempted to develop hypotheses worth pursuing to be tested empirically using panel (longitudinal) data analysis, as suggested by the literature (Bruton *et al.*, 2008; Levie and Autio, 2011).

3.3 Informal Institutions: Culture and Social Conditions for Entrepreneurship

Concerning entrepreneurship, social conditions or culture can broadly be defined as how positively a given country's residents encourage entrepreneurship and value innovation (Gnyawali and Fogel, 1994; Busenitz *et al.*, 2000; Acs *et al.*, 2014a). It encompasses the general status and attitude of society towards entrepreneurial behaviour (e.g., close social networks from family, relatives, or spouses), and appreciates successful role models to spur individuals to start a new business (Gnyawali and Fogel, 1994; Hayton and Cacciotti, 2013; Stenholm *et al.*, 2013; Álvarez *et al.*, 2014; Urbano and Álvarez, 2014). It is critical, therefore, to understand the influence of the institutional environment that could encourage (or not) the conditions in which a particular culture effectively stimulates the individuals towards entrepreneurship (Fernández-Serrano and Romero, 2014).

In this respect, the link between entrepreneurship and different cultural characteristics has recently received considerable attention in the literature, such as social networks (De Clercq *et al.*, 2010a; Estrin *et al.*, 2013; Stenholm *et al.*, 2013), cultural values (Hayton and Cacciotti, 2013; Liñán and Fernandez-Serrano, 2014; Fernández-Serrano and Romero, 2014; Sambharya and Musteen, 2014; Brancu *et al.*, 2015), role models (Álvarez and Urbano, 2011), media attention (Stenholm *et al.*, 2013), and social recognition (Stenholm *et al.*, 2013; Urbano and Álvarez, 2014; Castaño-Martínez *et al.*, 2015; Castaño *et al.*, 2015).

For example, in the national cultural dimension literature (e.g., individualism and power distance), findings provided evidence that culture plays a significant role for entrepreneurship. However, results showed that culture is a complex phenomenon that cannot be explained by focusing only on cultural values without interaction with other variables, such as other institutions and government policies. Moreover, culture should be considered in different contexts (e.g., emerging economies): previous studies used larger samples that led to uncertain findings (Busenitz *et al.*, 2000; Hayton and Cacciotti, 2013; Liñán and Fernandez-Serrano, 2014).

Moreover, using the Global Entrepreneurship Monitor dataset, some cross-sectional studies of the normative dimension effect on entrepreneurship were inconsistent. Stenholm *et al.* (2013) contended that normative institutional arrangements (measured as high status and media attention) do not have a significant impact on opportunity entrepreneurship. However, other studies concluded that social recognition of entrepreneurial achievements is associated with the rate of entrepreneurial activity in a specific country (Urbano and Álvarez, 2014; Castaño-Martínez *et al.*, 2015). These findings may be somewhat limited by focussing on different samples from developed nations where institutional changes are relatively stable over time. It can thus be suggested that future studies should focus on developing nations by considering longitudinal changes of institutional dimensions over time (Stenholm *et al.*, 2013).

Building on previous suggestions, Fuentelsaz *et al.* (2018) examined the moderating role of informal institutions (measured by individualism/collectivism, and uncertainty avoidance) on the relationship between formal institutions (proxied through the six governance dimensions developed by Worldwide Governance Indicators (WGI): Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption) and opportunity entrepreneurship. This study used an unbalanced panel dataset of 84 countries including developed and developing countries over the years 2002-2015. The authors found some evidence that formal institutions have more influence on opportunity entrepreneurship in countries that are characterised by individualism and uncertainty avoidance (Fuentelsaz *et al.*, 2018).

The preceding discussion showed some evidence that broad cultural aspects are associated with the development of entrepreneurial activity. However, these relationships were inconsistent over time. Bruton *et al.* (2010) therefore suggested future research should consider the interaction effect of culture with other institutions to clear up the confusion.

3.4 Informal Institution: Corruption and Entrepreneurship

Based on the previous discussion, the extent to which specific cultural variables can be linked to entrepreneurship in a particular economy is not fully understood

(Fernández-Serrano and Romero, 2014). However, the interaction effect of corruption with other institutions is significantly underrepresented in the literature, albeit being purported to be among the most important negative indicators for entrepreneurship (Anokhin and Schulze, 2009; Aidis *et al.*, 2012).

Traditionally, corruption is defined as the abuse of public office or authority for private benefit. Because corruption becomes institutionally embedded, it has subscribed to the belief that it can play a significant role in addressing the issue of institutional quality (Aidis *et al.*, 2012). In other words, it is considered as an informal institution that reflects the multidimensional impact of weak institutions in a specific country, such as high taxes, high level of government spending, complex regulations and the inefficient rule of law (Tanzi, 1998; Payne *et al.*, 2013).

When corruption is prevalent, it is turned into a consistent expectation from people, and a social norm of behaviour in that more entrepreneurs undermine confidence in the formal institutions that are necessary to start a new venture (Levie and Autio, 2011). Furthermore, corruption responds slowly to formal institutional reforms and becomes difficult to change; it may therefore discourage individuals to take advantage of the entrepreneurial opportunities and start their own business as they suffer from additional costs and time to complete business activities (Anokhin and Schulze, 2009; Aidis *et al.*, 2012). Therefore, control of corruption is necessary to reduce uncertainty from human interaction and motivate higher levels of entrepreneurial activity (Chowdhury *et al.*, 2015a, b; Aparicio *et al.*, 2016).

This previous understanding of corruption was brought by North (1990), who argued that informal institutions (e.g., corruption) are considered as culturally embedded behaviour that may take a more extended period to change than formal institutions (e.g., regulations). Also, Williamson (2000) argued that informal institutions, such as corruption, are in the highest level of the institutional hierarchy and can constrain other institutional categories, such as property rights and regulatory institutions.

However, North's (1990) and Williamson's (2000) theories were challenged by Djankov *et al.* (2002) who found that corruption levels and the complexity of entry regulations are positively correlated. This could suggest that inefficient institutions, such as strict business regulations set by the government, may create the conditions

in which corrupt practices increase, especially when officials are endowed with discretionary power. Therefore, corruption may be perceived as a result of inefficient, over-regulated environment. In contrast, Aidis *et al.* (2012) contended that the complexity of regulatory barriers could be determined by corruption when politicians are corrupt and rent seekers. Aidis' *et al.*'s (2012) argument was supported by Shleifer and Vishny (1993, p. 616) who stated that corruption:

“can also cause leaders of a country to maintain monopolies, to prevent entry, and to discourage innovation by outsiders if expanding the ranks of the elite can expose existing corruption practices”.

3.4.1 Corruption effects on entrepreneurship and economic growth

There are two different views when it comes to ascribing the role of corruption in entrepreneurial activity and economic growth (Dutta and Sobel, 2016). On the one hand, according to the ‘grease the wheel’ theory, it is suggested that corruption helps entrepreneurship by shortening the start-up process for aspiring entrepreneurs (Aidt, 2009; Dreher and Gassebner, 2013; Krasniqi and Desai, 2016). On the other hand, a more substantial body of research posited that corruption has a negative overall impact on economic development in the long run, due to continuous rent-seeking from entrepreneurs by corrupt officials (Aidt, 2009; Anokhin and Schulze, 2009; Aidis *et al.*, 2012; Avnimelech *et al.*, 2014; Aparicio *et al.*, 2016; Dutta and Sobel, 2016).

In this regard, corruption hurts entrepreneurship in many ways. First, it may divert entrepreneurial energy away from productive activities, such as the development of innovations, and towards destructive (e.g., drugs) or unproductive (rent-seeking) forms of entrepreneurship (Baumol, 1990; Baumol *et al.*, 2007). For instance, El Harbi and Anderson (2010) found that corruption may encourage self-employment (i.e., necessity entrepreneurship) but discourages innovation as opportunity entrepreneurs will be unwilling to operate in a corrupt and weak rule of law environment because they are worried about the protection of their innovation. As a result, expectations of such behaviour may create a negative societal attitude towards entrepreneurship, as the “opportunity cost” of losing the productive services of these potential entrepreneurs is perhaps the highest cost coming from corruption (Baumol *et al.*, 2007; Aidis *et al.*, 2012).

Second, while corruption is often associated with a high degree of uncertainty, the cost of doing business is higher. Therefore, it may discourage local and foreign investment from funding new start-ups that are usually associated with expensive, uncertain and risky innovations (Baumol *et al.*, 2007; El Harbi and Anderson, 2010). Nofsinger and Wang (2011) contended that countries with a better legal environment to protect investors, including high levels of corruption protection, property rights, and contract enforcement, help initial start-ups to increase the access of different external financing sources. Similarly, Payne *et al.* (2013) argued that Initial Public Offering (IPO) investors tend to actively seek out more information about an organisation's ethical issues and perceived value when these firms come from more highly corrupt countries (i.e., emerging economies). Hence, Payne *et al.* (2013) found that the performance of foreign IPOs for entrepreneurial firms is dependent on the level of perceived corruption for each IPO firm's home country.

Lastly, a corrupt environment may prevent businesses from growing, as entrepreneurs tend to avoid corruption obstacles, such as the number of bribes paid, the percentage of senior management's time spent with regulators, and corruption of tax administration and bank officials (Beck *et al.*, 2005; Aidis *et al.*, 2012). Similarly, Estrin *et al.* (2013) argued that when high growth entrepreneurs expand their businesses, they reach a point after which the new venture will begin to attract unwelcome attention from corrupt officials, leading to a decrease in their returns.

In general:

“corruption is considered like a heavy tax that bleeds resources away from productive entrepreneurs. Resources “invested” in bribing politicians and bureaucrats cannot be invested in machinery and equipment, thus reducing productivity”.

Moreover:

“Corrupt government officials will also harass entrepreneurs, creating excessive rules and regulations that force entrepreneurs to pay them to stop making trouble” (Cowen and Tabarrok, 2013, p. 127).

3.4.2 Empirical findings between corruption and entrepreneurship

Existing research recognised the critical role played by the corrupt environment on entrepreneurship. For example, Djankov *et al.* (2005) found that the perception of low corruption, combined with a favourable attitude of the population and government towards entrepreneurship, increases the probability of people in Russia starting and growing their businesses.

Another study by Beck *et al.* (2005) found that smallest firms' growth is consistently the most adversely affected by higher levels of corruption in a poor financial and legal infrastructure compared to countries with less corruption. Also, Aidis *et al.* (2012, p. 119) analysed the impact of government size, freedom from corruption, and "market freedom", which is defined as "a cluster of variables related to the protection of property rights and regulation", on the decision to become an entrepreneur. The authors found that entrepreneurial entry is higher when the corruption level is lower, especially when the high-income countries were removed from the sample.

There is a growing body of literature that recognises the adverse effect of corruption on "productive" entrepreneurship and innovation. Avnimelech *et al.* (2014) explored the link between corruption and productive entrepreneurship by using data from 176 countries collected from a professional website (LinkedIn members with high-level managerial and entrepreneurial positions). The findings showed that countries with higher levels of corruption have a lower level of productive entrepreneurship.

Moreover, Anokhin and Schulze (2009) used data from 64 countries to investigate the link between corruption, innovation and entrepreneurship. The authors found that better control of corruption contributes to an increase in innovation (measured by the number of patent applications and rate of realised innovation) and entrepreneurship (measured by TEA from GEM). Similarly, El Harbi and Anderson (2010) found that when entrepreneurs and experts perceive that the business environment becomes cleaner through a decrease in corruption, the corruption-free environment is positively associated with innovation (i.e., opportunity entrepreneurship), and negatively related to self-employment (i.e., necessity entrepreneurship).

Contrary to previous empirical studies, Dreher and Gassebner (2013) found that corruption facilitated firm entry in 43 highly regulated economies over the period

2003-2005. For instance, corruption may mitigate the negative impact of regulations that mean it takes around 50 days to start a new business. Thus, the results provided evidence that corruption can indeed be viewed as being beneficial rather than harmful to entrepreneurship (Dreher and Gassebner, 2013). Moreover, Krasniqi and Desai (2016) found that informal institutions, such as corruption, can grease the wheels for businesses in transition economies, where it is used by entrepreneurs to facilitate growth-oriented transactions. Similarly, Aidis *et al.* (2012) found that country-level fixed-effects regression models did not confirm the impact of control of corruption on entrepreneurial entry.

A more recent study by Chowdhury *et al.* (2015a) suggested that corruption could play a dual role, serving as both grease and sand for nascent international entrepreneurship (i.e., entrepreneurial activity across national borders) in 44 countries derived from GEM data. In particular, the study findings suggested that:

“...corruption plays a greasing role when indirect taxes are high, but corruption plays a sanding role when are document requirement for export, cost of export and corporate tax are high” (Chowdhury *et al.*, 2015a, p. 976).

In summary, the findings from reviewing the empirical studies were inconclusive regarding the impact of corruption on the development of entrepreneurial activity. Therefore, there is a need to examine corruption in different mechanisms, such as a moderator with other formal institutions, in order to clear up this misunderstanding (Bruton *et al.*, 2010). Also, this relationship could be different when we consider the level of economic development in a specific economy (Smallbone *et al.*, 2014). The latter assumption is discussed in the following section.

3.4.3 Corruption, entrepreneurship and a country’s level of economic development

The preceding discussion showed that a country’s level of economic development should be taken into consideration when focusing on the relationship between corruption and entrepreneurship (Smallbone *et al.*, 2014). Countries with higher levels of corruption and political instability are at lower stages of economic development, and consequently have higher rates of unproductive entrepreneurship (e.g., necessity entrepreneurship). In contrast, countries that move forward in economic development are characterised by higher levels of political stability and

freedom from corruption, and in turn have higher rates of productive entrepreneurship (Álvarez and Urbano, 2011; Bruton *et al.*, 2013).

Naudé (2011) further argued that in less developed countries with a high prevalence of corruption, complex business regulations could be a source of rent to corrupt officials. In this case, these barriers may not screen out unproductive or destructive entrepreneurs, and it will be challenging to make reforms or remove these barriers. In contrast, the effect of entry regulation improvements was seen mainly in developed countries or countries where there is less corruption (Klapper *et al.*, 2006). Therefore, the effectiveness of business regulations is contingent on the ability of government to control corruption to achieve higher rates of productive entrepreneurship (Naudé, 2008).

On the one hand, a corrupt environment may distort entrepreneurial opportunities and appropriate returns by acting as a barrier that hinders the entry or growth of businesses; at the same time, it becomes a fertile environment for entrepreneurs to engage in self-employment (necessity entrepreneurship) or corrupt practices. On the other hand, countries with a more corrupt free environment often support entrepreneurs with a variety of possible, merit-based business opportunities and international growth potential (El Harbi and Anderson, 2010; Aidis *et al.*, 2012; Estrin *et al.* 2013; Chowdhury *et al.*, 2015b).

This argument was supported by Klapper *et al.* (2010, p. 132) who stated that:

“...because of burdensome regulations, high marginal tax rates, the absence of monitoring and compliance (of both registration and tax regulations), and other weaknesses in the business environment, many firms might find it optimal to evade regulations and operate in the informal sector”.

However:

“Firms that choose to stay small and informal might be unable to realise their full growth potential”

and benefit from the potential advantages of participating in the formal economy.

These advantages may include:

“police and judicial protection (and less vulnerability to corruption and the demand for bribes), access to formal credit institutions, the ability to use formal labour contracts, and greater access to foreign markets”.

3.5 Corruption as a Moderator between Formal Institutions and Entrepreneurship (Hypotheses)

Based on the previous discussions in this chapter, the current literature is discrepant when it comes to ascribing the role of corruption in entrepreneurial activity (Chowdhury *et al.*, 2015a; Dutta and Sobel, 2016). Therefore, in light of the current discrepancy, the hypotheses formed in this section aim to expand the understanding of the indirect effect of corruption as a moderator between formal institutions and entrepreneurial activity (Pathak *et al.*, 2015). Consistent with assertions of the signalling theory (Spence, 1973), formal institutions (e.g., business regulations) are likely to have a better effect on entrepreneurial activity in a corruption-free environment (Levie and Autio, 2011). In other words, if corruption is low, formal institutions are likely to have a better impact on entrepreneurial activity. However, if corruption is high, entrepreneurs may undermine confidence in the reform of formal institutions and, therefore, it will affect their decisions to start and grow their ventures (Levie and Autio, 2011).

This previous understanding of the interaction between formal and informal institutions may lead to different forms of entrepreneurship that do not necessarily benefit society in the context of emerging economies. Specifically, corruption and weak legal institutions may contribute to unproductive and destructive entrepreneurial activities that eliminate productive entrepreneurship (Bruton *et al.*, 2013).

The relative importance of corruption and the rule of law on entrepreneurship have been subject to considerable discussion. While Tonoyan *et al.* (2010) assumed that corruption has a direct effect on entrepreneurship, Levie and Autio (2011) argued that corruption is considered as one of several relevant consequences of a weak rule of law in which the credibility of government signal (i.e., regulations reforms) on entrepreneurship is contingent on the strength of the legal system of policing, trial and punishment. Therefore, the authors employed the rule of law rather than

corruption as a predictor of regulations and strategic (i.e., productive) entrepreneurship. Levie and Autio's (2011) findings suggested that lighter business regulations have more influence on productive entrepreneurship while a strong rule of law moderates this relationship.

Although corruption is highly correlated with the rule of law that differentiates developed from emerging economies (Payne *et al.*, 2013), legal (i.e., formal) institutions that enforce the rule of law may not offer a better understanding of the interaction between formal and informal institutions (North, 1990). In particular, De Clercq *et al.* (2010a) suggested that Western conceptualisations about the "need" for a strong rule of law may not be useful in emerging economies; this is because it underestimates the power of local cultures and traditions that could be more effective in maintaining close business relationships. Moreover, corruption is considered as an interdisciplinary and complex phenomenon that includes political, economic and socio-cultural backgrounds, and consequences whereby it is not limited to essential effects of a weak rule of law (Judge *et al.*, 2011). Corruption is therefore categorised in the highest level of the institutional hierarchy, may take a more extended period to change, and could hinder other formal institutional reforms (North, 1990; Williamson, 2000).

As a result, corruption is probably the most important (negative) indicator of an informal institution that is likely to influence entrepreneurial activity through the interaction with other formal institutions; this is because it "undermines the foundations of institutional trust that are needed for the development of trade and entrepreneurial and innovative activity" (Anokhin and Schulze, 2009, p. 1). This argument is supported by Griffiths *et al.* (2009, p. 627), who stated that "few studies have investigated how macro-environmental variables augment the individual-level perceptions of culture on influencing individual intentionality". Moreover, Pathak *et al.* (2015) contended that there is a need to test corruption as a moderator as most previous studies treated corruption merely as a control variable.

In the following sections, therefore, this study proposes that corruption may have a moderating effect on the relationship between formal institutions (i.e., number of business procedures, education and training, access to credit, and firm-level technology absorption) and entrepreneurial activity in the context of emerging

economies located at different stages of economic development (Payne *et al.*, 2013). A number of hypotheses are developed in the following sections.

3.5.1 Corruption as a moderator of the number of procedures effects

Governmental policies and procedures consist of legislative proceedings that can affect market mechanisms. These policies and procedures can encourage the market to function more efficiently throughout the life of the business by minimising market barriers and the rigid application of strict regulations (Gnyawali and Fogel, 1994; Álvarez *et al.*, 2014).

The literature on governmental policies and procedures has highlighted several aspects related to entrepreneurial activity, such as business regulations (e.g., Stephen *et al.*, 2009; Aidis *et al.*, 2012), labour regulations (e.g., McMullen *et al.*, 2008; Levie and Autio, 2011), government spending (e.g., Aidis *et al.*, 2012; Estrin *et al.*, 2013), fiscal freedom (e.g., McMullen *et al.*, 2008; Estrin *et al.*, 2013), property rights (e.g., Estrin *et al.*, 2013; Stenholm *et al.*, 2013), and openness to trade (e.g., Castaño *et al.* 2015; Chowdhury *et al.*, 2015b). In the following paragraphs, this framework considers the effects of the number of business regulations and procedures on entrepreneurship.

In their theoretical framework, Gnyawali and Fogel (1994) suggested that governmental regulations, such as the number of procedures, costs and taxes, among other factors, that are associated with starting a business have a negative connotation for potential entrepreneurs. For example, entrepreneurs in Australia spend two days to start-up a new venture while in Brazil it may take up to 152 days to establish an enterprise due to stringent regulations and the extended length of time needed to acquire necessary permits and licenses (Klapper *et al.*, 2006). Hence, these extensive business procedures may distract entrepreneurs from investing their resources in “productive” activities (Baumol, 1990; Chowdhury *et al.*, 2015b).

Theories have long debated the impact of business regulations on the creation and diffusion of entrepreneurial activity. The public interest theory argued that entrepreneurs who function in unregulated markets tend to have more failures ranging from monopoly power to externalities (e.g., pollution). Therefore, it is the government’s role to reduce market failures by screening the new entrants in order to

offer consumers high-quality products or services from “desirable” firms. As a corollary, public interest theory suggested that stricter entry regulation is associated with higher consumer welfare (Djankov *et al.*, 2002).

In contrast, the public choice theory argued that government regulations are used as a tool to create rents for bureaucrats or existing firms. This theory comes in two strands. The regulatory capture theory suggests that existing firms may acquire stricter regulations of entry to keep new competitors out of the market. As a result, incumbent firms may increase their market power and profits, which may lead to a decrease in competition and be of benefit to consumers (Stigler, 1971; Djankov *et al.*, 2002).

While the capture theory emphasised the benefits to industry, the toll booth theory pursued the benefit to politicians and bureaucrats. Djankov *et al.* (2002) draw an analogy to toll booths on a highway where toll collectors may block alternative routes to force traffic onto the toll road. Similarly, the regulators may offer stringent regulations to collect bribes from potential entrepreneurs and serve no social purpose. As a result, inefficient regulations by politicians may be associated with higher levels of corruption and a higher relative size of the informal economy (Shleifer and Vishny, 1993; Djankov *et al.*, 2002).

Based on the signalling theory (Spence, 1973), Levie and Autio (2011) contended that if regulation of administrative requirements and entry demands are complicated, the signal sent by the government to potential entrepreneurs is that starting new enterprises is exposed to penalties. Such signals could be more important for strategic (i.e., productive) entrepreneurs among other types, such as necessity entrepreneurs and the self-employed (Fuentelsaz *et al.*, 2015). In particular, necessity entrepreneurs are more concerned with entry barrier survival, either by fulfilling them or avoiding compliance with them, while productive entrepreneurs are more concerned with trade-offs and high opportunity costs that are linked to business growth (Cassar, 2006). Therefore, the signal sent by strict entry regulations is significant to productive entrepreneurs as they have more incentives to comply with formal regulations to benefit from the limited liability that non-registered businesses lack. However, strict entry regulations are less critical for necessity entrepreneurs as

they do not need to formally register in many countries and, therefore, they can pass the rigid administrative regulations (Levie and Autio, 2011).

Several empirical studies have examined the relationship between government regulations and entrepreneurial activity (Djankov *et al.*, 2002; van Stel *et al.*, 2007; Aparicio *et al.*, 2016). Van Stel *et al.* (2007) found that time and cost to register did not affect general entry. In contrast, Djankov *et al.* (2002) found that countries with strict entry regulations have more corruption and larger informal economies in which many businesses prefer to function; by doing this, they do not have to register and avoid costly regulations. Also, by analysing a six-year panel data of 54 countries, Levie and Autio (2011) found that the lighter burden of regulation is associated with a higher rate and relative prevalence of entrepreneurial activity. To this end, a variety of empirical research has established that simpler procedures and regulations to start a business increase the creation of new firms, especially those based on opportunity (Urbano and Álvarez, 2014; Castaño-Martínez *et al.*, 2015; Chowdhury *et al.*, 2015b; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016).

In line with the above-mentioned empirical evidence, the Doing Business project at the World Bank advocates for regulation reduction, suggesting that simpler procedures further stimulate entrepreneurs to start new ventures. For example, “simplifying the formalities of registration was the most popular reform during the years 2007 and 2008, implemented in 49 countries” (Álvarez and Urbano, 2011, p. 35).

The above observations about the impact of procedures on entrepreneurship are particularly crucial in the context of emerging economies, since aspiring entrepreneurs in such economies must tackle issues such as volatile or ineffective regulations (Aidis *et al.*, 2008). This argument is further applicable in the context of post-communist countries that are characterised by higher levels of corruption (Smallbone and Welter, 2001; Tonoyan *et al.*, 2010).

In this realm, Klapper and Love (2010) found that government policy reforms in regards to reducing the number of procedures are more effective in countries with a better business environment. Conversely, the authors contended that improvements in procedures need much work in countries with a less favourable business

environment. In accordance with Klapper and Love's (2010) findings, lower levels of corruption are one factor that could be beneficial to society regarding the promotion of greater trust in government reform policies and, as such, encourage aspiring entrepreneurs to formally register their ventures (Aparicio *et al.*, 2016).

However, different studies suggested that the effect of government policy reforms varies based on the country's level of development (Acs and Szerb, 2007; Naudé, 2008). Emerging economies that have managed to reach the innovation stage have relatively more transparent rules and regulations, and their enforcement is less uncertain than in less developed economies (Ahlstrom *et al.*, 2008). Because less developed emerging economies generally exhibit high levels of corruption, strict entry procedures could be a source of rents to corrupt officials (Aidis *et al.*, 2008). Therefore, it will be difficult for the government to make reforms for or abolishment of these complex procedures; this may, therefore, discourage entrepreneurs from entering the market (Naudé, 2008). Consequently, the impact of a lower number of procedures may have relatively more favourable effects in more developed emerging countries, where sources of rent-seeking and unproductive activities could be removed and more aspiring entrepreneurs could start new ventures (Naudé, 2008; Aparicio *et al.*, 2016). Accordingly, the following hypotheses are proposed:

H1a: The negative relationship between the number of procedures and entrepreneurship within an emerging economy is moderated by the country's level of corruption, such that this negative relationship is stronger at lower levels of corruption.

H1b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

3.5.2 Corruption as a moderator of education and training effects

Education and training for entrepreneurship have been widely recognised and studied to ameliorate entrepreneurial activity (Gnyawali and Fogel, 1994; Levie and Autio, 2008; Fuentelsaz *et al.*, 2015). From an economic perspective, Leibenstein (1968, pp. 82-83) highlighted the importance of education to entrepreneurship, stating that: "[...] training can do something to increase the supply of entrepreneurship". He further contended that:

“[...] since entrepreneurship requires a combination of capacities, some of which may be important gaps in carrying out the input-completing aspect of the entrepreneurial role, training can eliminate some of these gaps. For example, it may be difficult to train people to spot economic opportunities, but it is possible to train them to assess such opportunities once perceived” Leibenstein (1968, pp. 82-83).

In the same vein, Levie and Autio (2008) suggested that entrepreneurship specific training and education are likely to encourage the supply of entrepreneurship through two primary mechanisms. First, through enhancing the cognitive ability of individuals and, therefore, enabling them to better recognise and exploit the opportunities in the market. Also, Shane and Venkataraman (2000) contended that an individual’s ability to identify opportunities could be determined through the possession of the necessary experience, and the cognitive ability to analyse information in which it originates from the social interactions in the market. In particular, entrepreneurs with a higher level of education are more capable of identifying opportunities in the market. This is because they have the ability to understand and analyse the information received from social and economic interactions, and use this information to create new products and services that add a value or fill a gap in the economy (Levie and Autio, 2008).

The second mechanism to increase entrepreneurial activity is through providing entrepreneurs with the necessary skills and competencies required to start up and grow a new firm (Levie and Autio, 2008). Historically, Schumpeter (1947, p. 152) contended that inventors create new ideas, while entrepreneurs “get things done”. To get things done, entrepreneurs need to be sufficiently skilled, not only in their specific domain but also in a number of business areas such as management and leadership skills; they use these skills to bring and combine the resources necessary for starting and growing a successful business. Therefore, entrepreneurs who are “jacks of all trades” tend to have more balanced talents that span many different skill sets (Lazear, 2005).

Based on the previous argument, some studies have highlighted the importance of focusing on a specific rather than general education; this specific education should include entrepreneurial skills used to operate the venture (Bowen and De Clercq, 2008; Jiménez *et al.*, 2015). Therefore, an educational system that is

entrepreneurship focused is more likely to teach entrepreneurs the necessary skills for their businesses in the areas of market analysis, product and service development, business and financial literacy, and international growth strategies (Bowen and De Clercq, 2008; Levie and Autio, 2008; Danis *et al.*, 2011; Jiménez *et al.*, 2015). As a result, the positive impact of this broad skill set will increase individuals' self-confidence and reduce perceived risk to better seek and exploit entrepreneurial opportunities in the market (Levie and Autio, 2008; Jiménez *et al.*, 2015).

Several empirical studies have proposed a convergence between education and training with entrepreneurship (Castaño-Martínez *et al.*, 2015; Chowdhury *et al.*, 2015b; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016). Individuals with a higher level of education and business skills have a greater sense of self-confidence, as well as the entrepreneurial skills required to exploit market opportunities and create a new venture (Castaño-Martínez *et al.*, 2015; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016). Therefore, education and training services that focus on entrepreneurial skills are particularly important in developing countries to ensure manpower efficiency and encourage firms to design growth strategies in their businesses (Gnyawali and Fogel, 1994; Carlos Díaz Casero *et al.*, 2013; Castaño-Martínez *et al.*, 2015; Fuentelsaz *et al.*, 2015).

In the context of emerging economies, the literature suggested that an educated workforce is an essential ingredient for higher rates of entrepreneurship (Baumol *et al.*, 2007; Aidis *et al.*, 2008; Valliere and Peterson, 2009). However, educated entrepreneurs may not react similarly to opportunities in all contexts, but rather their reactions may be conditioned by the institutional environment, especially in the context of emerging economies (Baumol *et al.*, 2007; Autio and Acs, 2010; Danis *et al.*, 2011; Acs *et al.*, 2014b). For example, Manolova *et al.* (2008) found that some emerging economies, such as Bulgaria, Hungary and Latvia have higher levels of education. However, these countries tend to exhibit lower rates of entrepreneurship due to the entrepreneur's lack of confidence and the required skills to start new businesses (Manolova *et al.*, 2008). Apart from the fact that this low confidence could be explained by political and social transition (Manolova *et al.*, 2008), the literature suggested that improving education would be more effective in increasing

entrepreneurial activity levels if it is accompanied by lower levels of corruption (Álvarez and Urbano, 2011; Aparicio *et al.*, 2016).

In this realm, Aparicio *et al.* (2016) contended that control of corruption increases trust in the system and, as such, will create a better alliance between government policies and the education system. Moreover, Álvarez and Urbano (2011) suggested that control of corruption could allow future entrepreneurs to gain a more significant share of their generated revenue and, therefore, propel higher levels of entrepreneurial activity. Moreover, control of corruption would allow an increase in the amount of budget allocated to the education infrastructure and research and development (R&D), which are extra variables in the support of entrepreneurial activity (Aparicio *et al.*, 2016). Therefore, lower levels of corruption could result in more opportunities for new venture creation (Aidis *et al.*, 2008), based on technology and with higher added value (Aparicio *et al.*, 2016).

However, a comparison across emerging economies may lead to different conclusions. Entrepreneurs in less developed countries usually acquire their skills through workplace trial and error in relatively simple business activities, while in more developed countries entrepreneurs acquire their skills through formal education and training. Thus, education, especially post-secondary education, plays a vital role in teaching and developing entrepreneurial skills (Acs *et al.*, 2014b).

Therefore, the primary challenge for policymakers in emerging economies is to overcome the high levels of corruption to improve the tertiary education effects on entrepreneurial activity (Acs *et al.*, 2014a; Castaño *et al.*, 2015; Aparicio *et al.*, 2016). In particular, emerging economies that are located in lower stages of economic development must educate the workforce and increase their production efficiency in order to adapt to the following technological development stage (Acs and Amoros, 2008; Acs *et al.*, 2008a; Acs and Szerb, 2010). Consequently, education and training could play a more critical role for entrepreneurship in emerging economies that are located in the innovation-driven stage (Acs *et al.*, 2008a). As a result, this study proposes the following hypotheses:

H2a: The positive relationship between education and training and entrepreneurship within an emerging economy is moderated by the

country's level of corruption, such that this positive relationship is stronger at lower levels of corruption.

H2b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

3.5.3 Corruption as a moderator of access to credit effects

As mentioned earlier, financial support availability is among the most important pillars for entrepreneurs to start and grow their ventures (Gnyawali and Fogel, 1994). Van Auken and Neely (1999) underscored that inadequacy in financial structure poses a significant obstacle to venture creation; this is because, with no access to credit, individuals are unable to materialise their ideas, and as a result, the entrepreneurial activity decreases.

In the beginning, entrepreneurs tend to obtain financial resources from family and friends, but soon need additional resources, such as venture capital funds, angel investors and corporate investors, to finance the growth of their businesses (Denis, 2004; Bowen and De Clercq, 2008). Whereas venture capital funds refer to “limited partnerships in which the managing partners invest on behalf of the limited partners”, angel investors refer to “high net worth individuals that invest their own funds in a small set of companies”. In addition, the term corporation investors refer to those “corporations [who] invest on behalf of their shareholders, for financial and/or strategic reasons” (Denis, 2004, p. 304).

Although new businesses may depend on personal funds received from informal investors, such as family and social networks (Ho and Wong, 2007; Szerb *et al.*, 2007), financial resources such as venture capital and bank loans are integral for aspiring entrepreneurs who seek to expand their businesses, either locally or in foreign markets (Bowen and De Clercq, 2008; Korosteleva and Mickiewicz, 2011; Stenholm *et al.*, 2013; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016). In this regard, Beck *et al.* (2005) found that entrepreneurs who face financial constraints, such as high-interest rates, collateral requirements or lack of money in the banking system, or who face the need for special bank connections, are less likely to exhibit venture growth rates. Conversely, Beck *et al.* (2008) found that small firms that obtain

formal financing have better performance in comparison with similar firms that depend on informal funding.

This issue of funding distinguishes established firms from start-ups due to the high risk associated with entrepreneurs, such as lack of credit history and of credible reputation, as well as having less information about the potential value of a new innovation (Denis, 2004; Bowen and De Clercq, 2008; Korosteleva and Mickiewicz, 2011; Fuentelsaz *et al.*, 2015). In addition, financial institutions, such as bankers, may hesitate to finance new start-ups as they find it costly to monitor small businesses; this is despite improvements in technology (e.g., credit scoring and risk-rating tools) that can handle entrepreneurial finance better than in the past (Gnyawali and Fogel, 1994; de la Torre *et al.*, 2010).

Therefore, in order to promote entrepreneurship, several studies have shown that policies for increasing access to bank credit should focus on decreasing capital requirements, creating investment companies, promoting low-interest loans and loan guarantee systems for small business financing (Gnyawali and Fogel, 1994; Castaño-Martínez *et al.*, 2015; Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016). In particular, access to credit could be a priority for entrepreneurs with higher growth aspirations to expand their businesses or seek opportunities in foreign markets (Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016).

Concerning the relationship with corruption, prior research suggested that higher levels of corruption and bribery adversely impact the development of a country's financial infrastructure (La Porta *et al.*, 1999), and this uncertainty caused by corruption could generate distrust among entrepreneurs in the financial system, preventing its maturity (Aparicio *et al.*, 2016). On the contrary, the prevalence of trust has been found to positively influence entrepreneurs to engage in high-growth business activities (Bowen and De Clercq, 2008). This suggests a potential interaction effect between a country's level of corruption and financial development on the one hand, and the new firm start-ups rates within its borders on the other (Bowen and De Clercq, 2008; Chowdhury *et al.*, 2015b).

In this respect, Johnson *et al.* (2002) analysed entrepreneurship in post-communist countries and found that extra-legal payments (bribes) hinder entrepreneurial activity

more than the lack of financing. Therefore, corruption (as well as other deficiencies in the governance of a country) may increase transaction costs while limiting the income of entrepreneurs (Álvarez and Urbano, 2011). In turn, lower levels of corruption may motivate increased entrepreneurial activity by allowing entrepreneurs to retain a more significant share of their generated revenue (Álvarez and Urbano, 2011). Accordingly, this study extends this argument by hypothesising that the presence of lower levels of corruption can leverage the financial system towards entrepreneurship (Korosteleva and Mickiewicz, 2011; Nofsinger and Wang, 2011; Aparicio *et al.*, 2016).

However, the extent to which the financial system supports entrepreneurial activity regarding the provision of resources to start and grow the business varies substantially due to the country's level of economic development (Levie and Autio, 2008; Korosteleva and Mickiewicz, 2011; Chowdhury *et al.*, 2015b). Emerging economies that are located in lower stages of development lack the development of the financial institution, and thus, the availability of financial resources is limited (Aidis *et al.*, 2008; Acs and Correa, 2014). Therefore, entrepreneurs in these countries rely mainly on social networks and family connections as the existing financial institutions are less likely to support their start-ups (Leibenstein, 1968; Chowdhury *et al.*, 2015b). In this way, access to credit is more difficult in less developed than in more developed emerging economies (Chowdhury *et al.*, 2015b).

Based on the previous discussion, it is more likely that emerging economies that are characterised with lower levels of corruption and a more developed financial system can provide higher availability of financial resources for entrepreneurs to pursue their ambitions towards new ventures. Accordingly, this reasoning leads to the proposition of the following hypotheses:

H3a: The positive relationship between access to credit and entrepreneurship within an emerging economy is moderated by the country's level of corruption, such that this positive relationship is stronger at lower levels of corruption.

H3b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

3.5.4 Corruption as a moderator of technology absorption effects

The last formal institution analysed in this study is technology absorption (Gnyawali and Fogel, 1994). The diffusion of new technology, as well as the capacity for firms to absorb it, is an essential factor for innovation and high growth ventures (Stenholm *et al.*, 2013; Acs *et al.*, 2014b). The World Bank (2007) suggested that the dimension of technological infrastructure is among the most critical factors for developing countries to move towards the knowledge-based economy (i.e., the innovation-driven stage). In this regard, the World Bank (2007, p. 24) stated:

“A modern and adequate information infrastructure will facilitate the effective communication, dissemination, and processing of information and knowledge. Information and communication technologies (ICTs)—including telephone, television, and radio networks—are the essential infrastructure of the global, information-based economies of our time, as railways, roads, and utilities were in the industrial era. They can considerably reduce transaction costs by providing ready access to information. ICT-related policies cover telecommunications regulation as well as the investments needed to build and exploit ICTs throughout the economy and society through various “e-applications”—e-government, e-business, e-learning, etc. Low-income countries should focus first on the basic ICT infrastructure before promoting advanced technologies and applications”.

Although the literature that links technology innovation to entrepreneurship in emerging economies remain sparse, a few studies have highlighted that improvements in information and communication technology (ICT) via the Internet (e.g., cloud computing, social media, Internet of Things, cell phone applications and big data analytics) may motivate individuals in emerging economies to start and grow their businesses internationally. This is due to the potential for higher returns in terms of better exchange information, fewer expenses and being less time consuming (Acs, 2006; Acs *et al.*, 2008a).

In this respect, Kiss *et al.* (2012, p. 267) critically evaluated international entrepreneurship research in emerging economies by conducting a systematic literature review for 88 articles published over the past 20 years. In this study, Kiss *et al.* (2012, p. 267) defined international entrepreneurship as “the discovery, enactment, evaluation, and exploitation of opportunities—across national borders—to create future goods and services”. The authors revealed that entrepreneurs in emerging economies face more difficulties accessing technology than advanced

economies due to the lack of technological infrastructure. However, entrepreneurs in some emerging economies, such as India, have managed to overcome these challenges and develop new industries, such as medical tourism and IT services that compete effectively with other entrepreneurs in developed economies. These new industries have become globally competitive by offering cheap and up-to-date technology, as well as a highly skilled labour force to attract customers and businesses around the world (Kiss *et al.*, 2012).

Therefore, questions have been raised about the role of governments in emerging economies to alter their public policies towards providing an adequate technological infrastructure. They do this by facilitating awareness of importing foreign technologies that can lead, in turn, to more entrepreneurial activity and more innovation (Acs and Szerb, 2007; Audretsch and Belitski, 2016). In this respect, Acs and Szerb (2007, p. 113) stated: “One of the worst economic mistakes any business or country can make is to adopt the “not invented here” syndrome: The refusal to embrace something developed and used elsewhere”. Indeed, some countries, such as the USA, managed to overcome this syndrome when the American manufacturing sector imported the technology of “Just In Time” production systems or “quality circles” from Japan (Acs and Szerb, 2007).

However, as suggested by the literature, it is essential to remove barriers that hinder the development of technological infrastructure policies in the context of emerging economies (Acemoglu and Robinson, 2006; Pathak *et al.*, 2015; Audretsch and Belitski, 2016). In particular, these barriers may point to efforts by the political elite to block technological and institutional development to protect their benefits under the *status quo* system (Acemoglu and Robinson, 2006). Thus, corrupt countries tend to benefit less from Foreign Direct Investments (FDI) by high tech companies, which are uncertain about expanding their businesses in markets that are characterised by higher potential costs of corruption (Anokhin and Schulze, 2009). Commenting on the link between technology and corruption, Anokhin and Schulze (2009, p. 4) argued that:

“Firms with better technologies, human capital, training programs, and so forth are understandably reluctant to enter markets where gains may be more than offset by the potential costs of corruption. Corrupt nations are thus less

likely to benefit from investment by high-quality companies that employ sophisticated technologies”.

As a result, it is believed that corruption and access to foreign technology interact to produce significant outcomes for the rates of entrepreneurial activity in emerging economies. In particular, emerging economies that have lower levels of corruption may facilitate the transformation of technical knowledge through FDI that ultimately fosters innovation and higher rates of entrepreneurial productivity (Audretsch *et al.*, 2008; Anokhin and Schulze, 2009; Pathak *et al.*, 2015).

Regarding the stages of economic development, control of corruption is more important for the effect of technology absorption on entrepreneurial activity in emerging economies that are in the innovation-driven stage. As emerging economies move into the innovation-driven stage, there is an increase in knowledge, and thus entrepreneurs can initiate new start-ups based on technology (Romer, 1990; Acs, 2006). Therefore, this study proposes the following hypotheses:

H4a: The positive relationship between technology absorption and entrepreneurship within an emerging economy is moderated by the country’s level of corruption, such that this positive relationship is stronger at lower levels of corruption.

H4b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

3.6 Summary and Conclusions

This chapter developed a conceptual framework to suggest that emerging economies can encourage higher levels of entrepreneurial activity through enhancing the institutional environment. The review of the literature advanced the existing theory in the field of entrepreneurship and institutional theory. In particular, the developed model extends Gnyawali and Fogel’s (1994) conceptual framework by making a clear distinction between formal and informal institutions (North, 1990). Moreover, this study was among the first to suggest the moderating effect of corruption on the relationship between formal institutions and entrepreneurial activity (Williamson, 2000). This interplay between formal and informal institutions may offer different

implications to entrepreneurship in emerging economies that are at different stages of development. The next chapter goes on to describe the research methodology to test the conceptual framework and the data used in this study.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

As discussed in Chapter 1, the primary aim of this thesis is to examine the interaction impact of formal and informal institutions on the development of entrepreneurial activity in emerging economies that are located at different stages of development. This chapter presents the development of the research methodology for this thesis: it provides a discussion of the researcher's primary philosophical and methodological approaches. This study embraces a positivist stance and makes use of a deductive approach. Moreover, it embraces panel (longitudinal) analysis to offer a more in-depth analysis of the empirical data collected.

The nature of research requires different approaches to data collection. In order to accomplish the identified research aims and objectives, this chapter will arrange a blueprint and explanation for the methods and approaches selected for this thesis.

The discussion in this chapter has been separated into 12 sections. The first section was the introduction and the second section presents the research context and justification. Section 3 outlines the research philosophy and the rationale for using the deductive approach in the thesis. Sections 4 and 5 present the study hypotheses and provide a detailed description of the research design. Section 6 describes the data sources used in the research. Sections 7, 8 and 9 justify the validation of the measures used for the independent, dependent and control variables. Sections 10 and 11 offer a detailed discussion about the justification for choosing a panel data approach in this study, particularly the most appropriate models used in panel data analysis. The last section concludes with a brief discussion of the chapter.

4.2 Research Context and Justification

Emerging economies are fast becoming key players in the new global economy. In this regard, Kiss *et al.* (2012, p. 266) stated that:

“The largest of these economies (i.e., China, India, Russia, Brazil, Mexico, South Korea, Turkey, Indonesia, and Poland) now comprise over a third of the world's 25 largest economies and are growing at around three times the pace of the advanced ones”.

With this in mind, and with the significant role of entrepreneurship in contributing to prosperity and economic development in emerging economies, there is a strong need to develop a better understanding of the effect of the institutional environment on the success of new businesses in emerging economies (Bruton *et al.*, 2008).

Most studies that link entrepreneurship and institutions have focused on developed economies, which are often characterised by a mature and stable institutional environment (Estrin *et al.*, 2013; Sambharya and Musteen, 2014; Castaño-Martínez *et al.*, 2015). While these studies provided exciting insights into the field, researchers have suggested more elaboration and examination of the theory within the context of emerging economies (Hoskisson *et al.*, 2000; Ahlstrom *et al.*, 2008; Bruton *et al.*, 2008; Bruton *et al.*, 2009; Hoskisson *et al.*, 2011).

Little is known about entrepreneurship dynamics in emerging economies: “economies that are increasingly moving to market orientation and seeking to rapidly advance economically” (Bruton *et al.*, 2008, p. 1). While emerging economies are different from developed economies in that they lack well-developed institutions, often resulting in lower entrepreneurial activity (Ahlstrom *et al.*, 2008; Bruton *et al.*, 2008; Bruton *et al.*, 2009), some emerging economies, such as Estonia, Slovenia, and Slovakia, have managed to close this gap and appear in the top 30 of the Global Entrepreneurship Index (Acs *et al.*, 2014b).

Shedding light on the varying degree to which emerging countries have achieved entrepreneurial development, it is, therefore, imperative to understand the role of institutions (formal and informal) that have resulted in a better performing entrepreneurial environment in the countries mentioned above. This is of particular importance as while reforming formal institutions (e.g., government regulations and education) is integral to overall institutional effectiveness, such improvements do not necessarily guarantee increased entrepreneurial activity (Bruton *et al.*, 2013). This phenomenon is evident in the case of former communist emerging economies; on the surface, they have laws and regulations similar to those seen in developed economies, however, as commercial laws that affect entrepreneurship are not efficiently implemented, these institutions are not conducive to entrepreneurial activity (Feige, 1997; Smallbone and Welter, 2001; Aidis *et al.*, 2008; Tonoyan *et al.*, 2010; Smallbone *et al.*, 2014).

In general, the countries mentioned earlier share common legacies concerning their shared histories of absent or immature institutions and centralised economic control (Smallbone and Welter, 2001; De Clercq *et al.*, 2010a; Tonoyan *et al.*, 2010). Therefore, differences in the pace and extent of institutional development and economic liberalisation can offer a useful context for a comprehensive theoretical understanding of the role of institutions (formal and informal) on entrepreneurship, and whether an improved institutional environment has helped these countries increase their level of entrepreneurial activity (Bruton *et al.*, 2008; Bruton *et al.*, 2009). Essentially, due to the prevalence of corruption in these countries' institutions, there is a need to test corruption as a moderator in order to have a better understanding of institutional dynamics; this is because most previous studies have treated corruption merely as a control variable (Bruton *et al.*, 2008; Bruton *et al.*, 2013; Pathak *et al.*, 2015).

While previous studies mainly used cross-sectional data to test the impact of institutions on entrepreneurship (De Clercq *et al.*, 2010a; Danis *et al.*, 2011; Stenholm *et al.*, 2013), this thesis advances our understanding of institutional dynamics by using panel (longitudinal) data over the period 2006-2014. Because the development of institutions may take an extended period (Hoskisson *et al.*, 2000; Williamson, 2000), this type of analysis is necessary for testing the interaction effect of informal and formal institutions on the development of entrepreneurial activity in emerging economies (Estrin *et al.*, 2013).

In this regard, Bruton *et al.* (2009, p. 775) stated that:

“Typically, institutions are viewed as static, and only changing very slowly over time. However, the evidence presented here suggests that, in the fast-changing environment of emerging economies, new institutions are developing and actors in the environment can shape existing institutions. These new institutions are evolving to meet the shift to market orientation and the increasing economic activity. Future research should expand this understanding by pursuing a longitudinal study of institution building and change so that the manner in which these activities occur and their change over time can be developed”.

In the same vein, Kiss *et al.* (2012, p.275) argued that:

“...this failing [of using longitudinal approaches] is especially problematic in the context of emerging economies since these countries are in a state of institutional flux. Consequently, the dynamic interconnections between entrepreneurial behaviour and institutional context, which are vitally important in emerging economies, cannot be adequately understood via the static approaches employed in most international entrepreneurship research to date”.

Similar to other studies (De Clercq *et al.*, 2010a; Danis *et al.*, 2011), the research population for this thesis consisted of all possible emerging countries that fit the characterisations of emerging economies, as suggested by Hoskisson *et al.* (2000). In this sense, the selection criteria for emerging economies considers transition economies, such as post-communist countries, that are characterised by the encouragement of private enterprise and increasing liberalisation, as well as developing countries in Latin America, Asia and Africa that have gone through the adoption of a free-market system and economic liberalisation (Hoskisson *et al.*, 2000).

Significantly, some emerging economies, such as Estonia, Slovenia, and the Czech Republic, have experienced an extraordinary transformation regarding economic growth, institutional development and knowledge creation (Hoskisson *et al.*, 2000; De Clercq *et al.*, 2010a). At the same time, countries such as the Kyrgyz Republic, Ghana, and Georgia have been less successful in improving economic development compared to other emerging economies (Schwab and Sala-i-Martin, 2014). Therefore, there is a need to understand the effects of institutional factors on entrepreneurial activity in the context of emerging economies. In particular, there is an emerging interest in how emerging economies at the factor and the efficiency-driven stage could increase exports and develop more value-added industries to diversify their economies and reach the innovation-driven stage (i.e., a knowledge-based economy).

Based on the availability of published data of entrepreneurship and institutional variables related to the thesis framework, the final sample consisted of a balanced panel of 44 countries over the years 2006 to 2014 (9 years). Also, the data were grouped by country and year, resulting in 396 country-year observations. Table 4.1

below shows the sample of countries and their respective stage of economic development at the time of sampling.

To compare between emerging economies at different levels of development, this study considers country-level stages of economic development (factor-driven, efficiency-driven, and innovation-driven economies) as suggested by the Global Competitiveness Report (GCR) (Schwab and Sala-i-Martín, 2014). As discussed in Chapter 2 (Section 2.4.5), this comparison was developed as it was suggested that the institutional factors impact entrepreneurial activity differently based on the stage of economic development (Bowen and De Clercq, 2008; Carlos Díaz Casero *et al.*, 2013; Acs *et al.*, 2014a; Schwab and Sala-i-Martín, 2014).

Table 4.1: Emerging countries at respective stages of economies development

Development stages				
Stage 1: Factor-driven	Transition from stage 1 to stage 2	Stage 2: Efficiency- driven	Transition from stage 2 to stage 3	Stage 3: Innovation- driven
Ghana	Azerbaijan	Albania	Argentina	Czech Republic
India	Botswana	Armenia	Brazil	Estonia
Kyrgyz Republic	Philippines	Bulgaria	Chile	Israel
Nigeria		Colombia	Croatia	Korea Republic
Pakistan		Georgia	Hungary	Portugal
Tajikistan		Indonesia	Kazakhstan	Slovak Republic
		Jamaica	Latvia	Slovenia
		Jordan	Lithuania	
		Macedonia, FYR	Malaysia	
		Morocco	Mauritius	
		Peru	Mexico	
		Romania	Russian	
		South Africa	Federation	
		Thailand	Turkey	
		Tunisia		

Source: Schwab and Sala-i-Martin (2014)

As shown in Table 4.1, it is worth mentioning that only six countries were classified as factor-driven by GCR (see Section 5.5 for more details). Therefore, following Anokhin and Wincent's (2012) approach, the sample of emerging economies was divided into more developed and less developed emerging economies to distinguish the country-level stage of development for the study. Based on GCR, more developed emerging economies are characterised as being at the innovation stage or in the transition to innovation stage, while less developed emerging economies are

located at lower stages of development, as shown in Table 4.2 (Schwab and Sala-i-Martin, 2014).

For the purpose of this study, we acknowledge that the sample of emerging economies includes a diverse range of countries regarding both geography and stage of development. In particular, while the Czech Republic, Estonia, Israel, Korea Republic, Portugal, Slovak Republic and Slovenia are located in the 2014 GCR as innovation-driven economies, these countries were considered emerging economies since they are often recognised in academic studies. Moreover, their classification as innovation-driven economies is if any of these countries have recently entered the innovation-driven level, or if they are still a matter of scholarly debate (Hoskisson *et al.*, 2000; Valliere and Peterson, 2009; Kiss *et al.*, 2012).

Table 4.2: Emerging countries: more developed and less developed emerging countries classification

	More developed emerging countries	Less developed emerging countries
1	Argentina	Albania
2	Brazil	Armenia
3	Chile	Azerbaijan
4	Croatia	Botswana
5	Czech Republic	Bulgaria
6	Estonia	Colombia
7	Hungary	Ghana
8	Israel	Georgia
9	Kazakhstan	India
10	Korea Republic	Indonesia
11	Latvia	Jamaica
12	Lithuania	Jordan
13	Malaysia	Kyrgyz Republic
14	Mauritius	Macedonia, FYR
15	Mexico	Morocco
16	Portugal	Nigeria
17	Russian Federation	Pakistan
18	Slovak Republic	Philippines
19	Slovenia	Peru
20	Turkey	Romania
21		South Africa
22		Tajikistan
23		Thailand
24		Tunisia

Source: Devised by author

4.3 Research Paradigms

The research paradigm is “a framework that guides how research should be conducted based on people’s philosophies and their assumptions about the world and the nature of knowledge” (Collis and Hussey, 2014, p. 41). In this regard, Burrell and Morgan (1979, p. 24) contended that “to be located in a particular paradigm is to view the world in a particular way”. Therefore, selecting which research paradigm should be used in this study is essential to offer meaningful insights to the research design in terms of data collection, analysis and interpretations (Creswell, 2009; Easterby-Smith *et al.*, 2012).

Two, largely opposing, schools of thought exist, each of which is related to a different research paradigm: positivism (i.e., realism) and interpretivism (i.e., idealism) (Saunders *et al.*, 2009; Collis and Hussey, 2014). Positivism rests on the assumption that “social reality is singular and objective, and is not affected the act of investigating it” (Collis and Hussey, 2014, p. 43). The research includes “a detective process with a view to providing explanatory theories to understand social phenomena” (Collis and Hussey, 2014, p. 43). In contrast, interpretivism rests on the assumption that “social reality is in our minds, and is subjective and multiple” (Collis and Hussey, 2014, p. 44). Hence, social reality is influenced by the act of investigating it. Interpretivism research comprises “an inductive process with a view to providing interpretive understanding of social phenomena with a particular context” (Collis and Hussey, 2014, p. 44). It is noteworthy, however, that some terms have emerged over the years that describe different approaches within the two main paradigms. The most common approaches are described in Table 4.3.

Table 4.3: Approaches within the two main paradigms

Positivism	Interpretivism
Quantitative	Qualitative
Objective	Subjective
Scientific	Humanist
Traditionalist	Phenomenological

Source: Collis and Hussey (2014)

4.3.1 Assumptions of Positivism and Interpretivism

Before we design the study, it is necessary to take into account the research assumptions that support positivism and interpretivism research in order to decide whether this study is broadly positivist or broadly interpretivist.

As summarised in Table 4.4, concerning the ontological assumption, positivists believe that social reality is stable and concrete. The researcher can describe and examine the phenomenon objectively without the act of affecting it (Saunders *et al.*, 2009). Thus, everybody has the same sense of reality as there is only one social reality (Easterby-Smith *et al.*, 2012). In the opposite school of thought, interpretivists hold the belief that reality is subjective because it is “socially constructed”. Hence, there are different realities as every person has his or her own sense of reality (Saunders *et al.*, 2009; Collis and Hussey, 2014).

Regarding the epistemological assumption, researchers that use the positivism approach believe that knowledge can be valid only if phenomena are observable and measurable, and they attempt to keep an independent and objective stance (Saunders *et al.*, 2009). In contrast, researchers that practice an interpretivism approach attempt to minimise the gap and become closer to the research subject by trying to be involved in different methods of participative analysis (Saunders *et al.*, 2009; Collis and Hussey, 2014).

Concerning the axiological assumption, positivists consider the phenomena under research as objects and regard that they are independent and detached from what they are investigating. Also, positivists believe that these objects were existent before they became interested in studying the correlation between the objects, and that these objects will not be affected during or after their investigation activities. Therefore, positivists hold the belief that the process of investigation is “value-free” (Johnson and Duberley, 2011). On the other hand, interpretivists assume that the research investigators are biased in their values, “even if they have not been made explicit”. These values guide the researcher to identify what is perceived as facts and the interpretations and explanations drawn from these facts. As a result, most scholars who use the interpretivism approach believe that the researcher is involved with that which is being studied (Saunders *et al.*, 2009; Collis and Hussey, 2014).

Table 4.4: Comparison between positivism and interpretivism

Philosophical assumption	Positivism	Interpretivism
Ontological assumption (the nature of reality)	“Social reality is objective and singular, separate from the researcher” “There only one reality”	“Social reality is subjective and socially constructed” “There are multiple realities”
Epistemological assumption (what constitutes valid knowledge)	“Knowledge comes from objective evidence about observable and measurable phenomena” “The researcher is distant from phenomena under study”	“Knowledge comes from subjective evidence from participants” “The researcher interacts with phenomena under study”
Axiological assumption (the role of values)	“The researcher is independent from phenomena under study and the results are value-free and unbiased”	“The researcher acknowledges that research is subjective and the findings are value-laden and biased”
Rhetorical assumption (the language of research)	“The researcher writes in a formal style and uses the passive voice, accepted quantitative terms and set definitions”	“The researcher writes in an informal style and uses the personal voice, accepted qualitative terms and limited definitions”
Methodological assumption (the process of research)	“The researcher takes a deductive approach” “The researcher studies cause and effect and uses a static design where categories are identified in advance” “Generalizations lead to predictions, explanations and understanding” “Results are accurate and reliable through validity and reliability”	“The researcher takes an inductive approach” “The researcher studies the topic within its context and uses an emerging design where categories are identified during the process” “Patterns and theories are developed for understanding” “Findings are accurate and reliable through verification”

Source: Collis and Hussey (2014)

In a positivist study, the language of research should be written in a formal style using the passive voice, while the situation is less evident in an interpretivist approach. Also, the process of research in a positivism approach should be focused on assuring that any variables used can be operationalised; to be precise, defined in such a way that they can be measured. Conversely, the interpretivist approach examines a small sample, probably over a period of time. In this respect, the researcher employs a number of study methods to receive various viewpoints of the phenomena. Moreover, in the process of analysing these perspectives, the examiner will be looking for understanding what is happening in a particular condition and seeking patterns that could be replicated in other similar circumstances (Collis and

Hussey, 2014). Building on the research philosophy discussed in this part, the next section looks in greater detail at the study approach taken in this thesis.

4.3.2 Rationale for choosing a positivism paradigm

According to Collis and Hussey (2014), choosing the appropriate paradigm is partly determined by the research assumptions. Also, it will be affected by the dominant paradigm in the research field and the nature of the research problem we are investigating. Table 4.5 compares the main characteristics of the two paradigms.

Table 4.5: Features of the two main paradigms

Positivism tends to:	Interprevisim tends to:
“Use large samples”	“Use small samples”
“Have an artificial location”	“Have a natural location”
“Be concerned with hypothesis testing”	“Be concerned with generating theories”
“Produce precise, objective, quantitative data”	“Produce “rich”, subjective, qualitative data”
“Produce results with high reliability but low validity”	“Produce findings with low reliability but high validity”
“Allow results to be generalised from the sample to the population”	“Allow findings to be generalised to one setting to another similar setting”

Source: Collis and Hussey (2014)

In line with the discussion in the previous section, this thesis follows a generally positivist philosophy. This is more suitable for this thesis as it aims to examine the moderating effect of control of corruption of the relationship between formal institutions and the development of entrepreneurial activity. It does this by conducting a number of study hypotheses that can be empirically verified using the positivism research tools (Saunders *et al.*, 2009).

As a result, the primary approach that this thesis adopts is deductive since the researcher is building the hypotheses from theory and these need to test the causal relationships between the study variables (Saunders *et al.*, 2009). The appropriate approach utilised by this thesis is, therefore, a quantitative method, in which the researcher uses a panel (longitudinal) data tool for data collection (in this case, secondary data from different sources). Such panel data analysis is worth pursuing to enhance the reliability and validity of the research (for more details, see Section 4.10). In this context, reliability refers to “the accuracy and precision of the

measurement and absence of differences in the results if the research was repeated”, while validity refers to “the extent to which a test measures what the researcher wants it to measure and the results reflect the phenomena under study” (Collis and Hussey, 2014, pp. 52-53). Because the development of institutions may take an extended period (North, 1990; Williamson, 2000), this type of analysis is necessary for testing the interaction effect of informal and formal institutions on the development of entrepreneurial activity in emerging economies (Estrin *et al.*, 2013).

To this end, it is appropriate that this study follows a quantitative data collection method, employing deductive methods to answer the research question,

Do formal institutions affect entrepreneurial activity levels in the same way under both conditions of endemic corruption and freedom from it?

The detail on how this is applied in this study is given in the later section, Research Design (Section 4.5). The next section outlines the hypotheses that have been developed from the theory in Section 3.5.

4.4 Study Hypotheses

The study hypotheses are formulated in null form as follows:

H1a: The negative relationship between the number of procedures and entrepreneurship within an emerging economy is moderated by the country’s level of corruption, such that this negative relationship is stronger at lower levels of corruption.

H1b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

H2a: The positive relationship between education and training and entrepreneurship within an emerging economy is moderated by the country’s level of corruption, such that this positive relationship is stronger at lower levels of corruption.

H2b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

H3a: The positive relationship between access to credit and entrepreneurship within an emerging economy is moderated by the country's level of corruption, such that this positive relationship is stronger at lower levels of corruption.

H3b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

H4a: The positive relationship between technology absorption and entrepreneurship within an emerging economy is moderated by the country's level of corruption, such that this positive relationship is stronger at lower levels of corruption.

H4b: The hypothesised moderator effect will be stronger in more developed than in less developed emerging economies.

4.5 Research Design

While the research paradigm is a philosophical framework, it also guides how research should be conducted. Hence, since this study adopted the positivism paradigm, it should be closely linked to the research design, which refers to choosing the most appropriate methodology and methods that will be used to address the research question (Collis and Hussey, 2014). In this realm, the methodology is “an approach to the process of the research, encompassing a body of methods”, while a method is “a technique for collecting and/or analysing data” (Collis and Hussey, 2014, p. 59).

Different methodologies are associated with a positivism approach, such as experimental studies, surveys, cross-section studies and panel (longitudinal) studies. To test the study's hypotheses, this thesis relies on a quantitative approach with underlying panel regression analysis. The novelty of the study's approach is that it considers the institutional variables (formal and informal) as interaction variables, not as independent indicators. The interaction variables approach is used in regression analysis, where two independent variables are multiplied by each other to show their combined impact on the dependent variable.

Indeed, as revealed by our review of the literature in the previous chapters, there have been a substantial number of studies incorporating the institutional variables as independent factors to address the variations of entrepreneurial activity. However, our review of the empirical and theoretical literature identified that, whereas formal and informal institutional variables are entered independently, informal institutions become more dominant factors in emerging economies. In particular, formal institutional factors favour developed countries while informal institutions favour emerging countries. Moreover, it is quite apparent that the theoretical and empirical literature has mainly ignored and failed to address the impact of informal institutions on the development of formal institutions that focused on entrepreneurial activity (e.g., Fuentelsaz *et al.*, 2015; Aparicio *et al.*, 2016). Therefore, the applied interaction method appears to offer an appropriate balance for these opposing development effects of institutions.

In order to address shortcomings mentioned above, we put forward a theoretical framework in Chapter 3. This framework seeks to explain the moderating effect of control of corruption as an informal institution on the relationship between formal institutions and entrepreneurial activity. Briefly, our study argues that the impact of formal institutions on the development of entrepreneurial activity will be stronger in the presence of lower levels of corruption. Hence, for the first time, our study can contribute by extending the current literature, which only addresses the independent effect of formal and informal institutions, to include a model that can help explain the determinants of entrepreneurial activity in emerging economies that are located at different stages of economic development.

The generalised version of the theoretical framework and research hypotheses outlined in Figure 3.1 consisted of five primary factors identified by the theoretical and empirical literature: (1) the number of procedures, (2) education and training, (3) access to credit, (4) technology absorption, and (5) control of corruption. The theoretical framework drawn from Chapter 3 was developed into an empirical model in Chapter 5. Specifically, the robustness of the model specification and estimation issues was discussed in Section 5.4.

The following sections define the dependent variable and independent variables employed as proxies for those variables outlined in our conceptual framework (Sections 3.1 and 3.5) regarding the data sources and methods used.

4.6 Data Sources

To gather country-level secondary data about the variables included in the conceptual framework, this study relied on different sources. First, the dependent variable related to entrepreneurial activity was derived from the New Entry Rate (NER) of the World Bank entrepreneurship dataset (Acs *et al.*, 2008b).

Regarding the informal institutions, the data of control of corruption (CC) as the independent variable, was obtained from the Worldwide Governance Indicators (WGI) project. Moreover, the source of data for the independent variables of formal institutions, such as procedures for starting a business (PRO), was taken from the World Bank's Doing Business (DB) project. The second independent variable for business and entrepreneurial skills (TEDU) was obtained from the UNESCO database (Álvarez and Urbano, 2011; Chowdhury *et al.*, 2015b). The third independent variable for access to credit (AC) was selected from the Domestic Credit Indicator (Álvarez and Urbano, 2011). Lastly, the independent variable for the availability of the latest technologies in a country (TA) was taken from the Global Competitiveness Report (Acs *et al.*, 2008b; Stenholm *et al.*, 2013).

The data sources of control variables of GDP growth (GDPg) and GDP per capita purchasing power parity (GDPpc) were obtained from the World Bank (Bowen and De Clercq, 2008; Levie and Autio, 2011; Fuentelsaz *et al.*, 2015).

Table 4.6 presents a list of dependent and independent variables used in this study, including their sources. Our final sample consisted of a balanced panel (i.e., an equal number of time periods per country) with data on 396 observations and 44 countries (see Appendix 2 for a list of emerging economies with their mean values). The following sections offer a brief description of the data sources used in this study.

Table 4.6: Description of variables and their sources

Variable	Abbreviation	Description	Data source and availability
Dependant variable	New Entry Rate (NER)	“The number of newly registered firms with limited liability per 1,000 working-age people (ages 15-64) per calendar year.”	Doing Business 2006 to 2014 http://www.doingbusiness.org/data/exploretopics/entrepreneurship
Environmental factors Informal institutions	Control of Corruption (CC)	“Control of corruption (CC) – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests. The values are between -2.5 and 2.5 with higher scores corresponding to better outcomes of institutions”.	WGI 2006-2014 https://data.worldbank.org/data-catalog/worldwide-governance-indicators
Environmental factors formal institutions	Procedures for starting a business (PRO)	“The number of procedures required to legally operate a commercial or industrial firm are recorded, including interactions to obtain necessary permits and licenses and to complete all inscriptions, verifications, and notifications for starting operations. Data are for limited liability companies with certain standardized characteristics in order to facilitate comparisons between economies.”	Doing Business 2006 to 2014 https://data.worldbank.org/data-catalog/doing-business-database
	Tertiary Education (TEDU)	“Total enrolment in tertiary education, regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving.”	UIS 2006 to 2014 https://data.worldbank.org/indicator/SE.TER.ENRR?view=chart
	Access to Credit (AC)	“Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises.”	World Bank 2006 to 2014 https://data.worldbank.org/indicator/FD.AST.PRVT.GD.ZS
	Firm-level Technology Absorption (TA)	To what extent do businesses in your country absorb new technology? [1 = not at all; 7 = aggressively absorb]	Global Competitiveness Report 2006 to 2014 http://reports.weforum.org/global-competitiveness-report-2015-2016/downloads/
Control variable	GDP Growth (GDPg)	“Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value.”	World Bank 2006 to 2014 https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?view=chart
	GDP Per Capita PPP (GDPpc)	“GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates.”	World Bank 2006 to 2014 https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

Source: Devised by author

4.6.1 The Doing Business Project (DB)

The World Bank established the Doing Business (DB) report in 2004. It is conducted annually to provide objective measures of business regulations affecting domestic small and medium-size firms located in the largest business city of each economy. Over the past 15 years, the project has developed 11 areas (see Table 4.7) of business regulations and expanded to 190 economies (Doing Business, 2004, 2018).

The Doing Business project depends on gathering and analysing extensive quantitative data to compare between economies concerning their business environments over time. Hence, this project aims to encourage countries to compete towards more efficient regulations, offer measurable benchmarks for reform, and serve as a resource for governments, researchers, international organisations and think tanks to guide policies, develop new indexes and conduct research (Doing Business, 2018).

Table 4.7: Doing Business measures of business regulation

Indicator set	What is measured
1. Starting a business	“Procedures, time, cost and paid-in minimum capital to start a limited liability company”
2. Dealing with construction permits	“Procedures, time and cost to complete all formalities to build a warehouse and the quality control and safety mechanisms in the construction permitting system”
3. Getting electricity	“Procedures, time and cost to get connected to the electrical grid, the reliability of the electricity supply and the transparency of tariffs”
4. Registering property	“Procedures, time and cost to transfer a property and the quality of the land administration system”
5. Getting credit	“Movable collateral laws and credit information systems”
6. Protecting minority investors	“Minority shareholders’ rights in related-party transactions and in corporate governance”
7. Paying taxes	“Payments, time and total tax and contribution rate for a firm to comply with all tax regulations as well as post-filing processes”
8. Trading across borders	“Time and cost to export the product of comparative advantage and import auto parts”
9. Enforcing contracts	“Time and cost to resolve a commercial dispute and the quality of judicial processes”
10. Resolving insolvency	“Time, cost, outcome and recovery rate for a commercial insolvency and the strength of the legal framework for insolvency”
11. Labour market regulation	“Flexibility in employment regulation and aspects of job quality”

Source: Doing Business report (2018)

To offer reliable results, the methodology followed for each indicator is straightforward and easy to replicate, as shown in Figure 4.1. Researchers can follow the methodology and build the same measures as benchmarks for foreign companies and sole proprietorships. Different assumptions are employed to make the business comparable across nations. The business is:

“a limited-liability company (If there is more than one type of limited-liability company in the country, the type most popular among domestic firms is chosen.); operates in the country’s most populous city; is 100 per cent domestically owned and has five founders, none of whom is a legal entity; has start-up capital of 10 times income per capita, paid in cash; performs general industrial or commercial activities, such as the production and sale of products or services to the public; leases the commercial plant and offices; does not qualify for investment incentives or any special benefits; has up to 50 employees one month after the start of operations, all of them nationals; has turnover of at least 100 times income per capita; and has a company deed 10 pages long” (Doing Business, 2004, p. 3).

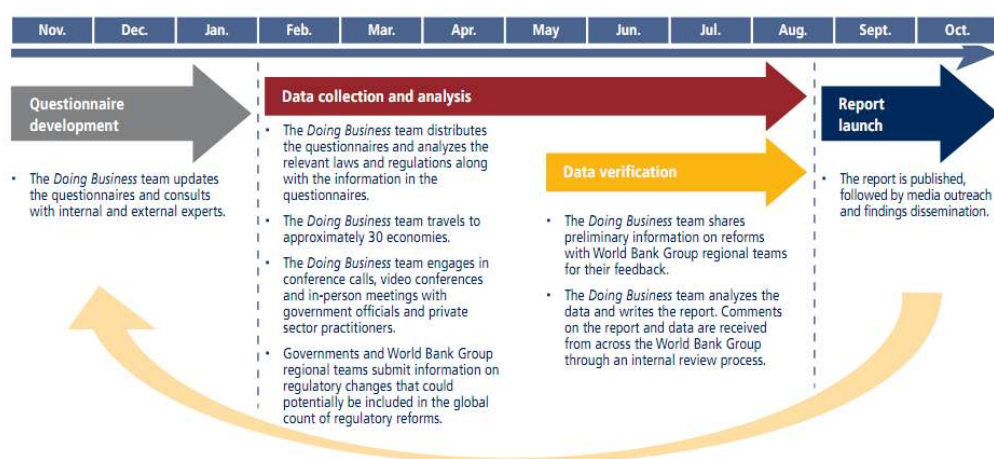


Figure 4.1: Doing Business methodology for collecting and verifying the data

Source: Doing Business report (2018)

Although the DB methodology is considered to be an easily replicable way to benchmark particular factors of business regulation, it is crucial to understand the advantages and limitations when using the data (Table 4.8). In this realm, the DB dataset is unable to cover informal entrepreneurship where this type of business is pervasive in emerging economies (Doing Business, 2018).

Table 4.8: Advantages and limitations of the Doing Business methodology

Feature	Advantages	Limitations
Use of standardized case scenarios	“Makes data comparable across economies and methodology transparent”	“Reduces scope of data; only regulatory reforms in areas measured can be systematically tracked”
Focus on largest business city	“Makes data collection manageable (cost-effective) and data comparable”	“Reduces representativeness of data for an economy if there are significant differences across locations”
Focus on domestic and formal sector	“Keeps attention on formal sector where regulations are relevant and firms are most productive”	“Unable to reflect reality for informal sector or for foreign firms facing a different set of constraints”
Reliance on expert respondents	“Ensures that data reflect knowledge of those with most experience in conducting types of transactions measured”	“Indicators less able to capture variation in experiences among entrepreneurs”
Focus on the law	“Makes indicators “actionable” because the law is what policy makers can change”	“Where systematic compliance with the law is lacking, regulatory changes will not achieve full results desired”

Source: Doing Business report (2018)

4.6.2 World Government Indicators (WGI)

The Worldwide Governance Indicators (WGI) is a research project produced by the World Bank to capture the quality of governance in over 200 countries. In this respect, governance consists of:

“the traditions and institutions by which authority in a country is exercised. This includes (a) the process by which governments are selected, monitored and replaced; (b) the capacity of the government to effectively formulate and implement sound policies; and (c) the respect of citizens and the state for the institutions that govern economic and social interactions among them” (Kaufmann *et al.*, 2010, p. 4).

The indicators measured six dimensions of governance: voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption between 1996 and 2016 (Table 4.9). The source data underlying the WGI come from nearly 40 data sources, produced by over 30 organisations worldwide and updated annually since 2002. The data reflect the perceptions on governance of the public sector, the private sector, NGO sector experts, and thousands of survey respondents worldwide (www.govindicators.org).

Table 4.9: The six dimensions of World Governance Indicators (WGI)

Indicator	What is measured
Voice and Accountability	“measuring 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”
Political Stability and Absence of Violence	“measuring perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism”
Government Effectiveness	“measuring 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”
Regulatory Quality	“measuring the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development”
Rule of Law	“measuring the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence”
Control of Corruption	“measuring the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests”

Source: Kaufmann *et al.* (2007)

To make the data comparable across countries, each of six aggregate WGI measures is created by averaging together data from the primary sources that relate to the definition of governance being measured. This approach is made in the three phases. First, individual questions from the underlying sources are placed to each of the six aggregate measures. Second, the questions derived from the individual data sources are first rescaled to run from 0 to 1, with higher values likely representing better outcomes. The last step uses the Unobserved Components Model (UCM) to build a weighted average of the individual indicators for each source. The UCM was justified by Kaufmann *et al.* (2010, p. 10), who argued that:

“since “true” governance is difficult to observe and we can observe only imperfect indicators of it, how can we best extract a “signal” of unobserved governance from the observed data? Under this view, all individual indicators of corruption, for example, should be viewed as noisy or imperfect proxies for corruption. Aggregating these together can result in a more informative signal of corruption. However, even these aggregate measures are imperfect, and this imperfection is usually summarised by the standard errors and confidence intervals generated by the UCM”.

Although WGI has significant problems in their methodology, such as the complexity of combining different data sources and choosing arbitrary data sources to reflect each indicator, it still offers a useful snapshot of some views of a country's quality of governance (Kaufmann *et al.*, 2007, 2010).

4.6.3 UNESCO Institute for Statistics (UIS)

The United Nations, Educational, Scientific and Cultural Organisation (UNESCO) Institute for Statistics (UIS) was established in 1999 to offer comparable data used to monitor progress towards the Sustainable Development Goal for education (SDG 4), and key targets related to science and culture. The UIS has the mandate to “work with partners to develop new indicators, statistical approaches and monitoring tools to better assess progress across targets related to UNESCO’s mandate” (UNESCO-UIS, 2017, p. 2).

Concerning formal education, the UIS releases data on its website twice a year. The UIS collects education statistics in a comprehensive form from official administrative sources at the national level. Collected information includes data on:

“educational programmes, access, participation, progression, completion, literacy, educational attainment and human and financial resources”.

These statistics cover:

“formal education in public (or state) and private institutions (early childhood education, primary and secondary schools, and colleges, universities and other tertiary education institutions), and special needs education (both in regular and special schools)”.

These data are gathered annually by the UIS and its partner agencies through three significant surveys: UIS survey of formal education, UOE (UNESCO-UIS, the OECD and Eurostat) survey of formal education, and Literacy and Attainment Survey².

² Background Information on Education Statistics in the UIS Database, UNESCO Institute for statistics, available at <http://uis.unesco.org/en/methodology#slideoutmenu>

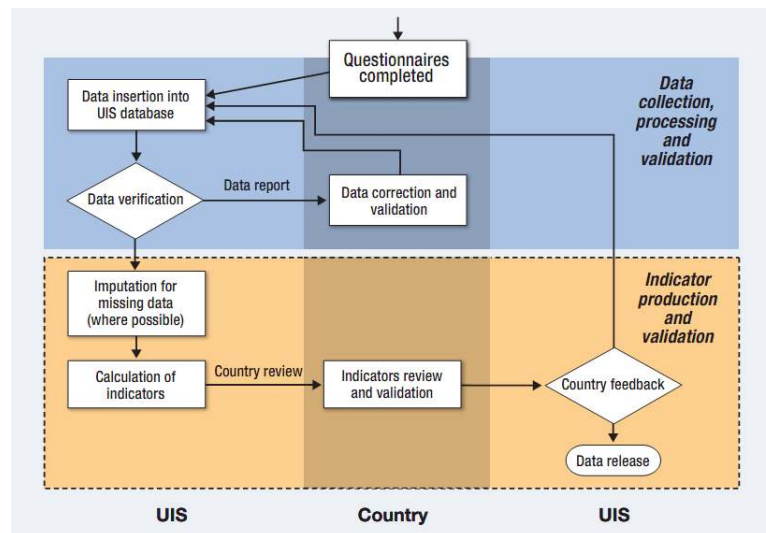


Figure 4.2: Quality assurance in UIS data collection, processing and validation

Source: UNESCO-UIS (2017)

To ensure that the data gathered are reliable and valid, they go through a series of checks, as shown in Figure 4.2. UIS data experts review the data to make sure that data cover the entire national education system and comply with international standards and definitions. Also, the statistical experts compare data across several sources, when possible, such as “household survey data and any available time series and national statistical yearbooks or databases. Reported data are also compared to other countries in the same region or income group” (UNESCO-UIS, 2017, p. 38).

4.6.4 World Development Indicators (WDI)

World Development Indicators (WDI) is conducted annually from the primary World Bank collection of development indicators and compiled from officially recognised international sources. It shows the most current and accurate global development data available and consists of regional, national and global estimates. WDI organises the data into six thematic areas and presents highlights from each one. These are:

- poverty and shared prosperity (progress toward the World Bank Group’s primary goals);
- people (gender, health and employment);
- environment (natural resources and environmental changes);
- economy (new opportunities for growth);

- states and markets (elements of good investment climate); and
- global links (evidence of globalisation).

These six thematic areas include over 800 indicators covering more than 200 economies (World Bank, 2017).

4.6.5 Global Competitiveness Report (GCR)

The Global Competitiveness Report (GCR) is a yearly report published by the World Economic Forum (WEF) since 2004. It provides an appropriate portrait of a country's economic environment and its capacity to accomplish sustained levels of economic growth and prosperity. For a portrayal that represents reliable and valid data, the WEF uses statistical data from two sources: international recognised organisations such as UNESCO, IMF and the World Bank, and its own Executive Opinion Survey (Survey) (Schwab and Sala-i-Martin, 2014).

The WEF has conducted its annual Survey for over 30 years; it captures the opinion of business executives for which data sources are scarce or not available around the world. Those business leaders are asked a set of standardised questions to draw their opinions about various aspects of the business environment of a specific economy where their firm operates. The survey targets firms that usually have more than 100 employees; they are randomly nominated based on the classification of firms (e.g., primary, secondary and tertiary sectors), based on the input of each industry sector to a country's GDP. The 2014 version of the survey has extended the size of its sample, reaching a record of over 14,000 surveys from 148 countries. Therefore, this survey offers an understanding of each country's economic and business environment as well as internationally comparable statistical data. Each year, the data collected from respondents are subject to a careful review by the WEF's experts to evaluate the quality and reliability of the response data by evaluating them with data from published sources (Schwab and Sala-i-Martin, 2014). The following sections discuss the measurements used for the study's variables in detail.

4.7 Dependant Variable: Entrepreneurial Activity

In an attempt to explain the causes of entrepreneurial activity in emerging economies, there are five explanatory variables consistent with the study hypotheses outlined in our conceptual framework developed in Chapter 3.

In practice, institutions are difficult to measure and may lead to serious specification dilemmas because the available indicators are usually highly correlated with each other (Aidis *et al.*, 2012). In this respect, North (1990, p. 107) stated “We cannot see, feel, touch or even measure institutions; they are constructs of the human mind”. Therefore, this study employed different statistical tools described in the next chapter (e.g., Variance Inflation Factor (VIF) computations) to ensure robustness of the findings.

4.7.1 Existing entrepreneurship measures

To date, several attempts have been developed and introduced to measure different types of entrepreneurial activity at the country-level (Acs *et al.*, 2008b; Acs and Szerb, 2010; Desai, 2011; Acs *et al.*, 2014a). In their review, Acs *et al.* (2014a) identified three broad approaches currently being adopted in research into measuring entrepreneurial activity; these are output, attitude, and framework indicators.

Output measures

Output indicators “track the emergence or registration of new self-employment or new firms within a given population” (Acs *et al.*, 2014a, p. 479). In other words, entrepreneurship is measured at the national level based on the number of registrations of new businesses, self-employment registries or survey data.

Based on primary survey data, the Global Entrepreneurship Monitor (GEM) has been widely used to measure entrepreneurship by offering uniform definitions and data collection that can be comparable across countries (Sternberg and Wennekers, 2005; Acs *et al.*, 2008b; Valliere and Peterson, 2009; Liñán and Fernandez-Serrano, 2014). According to GEM’s (2015) report, the GEM index is an annual assessment of the national level of entrepreneurial activity. The index has expanded from 10 countries in 1999 to 73 countries in the year 2014, representing 72.4% of the world’s

population, 90% of the world's GDP and includes both developed and developing countries (Acs *et al.*, 2008b; Singer *et al.*, 2015).

The GEM index uses different separate indices to measure Total Entrepreneurial Activity (TEA). These indices include both nascent entrepreneurship rate and gazelle firms. The nascent entrepreneurship rate is “the number of people actively involved in starting a new venture, as a percentage of the adult population (18-64 years of age)” (Wennekers *et al.*, 2005, p. 297). Gazelle firms are “all start-ups and newly formed businesses (less than 42 months old) which expect to employ at least 20 employees in 5 years” (Valliere and Peterson, 2009, p. 461). The GEM data also distinguish between opportunity and necessity of nascent entrepreneurial activity based on why individuals participate in entrepreneurial activities. Opportunity entrepreneurs are those who recognise a business opportunity (i.e. they choose to start a venture as one of several possible career alternatives), while necessity entrepreneurs are those who realise entrepreneurship as their last option (i.e. they feel obliged to start their own business because all other work alternatives are either absent or insufficient) (Wennekers *et al.*, 2005; Valliere and Peterson, 2009; Singer *et al.*, 2015).

Although the GEM index is considered to be the most commonly used in different studies, the nascent rate may not accurately measure the actual firm formation (Desai, 2011). In particular, Desai (2011) contended that the survey's respondents might be considered nascent entrepreneurs if they have taken initial steps to form a business. However, this new venture may not appear for several years, or it may never do so. Other authors (see Acs *et al.*, 2008b; Sautet, 2013) argued that the central dilemma of the GEM index is the incapability to compare between entrepreneurial activity in developed and developing countries effectively. Specifically, GEM measures fail to separate business's roles and impacts between traditional agricultural businesses in African countries compared to Internet-related businesses in the USA (Acs and Szerb, 2010). Moreover, the GEM index does not attempt to consider the interaction between the contextual factors, such as the institutional setting that influences the entrepreneurial productivity (Acs and Szerb, 2010).

While the GEM index uses random survey data of the adult population to measure entrepreneurial activity, the World Bank Index is more concerned with data from national business registries. The OECD data rely on business registries from the chamber of commerce and other public registries to conduct an index to measure high growth firms' prevalence concerning the overall population of registered firms. According to the OECD-Eurostat (2007) report, a high-growth firm refers to:

“a registered firm (trade registry, employment registry, or such) that has achieved at least 60% employment growth during a period of two years, with at least 20% annual growth in each, and which employed at least 10 employees at the beginning of the period” (Acs *et al.*, 2014a, p. 479).

Hence, based on the OECD index, entrepreneurial activity can be measured through the prevalence rate of firms that show high employment growth against new start-ups. Acs *et al.* (2014a) contended that the OECD approach failed to be comparable across countries due to differences in registration practices. Also, this approach may not capture the number of new businesses that did not register for any reason.

In the same vein, the data of World Bank Group Entrepreneurship Survey (WBEGS) depend on the birth of new business registries in the public sectors. The WBEGS index is designed to measure entrepreneurial activity by collecting data on the number of formal sector companies with limited liability (LLCs) in order to be comparable across countries. In this survey, entrepreneurship is defined as “the activities of an individual or a group aimed at initiating economic activities in the formal sector under a legal form of business” (Klapper *et al.*, 2010).

Desai (2011) highlighted that the WBEGS approach offers a high level of comparability across countries with different legal origins and political systems. However, the author questioned the usefulness of such an approach in the context of developing countries where informal entrepreneurship is considered an essential key driver to economic growth. She further argued that entrepreneurship might take different types in addition to LLCs in these developing economies.

Together these output indicators provide essential insights into considering a country to be entrepreneurial if it has a high number of new businesses registries or its individuals are trying to start new ventures. Acs *et al.* (2014a) suggested that the

strength of survey data is that it separates the type of entrepreneurship entries (e.g., necessity and opportunity entrepreneurs), records the number of individuals who have taken initial steps to be entrepreneurs, and can be comparable across countries. The authors further argued that the advantage of registry data is that it records formal entrepreneurs who are supposed to be active in the market. However, all the previous measures on entrepreneurship must be interpreted with caution as they may provide different interpretations (Acs *et al.*, 2014a).

Attitude measures

The second category of entrepreneurship indicators attempts to measure the country's attitudes and opinions towards entrepreneurship. There are a large number of published surveys (e.g., the International Social Survey Programme (ISSP, 1997); GEM survey and Euro-barometer survey (Gallup, 2009), that describe a country's attitude toward entrepreneurship. Acs *et al.* (2014a) contended that the Euro-barometer survey is probably the most critical index in this category as it has an extensive survey to measure a country's attitude towards entrepreneurship.

These survey-based indicators track a variety of attitudes relating to entrepreneurship. These include:

“preference for being self-employed; reasons for preferring self-employment (or not); attitudes towards entrepreneurs (including success and failure); and self-efficacy perceptions. Combined, such measures provide valuable evidence on the feasibility, desirability, and legitimacy considerations associated with the decision to become self-employed.” (Acs *et al.*, 2014a, p. 480).

Collectively, these attitude indicators suggest that entrepreneurial countries tend to have a more positive attitude climate towards entrepreneurship, or perceive self-employment as an opportunity career in the market. However, such attitude surveys remain narrow in focus, dealing only with the country's opinion environment or entrepreneurial culture, as these indicators do not accurately reflect the actual entrepreneurial activity (Acs *et al.*, 2014a).

Framework measures

A third category of measuring entrepreneurial activity, reviewed by Acs *et al.* (2014a), is based on the framework conditions for entrepreneurship. Three primary

approaches of framework measures exist. One approach is the GEM index, where national experts are asked to fill out a questionnaire survey that reflects the entrepreneurial framework conditions of each country (Reynolds *et al.*, 2005). Another approach is adopted by the World Bank “Ease of Doing Business” (EDB) index, which measures business regulations based on a questionnaire survey for new business entries (Djankov *et al.*, 2002). Building on the work of the EDB index, the third approach is the Organisation for Economic Co-operation and Development (OECD) entrepreneurship index, which has developed a more comprehensive framework measure to differentiate between framework conditions, entrepreneurial performance, and economic factors (Ahmad and Hoffmann, 2008).

According to Djankov *et al.* (2002), the EDB index is built on collecting data from the registration of new LLCs to measure the framework conditions of each country. Thus, these framework indicators are highly related to the regulatory environment. Building on the work of Djankov *et al.* (2002), Acs *et al.* (2014a, p. 480) illustrated some of these framework indicators such as:

“the number of procedures required to register a new business; the number of days required to complete a new business registration; minimum capital requirement for new limited liability companies (as % of GDP per capita); procedures and cost to build a warehouse; creditor recovery rate in bankruptcy events; and so on”.

However, this approach of measuring entrepreneurial activity has a number of limitations. Djankov *et al.* (2002) argued that the EDB index makes no attempt to provide information on new firm creation activity. Also, the EDB index dataset suffers from a restricted range of entrepreneurship types as it includes only registered companies that employ 5-50 employees within the first month of operation and have sales turnover of up to 10 times venture capital (Djankov *et al.*, 2002). Hence, the EDB index framework conditions may or may not represent 90% of the new entrepreneurial activity in a particular country (Acs *et al.*, 2014a).

The OECD entrepreneurship index initiated the Entrepreneurship Indicators Programme (EIP) in order to assess the framework conditions that enhance entrepreneurial performance (i.e., the registration and growth of new limited liability companies), and ultimately its impact on different economic factors (i.e., job

creation, economic growth, formalising the informal sector and poverty reduction) (Ahmad and Hoffmann, 2008). The EIP is built on different existing initiatives, including the Danish government and policy research think tank – FORA, the World Bank Ease of Doing Business index, the World Bank Entrepreneurship Survey, and the OECD’s efforts to track various forms of new business registrations and exits (Hoffmann *et al.*, 2006; Ahmad and Hoffmann, 2008).

Acs *et al.* (2014a), however, argued that the link between entrepreneurial performance and framework conditions remain an assumption rather than empirical-based evidence. Thus, Acs *et al.* (2014a) further argued that establishing a statistical relationship may be challenging among the different variables in the EIP model (Ahmad and Hoffmann, 2008).

In summary, framework indicators provide valuable insight into evaluating the institutional and regulatory conditions that exist in a country. However, Acs *et al.* (2014a) contended that difficulties arise when an attempt is made to link framework conditions and individual entrepreneurial activity. In that sense, a country is considered to be entrepreneurial when the institutional conditions and regulations are supportive, regardless of their link to different types of entrepreneurship. Also, these framework indicators neglect to measure the types of informal entrepreneurship in which they are essential in the context of developing countries (Acs *et al.*, 2014a).

This section has reviewed the three key indicators of measuring entrepreneurship at the country level; output, attitude, and framework indicators. Although all the previously mentioned measurement approaches have their own advantages, these approaches suffer from some severe limitations. Acs *et al.* (2014a) argued that output indicators tend to ignore the institutional context at the country level (i.e., new firm formations are the same, regardless of the national context). Moreover, the authors contended that it is possible that the results of positive attitude measures may not be interpreted as real active entrepreneurial behaviour. Acs *et al.* (2014a) further argued that framework indicators failed to offer adequate longitudinal data to explain the interaction effects between institutional conditions and entrepreneurial productivity. Finally, Acs *et al.* (2014a) suggested that all the approaches reviewed so far, have failed to focus on the processes that drive those output indicators (e.g., how and when entrepreneurs’ attitudes drive into productive behaviours). As a result, none of

the reviewed measures fully capture the systemic character of entrepreneurial activity at the country-level.

Acs *et al.* (2014a), therefore, suggested that there is a need for a new measure that tackles the limitations of the previous indicators in which an ecosystem of entrepreneurship is required within each country. Acs *et al.* (2014a) further argued that each government at the national-level should focus on the systems of entrepreneurship that provide incentives to entrepreneurs who pursue new opportunities in the market. In addition, Acs *et al.* (2014a) contended that an entrepreneurial country is characterised by the ecosystem of entrepreneurship in which there is constant interaction between individual-level actions and institutional framework (e.g., the government, education system, financial infrastructure, productive sectors, and civil society) in order to achieve higher levels of productive entrepreneurship and ultimately contribute to economic growth (Aparicio *et al.*, 2016).

In consideration of previous discussions, Acs *et al.* (2014a, b) initiated the Global Entrepreneurship Index (GEI), which is a complex measure to capture the multi-faceted nature of entrepreneurial activity at the country level. Moreover, GEI provides an appropriate contextualisation in which it allows for interactions between the institutional conditions and the individual level variables. Therefore, GEI is of great significance as it marks the first attempt to assess entrepreneurial activity by measuring the broader impact of the interactions between institution conditions and individual level variables (see Section 7.3.5 for more details about GEI methodology).

However, this approach suffers from multiple design flaws. Limited data availability has constrained the design of GEI pillars. In addition, several possible institutional variables may interact significantly with each individual level variable as the current model is limited to one institutional variable. In this sense, the existing model of interactions between an institution's conditions and individual level variables may not suit all countries and contexts where these countries are at different stages of economic development (Acs *et al.*, 2014a). Therefore, this thesis may provide a better understanding of such interactions between institutional conditions and individual level variables in the context of emerging economies.

4.7.2 New Entry Rate (NER) for measuring entrepreneurial activity

Based on the previous discussion, this study used the new entry rate (NER) as an indicator of entrepreneurial activity. This measure tracks the entry rate of firms that have been newly registered with government authorities, and calculates the density (i.e., population prevalence) of new limited liability companies (LLCs) established per 1,000 working-age population (18-64 years old) in a country (Acs *et al.*, 2008b). This data is derived from the WBEGS that defines the unit of measurement of entrepreneurship as:

“Any economic unit of the formal sector incorporated as a legal entity and registered in a public registry, which is capable, in its own right, of incurring liabilities and of engaging in economic activities and transactions with other entities” (Acs *et al.*, 2008b, p. 267).

This index is commonly used in the literature to compare entrepreneurial activity across countries (Acs *et al.*, 2008b; Dau and Cuervo-Cazurra, 2014; Autio and Fu, 2015; Belitski *et al.*, 2016). However, this measure does not consider other forms of businesses activities, such as a sole proprietorship, a partnership, a cooperative, a corporation, or a joint stock company. Private limited companies, however, are the most prevalent business type around the world. In the context of emerging economies, such as Latvia's, LLCs account for 62% of all registered businesses and 93% of output (Doing Business, 2004, 2018).

Therefore, this measure is particularly useful in accounting for “productive” entrepreneurship, as aspiring entrepreneurs tend to register their ventures in order to benefit from the potential advantages of participating in the formal economy (e.g., investors are encouraged to invest in LLCs due to limited potential losses to their capital investment) (Baumol, 1990; Doing Business, 2004; Klapper *et al.*, 2010; Levie and Autio, 2011; Ghura *et al.*, 2017).

Also, Acs *et al.* (2008b) found that these new start-up rates correlate positively to economic growth measured by GDP. In contrast, GEM TEA data has a U-shaped relationship with economic development (Sternberg and Wennekers, 2005; Wennekers *et al.*, 2005). This latter result could mislead policy-makers in emerging economies as it indicates that entrepreneurial activity may not contribute

significantly to economic growth and development for countries at the efficiency-driven stage.

In the same vein, GEM data measure the potential for entrepreneurial activity. However, WBEGS data measure the actual entrepreneurial activity, albeit at a formal level (Acs *et al.*, 2008b). Therefore, studies that used WBEGS and GEM data offered different findings. Acs *et al.* (2008b) suggested that these contradictory results in empirical entrepreneurship research are due to the differences in what the data capture. In particular, while GEM data do not relate to administrative barriers to entrepreneurial activity, a significant adverse effect exists with WBEGS data (Klapper and Delgado, 2007; van Stel *et al.*, 2007).

Considering that this study is examining the variations of entrepreneurial activity based on the institutional environment, Desai (2011) argued that nascent entrepreneurs in GEM data do not experience any regulation barriers. Therefore, nascent entrepreneurs have often not yet registered their new ventures because there is no formalisation condition. However, since the WBEGS dataset measures registered businesses, respondents would have experienced regulation obstacles. In other words, respondents in the GEM dataset do not report on regulation problems since they do not encounter them, not because they are not a barrier (Belitski *et al.*, 2016).

In this sense, the WBEGS dataset could be more valid for this study to measure entrepreneurial activity than other measures such as TEA or self-employment. This is because it measures new formal firms that, rationally, would be more sensitive to institution barriers, such as complex regulations and corruption.

4.8 Independent Variables

4.8.1 Control of Corruption (CC)

As discussed in Chapters 3, corruption is described as an illegal/informal activity used by public officials for private gain (Aidis *et al.*, 2012). Therefore, it is challenging for researchers to use objective measures of corruption (Tonoyan *et al.*, 2010). The solution was then assayed for corruption using subjective measures. Although critics have argued that subjective measures provide an inaccurate measure

of corruption in the sense that “the rankings of corruption index are perhaps, based on common press depictions of countries or conventional notions about what institutions or cultures are conducive to corruption” (Fan *et al.*, 2009; Lau *et al.*, 2013, p. 2), research contended that this method is an acceptable alternative for measuring corruption (Tanzi, 1998; Kaufmann *et al.*, 2010; Hamilton and Hammer, 2018).

There are a number of instruments available for measuring corruption. However, Judge *et al.* (2011) found that the two most common measures of corruption used were, (1) the Corruptions Perception Index (CPI), developed annually by Transparency International (TI), and (2) the Control of Corruption Index (CCI), reported by the World Bank. Moreover, more studies have tested the reliability and validity of these measures (Bowen and De Clercq, 2008; Tonoyan *et al.*, 2010; Payne *et al.*, 2013; Hamilton and Hammer, 2018). For example, Tonoyan *et al.* (2010) found very high correlation values between the above-mentioned measures, ranging from 0.81 to 0.84, between 2000 and 2008, thus indicating a high validity of these two measures.

While the results of CPI are only comparing year on year since 2012³, the alternative measure of corruption in this study is control of corruption (CC) derived from the CCI. Control of corruption (CC):

“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 elites and private interests” (Kaufmann *et al.*, 2007, p. 4).

The CCI is updated annually for countries throughout the world. Indicators include such things as, (1) frequency of additional payments required to get things done, (2) effects of corruption on the general business environment, and (3) the tendency of elites to control the state. The component indicators are assessed by international organisations, political and business risk rating agencies, international think tanks, and relevant non-governmental organisations. The scores in this database lie between -2.5 and 2.5, with higher scores corresponding to better outcomes of the institutions

³ Corruption Perceptions Index, 2017, “Technical Methodology Note”, Transparency International, available at:
https://www.transparency.org/news/feature/corruption_perceptions_index_2017#resources.

(Kaufmann *et al.*, 2007). Different studies in entrepreneurship research have recently used this measure (Álvarez and Urbano, 2011; Aparicio *et al.*, 2016; Belitski *et al.*, 2016).

To this end, Hamilton and Hammer (2018, p. 27) commented on using the measures mentioned earlier that:

“Using an extensive literature review, correlations, and factor analysis, this paper has shown that while both objective and subjective indicators of corruption meet these criteria, the most appropriate indicators are the composite subjective indicators: the CPI and the CC. This set of findings shows that it is possible to use robust subjective indicators of rent-extraction to measure underlying levels of corruption – an outcome that will be invaluable for measuring and monitoring progress against the Sustainable Development Goals”.

4.8.2 Number of Procedures (PRO)

Concerning the formal institutions, this study measures the dimension of the number of procedures (PRO) as “the number of procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business” produced by the World Bank’s Ease of Doing Business project (Doing business, 2004, p. 3).

Djankov *et al.* (2002) developed several assumptions for measuring the number of procedures and making them comparable across countries. First, a procedure is described as “any interaction of the business founder with external parties (e.g., government agencies, lawyers, auditors, notaries)”. Additionally, the authors stated that the “interactions between company founders or company officers and employees are not considered separate procedures”. Second, entrepreneurs “complete all procedures themselves, without facilitators, accountants, or lawyers, unless the use of such third parties is required”. Third, procedures are ignored if the law does not require them for starting the new venture. For example, “obtaining exclusive rights over the company name is not counted in a country where businesses are allowed to use a number as identification”. Fourth, the shortcuts of procedures are recorded if they satisfied three requirements: “they are not illegal, they are available to the general public, and avoiding them causes substantial delays”. Fifth, procedures are recorded if all businesses require them. For instance, procedures to meet the terms of

environmental regulations are not counted unless they are needed for all companies. Lastly, procedures that the entrepreneur goes through to get services, such as water, electricity, gas, and waste disposal, are excluded unless they are legally required to start operating the company (all quotes from Doing Business, 2004, p. 4).

To make this measure comparable across countries, these data are for limited liability companies with specific standardised characteristics (Djankov *et al.*, 2002, p. 6; Klapper and Love, 2010). Djankov *et al.* (2002) suggested a list of typical procedures associated with setting up a firm as shown in Table 4.10. These procedures are further separated based on their function: screening (a residual category, which generally aims to keep out “unattractive” projects or entrepreneurs), health and safety, labour, taxes, and environment.

The process of collecting data from the start-up procedures is as follows: the data are first collected from government publications such as the government web pages on the Internet. Then, the relevant government agencies should be contacted to check the accuracy of the data. Lastly, to eliminate any data conflict, at least one independent local law firm is employed in each country to confirm the results of the government officials. In case of discrepancy between the government officials’ estimates and the law firm, the median estimates are taken (Djankov *et al.*, 2002).

To validate the Doing Business dataset, Djankov *et al.* (2002) found that the number of procedures is highly correlated with two other measures of entry regulations (i.e., the official time required to complete the process of registering a new business, and its official cost). Moreover, Danis *et al.* (2011) found a positive correlation between one of the entry regulations variables (i.e., the time required to register a new business with the government), and GEM’s Expert Questionnaire about the reliability and effectiveness of a country’s regulations for new and growing firms. Recently, several studies used the Ease of Doing Business dataset to measure the number of procedures in emerging economies (Álvarez and Urbano, 2011; Chowdhury *et al.*, 2015b; Aparicio *et al.*, 2016).

Table 4.10: A list of common procedures required for starting up a firm

1. Screening procedures

- Certify business competence
- Certify a clean criminal record
- Certify marital status
- Check the name for uniqueness
- Notarize company deeds
- Notarize registration certificate
- File with the Statistical Bureau
- File with the Ministry of Industry and Trade, Ministry of the Economy, or the respective ministries by line of business
- Notify municipality of start-up date
- Obtain certificate of compliance with the company law
- Obtain business license (operations permit)
- Obtain permit to play music to the public (irrespective of line of business)
- Open a bank account and deposit start-up capital
- Perform an official audit at start-up
- Publish notice of company foundation
- Register at the Companies Registry
- Sign up for membership in the Chamber of Commerce or Industry or the Regional Trade Association

2. Tax-related requirements

- Arrange automatic withdrawal of the employees' income tax from the company payroll funds
- Designate a bondsman for tax purposes
- File with the Ministry of Finance
- Issue notice of start of activity to the Tax Authorities
- Register for corporate income tax
- Register for VAT
- Register for state taxes
- Register the company by laws with the Tax Authorities
- Seal, validate, rubricate accounting books

3. Labor/social security-related requirements

- File with the Ministry of Labor
- Issue employment declarations for all employees
- Notarize the labor contract
- Pass inspections by social security officials
- Register for accident and labor risk insurance
- Register for health and medical insurance
- Register with pension funds
- Register for Social Security
- Register for unemployment insurance
- Register with the housing fund

4. Safety and health requirements

- Notify the health and safety authorities and obtain authorization to operate from the Health Ministry
- Pass inspections and obtain certificates related to work safety, building, fire, sanitation, and hygiene

5. Environment-related requirements

- Issue environmental declaration
 - Obtain environment certificate
 - Obtain sewer approval
 - Obtain zoning approval
 - Pass inspections from environmental officials
 - Register with the water management and water discharge authorities
-

Source: Djankov *et al.* (2002)

4.8.3 Education and Training (TEDU)

The second formal institution for the education and training variable (TEDU) was measured as the percentage of the population with tertiary education in the country, as obtained from the UIS database. UIS defined the tertiary education measure as the:

“total enrolment in tertiary education (ISCED 5 to 8), regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving”⁴.

Acs *et al.* (2017) suggested that this indicator is useful to measure the country’s level of education and found that it is related positively to a higher quality of entrepreneurial activity.

This study followed Bowen and De Clercq (2008) to validate our measures, and calculated its correlation with the following question asked in the World Economic Forum’s (WEF) Executive Opinion Survey: “How would you assess the quality of scientific research institutions in your country?” (1 = very poor; 7 = the best in their field internationally) over the period 2006-2014. A relatively low but significant correlation of 0.37 ($p < 0.001$) was found. Different studies used the study’s measure to estimate the start-up skills in a certain country (Álvarez and Urbano, 2011; Acs *et al.*, 2014a, b; Chowdhury *et al.*, 2015b).

4.8.4 Access to Credit (AC)

The third formal institution for access to credit (AC) was measured from the overall domestic credit to the private sector provided by banks as a share of GDP; it comes from the WDI dataset.

Domestic credit to the private sector by banks refers to:

“financial resources provided to the private sector by other depository corporations (deposit-taking corporations except for central banks), such as through loans, purchases of nonequity securities, and trade credits and other

⁴ “Background Information on Education Statistics in the UIS Database”, UNESCO Institute for statistics, available at: <http://uis.unesco.org/en/methodology#slideoutmenu>.

accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises”⁵.

The data on domestic credit provided to the private sector by banks as a share of GDP are taken from the financial corporation survey of the International Monetary Fund’s (IMF) International Financial Statistics or, when these are unavailable, from its depository corporation survey. The financial corporation survey includes monetary authorities (the central bank), deposit money banks, and other banking institutions, such as finance companies, development banks, and savings and loan institutions⁶.

In this respect, Khaltarkhuu and Sun (2014) argued in the World Bank data blog that the credit data by banks are almost the same as the data for total private credit in the context of developing economies. Thus, these countries are still at an early stage of financial development. The authors further contended that:

“banks are the dominant component of the financial sector, especially in places where there's a nascent or still-in-the-works stock market. On the other hand, financial deepening (the expansion of financial services) and the corresponding changes in financial landscapes have changed this scenario in a growing number of countries, such as Thailand, Indonesia, Bolivia, Mexico, and Romania. As a result, private credit provided by other financial institutions is increasing” Khaltarkhuu and Sun (2014).

This study followed Bowen and De Clercq (2008) to validate our measure and calculated its correlation with the following question asked in the WEF’s Executive Opinion Survey: “in your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital?” (1 = very difficult; 7 = very easy) over the period 2006-2014. A relatively low but significant correlation of 0.35 ($p < 0.001$) was found. Several studies used the same measure in the field of entrepreneurship (Álvarez and Urbano, 2011; Chowdhury *et al.*, 2015b).

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[http://databank.worldbank.org/data/Views/Metadata/MetadataWidget.aspx?Name=Domestic%20credit%20to%20private%20sector%20by%20banks%20\(%%20of%20GDP\)&Code=FD.AST.PRVT.GD.ZS&Type=S&ReqType=Metadata&ddlSelectedValue=&ReportID=52633&ReportType=Table](http://databank.worldbank.org/data/Views/Metadata/MetadataWidget.aspx?Name=Domestic%20credit%20to%20private%20sector%20by%20banks%20(%%20of%20GDP)&Code=FD.AST.PRVT.GD.ZS&Type=S&ReqType=Metadata&ddlSelectedValue=&ReportID=52633&ReportType=Table)

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[http://databank.worldbank.org/data/Views/Metadata/MetadataWidget.aspx?Name=Domestic%20credit%20to%20private%20sector%20by%20banks%20\(%%20of%20GDP\)&Code=FD.AST.PRVT.GD.ZS&Type=S&ReqType=Metadata&ddlSelectedValue=&ReportID=52633&ReportType=Table](http://databank.worldbank.org/data/Views/Metadata/MetadataWidget.aspx?Name=Domestic%20credit%20to%20private%20sector%20by%20banks%20(%%20of%20GDP)&Code=FD.AST.PRVT.GD.ZS&Type=S&ReqType=Metadata&ddlSelectedValue=&ReportID=52633&ReportType=Table)

4.8.5 Technology Absorption (TA)

A final dimension of the formal institution is the availability of the latest technologies in a country (TA). This variable was measured from how favourable the environment is for the diffusion of technological change, and was obtained from the Global Competitiveness Report (GCR). In the GCR, firm-level technology absorption was calculated with the following question asked in the WEF's Executive Opinion Survey: "To what extent do businesses in your country absorb new technology?" (1 = not at all; 7 = aggressively absorb).

To validate our measure, its correlation was calculated with another question asked in the WEF's Executive Opinion Survey: "To what extent are the latest technologies available in your country?" (1 = not available; 7 = widely available) over the period 2006-2014. A value of 0.69 ($p < 0.001$) was obtained. A number of studies, including Stenholm *et al.* (2013) and Acs *et al.* (2014a, b), used the same measure to examine how aspiring entrepreneurs seek the development of new products and open new markets based on technology absorption.

4.9 Control Variables (GDPg and GDPpc)

Finally, given that the level of economic development of countries is considered a critical factor in explaining entrepreneurial activity (Wennekers *et al.*, 2005; Acs *et al.*, 2014a), this study controlled several macroeconomic factors, such as the country's annual percentage growth rate of GDP at market prices (GDPg), and the country's level of GDP per capita based on purchasing power parity (PPP) (GDPpc). In line with other studies, these data sources were obtained from the World Bank (Bowen and De Clercq, 2008; Levie and Autio, 2011; Fuentelsaz *et al.*, 2015).

The literature suggested including other control variables, such as the size of the working-age population (millions), and the annual growth rate of the country's population (Levie and Autio, 2011). However, this study did not control for such variables because they are correlated strongly with GDP per capita as the latter captures the joint effect of the GDP level and the population size indirectly.

To this end, the variables mentioned earlier are the indicators used to test our model of entrepreneurial activity. As discussed earlier, their selection reflects both the

availability of suitable data and the reviewed literature concerning their significant impact on entrepreneurial activity in emerging economies. The next section will explain the econometric methods used to test the country's variation in rates of entrepreneurial activity.

4.10 Rationale for Using Panel Data

Most studies that examined the relationship between institutions and entrepreneurship have used regression analysis as the primary approach of analysis; they do this in order to estimate causality between independent (institutions) and dependent (entrepreneurial activity) variables (Anokhin and Schulze, 2009; De Clercq *et al.*, 2010a; Aidis *et al.*, 2012; Estrin *et al.*, 2013; Chowdhury *et al.*, 2015b; Aparicio *et al.*, 2016; Dutta and Sobel, 2016; among others). Adopting the same method in this thesis allows us to compare the study's results with the previous research.

Due to the availability of secondary data in recent years, more studies in the field of entrepreneurship have increasingly used panel data (Anokhin and Schulze, 2009; Aidis *et al.*, 2012; Aparicio *et al.*, 2016, among others). In this regard, panel data refer to “the pooling of observations on a cross-section of households, countries, firms, etc. over several time periods” (Baltagi, 2005, p. 1). As shown in Table 4.11 below, there are several benefits of using panel data over time series and cross-section studies (Baltagi, 2005).

First, unlike time series and cross-section data, panel data can control the risk of obtaining biased results and therefore offer more trustworthy and reliable estimates (Mehmetoglu and Jakobsen, 2017). For example, Baltagi (2005) suggested that cigarette consumption across 46 American states for the years 1962-1988 was contingent on the variables of price and income. Although this relationship may vary with states and time, several other variables are effectively time-invariant within a given state (e.g., religion or culture) that may influence cigarette demand. Therefore, panel data analysis is used for this study to control for the “unobserved explanatory variables” and avoid the “omission of unobserved heterogeneity”; cross-section studies and time-series studies cannot do this (Baltagi, 2005, p. 5; Mehmetoglu and Jakobsen, 2017, p. 229).

Second, pooling cross-sectional countries with time series data generates a more substantial number of observations. Therefore, the parameter estimates (coefficients) are more efficient as a result of minimising the potential problems associated with collinearity and smaller standard errors among the variables (Baltagi, 2005).

Third, panel data is able to analyse change over time (dynamics of change); they therefore provide a more accurate estimate of the effect of the independent variable (Gujarati, 2004; Baltagi, 2005; Mehmetoglu and Jakobsen, 2017). This latter advantage is significant to the study's objective, to offer more in-depth analysis of the impact of institutional dynamics on entrepreneurial activity. While panel surveys and cross-section yield data on *changes* for entrepreneur's behaviour at one point in time, panel data enables us to study *how* the entrepreneur's behaviour changes during the development process of the institutional environment over time (Gujarati, 2004; Baltagi, 2005). In particular, this analysis allows us to observe whether the interaction between informal (i.e., corruption) and formal institution reforms would affect the entrepreneur's behaviour in starting new ventures for a specified period.

Although using panel data has several benefits, some limitations should be considered whenever panel data analysis is used (see Table 4.11). The primary concern related to the study's aim is about the validity and availability of the data collected to measure the variables. Also, panel data findings are more useful when they are over long time periods, such as five years or even longer (Baltagi, 2005). Therefore, the data selected to measure the study's variables are based on previous literature (see Sections 4.7, 4.8, and 4.9) to produce reliable results over a nine-year period (2006-2014). The following section reviews the alternative panel regression models, their fundamental assumptions, and their appropriateness for analysing the impact of the institutional environment on the development of entrepreneurial activity in emerging economies.

Table 4.11: Advantages and disadvantages of using panel data

Advantages	Disadvantages
“Controlling for individual heterogeneity”	“Design and data collection problems”
“Panel data give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency”	“Distortions of measurement errors”
“Panel data are better able to study the dynamics of adjustment”	“Selectivity problems. a) Self-selectivity b) Nonresponse c) Attrition”
“Panel data are better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data”	“Short time-series dimension”
“Panel data models allow us to construct and test more complicated behavioural models than purely cross-section or time-series data”	“Cross-section dependence”
“Micro panel data gathered on individuals, firms and households may be more accurately measured than similar variables measured at the macro level”	
“Macro panel data on the other hand have a longer time series”	

Source: Baltagi (2005)

4.11 Panel Models

This section discusses how panel data models examine individual effects in order to deal with heterogeneity or cross-section variation that may or may not be observed. These are either fixed or random effects. Choosing the right panel data model is important to ensure the validity of the research findings. Park (2011, p. 1) stated there is:

“A common misunderstanding is that fixed and/or random effect models should always be employed whenever your data are arranged in the panel data format. The problems of panel data modelling, by and large, come from 1) panel data themselves, 2) modelling process, and 3) interpretation and presentation of the result. Some studies analyse poorly organised panel data (in fact, they are not longitudinal in a strong econometric sense), and some others mechanically apply fixed and/or random effect models in haste without consideration of the relevance of such models. Careless researchers often fail to interpret the results correctly and to present them appropriately”.

The remainder of this section reviews the different panel data models available and the methods employed to choose the most applicable model for this thesis.

4.11.1 The pooled panel model

The nature of panel data is that the number of observations is given by multiplying i (units) by t (time points). The basic ordinary least squares (OLS) pooled panel model can be expressed as:

$$Y_{it} = \beta_0 + \beta X_{it} + \varepsilon_{it} \quad (4.1)$$

Where (i) indicates the individual country and (t) indicates time. The error term (unexplained variance) is written simply as (ε_{it}). The pooled OLS model assumes that the errors (ε_{it}) are both independent of each other and normally distributed. However, in most cases, the error term of panel data will be correlated over time (t) for a given unit (i) (autocorrelation). Therefore, regular OLS regression may produce false-positive findings on the dependent variable (Y) (invalid statistical significant results) by underestimating the standard errors, and the (t -) and (F -statistics) will be inflated. Moreover, this correlation between errors can also lead to the correlation between the explanatory (i.e., independent or predictor) (X) variables and variance of the error term (heteroscedasticity). Therefore, there is a need to account for the correlation of the error terms for each unit (i). To this end, panel data can be regularly estimated using OLS if the model is correctly specified and the explanatory (X) variables are uncorrelated with the error term and its variance (Mehmetoglu and Jakobsen, 2017).

4.11.2 The fixed effect model

When performing OLS regression, we face the problem that we cannot be confident what type of effect we are measuring. For example, suppose that we are investigating the effect of income level on happiness in 30 countries for years 2006-2014. If one of these countries (who has the highest income levels) has some cultural and social issues such as gender inequality (an unobserved time-invariant variable), that makes this country generally more unhappy compared to others. The OLS regression would be biased as the income variable also catches the effect of these social issues for this specific country (Mehmetoglu and Jakobsen, 2017). This is where the fixed effects (regression) model (FEM) becomes useful. FEM only compares the effect of income levels on happiness within a particular economy. For this reason, it is also referred to

as the “within” estimator. It considers the “individuality” of each country by allowing the intercept to vary for each country, but still assumes that the slope coefficients are constant across countries (Gujarati, 2004, p. 642). The FEM can be written as:

$$Y_{it} = \beta_i + \beta_1 X_{1it} + \varepsilon_{it} \quad (4.2)$$

It is noteworthy that we have placed the subscript (i) on the intercept term (β) to suggest that the intercepts of the countries may be different due to special characteristics of each country, such as political, economic, or social conditions (Gujarati, 2004, p. 642).

In this regard, Gujarati (2004, p. 642) stated that:

“The term “fixed effects” is due to the fact that, although the intercept may differ across individuals [here countries], each individual’s intercept does not vary over time; that is, it is time invariant”.

Therefore, if the intercept was written as (β_{it}), it would indicate that the intercept of each country is time variant. As a result, the FEM equation given in (4.2) assumes that the (slope) coefficients of the independent variables (X) do not vary across countries or over time (Gujarati, 2004).

To this end, FEM is very useful when we are interested in the effect of variables that vary over time. This estimator helps to examine the relationship between the dependent and the predictor variables within a unit (e.g., person, company, country). Each unit (here country) has its own individual characteristics that may or may not impact the independent variables. However, because the time-invariant variables are omitted in FEM, it is challenging to investigate the effect of time-invariant variables such as gender, political institutions, and geographic variables. For example, to compare between oil-based economies, it is interesting to investigate why Norway was better able to cope with the financial crisis than other oil-based economies, and simply conclude that it did so because it is Norway (as we would in FEM) (Mehmetoglu and Jakobsen, 2017). As a result, FEM could be more effective in examining the changes within a country rather than differences across countries.

4.11.3 The random effect model

The random effects model (REM) is to be used if the study theoretically assumes that both variations within units (here countries) (FEM) and between units (between effects) have some influence on the dependent variable (Mehmetoglu and Jakobsen, 2017). REM is a combination of the between and within estimators and can be written as:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + u_i + \varepsilon_{it} \quad (4.3)$$

The REM equation has two error terms, (u_i), which is the unit specific (rather time-specific) error term, and (ε_{it}), which is the combined time series and cross-section error component.

While in FEM each cross-sectional unit (e.g., country) has its own (fixed) intercept value, the intercept (β_0) of REM shows:

“the mean value of all the (cross-sectional) intercepts and the error component [u_i] shows the (random) deviation of individual intercept from this mean value”.

Nevertheless, the error component u_i is not directly observable; it is what is known as an “unobservable, or latent, variable” (Gujarati, 2004, p. 648).

As a result, the REM requires all of the same assumptions as the FEM plus the additional assumption that the individual effect is uncorrelated with “all explanatory variables in all time periods” (Wooldridge, 2012, p. 492). This is the key assumption that eliminates any correlation between the individual effect and the explanatory variables. Moreover, because it is assumed that the individual effect is uncorrelated with the explanatory variables, time-invariant explanatory variables can be comprised in the REM, and estimates are more efficient. Comparing with FEM, the main drawback of REM is the additional, and often implausible, assumption that the individual effect is uncorrelated with the explanatory variables (Gujarati, 2004; Park, 2011).

4.11.4 Selecting a fixed or random effect model

Since FEM allows an arbitrary correlation between the individual effect and the X_{it} , and REM does not, FEM is “widely thought to be a more convincing tool for estimating ceteris paribus effects” (Wooldridge, 2012, p. 495). However, REM is used in specific situations. In particular, if the key independent variable is constant over time, FEM cannot be used to estimate its effect on the dependent variable (Wooldridge, 2012, p. 496).

To solve this problem, researchers commonly use both REM and FEM, and then formally examine for statistically significant differences in the coefficients on the time-varying independent variables. This test was first proposed by Hausman (1978), who suggested comparing FEM and REM estimates, and then selecting the more efficient REM if the estimates are similar, but FEM if they are different. The null hypothesis is that the researcher uses the random effects estimates unless the Hausman test rejects it. In this respect, Wooldridge (2012, p. 496) argued that:

“In practice, a failure to reject means either that the [REM] and [FEM] estimates are sufficiently close so that it does not matter which is used, or the sampling variation is so large in the [FEM] estimates that one cannot conclude practically significant differences are statistically significant”.

However, Wooldridge (2012) further contended that in some applications of panel data analysis, the study sample cannot be treated as a random sample from a large population, particularly when the unit of observation is a large geographical unit (e.g., regions or countries). In this case, it often makes sense to think of each u_i as a separate intercept to estimate for each cross-sectional unit (here country). In relation to the study context, using FEM might be more appropriate as it mechanically allows a different intercept for each country. To this end, Wooldridge (2012, p. 496) stated that:

“whether or not we engage in the philosophical debate about the nature of [the data], [FEM] is almost always much more convincing than REM for policy analysis using aggregated data”.

4.12 Conclusions

This chapter started by explaining the rationale for choosing the study context. This was followed by discussing the research paradigm to be used in this study, and then provided a full justification for the choice of quantitative analysis. The chapter then presented the study's hypotheses, followed by providing a thorough description of the research design, data sources and the measures of the study's variables. Finally, this chapter presented a justification for using panel data and the alternative models for using it.

The following chapter will examine the results of the research in order to discuss these in detail, comparing them with the findings of previous research to reach appropriate conclusions.

CHAPTER FIVE: RESULTS

5.1 Introduction

This thesis aims to examine the interaction effect of informal and formal institutions on the development of entrepreneurial activity in the context of emerging economies. In particular, it sets out to answer the question:

Do formal institutions affect the development of entrepreneurial activity in the same way under conditions of both endemic corruption and freedom from that corruption?

It was, therefore, necessary to examine the moderating effect of corruption (as an informal institution) on the relationship between formal institutions and entrepreneurial activity. As discussed in Chapter 4, secondary panel data from different sources such as from World Bank UNESCO and GCR databases were used, as shown in Section 4.6.

In this chapter, the results of the Hausman test supported the use of a fixed effects model for the regression model. This specification model enables us to study the impact of variables that vary over time. In particular, it allows us to examine the interaction effect of formal and informal institutions on the development of entrepreneurial activity within each emerging economy. To meet the objective of the study, different panel data techniques were used to test the moderating effect of corruption on the relationship between formal institutions and entrepreneurial activity summarised in Table 5.11. The results of the panel data analysis were conducted using the STATA version 15 software package.

5.2 Descriptive Statistics and Dynamics among Variables

The summary statistics of the variables included in our baseline model are listed in Table 5.1. Across the 44 emerging economies covered in our sample for years 2006-2014, the average value of the entrepreneurship rate was 3%; it ranged from a minimum of 0.03% (India, in 2006), to a maximum of 16.26% (Estonia, in 2013).

Table 5.1: Descriptive statistics of dependent and independent variables

			Emerging economies			
		Obs.	Mean	Std. Dev.	Min.	Max.
	1. New Entry Rate (NER)	375	3.00	3.00	0.03	16.26
Informal	2. Control of corruption (CC)	396	-0.10	0.63	-1.27	1.57
Formal	3. Procedures for starting a business (PRO)	396	7.65	2.85	2.00	16.00
	4. Business and entrepreneurial skills (TEDU)	360	46.36	22.47	4.99	99.66
	5. Access to credit (AC)	394	51.26	31.90	6.17	159.76
	6. Firm-level technology absorption (TA)	392	4.76	0.59	3.11	6.16
Control	7. GDP growth (GDPg)	396	3.93	4.50	-14.81	34.50
	8. GDP per capita PPP (GDPpc)	396	14735.23	8107.89	1641.04	34929.32

Source: Own calculations

Based on the data analysis in Figure 5.1, the dynamics of the entrepreneurial activity showed that the indicator rate was on an upward trend. However, it slowed because of the global financial crisis of 2008-2009. Afterwards, emerging economies in our selected sample started to recover and the growth of entrepreneurial activity resumed. Therefore, in recent years, individuals are more likely to start their businesses in emerging economies.

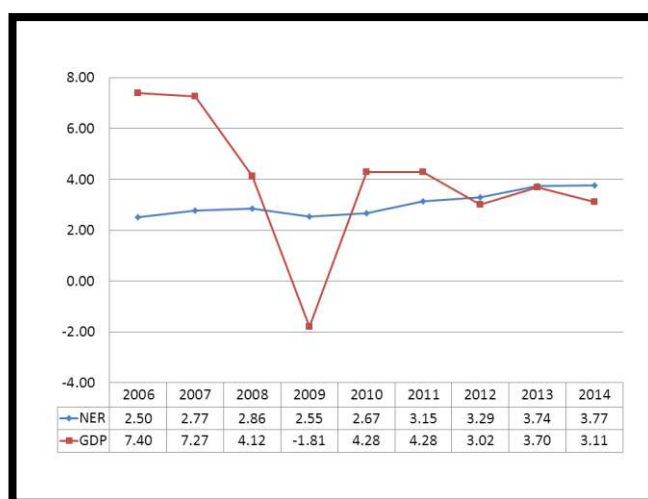


Figure 5.1: The dynamics of entrepreneurship rates in the selected emerging economies

Source: Own calculations based on data from NER and GDPg values.

Concerning the variable related to informal institutions, the level of corruption varies significantly among emerging economies, where the lowest level of corruption was 1.57 (Chile in 2012), and the highest level was -1.27 (the Kyrgyz Republic in 2006). According to Figure 5.2, the selected sample of emerging economies suffers relatively from high levels of corruption as the average value of corruption was -0.10. This result is consistent with other studies that showed that emerging economies (especially post-communist countries) inherited high levels of corruption (Aidis *et al.*, 2008; Tonoyan *et al.*, 2010; Smallbone *et al.*, 2014).

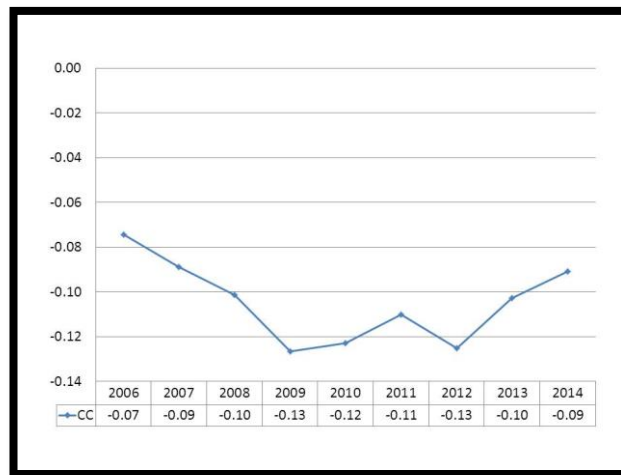


Figure 5.2: The dynamics of corruption levels in the selected emerging economies

Source: Own calculations based on data from CC values

Among the formal institutions' variables, the number of procedures to start a business showed a large disparity, where the most efficient regarding the number of procedures was Jamaica (2 procedures in 2014), and the lowest was Brazil (16 procedures in 2007 and 2008). This indicates significant differences between countries regarding the policy reforms of the number of procedures. However, the efficiency of the number of procedures was improved if we consider the average number of procedures in the study's sample for all emerging economies (Figure 5.3).

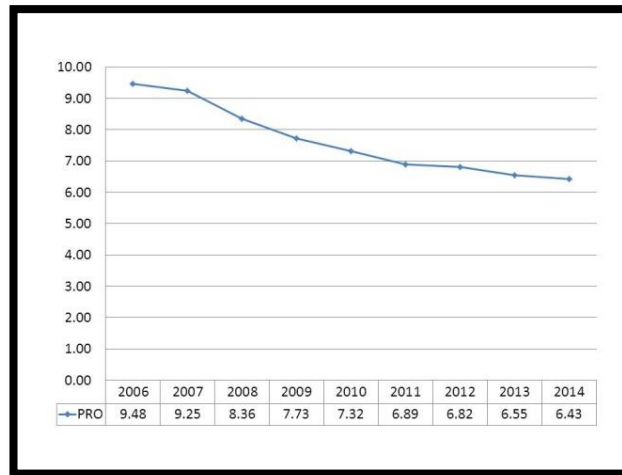


Figure 5.3: The dynamics of number of procedures in the selected emerging economies

Source: Own calculations based on data from PRO values

Another formal institution with a high standard deviation is the percentage of the gross enrolment ratio of tertiary education, which ranged from 4.99% (Pakistan in 2006) to 99.6% (the Korean Republic in 2010). Nevertheless, there is an upward trend in the average rate of tertiary education among the selected sample of emerging economies (Figure 5.4).

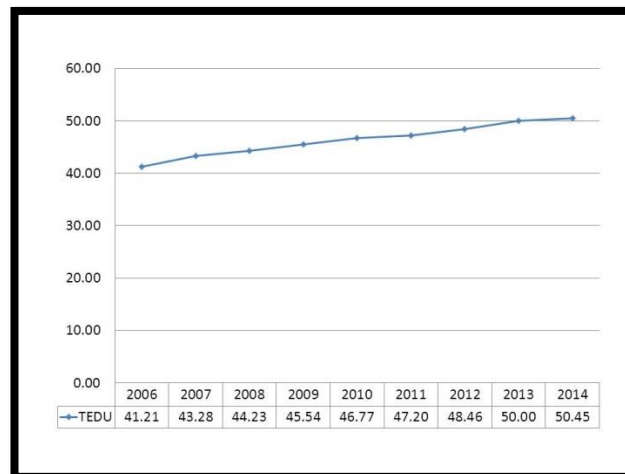


Figure 5.4: The dynamics of tertiary education rates in the selected emerging economies

Source: Own calculations based on data from TEDU values

Domestic credit to the private sector by banks as a share of GDP showed the most substantial discrepancy, ranging from 6.17% (the Kyrgyz Republic in 2007) to 159.76% (Portugal in 2009). This indicates significant differences among emerging economies regarding financial development. According to Figure 5.5, the average domestic credit to the private sector by banks as a share of GDP has increased by a small amount among the selected sample of emerging economies.

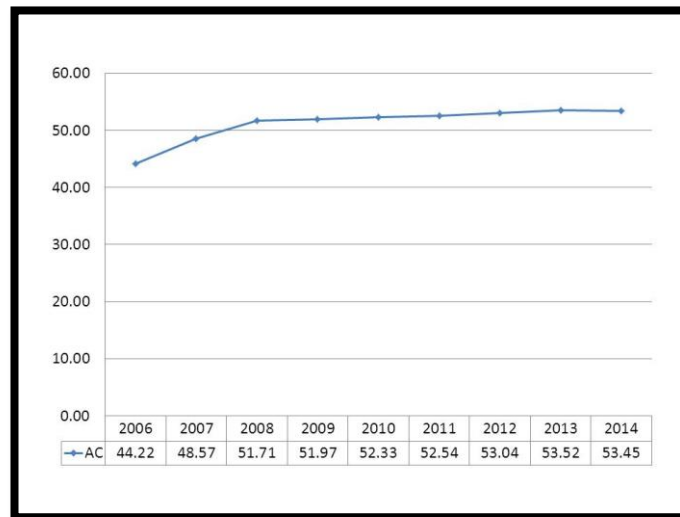


Figure 5.5: The dynamics of access to credit rates in the selected emerging economies

Source: Own calculations based on data from AC values

The last formal institution is the average survey response to the question: “to what extent do businesses in your country absorb new technology?” (measured on a 7-point Likert scale). This formal institution showed the lowest standard deviation (0.59). The lowest value was 3.11 (the Kyrgyz Republic in 2006), and the highest value was 6.17 (Israel in 2012). Based on Figure 5.6, the average rate of the firm-level of technology absorption has not improved significantly among the selected sample of emerging economies.

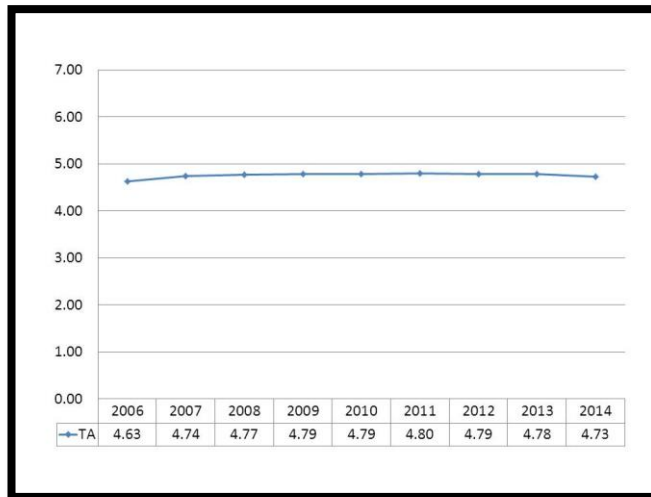


Figure 5.6: The dynamics of technology absorption rates in the selected emerging economies

Source: Own calculations based on data from TA values

With regard to the control variables, GDP growth also had significant variations, from -14.81 (Lithuania in 2009) to 34.5 (Azerbaijan in 2006). Another macroeconomic variable with a high standard deviation is GDP per capita based on purchasing power parity (PPP), which ranged from \$1,641 (Tajikistan in 2006) to \$34,929 (Israel in 2014).

5.3 The Correlation among Variables

The correlation matrix (Table 5.2) reports the correlation coefficients of the variables used in this thesis. While the correlation matrix does not inform us about causal relationships between these variables, it could be a useful estimate for the hypothesis testing in the next sections as it demonstrates the strength and direction of any relationship between variables. Also, it allows for the analysis of potential multicollinearity problems in the data. The results shown in Table 5.2 are discussed in the following section (5.4.1: Absence of Multicollinearity).

Table 5.2: Correlation matrix between the variables included in the baseline model

Variable	1	2	3	4	5	6	7	8
1. NER	1							
2. CC	0.567***	1						
3. PRO	-0.346***	-0.232***	1					
4. TEDU	0.336***	0.432***	-0.277***	1				
5. AC	0.270***	0.593***	-0.261***	0.465***	1			
6. TA	0.035	0.523***	-0.044	0.233***	0.584***	1		
7. GDPg	-0.113*	-0.179***	0.248***	-0.282***	-0.248***	-0.052	1	
8. GDPpc	0.431***	0.600***	-0.273***	0.759***	0.564***	0.477***	-0.262***	1

*** $p < 0.001$; * $p < 0.05$.

Source: Own calculations

5.4 Model Specification and Estimation Issues

As the study's dataset deal with a relatively substantial number of cross-sectional units (44 emerging economies) that have various characterisations (e.g., cultural values, religions, social norms, and using different currencies), it is more likely to have heterogeneity in panel data (Wooldridge, 2012). Therefore, it is essential to consider this heterogeneity when determining the specification of the econometric model and to select the most appropriate estimation technique.

In this regard, after performing a REM, the Lagrange multiplier (LM) test was used for the REM. This test was established by Breusch and Pagan (1980) and developed by Baltagi and Li (1990), so it can be used for unbalanced panels. The LM test guides choice between the OLS and the REM. The result of testing the null hypothesis was rejected; this stated that the variance of the unobserved fixed effects is not statistically different from zero. Therefore, the study's result indicated that pooled OLS is not the most suitable model. This conclusion was supported by the results of the F test of heterogeneity of effects at the panel-unit level, provided after performing an FEM. The null hypothesis was rejected; this stated that the constant terms are equal among units (i.e., countries), suggesting that pooled OLS could show unreliable estimates.

To select between FEM and REM, the Hausman test was used. The result of the null hypothesis was rejected (p value = 0.0078); this stated that the coefficients estimated by the REM do not differ substantially from those estimated by the FEM

(Wooldridge, 2012). In other words, the REM is inconsistent and the FEM is more suitable for this study. Therefore, this research applied the FEM, which allows controlling for unobserved heterogeneity across countries that is fixed over time.

Based on the previous results, this study proposed the general model given below for the hypotheses analyses; this indicated that an FEM provided a better fit for our data. However, this study takes into account that the FEM uses only within-country variation, which impacts the interpretation of the results (Aidis *et al.*, 2012).

$$NER_{it} = \beta_i + \beta_1 II_{it} + \beta_2 FI_{it} + \beta_3 CV_{it} + \beta_4 II_{it} FI_{it} + \varepsilon_{it} \quad (5.1)$$

Where:

β_i : country specific fixed effect

II_{it} : matrix of informal institutions in country i in year t

FI_{it} : matrix of formal institutions in country i in year t

CV_{it} : matrix of the control variable in country i in year t

5.4.1 Absence of multicollinearity

This assumption indicates that two explanatory variables in the same model cannot be perfectly correlated with one another. The results from including such variables that measure the same phenomenon can conduct too low standard errors, and the coefficients provide imprecise estimates. Also, because the variables will steal explanatory power from each other, it will be difficult to assess the relative importance of the different explanatory variables. Therefore, the absence of multicollinearity is necessary for the regression model to separate those explanatory variables that have a significant impact on the dependent variable. The best solution to the problem of multicollinearity is to exclude one of the highly correlated explanatory variables (Mehmetoglu and Jakobsen, 2017).

In this realm, Gujarati (2004) suggested a rule of thumb that all correlation coefficients should be below (0.8). Therefore, after computing the correlation matrix, the results in Table 5.2 showed that there was no strong correlation across the independent variables. However, these results also found relatively high correlations,

and so it remains possible that some of the groups of variables might be highly correlated (e.g., control of corruption with the number of procedures, tertiary education, and access to credit). Therefore, the problem of multicollinearity was tested, which could influence the significance of the main parameters in the regressions by computing the variance inflation factors (VIFs). The results (Table 5.3) showed that multicollinearity is not going to pose a problem in this study as the highly correlated variables were below the threshold of 5 (the mean VIF was 2.11), and the tolerance value (1/VIF) was not below 0.2. It is noteworthy that the previous conditions are not included for models including interaction terms (Mehmetoglu and Jakobsen, 2017). The absence of multicollinearity in the interaction terms is discussed in Section 5.4.6.

Table 5.3: Results of VIF analysis for the independent variables

Variable	VIF	1/VIF
Control of corruption (CC)	1.99	0.50
Procedures for starting a business (PRO)	1.18	0.84
Business and entrepreneurial skills (TEDU)	2.63	0.38
Access to credit (AC)	2.09	0.47
Firm-level technology absorption (TA)	2.02	0.49
GDP growth (GDPg)	1.13	0.88
GDP per capita PPP (GDPpc)	3.70	0.27
Mean VIF	2.11	0.54

Source: Own calculations

5.4.2 Endogeneity

As discussed earlier in Chapters 2 and 3, entrepreneurial activity is affected by environmental factors measured through informal and formal institutions. However, reverse causality is a distinct danger when formal institutions, corruption, and entrepreneurship are included in one model (Bjørnskov and Foss, 2016). For example, corruption levels could increase when entrepreneurs keep practising “grease the wheels” to minimise administrative barriers, or rent-seeker entrepreneurs could form lobbying to influence the policies of formal institutions, such as offering complex regulations to protect their benefits (Belitski *et al.*, 2016). Moreover, because particular time-varying factors may affect both formal and informal

institutions at the same time as entrepreneurship (such as revolution and conquest) (North, 1990), then that would impose omitted variable bias on regression results.

One way to deal with the possible endogeneity of the independent variables, simultaneity bias, reverse causality and omitted variables is to consider panel unit root test and panel cointegration using Windmeijer (2005) system general method of moment (SGMM) estimator, with the two-step finite-sample correction. Although the use of GMM estimation can overcome the endogeneity bias, and control the fixed effects model (FEM), time effects, and multiple endogenous variables, SGMM is better because the conventional dynamic GMM coefficients will be biased for small samples if the series is near unit root processes and the instrument variables are weak (Windmeijer, 2005).

Since the time series of this study is relatively small (nine years), another way to deal with the potential reverse-causality and endogeneity issues is to include lagged values of institutional variables. In this regard, we ran the instrumental variable (IV) regressions of a model (including the interaction terms) and instrumented the informal and formal institution variables with their lags (first and second). Following Roman et al. (2018), the Durbin-Wu-Hausman test of endogeneity was applied to conclude whether IV and OLS estimates are close enough. The test result failed to reject the null; this stated that the variables are exogenous, at the significance level of 5%. Also, to offer more robust results, the control variables were lagged by one period, and the results remained the same. The Hausman test results indicated that the current values of the dependent variable (NER) could not influence the past values of the independent variables (formal and informal institutions). Therefore, endogeneity is not a problem in the study's analysis.

This result may be explained by the nature of the independent variable (NER), which captures the early stage of becoming an entrepreneur. It is concerned with the entrepreneurship process of starting a new business activity, while the effects of entrepreneurship on the development of institutions tend to take time after the business was formed. Therefore, even though entrepreneurship could affect the development of institutions, these effects are unlikely to occur instantaneously (North, 1990; Roman *et al.*, 2018). To this end, confidence in the unbiased findings about endogeneity is confirmed by controlling for country FEM and using lags.

5.4.3 Heteroscedasticity

Analysing panel data consists of different statistical challenges. One of these frequent problems is known as “groupwise heteroskedasticity” (Baum, 2001, p. 101). According to Baum (2001, p. 101), the error process may be homoscedastic within cross-sectional units (i.e., countries). However, its variance may differ across units (i.e., non-constant variance). To examine this condition, Baum (2001) suggested performing the modified Wald test for “groupwise heteroskedasticity” in the FEM. This test was also adopted recently by Roman *et al.*, (2018). The result of the null hypothesis was rejected; this stated that $\varepsilon_i^2 = \varepsilon^2$ (for all i). Therefore, we concluded that the errors are heteroscedastic.

In addition, the presence of heteroscedasticity in the data was confirmed by drawing a plot of the standardised residuals against the fitted residuals (see Figures 5.7 to 5.11). In all five graphs, the spread of the residuals clearly differs across the range of the independent variable. The approach to dealing with the presence of heterogeneity is addressed in the next section.

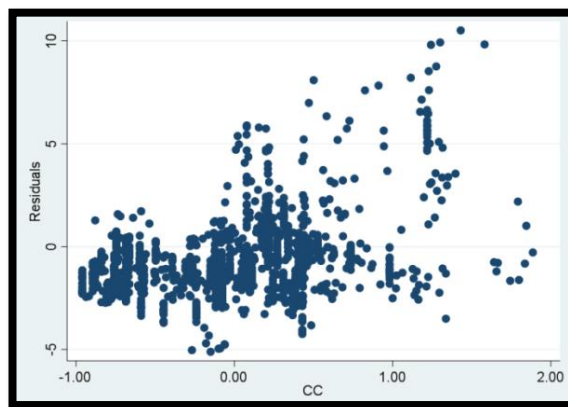


Figure 5.7: Homoscedastic scatterplot of standardised residuals against predicted values of corruption

Source: Devised by author

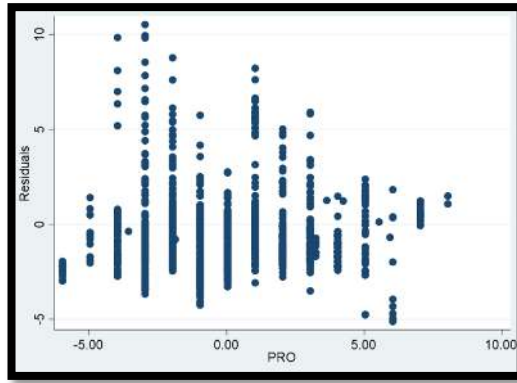


Figure 5.8: Homoscedastic scatterplot of standardised residuals against predicted values of procedures

Source: Devised by author

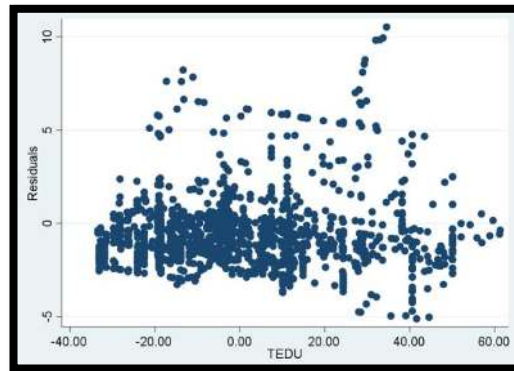


Figure 5.9: Homoscedastic scatterplot of standardised residuals against predicted values of tertiary education

Source: Devised by author

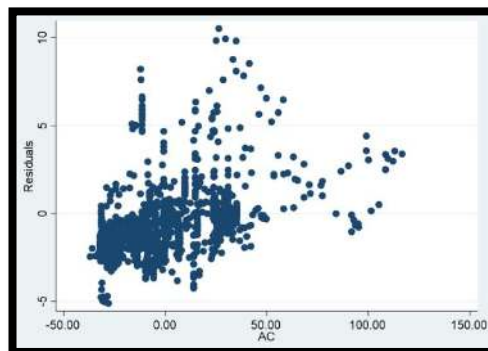


Figure 5.10: Homoscedastic scatterplot of standardised residuals against predicted values of access to credit

Source: Devised by author

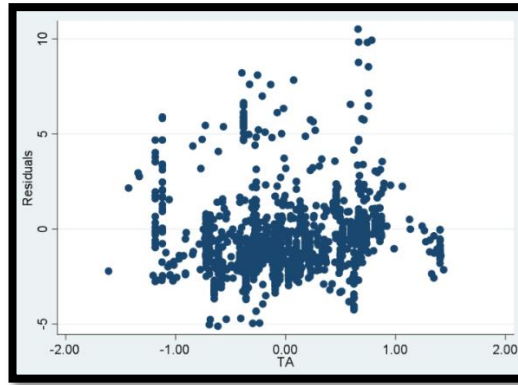


Figure 5.11: Homoscedastic scatterplot of standardised residuals against predicted values of technology

Source: Devised by author

5.4.4 Autocorrelation

In panel data models, there is a standard assumption that the error terms are not correlated, both in time and across cross-sectional units (i.e., countries). In this regard, we used the Wooldridge (2002) test for serial correlation in linear panel-data models to test for serial correlation (i.e., autocorrelation) in the idiosyncratic errors. The null hypothesis was rejected; this stated that there is no first-order autocorrelation in the error terms.

In addition, we examined for the existence of contemporaneous correlation and ran a Pesaran (2004) test for the cross-section dependence. The null hypothesis was rejected; this stated that there is no contemporaneous correlation. We therefore conclude that the impact of shocks in one country could affect another country when both countries belong in the panel dataset.

In summary, the study results found that the error structure was heteroscedastic, autocorrelated, cross-sectional dependence and correlated among the panels. As a result, following Roman *et al.* (2018, p. 517), this study used Driscoll and Kraay's (1998) "standard errors for the coefficients estimated by the within-group regression, robust to heteroskedasticity and the very general forms of cross-sectional and temporal dependence".

5.4.5 Missing values and data imputations

Many missing values are likely to lower the quality of panel data. The extent of the missing data problem in the dataset can be seen in the “Observations” column in Table 5.1. Listwise deletion is the most common approach for dealing with missing values when an entire record is eliminated from analysis if any single value of a variable is missing. However, this approach can introduce bias into estimates if the data are not missing at random, and reduces the number of observations used in a model, weakening the statistical power of any test (Park, 2011).

Table 5.4: Imputed values for emerging countries

Variable	Complete	Incomplete	Imputed	Total
New Entry Rate (NER)	375	21	21	396
Tertiary education (TEDU)	360	36	36	396
Access to credit (AC)	394	2	2	396
Firm-level technology absorption (TA)	392	4	4	396

Source: Own calculations

To deal with missing values in the study’s dataset, we implemented multiple imputation techniques to replace the missing values, as shown in Table 5.4 above. The strength of multiple imputation techniques among other techniques used for replacing missing values is that “it can restore observations and statistical power, and at the same time reduce the likelihood of biased coefficients” (Mehmetoglu and Jakobsen, 2017, p. 342). In contrast, other missing data techniques, such as listwise deletion or country average estimates, may lead to results that will be less efficient (wider confidence intervals, larger standard errors, and less power) than multiple imputations results (Mehmetoglu and Jakobsen, 2017).

5.4.6 Interaction analysis

Finally, to analyse the interaction effect of formal and informal institutions on entrepreneurial activity, this study used the product-term approach, which is the most commonly used to examine statistical interaction (also called moderation) effects using linear regression (Mehmetoglu and Jakobsen, 2017). In this approach, the interaction/moderation effect occurs when a third variable (moderator) affects the relationship between an independent variable and a dependent variable. This can be

demonstrated when a new variable is created (X3) by multiplying two independent variables (X1xX2) and then entering this new variable (X3) into the regression model together with its component terms X1 and X2 (Mehmetoglu and Jakobsen, 2017).

As a result, we multiplied informal institution variable (CC) with formal institutions (PRO, TEDU, AC and TA) to produce new variables (CCxPRO, CCxTEDU, CCxAC and CCxTA), as shown in equation 5.1⁷. From a statistical point of view, both informal and formal institutions can be treated as a moderator variable (Mehmetoglu and Jakobsen, 2017). In practice, however, informal institution (i.e., corruption) is treated as the moderator between formal institutions and entrepreneurship based on the study's hypotheses (Williamson, 2000).

$$NER_{it} = \beta_i + \beta_1 II_{it} + \beta_2 FI_{it} + \beta_3 CV_{it} + \beta_4 II_{it} FI_{it} + \varepsilon_{it} \quad (5.1)$$

Nevertheless, the VIF result of the interaction terms showed that there is a problem of multicollinearity (see Table 5.5). To solve this issue, and to avoid dropping any variable from the regression model, we followed Aiken and West's (1991) procedures to assess the interaction effects; we formed interaction terms by multiplying the mean-centred values of the interacting variables, then include these terms in one regression equation. This approach was adopted in different studies to minimise the possibility of multicollinearity (De Clercq *et al.*, 2010a, b; Danis *et al.*, 2011). As a result, the VIF scores shown in Table 5.6 are below the cut-off value of 5, and thus multicollinearity is not a concern in the analysis (Mehmetoglu and Jakobsen, 2017).

In order to better understand the interpretation of the results from the moderation effect model with a product term, this study first recalls how to interpret the coefficients without the moderation effect of the new product term (Mehmetoglu and Jakobsen, 2017). While some studies tended to analyse the moderation hypotheses by suggesting the direct and indirect effect in the hypotheses (De Clercq *et al.*, 2010a; Levie and Autio, 2011; Turro *et al.*, 2014), other studies analysed the moderation hypotheses directly without including a direct effects hypothesis but still model the direct effects (Valliere and Peterson, 2009; De Clercq *et al.*, 2010b; Pathak *et al.*,

⁷ Equation repeated here for ease of reading.

2015). Because the direct effects hypotheses of formal institutions on entrepreneurship was discussed in the literature, as explained in Chapter 3, this study is more concerned with the interaction effect hypotheses of informal and formal institutions on entrepreneurship. Therefore, this study followed the latter approach by creating several models to test the hypotheses, as discussed in the next section.

Table 5.5: Results of VIF analysis including the interaction terms

Variable	VIF	1/VIF
Control of corruption (CC)	120.65	0.00
Procedures for starting a business (PRO)	1.49	0.67
Business and entrepreneurial skills (TEDU)	2.84	0.35
Access to credit (AC)	2.45	0.40
Firm-level technology absorption (TA)	2.28	0.43
GDP growth (GDPg)	1.14	0.87
GDP per capita PPP (GDPpc)	3.79	0.26
CC x PRO	12.01	0.08
CC x TEDU	9.60	0.10
CC x AC	8.36	0.11
CC x TA	114.77	0.00

Source: Own calculations

Table 5.6: Results of VIF analysis with Aiken and West's (1991) approach

Variable	VIF	1/VIF
Control of corruption (CC)	2.06	0.48
Procedures for starting a business (PRO)	1.30	0.76
Business and entrepreneurial skills (TEDU)	2.92	0.34
Access to credit (AC)	2.81	0.35
Firm-level technology absorption (TA)	2.31	0.43
GDP growth (GDPg)	1.14	0.87
GDP per capita PPP (GDPpc)	3.79	0.26
CC x PRO	1.27	0.78
CC x TEDU	1.77	0.56
CC x AC	2.56	0.39
CC x TA	1.74	0.57

Source: Own calculations

5.5 Regression Analysis Results

In Table 5.7, Model 1 includes the direct effect of informal and formal institutions on entrepreneurial activity, whereas Model 2 shows the moderating influence of the informal institution (i.e., corruption) on the relationship between formal institutions and entrepreneurial activity. The first two models are central to addressing the research question. In this way, we get to test for Hypotheses 1a, 2a, 3a and 4a by examining the significant difference in the model fit when progressing from Model 1 to Model 2.

To test hypotheses 1b, 2b, 3b and 4b, Models 3 and 4 consider country-level stages of economic development (factor-driven, efficiency-driven, and innovation-driven economies) as reported by the Global Competitiveness Report (GCR). These models were developed as it was suggested that the institutional factors affect entrepreneurial activity differently based on the stage of economic development (Acs *et al.*, 2014a; Schwab and Sala-i-Martin, 2014). Accordingly, the sample was split into high/low innovation countries to distinguish the country-level stage of development for our study. While Model 3 represents more developed emerging countries, characterised as being at the innovation stage or in the transition stage to the innovation stage, Model 4 represents less developed emerging countries that are in the lower stages of economic development, as shown in Chapter 4 (see Table 4.2). It is noteworthy that Model 4 combines factor-driven and efficiency-driven economies, as only six countries were classified as factor-driven by GCR (Table 4.1), and therefore, there is not sufficient statistical power to evaluate them separately.

To test the regression model robustness, we conducted a model specification link test for Models 1-4, which indicated that the models were well specified and statistically significant ($p < 0.05$). Also, the value of R^2 indicates that the model can explain approximately 90% of country variations in rates of entrepreneurial activity for all models (1-4). However, the summary statistics of the independent variables (Table 5.1) suggest that outliers are present in the data. This could indicate that the overall summary statistics, such as R^2 , arising from data analyses found on regression models can show a misleading and distorted picture (Cook, 1977). Therefore, we used Cook's (1977) distance diagnostic test to estimate the influence of a data point when performing regression analysis; we found that these outliers data of the independent variables were not a problem.

While the regression models' results are discussed thoroughly in Chapter 6, it is useful to highlight the main results of Model 2 in Table 5.7 as an introduction to the next chapter. In Model 2, we see that all four interaction terms are statistically significant, indicating that corruption does moderate the effect of the formal institutions on the rates of entrepreneurial activity. We see, for example, that the coefficient on PRO is -0.104 and the coefficient on CCxPRO is -0.163. This means that while PRO has a negative effect in general, with a one-unit higher value of PRO

associated with a 0.163 reduction in NER in countries for which CC is 0, the effect of PRO is even more strongly negative in countries in which there is a high level of CC (lower levels of corruption).

Table 5.7: Regression analysis explaining entrepreneurial activity (NER) for emerging economies-baseline models

	Model 1 All countries	Model 2 All countries	Model 3 More developed countries	Model 4 Less developed countries
Informal institutions				
CC	0.610 (0.660)	0.223 (0.559)	1.577* (0.750)	-0.678 (0.626)
Formal institutions				
PRO	-0.103** (0.031)	-0.104** (0.033)	0.125* (0.056)	-0.083 (0.046)
TEDU	0.014 (0.014)	0.004 (0.013)	-0.003 (0.028)	0.009 (0.014)
AC	-0.023 (0.011)	-0.014 (0.013)	-0.022 (0.029)	0.012 (0.016)
TA	-0.248 (0.175)	-0.100 (0.172)	0.264 (0.274)	0.014 (0.411)
H1: CC x PRO	-	-0.163*** (0.025)	-0.385*** (0.069)	-0.181* (0.073)
H2: CC x TEDU	-	0.040*** (0.009)	0.026* (0.011)	0.056 (0.029)
H3: CC x AC	-	-0.020** (0.005)	-0.011 (0.015)	-0.011 (0.015)
H4: CC x TA	-	-0.681* (0.279)	-1.790*** (0.302)	-0.201 (0.894)
Control variable				
GDPg	0.047** (0.013)	0.0419** (0.015)	0.058** (0.018)	0.027 (0.014)
GDPpc	0.000** (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
Constant	3.547* (1.351)	1.666** (0.502)	1.505 (0.825)	1.090 (0.824)
F-statistic	46.44	51.36	201.99	7.99
Prob.(F-statistic)	0.0039	0.0285	0.0006	0.0000
R ²	0.898	0.907	0.913	0.892
Observations	396	396	180	216
Countries	44	44	20	24

Notes: Driscoll-Kraay standard errors between parentheses.

*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Source: Own calculations

Also, the coefficient on TEDU is 0.004 and the coefficient on CCxTEDU is 0.040. This means that while TEDU has a positive effect in general, for one unit increases of TEDU, NER is expected to increase by 0.040 units in countries for which CC is 0. As a result, for every one-unit increase in CC, the effect of a one-unit increase in

TEDU on NER becomes more positive by 0.040. Therefore, the effect of TEDU is seen even more strongly in countries that have lower levels of corruption.

Moreover, the coefficient on AC is -0.014 and the coefficient on CCxAC is -0.020. This means that while AC has a negative effect in general, for one-unit increases in AC, NER is expected to decrease by 0.020 units in countries for which CC is 0. As a result, for every one-unit increase in CC, the effect of a one-unit increase in AC on NER becomes more negative by -.020. Therefore, the negative effect of AC is seen even more strongly in countries that have lower levels of corruption.

Finally, the coefficient on TA is -0.100 and the coefficient on CCxTA is -0.681. This means that while TA has a negative effect in general, for one-unit increases in TA, NER is expected to decrease by 0.681 units in countries for which CC is 0. Consequently, for every one-unit increase in CC, the effect of a one-unit increase in TA on NER becomes more negative by -0.681. Thus, the negative effect of TA is seen even more strongly in countries that have lower levels of corruption.

5.6 Model Robustness Checks

5.6.1 Moderated hierarchical regression analysis

To assess the robustness of the interaction effects results in this study, a moderated hierarchical regression analysis was performed. This approach was used in different studies to minimise the possibility of multicollinearity (De Clercq *et al.*, 2010a, b). Although multicollinearity was not a concern in this study (see Table 5.6), reporting the interaction terms in separate regression equations can provide consistency of the signs of the interactions terms compared with those in the models in which the interaction terms are included in the full model (De Clercq *et al.*, 2010b).

The results in Table 5.8 show that the interaction terms in Models 1-4 were consistent in sign compared with Model 2 in Table 5.7. However, the interaction effects of CCxAC and CCxTA became subdued and insignificant in Table 5.8 (Models 3 and 4). This shift to different effects could suggest that the simultaneous inclusion of the interaction terms considers each effect in the presence of the other effects as shown in Table 5.7 (Model 2). Specifically, the moderating effect of control of corruption (CC) covers each of the interaction terms that represent the

differential effect of formal institutions (PRO, TEDU, AC and TA) on entrepreneurial activity (NER). Therefore, the lack of significance in Table 5.8 (Models 3 and 4) indicated that each of the moderating effects is sensitive to the other moderators, as shown in Table 5.7 (Aiken and West, 1991; De Clercq *et al.*, 2010b).

Table 5.8: Hierarchical regression analysis explaining entrepreneurial activity (NER) for emerging economies

	Model 1 All countries	Model 2 All countries	Model 3 All countries	Model 4 All countries
Informal institutions				
CC	0.409 (0.564)	0.384 (0.621)	0.623 (0.659)	0.615 (0.661)
Formal institutions				
PRO	-0.112 ** (0.030)	-0.113** (0.034)	-0.101** (0.031)	-0.092* (0.036)
TEDU	0.013 (0.015)	0.005 (0.012)	0.015 (0.015)	0.015 (0.015)
AC	-0.023* (0.010)	-0.021 (0.011)	-0.021 (0.012)	-0.023 (0.012)
TA	-0.172 (0.169)	-0.245 (0.163)	-0.252 (0.179)	-0.185 (0.150)
H1: CC x PRO	-0.161*** (0.024)	-	-	-
H2: CC x TEDU	-	0.037** (0.010)	-	-
H3: CC x AC	-	-	-0.004 (0.006)	-
H4: CC x TA	-	-	-	-0.498 (0.534)
Control variable				
GDPg	0.046** (0.014)	0.044** (0.014)	0.047** (0.012)	0.046** (0.012)
GDPpc	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)
Constant	1.179** (0.460)	1.111* (0.475)	0.963* (0.399)	0.958* (0.424)
F-statistic	83.00	53.91	39.05	39.16
Prob.(F-statistic)	0.0038	0.0035	0.0085	0.0083
R ²	0.901	0.902	0.898	0.899
Observations	396	396	396	396
Countries	44	44	44	44

Notes: Driscoll-Kraay standard errors between parentheses.

*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Source: Own calculations

5.6.2 Assessing the role of time effects

In this study, the period covered by the dataset comprises the outbreak of the international economic and financial crisis in 2007 (but with consequences in emerging economies starting in 2008 and 2009) that strongly influenced many of the nations comprised in the study's sample (see Figure 5.1). Therefore, there is a need to control for time effects, and to test the robustness of the estimates against the inclusion of such effect in the study's models. One approach, as suggested by Roman *et al.* (2018), was to introduce an indicator for the crisis period 2008-2009 that captures the effect of the international economic crisis as compared to the after-crisis period 2010-2014 as shown in Table 5.9.

Also, as suggested by Roman *et al.* (2018), we included individual time dummies for each of the years in the study period, in the right-hand side of Equation (5.1) (in fact, we introduced just 8-year dummies (2007-2014) for the total 9 years, to avoid falling into the dummy variable trap). The results are summarised in Table 5.10. Results were similar across all approaches to controlling for time effects.

Table 5.9: Results of regression analysis with economic crisis effects

	Model 1 All countries	Model 2 All countries	Model 3 More developed countries	Model 4 Less developed countries
Informal institutions				
CC	0.723 (0.665)	0.301 (0.574)	1.851** (0.704)	-0.615 (0.649)
Formal institutions				
PRO	-0.089** (0.030)	-0.096** (0.031)	0.117* (0.053)	-0.070 (0.045)
TEDU	0.014 (0.014)	0.003 (0.013)	-0.001 (0.028)	0.009 (0.014)
AC	-0.025* (0.011)	-0.016 (0.013)	-0.025 (0.030)	0.012 (0.017)
TA	-0.313 (0.179)	-0.150 (0.178)	0.061 (0.271)	0.024 (0.430)
H1: CC x PRO	-	-0.157*** (0.026)	-0.367*** (0.062)	-0.173* (0.076)
H2: CC x TEDU	-	0.040*** (0.009)	0.026* (0.011)	0.056 (0.029)
H3: CC x AC	-	-0.020** (0.005)	-0.012 (0.015)	-0.011 (0.015)
H4: CC x TA	-	-0.677* (0.292)	-1.814*** (0.315)	-0.164 (0.917)
Control variable				
GDPg	0.057** (0.015)	0.049** (0.018)	0.087*** (0.021)	0.027 (0.016)
GDPpc	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Crisis	0.318** (0.094)	0.226* (0.102)	0.628** (0.174)	0.049 (0.104)
After crisis	0.261 (0.223)	0.167 (0.211)	0.413 (0.345)	0.107 (0.180)
Constant	0.946 (0.645)	1.644* (0.706)	1.681 (1.194)	1.152 (0.979)
<i>F</i> -statistic	34.99	72.99	80.31	8.34
Prob.(<i>F</i> -statistic)	0.0111	0.0124	0.0020	0.6756
R ²	0.899	0.908	0.915	0.892
Observations	396	396	180	216
Countries	44	44	20	24

Notes: Driscoll-Kraay standard errors between parentheses.

*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Source: Own calculations

Table 5.10: Results of regression analysis with time effects

	Model 1 All countries	Model 2 All countries	Model 3 More developed countries	Model 4 Less developed countries
Informal institutions				
CC	0.881 (0.640)	0.444 (0.550)	2.366** (0.674)	-0.551 (0.601)
Formal institutions				
PRO	-0.069 (0.035)	-0.077* (0.037)	0.159** (0.056)	-0.054 (0.045)
TEDU	0.013 (0.015)	0.002 (0.013)	-0.008 (0.030)	0.007 (0.014)
AC	-0.027* (0.012)	-0.018 (0.013)	-0.021 (0.032)	0.012 (0.017)
TA	-0.384* (0.178)	-0.215 (0.158)	-0.259 (0.319)	0.159 (0.429)
H1: CC x PRO	-	-0.154*** (0.025)	-0.370*** (0.067)	-0.172* (0.071)
H2: CC x TEDU	-	0.042*** (0.010)	0.027* (0.012)	0.060 (0.027)
H3: CC x AC	-	-0.018** (0.005)	-0.015 (0.014)	-0.006 (0.016)
H4: CC x TA	-	-0.620* (0.258)	-1.881*** (0.335)	-0.043 (0.857)
Control variable				
GDPg	0.062** (0.022)	0.050 (0.026)	0.123** (0.045)	0.017 (0.019)
GDPpc	0.000 (0.000)	>-0.001 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Y2007	0.353* (0.114)	0.371* (0.126)	0.785*** (0.153)	0.105 (0.152)
Y2008	0.622*** (0.144)	0.594** (0.159)	1.404*** (0.305)	0.304* (0.138)
Y2009	0.692** (0.233)	0.532* (0.267)	1.847** (0.543)	0.080 (0.235)
Y2010	0.354* (0.169)	0.274 (0.189)	1.030** (0.332)	0.062 (0.195)
Y2011	0.752** (0.190)	0.675** (0.208)	1.785*** (0.407)	0.252 (0.210)
Y2012	0.961*** (0.215)	0.853** (0.233)	1.952*** (0.503)	0.614* (0.239)
Y2013	0.863** (0.231)	0.787** (0.248)	1.963*** (0.520)	0.516 (0.255)
Y2014	0.828** (.257)	0.816** (0.276)	1.873** (0.586)	0.733* (0.291)
Constant	1.484** (1.490)	2.277** (0.574)	3.579** (0.994)	1.957* (0.869)
<i>F</i> -statistic	62.41	53.45	5.38	19.40
Prob.(<i>F</i> -statistic)	0.0000	0.000	0.000	0.000
R ²	0.902	0.910	0.921	0.897
Observations	396	396	180	216
Countries	44	44	20	24

Notes: Driscoll-Kraay standard errors between parentheses.

*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Source: Own calculations

5.7 Summary

This chapter reported the findings from the investigation into the interaction effect of formal and informal institutions on the development of entrepreneurial activity across emerging economies. Different statistical techniques and approaches have been used to meet the objective and to test the hypotheses of this study (see Table 5.11).

The results from Section 5.2 revealed that there was a considerable variation in rates of entrepreneurial activity across emerging economies. Indeed, it is apparent from the regression models presented in Section 5.5 that the quality of institutions can predict the rates of entrepreneurship. In particular, the empirical results showed that the interaction effect of formal and informal institutions has a significant impact on the development of entrepreneurial activity in emerging economies. In the next chapter, the results of the regression models are discussed in detail.

Table 5.11: A summary of statistical tests included in this chapter

Test	Description	Null hypothesis	Result
Correlation	To exclude strongly correlated variables, all correlation coefficients should be below 0.8.		Correlation is not a concern
Variance inflation factors (VIFs)	To test the presence of multicollinearity, the score should be below the threshold of 5.		VIF score is not a concern
Lagrange multiplier (LM) test for random effects, Breusch and Pagan (1980)	To choose between the simple ordinary least squares (OLS) and random-effects regressions	The variance of the unobserved fixed-effects is zero	Rejected, so OLS is not the most appropriate model
The <i>F</i> test of heterogeneity	to choose between the (OLS) and fixed-effects within-group model	The constant terms are equal among units (countries)	Rejected, so OLS would produce inconsistent estimates
The Hausman test	To choose between fixed (within-group) and random effects	The coefficients estimated by the random-effects estimator do not differ substantially from the ones estimated by the fixed-effects estimator	Rejected, so fixed effect model is more appropriate
The Durbin-Wu-Hausman test of endogeneity	To deal with the potential reverse-causality and endogeneity issues	The variables are exogenous	Not rejected, so reverse causality is not a concern
The modified Wald test for groupwise heteroscedasticity in the fixed-effects regression model	Although the error structure may be homoscedastic within cross-sectional units, its variance may differ across units, a condition that is known as groupwise heteroscedasticity	Variation in the residuals is unrelated to group identity.	Rejected, so there is heteroscedasticity
Wooldridge (2002) test for serial correlation in linear panel-data models	A standard assumption in panel-data models is that the error terms are not correlated, both in time	There is no first-order autocorrelation.	Rejected, so there is serial correlation /autocorrelation

	and across cross sections (entities). To test for serial correlation in the idiosyncratic errors.		
Test of Pesaran (2004)	The existence of cross-section dependence	There is no contemporaneous correlation.	Rejected, so there is cross-section dependence
Driscoll and Kraay's (1998) standard errors	To offer more robust for the coefficients estimated by the within-group regression		
Cook's distance diagnostic test (1977)	It is used to estimate the influence of outliers data points when performing regression analysis		Outliers in the data are not a concern
Moderated hierarchical regression analysis	To minimise the possibility of multicollinearity and to provide the consistency of the signs of the interactions terms compared with those in the models in which the interaction terms are included in the full model		The signs of the interaction terms were consistent with the full model.
Control variable for the international economic crisis	Assessing the need to control for time effects and checking the robustness of our estimates against the international economic and financial crisis in 2007 (but with consequences starting in 2008 and 2009)		Adding a control for the economic crisis does not change the estimates of interest.
Including individual time dummies, for each of the years in our study period	There may be time-specific events that affect both NER and institutions on a country level.		Adding time effects does not change the estimates of interest.

Source: Devised by author

CHAPTER SIX: INTERPRETATION AND DISCUSSION OF RESULTS

6.1 Introduction

The preceding chapter of this thesis presented the results following a quantitative investigation into the interactive effect of formal and informal institutions on the development of entrepreneurial activity in emerging economies.

This chapter aims to discuss the panel regression findings reported in the previous chapter. The results of each fixed effect model are interpreted and discussed in line with the earlier theoretical and empirical literature outlined in Chapters 2 and 3. Synthesising the results with the theoretical and empirical literature allows drawing the conclusions and policy recommendations in Chapter 7. Also, it helps to evaluate the extent to which the different econometric models can offer a better understanding of the different rates of entrepreneurial activity in emerging economies.

6.2 The interaction effect of formal and informal institutions on entrepreneurship

As mentioned before in Chapter 5, Model 1 included only the direct effect of formal and informal institutions on entrepreneurial activity with control variables. The results showed (Table 5.7) that, for emerging economies, corruption is not a significant direct factor, controlling for the presence of other institutions. In this respect, the relationship between the number of procedures for starting a business and entrepreneurial activity was significant at ($p < 0.05$) with a negative sign. In contrast, the relationship between education and training with entrepreneurial activity was not significant. Moreover, the relationship between access to credit and entrepreneurial activity was not significant at the 95% level. Lastly, the relationship between firm-level technology absorption and entrepreneurial activity was not significant. This model explains 89.8% of the total variation in entrepreneurial activity.

Opposite to Model 1, the results found in Model 2 (see Table 5.7) showed that the interaction effect of informal and formal institutions was related with entrepreneurial activity. In this model, we included control of corruption as the moderating factor between the relationship of formal institutions and entrepreneurship. While most of

the moderating coefficients in this model were significant at ($p < 0.05$), the moderating coefficient of technology absorption was only marginally significant at ($p < 0.10$). Model 2 explains 90.7% of the total variation in entrepreneurial activity.

In comparison with Model 1, the Model 2 results were indicative that, overall, corruption has an indirect impact as a moderator when it comes to the relationship between institutions (formal and informal) and entrepreneurship for each emerging economy listed in the study, thereby consolidating the importance of corruption to promoting entrepreneurial activity in emerging economies (Pathak *et al.*, 2015).

Model 3 assessed the moderating effect of control of corruption on the relationship between formal institutions and entrepreneurial activity for emerging economies that are located in the innovation-stage, or in the transition to the innovation-driven stage (more developed emerging countries). The results (Table 5.7) indicated that the interaction between control of corruption and number of procedures and technology absorption were highly significant ($p < 0.01$) on entrepreneurial activity. While the number of procedures has the expected sign (negative), technology absorption did not have the expected sign (negative). At the same time, the estimated model showed that the interaction between control of corruption and education and training has a positive and marginally significant influence ($p < 0.10$) on entrepreneurial activity. However, the estimated model shows that the interaction between control of corruption and access to credit has no significant impact on entrepreneurial activity. The model explains 91.3% of the total variation in entrepreneurial activity.

Finally, Model 4 assessed the moderating effect of control of corruption on the relationship between formal institutions and entrepreneurial activity for emerging economies that are located in lower stages of development (less developed emerging countries). In contrast to the previous model, the results (Table 5.7) indicated that only the interaction effect between corruption and number of procedures was marginally significant ($p < 0.10$) on entrepreneurial activity and has the expected sign. This model explains 89.2% of the total variation in entrepreneurial activity. Accordingly, the analyses of the hypotheses will be discussed in the following sections.

6.2.1 Corruption, number of procedures and entrepreneurship

Concerning the hypotheses testing, Hypothesis 1a suggested that the number of procedures for starting a business has a negative influence on entrepreneurship in each emerging economy that has lower levels of corruption. While Model 1 showed that number of procedures has a negative and significant influence on entrepreneurial activity for each emerging economy ($\beta = -0.103$; $p < 0.05$), Model 2 showed that the interaction effect between number of procedures and corruption has a negative and significant influence on entrepreneurial activity for each emerging economy ($\beta = -0.163$; $p < 0.01$). The results showed that the interaction effect of control of corruption and the number of procedures coefficient is higher than the coefficient of the direct effect of number of procedures in each emerging economy, supporting Hypothesis 1a. Although the results of Model 1 were congruent with the literature (the more days required for the creation of a new firm, the less likely it is that the entrepreneurial activity will occur) (Álvarez and Urbano, 2011; Aparicio *et al.*, 2016), the results of Model 2 showed that the number of procedures has a better impact on entrepreneurial activity in emerging economies that have lower levels of corruption as suggested by the literature (Naudé, 2008; Klapper and Love, 2010; Aparicio *et al.*, 2016).

To test whether the moderating effect of control of corruption has a higher influence in more developed than in less developed emerging countries included in the sample, as proposed in Hypothesis 1b, this study followed Cloggs *et al.*'s (1995) guidelines and was adopted recently by Danis *et al.* (2011). The null hypothesis is that the two coefficients in Models 3 and 4 (Table 5.7) are equal. In this regard, Table 6.1 shows the coefficients on the more developed interaction terms give the differences between the two Models 3 and 4 from Table 5.7. As shown in Table 6.1, we performed a z-test to assess whether the regression coefficient for the number of procedures in more developed emerging economies (-0.204) was significantly greater than the corollary coefficient for less developed emerging economies (-0.182). No support was found for Hypothesis 1b as the z-value (-1.620) was not rejected at $p < 0.05$. Therefore, the results showed that the interaction effect between control of corruption and the number of procedures on entrepreneurial activity is similar in emerging economies that are located in more developed and less developed stages.

6.2.2 Corruption, education and training and entrepreneurship

Hypothesis 2a proposed that lower levels of corruption positively influence the relationship between education and training with entrepreneurial activity in each emerging economy. While Model 1 showed that education and training were not significant to entrepreneurial activity, Model 2 showed that the interaction effect between education and training with corruption has a positive and highly significant influence on entrepreneurial activity ($\beta = 0.040$; $p < 0.01$). The results for the moderating role of corruption were in line with our expectations, supporting Hypothesis 2a. Therefore, an educational system with an entrepreneurial focus is more likely to increase entrepreneurial activity in emerging economies that have lower levels of corruption rather than higher levels of corruption as suggested by literature (Álvarez and Urbano, 2011; Aparicio *et al.*, 2016).

Hypothesis 2b proposed that this interaction effect has a higher influence in more developed than in less developed emerging countries included in the sample. In this respect, we performed a z-test to assess whether the regression coefficient for the tertiary education in more developed emerging economies (-0.030) was significantly greater than the corollary coefficient for less developed emerging economies (0.056). No support for Hypothesis 2b was found as the z-value (-0.870) was not rejected at $p < 0.05$ (see Table 6.1). Therefore, the results showed that the interaction effect between control of corruption and the education and training on entrepreneurial activity is similar in emerging economies, regardless of the level of economic development.

6.2.3 Corruption, access to credit and entrepreneurship

Hypotheses 3a and 3b suggested that access to credit from banks has a positive influence on entrepreneurial activity in the context of each emerging economy that has lower levels of corruption, and that this interaction effect is higher in more developed countries. While Model 1 showed that access to credit was not significant to entrepreneurial activity, Model 2 showed that the interaction effect between control of corruption and access to credit has a negative and significant influence on entrepreneurial activity ($\beta = -0.02$; $p < 0.05$). Also, Table 6.1 showed that this interaction effect was insignificant for both more developed and less developed

emerging countries. The results from the previous models did not support the study's expectations.

The interpretation of the previous results could be explained in three ways. First, the previous results could suggest that entrepreneurs who are associated with higher risk levels tend to obtain financial resources from social networks and family connections; this may be because existing financial institutions are underdeveloped and less likely to support their new ventures (Ho and Wong, 2007; Chowdhury *et al.*, 2015b; Fuentelsaz *et al.*, 2015; Ghura *et al.*, 2017). This argument was consistent with Aidis *et al.* (2008, p. 670) who stated that:

“Our findings suggest that in the case of Russia, the weakness of institutions is detrimental to entrepreneurial activity and though networks are important, they are not entirely able to offset these deficiencies. Further research in this area is needed to pin down more carefully the relationship between institutional development and levels of entrepreneurial activity and how additional factors such as the presence and strength of informal networks may act as substitutes for dysfunctional institutions in a different way for business insiders than for newcomers”.

Second, another interpretation for the findings was suggested by Wennekers *et al.* (2005), who argued that emerging economies have higher rates of necessity entrepreneurship (i.e., informal entrepreneurship), which does not require large amounts of credit.

Lastly, although this latter idea could be true, the results also suggested that entrepreneurs may later depend on alternative sources to fund their growing businesses, such as venture capital funds, angel investors and corporate investors, due to the lack of adequate financial infrastructure (Denis, 2004; Bowen and De Clercq, 2008; Aidis, 2012; De Clercq *et al.*, 2013; Ghura *et al.*, 2017). This latter argument was supported by Acs and Szerb (2007, p. 116) who stated that:

“In the past several decades, a vibrant venture capital industry has developed to fund the relatively small but vital number of technologically sophisticated or capital-intensive start-ups. In recent years, “angel investors” – wealthy individuals or groups of such individuals – have become an increasingly important source of early-stage equity capital as well (by some accounts, angel investors may now be more important than venture capital, especially since the “Internet stock bubble” burst in 2000)”.

6.2.4 Corruption, technology absorption and entrepreneurship

Finally, Hypotheses 4a and 4b suggested that firm-level technology absorption has a significant influence on entrepreneurship in each emerging economy that has lower levels of corruption, and that this interaction effect is stronger in more developed countries than less developed countries. The results were contrary to the study's expectations as the coefficient regression was not significant in Model 1 and marginally significant ($\beta = -0.681$; $p < 0.1$) with a negative sign in Model 2. However, this interaction effect was highly significant in Model 3 ($\beta = -1.790$; $p < 0.01$) with a negative sign, while it was not significant in Model 4. Also, Table 6.1 showed that this interaction effect was insignificant for both more developed and less developed emerging countries. The results from the previous models did not support the study's Hypotheses 4a and 4b.

Although not what we predicted, the previous results could suggest that new business activities in emerging economies that have lower levels of corruption are still not technology-based and characterised by imitative entrepreneurship (Models 2 and 3 in Table 5.7). In this regard, entrepreneurs in emerging economies tend to copy technologies from developed economies to expand their economy of scale (Acs, 2006; Minniti and Lévesque, 2010). Entrepreneurs are therefore less likely to invest in R&D, even though imitative entrepreneurship is significant to economic growth. This is especially true in the case of emerging economies, as they increase competition and product availability when the revenues to R&D expenditure are low (Minniti and Levesque, 2010).

We also acknowledge the possibility of alternative explanations drawn from the literature that suggested that educated individuals may work for technology-based corporations to seek higher returns in emerging economies that have lower levels of corruption. Anokhin and Schulze (2009) found that economies with lower costs of corruption are more likely to benefit from FDI investment by attracting high tech companies to enter markets (Anokhin and Schulze, 2009). Therefore, educated people are free to behave entrepreneurially within existing companies, and they enjoy high-wage employment and high remunerations (see Model 3 in Table 5.7). This could suggest that corporate entrepreneurial activity substitutes for start-up activity and therefore has a positive relationship with technology absorption in

emerging economies that have lower levels of corruption (Romer, 1990; Acs *et al.*, 2014b; Turro *et al.*, 2014).

6.3 Economic Growth and Economic Growth Per Capita

In general, the estimated coefficient of the control variable of economic growth was consistent with the existing literature (Models 1-3), which indicated a positive and significant influence between economic growth and entrepreneurial activity (Levie and Autio, 2011; Fuentelsaz *et al.*, 2015). These results were consistent with previous studies that indicated that economic growth is essential for entrepreneurs to exploit new opportunities in each level of economic development (Bowen and De Clercq, 2008; Levie and Autio, 2011; Fuentelsaz *et al.*, 2015). However, economic growth was not significant for emerging economies located at the lower stages of economic development (Model 4).

Moreover, the estimated coefficient of the control variable of GDP per capita was significant with a positive sign in Model 1 ($\beta = 0.000$; $p < 0.05$). In Model 2, economic growth per capita was marginally significant with a positive sign ($\beta = 0.000$; $p < 0.1$). However, Models 3 and 4 showed that GDP per capita did not have a significant influence on entrepreneurial activity.

Table 6.1: z-test results to compare the regression coefficients between Models 3 and 4 in Table 5.7

	All countries	Z value	[95% Conf.	Interval]
Informal institutions				
CC	-0.678 (0.627)	-1.080	-2.334	0.977
More developed CC	2.256** (0.849)	2.660	0.072	4.439
Formal institutions				
PRO	-0.084 (0.047)	-1.790	-0.219	0.052
TEDU	0.009 (0.015)	0.640	-0.030	0.049
AC	0.012 (0.017)	0.730	-0.033	0.058
TA	0.014 (0.412)	0.030	-1.020	1.048
CC x PRO	-0.182* (0.074)	-2.450	-0.379	0.016
CC x TEDU	0.056 (0.030)	1.900	-0.030	0.142
CC x AC	-0.012 (0.015)	-0.770	-0.058	0.034

CC x TA	-0.201 (0.896)	-0.220	-2.413	2.011
More developed PRO	0.209** (0.067)	3.120	0.007	0.412
More developed TEDU	-0.013 (0.027)	-0.480	-0.086	0.060
More developed AC	-0.035 (0.035)	-1.000	-0.130	0.061
More developed TA	0.250 (0.487)	0.510	-1.003	1.503
More developed CC x PRO	-0.204 (0.126)	-1.620	-0.521	0.112
More developed CC x TEDU	-0.030 (0.034)	-0.870	-0.126	0.066
More developed CC x AC	0.000 (0.019)	0.010	-0.053	0.053
More developed CC x TA	-1.590 (0.858)	-1.850	-3.738	0.558
Control variable				
GDPg	0.027 (0.015)	1.820	-0.017	0.072
GDPpc	0.000 (0.000)	1.090	0.000	0.000
More developed GDPg	0.032 (0.019)	1.670	-0.025	0.088
More developed GDPpc	0.000 (0.000)	0.070	0.000	0.000
Constant	1.279* (0.590)	2.170	-0.238	2.796
<i>F</i> -statistic	105.71			
Prob.(<i>F</i> -statistic)	0.000			
Observations	396			
Countries	44			

Notes: Driscoll-Kraay standard errors between parentheses.

The coefficients on the more developed interaction terms give the differences between the two models 3 and 4 from Table 5.7.

*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Source: Own calculations

6.4 Discussion and Conclusions

6.4.1 Overall model evaluation

In this chapter, the quantitative results were interpreted and discussed in accordance with the theoretical and empirical literature outlined in Chapters 2 and 3, as a foundation to the policy suggestions and conclusions in the next chapter. This thesis has the potential to address an important and primary question – how do formal institutions positively and negatively affect the development of entrepreneurial activity in the presence of higher or lower levels of the perception of corruption? We provide answers by looking into how the control of corruption interacts with other formal institutions proxied by the number of procedures required to start a business,

education and training, access to credit, and technology absorption in emerging economies that are located at different levels of development. The discussion and comparison of the research findings confirmed as hypothesised in Chapter 3 (Section 3.5), that the variation in entrepreneurial activity in each emerging economy is determined by the interaction effect of formal and informal institutional factors. In addition, the presence of the above-mentioned predictors in regression models collectively explained approximately 90% of the remaining variance across the 44 countries included in our study after controlling country level of economic development, thus confirming the choice of institutions and making them relevant predictors of the likelihood of entrepreneurs starting their new ventures in emerging economies.

The findings of the study are intriguing. First, on the basis of the results reported in the previous chapter, both our main results (Table 5.7) and the robustness checks (Tables 5.8, 5.9 and 5.10) indicated that the differences between Model 1 and Model 2 provided some support for the conceptual premise that it is essential to consider the interactions of formal and informal institutions and their impact on entrepreneurial activity (Baumol, 1990; North, 1990, 2005; Williamson, 2000; Acs *et al.*, 2014a; Ghura *et al.*, 2017). Specifically, this study added to a growing stream of research that suggests that the combined effect of corruption and other formal institutions play an important role in accounting for variations in rates of entrepreneurial activity across emerging economies (Levie and Autio, 2011; Aparicio *et al.*, 2016; Krasniqi and Desai, 2016; Urbano *et al.*, 2018; among others).

Second, our findings were directly consistent with arguments advanced by Williamson (2000), who emphasised that informal institutions are at the top of the hierarchy of institutions that can hinder other formal institutional reforms. While Williamson (2000) did not consider corruption as an informal institution, following North's (1990) propositions that highlighted the significant role of informal institutions, this current thesis hypothesised that corruption represents an embedded pattern of informal behaviour norms that become institutionalised as part of a slow changing informal order (Aidis *et al.*, 2012; Estrin *et al.*, 2013).

Finally, the study's findings have significant implications for governance and institutional reform in emerging economies. Briefly, efforts aimed at enhancing the

control of corruption seem to have a strong but indirect effect on the development of entrepreneurial activity. The results from the panel data analysis suggested that it takes time for institutional reforms (i.e., the number of procedures, and education and training) in emerging economies to generate positive outcomes on entrepreneurial activity (Baumol, 1990; Hoskisson *et al.*, 2000; Williamson, 2000; Bruton *et al.*, 2009; Kiss *et al.*, 2012; Estrin *et al.*, 2013; among others). Therefore, Anokhin and Schulze (2009, p. 2) stated that “Patience and persistence are thus essential parts of the reformer's toolkit”.

6.4.2 The combined effect of formal and informal institutions on entrepreneurship

Here, we offer a more in-depth discussion of the findings of this study. Interestingly, except for the number of procedures variable, the findings in Model 1 (Table 5.7) were contrary to previous studies that have suggested that low levels of corruption (Anokhin and Schulze, 2009; Aidis *et al.*, 2012; Avnimelech *et al.*, 2014; Aparicio *et al.*, 2016; Dutta and Sobel, 2016), education and training (Baumol *et al.*, 2007; Aidis *et al.*, 2008; Valliere and Peterson, 2009), access to capital (Bowen and De Clercq, 2008; Aparicio *et al.*, 2016), and technology absorption (Gnyawali and Fogel, 1994; Stenholm *et al.*, 2013; Acs *et al.*, 2014b) have a direct impact on, and often increase, the probability of entrepreneurial activity.

However, the results in Model 2 (Table 5.7) were in line with previous literature that suggested that specific informal institutional variables, such as control of corruption can allow formal institutions to operate more effectively in affecting the rates of entrepreneurial activity for the context of emerging economies (Aidis *et al.*, 2008; Tonoyan *et al.*, 2010; Bruton *et al.*, 2013; Aparicio *et al.*, 2016).

In this regard, the results of the combined effect of the number of procedures and control of corruption on the development of entrepreneurial activity were in line with the study's expectations (hypothesis 1a), suggesting that the reforms of lower number of procedures and control of corruption are significant for increasing entrepreneurial activity in emerging economies (Klapper and Love, 2010; Aparicio *et al.*, 2016). These findings were contrary to the “public interest” theory of regulation that proposed that countries have high registration costs because there are high benefits to registration. Alternatively, the study's results were consistent with the

“public choice” theory and the hypothesis that high registration costs exist to benefit corrupt officials (Djankov *et al.*, 2002; Klapper and Love, 2010). Therefore, the signal sent by promoting greater trust in government reform policies through lower levels of corruption, as well as facilitating entry regulations, is significant to increase the new firms to benefit from the formal economy (Spence, 1973; Levie and Autio, 2011).

In the same way, the results of the joint effect of education and training, and control of corruption were in line with the study’s expectations (hypothesis 2a), suggesting that education and training reforms are significant for increasing entrepreneurial activity in emerging economies, if it is accompanied by lower levels of corruption perception (Álvarez and Urbano, 2011; Aparicio *et al.*, 2016). These results may be explained by the fact that educated individuals have more confidence and the necessary skills to start new businesses in emerging economies that have lower levels of corruption (Levie and Autio, 2008). Also, emerging economies that have lower levels of corruption are more likely to spend more money on the education system, which in turn would increase the rates of entrepreneurial activity (Aparicio *et al.*, 2016).

Contrary to the study’s expectations, the results of the interaction effect between corruption with access to credit and with technology absorption were inconsistent with the study’s hypotheses (3a and 4a). The results showed that the joint effect of access to credit and control of corruption on entrepreneurial activity is negative, suggesting that such reforms reduce the growth effects of the entrepreneurial activity. At the same time, the results showed that the combined effect of reforms related to the diffusion of firm-level technology and control of corruption on the development of entrepreneurial activity is negative, suggesting that the control of corruption reform diminishes the positive effect of technology absorption on entrepreneurial activity.

This could suggest that entrepreneurs in emerging economies that have lower levels of corruption are more likely to depend on informal financing (e.g., social networks or angel investors) rather than the formal financial sector when they start a new business activity (Szerb *et al.*, 2007). This explanation is consistent with Aidis *et al.* (2008, p. 662) who argued that “In an environment where outside financing is

restricted, informal investors or business angels play an especially important role in providing financing for business start-ups”.

In addition, entrepreneurs are likely to start new ventures that are based on imitative entrepreneurship, which offers lower cost products rather than technology-based entrepreneurship (Minniti and Lévesque, 2010). In this realm, Klapper and Delgado (2007) contended that new formal firms in developing countries tend to work in the sectors of wholesale and retail trade rather than manufacturing, which are less dependent on access to credit and technology. Klapper and Delgado (2007, p. 3) stated that:

“Understanding why entrepreneurs in developing countries focus so disproportionately on some sectors requires a deeper analysis. Still, a preliminary analysis suggests that reasons for focusing on the wholesale and retail trade sector might include its lower requirements for investment, human resources, knowledge, and capital. Besides, firms in this sector might be more likely to join the formal economy—and therefore to be recorded by the survey— because of a reluctance among overseas importers and large domestic traders to purchase from informal sector firms”.

Simultaneously, improvements in each emerging economy’s infrastructure (e.g., telecommunications, transportation and credit markets) may increase the advantages of larger corporations over new business activity. Therefore, improvements in access to credit and technology absorption in the presence of lower costs of corruption would provide an attractive environment for high tech firms to expand their economy of scale to enter emerging markets; therefore, some educated entrepreneurs are more willing to work for them (Acs, 2006; Acs *et al.*, 2008a; Anokhin and Schulze, 2009).

This previous explanation was in line with Minniti and Lévesque’s (2010) study that suggested that entrepreneurial activity in emerging economies may take different forms, such as research-based and imitative entrepreneurship, which have a positive contribution to economic growth. Although our data did not permit us to differentiate between research-based and imitative entrepreneurship, we speculate that the financial and technology sectors could offer corporate entrepreneurship (entrepreneurship that occurs within organisations) preferential access to credit and technology absorption over new start-ups (Minniti and Levesque, 2010; Turro *et al.*, 2014).

6.4.3 Emerging economies at different levels of development

Concerning hypotheses 1b, 2b, 3b, and 4b, given that our full sample includes emerging economies that are located at different stages of economic development, the sample was adjusted into more developed and less developed emerging economies. We re-estimated the equation and report the results in Models 3 and 4 (Table 5.7). The results were similar to those reported in Models 1 and 2, and thus we draw the same conclusions, suggesting that the interaction effect between control of corruption and the formal institutions in this study have failed to show that the effects were different for emerging economies located at different levels of development. In contrast to Aidis *et al.*'s (2012) and Acs *et al.*'s (2014a) proposition, these findings were unexpected and suggested that the selected institutions have no significant impact on the development of entrepreneurial activity in emerging economies that are located at different stages of development. It is difficult to explain these results, but they might be related to the fact that other studies examined different institutional variables and study samples. For example, Carlos Díaz Casero *et al.* (2013) and Kuckertz *et al.* (2016) focused only on the impact of formal institutions on entrepreneurial activity in the context of developed and developing countries. In addition, these studies used different regression models that may offer different results. Therefore, our findings need to be interpreted with caution.

Moreover, it seems that our results were more consistent with Naudé (2011, p. 331), who argued that:

“There is as yet no substantial literature on the relationship between the stages of development, the evolving nature of entrepreneurship and the orientation of the state. It is likely to be cofounded by difficulties for governments and international development organisations to identify their stage of economic development, due to the fact that stages overlap [see the third column in Table 2.4], that some countries may leapfrog stages and that the instruments and measurements to guide appropriate policies at each stage are not well understood”.

Although Acs *et al.* (2014a, b) suggested that there is a link between entrepreneurship policy design across different stages, the measures of the selected institutional variables and entrepreneurship in our study were previously untested in the context of emerging economies. Clearly, future studies on the current topic are therefore recommended.

6.4.4 Concluding remarks

In short, this study confirmed that the dynamics of institutions might not have the same effects on entrepreneurs in emerging economies that might be expected in developed countries, as suggested by the literature (Bruton *et al.*, 2009; Hoskisson *et al.*, 2011; Pathak *et al.*, 2016). The results robustly indicated that institutions might have different, even negative effects of, access to credit and technology used by new start-ups in emerging economies. This could go a long way towards explaining the conflicting findings of the interaction effect of institutions on entrepreneurship found in the existing literature (Dutta and Sobel, 2016). For example, Anokhin and Schulze (2009) found a positive effect for control of corruption whereas Dreher and Gassebner (2013) reported negative associations between control of corruption and entrepreneurship. Similarly, Manolova *et al.* (2008) suggested a negative effect of high levels of education while Aparicio *et al.* (2016) found a positive impact of tertiary education and business skills on entrepreneurial activity. In general, therefore, it seems that future research should take into account the level of political and socio-economic development of a country when theorising about the role of institutions. It is noteworthy, however, that the study's results should be handled carefully as they may vary from results in other studies that have used different regression models (pooled OLS or the random effects model) (Aidis *et al.*, 2012).

The final and following chapter concludes by offering an overview of the research findings found in this thesis. Based on these findings, a number of policy recommendations will be suggested in an attempt to encourage higher rates of entrepreneurial activity in emerging economies.

CHAPTER SEVEN: CONCLUSIONS

7.1 Introduction

The previous chapter discussed the results of the panel data analysis that examined the hypotheses of the developed conceptual framework. This chapter offers an overall summary and summarises the the previous chapters of this thesis. Next, it highlights how this study contributes to the theory and practice. Finally, policy recommendations are suggested based on the main findings of the research; it also shows the limitations of the research and offers some recommendations for future work in order to advance the knowledge in the field of entrepreneurial economics.

Given that entrepreneurship is a key driver to economic growth and development through job creation, innovation and prosperity, the primary aim and contribution of this thesis was to study the impact of institutional dynamics on the development of entrepreneurial activity in the context of emerging economies. It specifically argued that lower levels of corruption as an informal institution could improve the impact of formal institutions presented by the number of procedures, education and training, access to credit and technology absorption on the rates of entrepreneurial activity. Moreover, this previous relationship may vary under the level of development of a particular emerging economy. Therefore, there is a continuous need to understand the institutional determinants that encourage entrepreneurial activity in emerging economies located at different stages of development theoretically, empirically and from a policy viewpoint.

The role of the institutional environment was examined by testing a number of hypotheses reflecting if the interaction effects of the above-mentioned institutions are able to explain disparities in rates of entrepreneurial activity in the context of emerging economies. To achieve this, this thesis was able to provide a better understanding of the interplay between the formal and informal institutions for entrepreneurial activity, and contribute to the limited body of existing research using panel data analysis of entrepreneurship in the case of emerging economies.

In addition, it is hoped that the study findings will offer guidance for policymakers and other associations that are interested in the design of entrepreneurship policy in

emerging economies, as part of an effort to encourage an institutional environment that is conducive to more productive entrepreneurial activities. The next section briefly reviews the results achieved from the quantitative results reported and discussed in Chapter 6.

7.2 Research Summary and Findings

Considering that entrepreneurship is a key driver for economic growth and development (Acs *et al.*, 2014a, b; Aparicio *et al.*, 2016; Ghura *et al.*, 2017), understanding which institutional variables contribute to fostering and enhancing entrepreneurship appears to be a remarkable phenomenon (Autio and Acs, 2010; Levie and Autio, 2011; Stenholm *et al.*, 2013; Fuentelsaz *et al.*, 2018; Urbano *et al.*, 2018). In this thesis, balanced longitudinal panel data (for the period 2006-2014) were used to empirically examine the simultaneous effect of institutional variables on the development of entrepreneurial activity in the context of 44 emerging economies. By developing a conceptual framework of institutional economics, this study analysed the interaction effect of informal (i.e., corruption) and formal institutions (i.e., the number of procedures involved in starting a business and education and training, access to credit, and technology absorption) on the rates of entrepreneurial activity. Also, this study considered the comparison of emerging economies that are located at different stages of economic development in the sample.

The research generated four key results. First, the quantitative findings provided evidence regarding the scheme proposed by Gnyawali and Fogel (1994), who suggested that the rates of entrepreneurial activity depend on the socio-economic and political context. Following the conceptual framework used in this thesis, these socio-economic factors and political context could be associated with the interaction between the formal and informal institutions (North, 1990, 2005). Also, Williamson (2000) suggested that informal institutions are at the top of the hierarchy of the institutional framework.

The findings of examining the developed conceptual framework in this study showed that there is evidence of a positive relationship between institutional variables and entrepreneurship. This is in line with the recent findings of entrepreneurship research, which suggests that the institutional environment of a specific economy

plays a crucial role in explaining the rates of entrepreneurial activity (Levie and Autio, 2011; Acs *et al.*, 2014a; Aparicio *et al.*, 2016; among others). Moreover, the study findings revealed that the rates of entrepreneurial activity could be explained by the interaction of formal and informal institutional variables within each emerging economy. As expected, this study found that variances in rates of entrepreneurship could most significantly be explained by the interaction effect between control of corruption with the number of procedures and, secondly, with education and training. However, the interaction between control of corruption and access to credit was found to influence rates of entrepreneurial activity negatively and, therefore, indicated that entrepreneurs who have limited access to finance are likely to fund their new ventures from different sources, such as social networks and family members. Similarly, findings related to the interaction between firm-level of technology absorption and control of corruption had a marginally significant effect with a negative sign and, therefore, indicated that entrepreneurs tend to work for big high-tech corporations due to higher returns.

Second, the research findings highlighted that the study of entrepreneurial activity is a country event, and that the characteristics of the country mainly affect the rates of entrepreneurial activity in each emerging economy. In consideration of this, the research findings showed that the nature of each country's political and socio-economic factors could affect the levels of entrepreneurial activity. Therefore, it is inappropriate to suggest an homogenous, one-size fits all entrepreneurship policy as each economy varies significantly based on social, economic and historical events (North, 1990).

Third, the results supported the idea that formal institutions have a more significant impact on the rates of entrepreneurial activity in emerging economies if they are accompanied by lower levels of corruption, as suggested by the literature (e.g., Aparicio *et al.*, 2016). In this respect, theoretical and policy implications could be derived regarding the institutional variables, particularly corruption as an informal institution, which influence the economic growth (North, 1990) indirectly throughout entrepreneurship (Aparicio *et al.*, 2016; Urbano *et al.*, 2018).

Lastly, the results suggested that the interaction effect of formal and informal institutions on the development of entrepreneurial activity did not show a significant

influence on emerging economies located at different stages of economic development. Therefore, it is vital that policymakers adopt different strategies to encourage the rates of entrepreneurial activity, regardless of the level of economic development of each emerging economy (Naudé, 2011). Following the research summary and findings, the next section sheds more light on how this thesis contributes to the limited body of existing research analysing entrepreneurship in the context of emerging economies under institutional lenses.

7.3 Thesis Contributions

Recently, different studies have focused on the interaction between formal and informal institutions and their effect on entrepreneurial activity (Estrin *et al.*, 2013; Belitski *et al.*, 2016; Fuentelsaz *et al.*, 2018). However, this study presented several contributions to knowledge by creating a multilevel understanding of entrepreneurship within the context of institutional theory in emerging economies. Three main theoretical, methodological, and contextual contributions were made in this research; they are supported by significant contributions given by each chapter in the thesis.

7.3.1 Theoretical contributions

The study has several theoretical contributions. First, it advanced the existing theory in the field of entrepreneurship and institutional economics as few empirical studies were grounded in both theories (Acs *et al.*, 2014a, b). The institutional environment was emphasised in this study as being at the core of productive entrepreneurship. Specifically, institutions provide the appropriate incentives for entrepreneurs to contribute to economic growth and development through innovative new firms (Baumol, 1990; North, 1990, Naudé, 2011; Urbano *et al.*, 2018).

Second, this study contributes theoretically by expanding the application of the theory to address the interaction effect between formal and informal institutions on the development of the entrepreneurial activity (e.g., North, 1990; Estrin *et al.*, 2013; Stenholm *et al.*, 2013). In this regard, this thesis extends Gnyawali and Fogel's (1994) framework by making a clear distinction between the informal institutions level and the lower level of formal institutions (Williamson, 2000). This distinction is essential because the outcomes derived from the interaction of each institutional

level (i.e., formal and informal) can influence the rates of entrepreneurial activity in a different way (Baumol, 1990; North, 1990).

Third, this study approached formal and informal institutions in a substantially different way by adopting a more comprehensive approach in examining the dynamics of institutional effects on the rates of entrepreneurial activity (Gnyawali and Fogel, 1994). Specifically, we extended the previous research on the intricate relationship between informal institutions reflecting the perception of corruption (e.g., Aidis *et al.*, 2012; Dreher and Gassebner, 2013) and formal institutions captured here by the number of procedures (e.g., Aparicio *et al.*, 2016), education and training (e.g., Aidis *et al.*, 2008), access to credit (e.g., Bowen and De Clercq, 2008), and technology absorption (e.g., Stenholm *et al.*, 2013). Based on the institutional theory, this research suggested that, together with the formal institutions emphasised by the entrepreneurship literature, it is important not to underestimate the role of informal institutions in encouraging entrepreneurial activity (North, 1990; Estrin *et al.*, 2013; Aparicio *et al.*, 2016).

Fourth, the link between entrepreneurship in the form of new start-ups and institutional dynamics is considered in this thesis; previously, few studies used these variables simultaneously (Bjørnskov and Foss, 2013). Unlike other studies, this type of entrepreneurship is particularly useful in accounting for “productive” entrepreneurship, as aspiring entrepreneurs are more likely to register their ventures in order to benefit from the potential advantages of participating in the formal economy based on the incentives provided by the institutional environment (Baumol, 1990; Klapper *et al.*, 2010; Levie and Autio, 2011).

Lastly, to the knowledge of the researcher, this is the first study of substantial duration that examined the moderating role of corruption as an informal institution (Aidis *et al.*, 2012) on the relationship between formal institutions and entrepreneurial activity. Before this study, it was difficult to make predictions about whether corruption can facilitate (grease the wheel theory) or constrain the rates of entrepreneurship (Dutta and Sobel, 2016). Thus, the empirical findings reported here shed new light on how the interplay between corruption and other formal institutions can affect the development of entrepreneurial activity (North, 1990; Williamson, 2000). The results found that formal institutions can have a better impact on the rates

of entrepreneurial activity if it is accompanied by lower levels of corruption. This new understanding should help to improve predictions of the development of entrepreneurial activity in the context of emerging economies.

7.3.2 Methodological contributions

This research contributed to the yet limited literature that provided a panel (longitudinal) study of entrepreneurship phenomena by demonstrating the interactive effect between formal and informal institutions at the macro-level environment.

While previous studies mainly used cross-sectional data to test the impact of institutions on entrepreneurship (De Clercq *et al.*, 2010a; Danis *et al.*, 2011; Stenholm *et al.*, 2013), still missing from the literature is a large longitudinal panel study of country-level rates of entrepreneurship. Using panel data analysis for a group of countries may offer a better understanding of the evolution of institutional quality through a specific period of time (Williamson, 2000; Levie and Autio, 2011; Stenholm *et al.*, 2013).

Therefore, this thesis advances our understanding of institutional dynamics by using panel (longitudinal) data over the period 2006-2014 for 44 emerging economies. Because the development of institutions may take a long period (Hoskisson *et al.*, 2000; Williamson, 2000), this type of analysis is necessary for testing the interaction effect of informal and formal institutions on the development of entrepreneurial activity (Estrin *et al.*, 2013).

7.3.3 Contextual contributions

This study contributed to the currently limited literature that examined entrepreneurship in emerging economies by considering the context of 44 emerging economies (Bruton *et al.*, 2008; Bruton *et al.*, 2009; Hoskisson *et al.*, 2011). In this realm, our findings suggested the impact of an institutional environment on entrepreneurship is genuinely relevant for emerging economies regardless to the stage of development. In this perspective, reducing corruption levels is significant in order to increase the impact of formal institutions on the development of entrepreneurial activity.

As a result, this thesis has significant implications for policymakers in the context of emerging economies, suggesting some new insights as to which institutions improve new business activity and which hinder them. In short, the research findings found a moderating effect of control of corruption for strengthening the impact of the number of procedures and education and training on entrepreneurial activity, regardless of the level of economic development. This calls upon governments' policymakers to promote reforms of the institutions mentioned above.

Building on the research findings of this study, the next section attempts to offer potential policy recommendations that could be implemented to foster and improve the institutional environment for entrepreneurial activity in the case of emerging economies.

7.4 Policy Implications

Policymakers in emerging economies should consider entrepreneurship in setting national policies; this is because it is apparent that entrepreneurship plays an essential role in sustaining economic growth and development. However, the literature reviewed in Chapters 2 and 3 showed that this relationship might not necessarily be the case. In particular, it should be noted that suitable policies for entrepreneurship, specifically in emerging economies where the institutional infrastructure is underdeveloped, should take into account that entrepreneurial activity may not always promote economic development (Baumol, 1990; Bruton *et al.*, 2009). For example, in emerging economies with high levels of corruption:

“the entry barriers could be a source of rents to corrupt officials, so that these barriers may not keep out dishonest entrepreneurs or will make reform or abolitions of these barriers difficult” (Naudé, 2011, p. 325).

Therefore, there is a need for supportive institutions to make effective entrepreneurship policies that, in turn, encourage entrepreneurial activity through the formation and growth of new firms (Acs and Szerb, 2007, Acs *et al.*, 2014a, b). In this regard, there are a number of policy recommendations to consider based on the research findings of this study.

The research's findings have significant implications for policymakers. The empirical results in this study provided a new understanding of the institutional

dynamics and how the higher level of informal institutions, such as corruption, are slower to change than lower levels ones, such as formal institutions. Moreover, the findings of this study suggested that policymakers concerned about increasing the rates of entrepreneurship through new business activity should focus their efforts on understanding the elements of the institutional environment that are most critical for a particular emerging economy. They should then work systematically to develop an attractive environment for entrepreneurs for the short term as well as the long-term (Aidis *et al.*, 2012; Estrin *et al.*, 2013). Also, it is inappropriate to rely on the reform changes of the formal institutions without considering the reforms of the informal institutions, such as corruption. The evidence from this study showed that formal institutions, such as the number of procedures, and education and training, are more likely to encourage individual's choice to become an entrepreneur and start a new business activity in emerging economies that have a perception of lower levels of corruption. Therefore, informal institutions, such as corruption, remain essential for increasing the rates of entrepreneurial activity as they act as a moderator between formal institutions and entrepreneurial activity (Belitski *et al.*, 2016).

Indeed, the results of this study recommended that entrepreneurship policies should be treated at the country level, and should consider emerging economies' heterogeneity regardless of the stage of economic development. However, this section of the thesis could suggest general policy recommendations drawn from the research findings. These policy suggestions could be useful for the governments and other organisations involved in growing new start-ups in the context of emerging economies.

7.4.1 Number of procedures for entrepreneurship

As predicted, the quantitative results highlighted that the number of procedures is a significant determinant explaining country variation in rates of entrepreneurial activity for emerging economies that have lower levels of corruption. In this regard, the Doing Business Report (2005, p. 23) stated that:

“Cumbersome entry procedures push entrepreneurs into the informal economy, where businesses pay no taxes and many of the benefits that regulation is supposed to provide are missing. Workers lack health insurance and pension benefits. Products are not subject to quality standards. Businesses cannot obtain bank credit or use courts to resolve disputes. Women are hurt

disproportionately since they constitute 75% of informal employees. Corruption is rampant, as bureaucrats have many opportunities to extract bribes”.

Therefore, one of the main steps that should be taken by policymakers seeking to encourage entrepreneurs to move from the informal to formal entrepreneurship is to enable the starting of a business to take place as quickly and cheaply as possible (Gnyawali and Fogel, 1994; Acs and Szerb, 2007; van Stel *et al.*, 2007; Aparicio *et al.*, 2016).

To effectively support entrepreneurial activity, all the governments in our sample need to institute both high quality business regulations and procedures supported by high quality control of corruption (Autio and Fu, 2015). However, there is some evidence that governments are able to decisively change cultural or social norms, such as corruption, as they tend to be resistant and stable over long periods (North, 1990; Naudé, 2011, p. 325). Therefore, what types of public policy instruments are best suited to fight corruption are beyond the scope of this study. On the basis of our definition, all policy recommendations that increase control of corruption will be useful.

In a recent study, Tonoyan *et al.* (2010) suggested that corruption is a rooted social norm that can only be changed in the long run through education and training, investing in strong mass media, building and supporting civil society, and promoting sustained public campaigns: a critical mass of business people and public officials has to be persuaded of the social and economic costs of corruption. For example, Bulgaria and Moldova fought corruption by increasing judges’ salaries and introducing a random allocation of court cases to judges. Moreover, Bulgaria developed a more transparent recruitment process for judges (Doing Business, 2008, p. 81). Therefore, there is a need to pay attention to the country-specific formal and informal institutions through political will to develop effective anti-corruption reforms, and a desire to change and coordinate with stakeholders to provide a supportive environment for entrepreneurs to flourish (Aidis *et al.*, 2012; Doing Business, 2012, p. 31).

Concerning reducing the number of procedures, the Doing Business report (2005, p. 21; 2009, p. 10) suggested several policy reforms to simplify the administrative process to start a business such as:

- (1) creating one-stop shop for entrepreneurs;
- (2) eliminating the need for the mandatory use of both notaries and judges to register the business;
- (3) allowing for online registration;
- (4) letting entrepreneurs operate and function by introducing temporary business licenses;
- (5) imposing a “silence is consent” rule, which states that once the deadline for registration has passed, the business is automatically considered registered;
- (6) standardising paperwork to make it easier for entrepreneurs to process the documents; and
- (7) having no minimum capital requirement.

The Doing Business report (2005, p 23) found that countries (e.g., Ethiopia, France, Morocco, Slovakia and Turkey) that adopted such reforms helped the new entry of formal businesses to grow 2-4 times faster compared to other countries.

To this end, policymakers can influence market mechanisms and make them work more effectively by removing and changing regulations, as well as preventing corruption that produces rigid administrative procedures and imperfections in the market (Gnyawali and Fogel, 1994; Castaño-Martínez *et al.*, 2015).

7.4.2 Education and training for entrepreneurship

The research findings highlighted that control of corruption, as well as a country’s level of education and training measured by tertiary education, is fundamental to generating incentives regarding entrepreneurial activity. Therefore, one method of increasing the awareness of entrepreneurship as a career option is by focusing on supporting tertiary education, accompanied by the perception of lower levels of corruption.

In this regard, the key question to be addressed at a policy level is whether the population has the skills necessary to start a business based on the availability of

tertiary education, and if corruption makes entrepreneurship difficult relative to other career paths.

A number of key policy priorities should, therefore, be to plan for the long-term care of tertiary education and control of corruption. Governments should make tertiary education more accessible to the people, offer interest-free loans to cover educational expenses, and, in some cases, adopt policies to minimise the child labour force. Moreover, policymakers in emerging economies should make high school business education compulsory, and offer regional fund initiatives to inspire students for entrepreneurship. In line with the previous policy recommendations, governments in emerging economies should ensure appropriate systems to reduce and prevent corruption as it can undermine the confidence of educated entrepreneurs to select an entrepreneurial career path (Acs *et al.*, 2018b).

7.4.3 Access to credit for entrepreneurship

Although the financial system is important to provide sufficient tools needed by entrepreneurs, the results of this study suggested that greater coverage of private credit may be a deterrent to new business activity in emerging economies that have the perception of lower levels of corruption. This finding was unexpected and could suggest that access to finance is significant to corporate entrepreneurship, rather than the new business activity that could depend on other capital sources such as social networks and angel investors.

Taken together, these findings did not support strong policy recommendations for new business activities. However, policymakers in emerging economies should consider to what extent capital is available for high growth and larger firms, and whether corruption hinders the process of funding. Therefore, continued efforts are needed by governments to make finance more accessible by reducing corruption by providing venture capital and private equity financing (Acs *et al.*, 2018b).

7.4.4 Technology absorption for entrepreneurship

The quantitative results reported that the benefits of technology absorption have a negative effect on rates of entrepreneurial activity in emerging economies with lower levels of corruption. This could suggest that the diffusion of new technology, and the

capacity to absorb it, is more important for larger organisations with high growth potential than new start-ups.

One of the ways in which policymakers might achieve higher levels of corporate entrepreneurship in emerging economies is through sponsoring leading technologists at ecosystem events, promoting local technologies and technologists, and paying particular attention to FDI (Acs and Szerb, 2007; Acs *et al.*, 2018b). Although jobs from FDI are apparently a vital source of increasing corporate entrepreneurship in emerging economies, it is essential to start enterprise development policies to encourage technology-based start-ups in the long run (Acs and Szerb, 2007; Pathak *et al.*, 2013).

7.4.5 Generalisability of policy recommendations

The results reported in this thesis provided evidence that entrepreneurship research should be discussed in a country event. Therefore, the policy recommendations mentioned above are only generalisable to the study's sample and may not fit other economies. This is due to the fact that suggestions were presented by arranging institutional determinants affecting entrepreneurial activity within each emerging market. Hence, it is an unavoidable limitation showing the complexity of the entrepreneurship study, which is restricted to country-specific unique characteristics (North, 1990).

Moreover, in consideration of the different characteristics of these countries, it is possible that some of the policy proposals offered from the study findings will be more appropriate in particular emerging economies than others. Accordingly, as previously explained, individual nations should retain their own unique set of tailor-made policies that consider the requirements, capacities and institutional structure of that country, as trying to adopt policy suggestions from other countries is no guarantee for achieving higher rates of entrepreneurial activity (Acs *et al.*, 2018b).

To provide tailored policies for each country, a recent attempt was made by Acs *et al.* (2014a) who offered the Global Entrepreneurship Index (GEI). This report was established in 2009 to measure country level entrepreneurship based on a National System of Entrepreneurship (NSE) perspective. In this context, NSE is defined as:

“a dynamic, institutionally embedded interaction between entrepreneurial attitudes, entrepreneurial abilities, and entrepreneurial aspirations by individuals, which drives the allocation of resources through the creation and operation of new ventures” (Acs *et al.*, 2014a, p. 479).

The critical features of GEI methodology can be summarised as follows (Acs *et al.*, 2014a). First, entrepreneurship is a multifaceted concept of NSE that consists of 14 pillars divided into three sub-indices: entrepreneurial attitudes (i.e., societies’ attitudes toward entrepreneurship), abilities (i.e., the characteristics of the entrepreneurs and their businesses), and aspirations (i.e., reflects the quality aspects of start-ups and new businesses). Second, each pillar includes an individual combined with an institutional variable that reflects the micro- and the macro-level facets of entrepreneurial activity, as shown in Table 7.1. All of the individual level data were obtained from the GEM adult population survey results, as published in annual GEM executive reports. National institutional variables were derived from different sources, such as the World Bank, World Economic Forum, UNESCO, and the Heritage Foundation (for more details about the variables used, see Acs *et al.*, 2014a, b). Finally, NSE is a dynamic system that allows continuous interaction between system components to trace the observable conditions within individual countries.

Table 7.1: The selection of institutional and individual variables used in GEI

Pillars	Institutional variables	Individual variables
Entrepreneurial Attitudes		
Opportunity Perception	Market Agglomeration	Opportunity Recognition
Start-up Skills	Tertiary Education	Skill Perception
Risk Acceptance	Business Risk	Risk Perception
Networking	Internet Usage	Know Entrepreneurs
Cultural Support	Corruption	Career Status
Entrepreneurial Abilities		
Opportunity Start-up	Economic Freedom	Opportunity Motivation
Technology Absorption	Tech Absorption	Technology Level
Human Capital	Staff Training	Educational Level
Competition	Market Dominance	Competitors
Entrepreneurial Aspirations		
Product Innovation	Technology Transfer	New Product
Process Innovation	GERD	New Tech
High Growth	Business Strategy	Gazelle
Internationalization	Globalization	Export
Risk Capital	Depth of Capital Market	Informal Investment

Source: Acs *et al.* (2014b)

Building on the Configuration Theory, the Penalty for Bottleneck (PFB) methodology was adopted to offer system dynamics into the GEI by allowing its pillars' components to interact. Concerning entrepreneurship, a bottleneck refers to the weakest link of a particular entrepreneurial pillar, relative to other pillars. This notion of bottleneck portrays a direct effect of the 14 pillars interacting to produce NSE performance. Therefore, increasing entrepreneurship performance can only be reached by strengthening the weakest link (i.e., the bottleneck) that restrains the performance of the system. In the context of NSE, the worse performing pillars (e.g., start-up skills) hinder the better performing pillars (e.g., product innovation) and consequently the overall GEI score (Szerb *et al.*, 2012; Acs *et al.*, 2014a).

Through the GEI of entrepreneurship, Acs *et al.* (2014b) provided some evidence that a higher level of entrepreneurial activity is contingent upon the institutional structures that are consistent with societal attributes and requirements. The authors classified the countries in line with the index result. Interestingly, some emerging economies, such as Estonia, Slovenia, and Turkey, among others, appeared in the top 35 out of the 88 countries analysed in their sample. While they emphasised the top position of advanced economies in the ranking, they found that emerging economies could achieve higher levels of entrepreneurial activity if they improved specific institutional variables. Analysing these results under the lens of institutional variables utilised by Acs *et al.* (2014b), emerging economies face different challenges, such as developing the tertiary education and business skills, controlling corruption, and assuring access to the financial system, among others. In this regard, the study results were in line with the previous findings concerning the significance of the institutional variables, as mentioned above, to encourage higher rates of entrepreneurial activity.

Summarising, GEI could be a helpful instrument for policies trying to ameliorate entrepreneurship performance in a specific nation. In contrast to other entrepreneurship reports (e.g., Global Entrepreneurship Monitor (GEM) and Doing Business), which suggest limited essential factors for improving entrepreneurial performance, GEI proposes a comprehensive balance of all the 14 pillars of entrepreneurial performance. Moreover, other entrepreneurship reports offer general

and uniform policy implications, while GEI gives individual, country level, tailor-made policy suggestions.

7.5 Limitations and Recommendations for Future Research

The generalisability of the study's findings is subject to certain limitations that could become future research lines. First, more accurate measures for both dependent and independent variables could be used. Our study has considered only one particular aspect of "productive" entrepreneurship, which is newly registered firms with limited liability (Baumol, 1990). Although newly registered firms are recognised among key components that entrepreneurial activity may make to economic growth (Acs *et al.*, 2008b; Levie and Autio, 2011), future research should seek to examine other aspects of productive entrepreneurship, such as activities involving a high level of innovation, corporate entrepreneurship or export-oriented entrepreneurship (Bowen and De Clercq, 2008; Turro *et al.*, 2014; González-Pernía and Peña-Legazkue, 2015; Belitski *et al.*, 2016).

Second, using other (or more) environmental variables (e.g., national culture or property rights) is crucial to understanding entrepreneurship in emerging countries where institutional arrangements can vary significantly from those in developed countries (Bruton *et al.*, 2008; Estrin *et al.*, 2013; Hayton and Cacciotti, 2013; Fernández-Serrano and Romero, 2014; Sambharya and Musteen, 2014; Brancu *et al.*, 2015; Chowdhury *et al.*, 2015b). In this regard, Urbano *et al.* (2018) stated that:

“In particular, we identified that property rights (formal institutions) and the belief systems (informal institutions) should be further analysed since there is still a scarcity of evidence dealing with these types of institutions”.

Therefore, future research could widen the scope of knowledge of how these formal and informal institutions might interact and affect the productivity of entrepreneurship at different levels of economic development (Belitski *et al.*, 2016)

Finally, it is recommended that further research should be undertaken in larger samples across more countries or in different regions such as resource-based economies, African or Asian contexts in which corruption is prevalent in many of those nations (Pathak *et al.*, 2015).

We hope that our study will inspire further investigations in the future into the interaction's impact between formal and informal institutions on the development of entrepreneurial activity.

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APPENDIX 1: LIST OF MAIN PAPERS DISCUSSING ENTREPRENEURSHIP, ECONOMIC GROWTH AND/OR INSTITUTIONS

Author(s)	Title	Theoretical framework	Methodology	Results	Key term	Dvariable	Ivariable	Type of paper
Acs, Z., Audretsch, D., Braunerhjelm, P., Carlsson, B. (2012)	Growth and entrepreneurship	Endogenous growth theory	Panel data	Entrepreneurship is a conduit of knowledge and positive effect of entrepreneurship activity (TEA) on economic growth	Knowledge spill over	Growth	Self-employment	Empirical
Acs, Z., Desai, S., Hessels, J. (2008a)	Entrepreneurship, economic development and institutions	Economic development theory	Cross section	The impact of entrepreneurship depends on the stage of development	Economic development			Special issue
Acs, Z., Desai, S., Klapper, L. F. (2008b)	What does entrepreneurship data really show?	Economic development theory	Cross section	The impact of entrepreneurship depends on the stage of development	Entrepreneurship data	GDPpc	TEA	Empirical
Acs, Z., Szerb, L. (2007)	Entrepreneurship, Economic Growth and Public Policy	Endogenous growth theory	Summarise	The impact of entrepreneurship depends on the stage of development Entrepreneurship has a positive effect on regional development, which is a relevant fact to design public policies	Economic growth			Special issue
Aidis, R., Estrin, S., Mickiewicz, T. (2008)	Institutions and entrepreneurship development in Russia: A comparative perspective	Institutional approach	Probit regression	Russia's institutional environment is important in explaining its relatively low levels of entrepreneurship development	Institutions	TEA	Formal institutions	Empirical
Aidis, R., Estrin, S., Mickiewicz, T. M. (2012)	Size matters: entrepreneurial entry and government	Institutional approach	Panel data	Entrepreneurial entry is inversely related to the size of the government, and more weakly to the extent of corruption. A cluster of institutional indicators representing "market freedom" is only significant in some specifications. Freedom from corruption is significantly related to entrepreneurial entry, especially when the richest countries are removed from the sample, but unlike the size of government, the results on corruption are not confirmed by country-level fixed-effects models.	Institutions	Start-up rate	Formal institutions	Empirical
Álvarez, C., Urbano, D., Amorós, J.E. (2014)	GEM research: achievements and challenges	Institutional approach	Literature review	The institutional approach is the most commonly used conceptual framework in the field of entrepreneurship.	Institutions			Theoretical

Anokhin, S., Schulze, W.S. (2009)	Entrepreneurship, innovation, and corruption	Contract theory	Panel data	Control of corruption contributes to the increase of innovation (number of Patent applications and rate of Realized Innovation) and entrepreneurship (TEA) These relationships are moderated by FDI which is a driver of technological advancement in developing nations.	Institutions	TEA	Formal, Informal institutions	Empirical
Aparicio, S., Urbano, D., Audretsch, D. (2016)	Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence	Institutional economic theory/ Endogenous growth theory	Panel data	The impact of informal institutions on entrepreneurial activity is more than the formal ones and at the same time entrepreneurship is positively contributes to economic growth Variables such as control of corruption, confidence in one's skills and private coverage to obtain credit promote a positive effect of opportunity entrepreneurship on economic growth in all the countries and especially Latin American countries.	Economic growth, institutions	Growth	Opportunity TEA, formal and informal institutions	Empirical
Autio, E., Fu, K. (2015)	Economic and political institutions and entry into formal and informal entrepreneurship	Institutional approach	Panel data	An increase in the quality of economic and political institutions could double the rates of formal entrepreneurship and halve the rates of informal entrepreneurship.	Institutions	Formal new firms	Formal institutions	Empirical
Audretsch, D. (2007)	Entrepreneurship capital and economic growth	Neoclassical economic growth theory	Develop a theoretical framework	Entrepreneurship capital is a conduit of knowledge spill over and positively contributes to economic growth	Economic growth			Theoretical
Audretsch, D., Bönte, W., Keilbach, M. (2008)	Entrepreneurship capital and its impact on knowledge diffusion and economic performance	Endogenous growth theory	Structural equation model	Innovation efforts have an indirect impact on economic performance through entrepreneurship	Regional economic growth	Regional growth	Entrepreneurship capital	Empirical
Audretsch, D., Keilbach, M. (2004a)	Does Entrepreneurship Capital Matter?	Social capital theory	Cross section	There is a positive impact of entrepreneurship capital on regional economic growth	Regional economic growth	Regional growth	Entrepreneurship capital	Empirical
Audretsch, D., Keilbach, M. (2004b)	Entrepreneurship Capital and Economic Performance	Neoclassical economic growth theory	Cross section	There is a positive impact of entrepreneurship capital on regional economic growth	Regional economic growth	Regional growth	Entrepreneurship capital	Empirical
Audretsch, D., Keilbach, M. (2005)	Entrepreneurship capital and regional growth	Neoclassical economic growth theory	Cross section	There is a positive impact of entrepreneurship capital on regional economic growth	Regional economic growth	Regional growth	Entrepreneurship capital	Empirical
Audretsch, D.,	Resolving the	Endogenous	Cross section	Entrepreneurship serves as a conduit of	Knowledge spill	Regional growth	Entrepreneurship	Empirical

Keilbach, M. (2008)	knowledge paradox: Knowledge-spill over entrepreneurship and economic growth	growth theory		knowledge spill over and positive impact of entrepreneurship activity (TEA) on economic growth	over		capital	
Baumol, W., Storm, R. J. (2007)	Entrepreneurship and economic growth	Institutional economic theory	Comment	Institutions are crucial in determining the positive effect of entrepreneurship on economic growth	Institutions			Theoretical
Belitski, M., Chowdhury, F., Desai, S. (2016).	Taxes, corruption, and entry	Institutional approach	Panel data	Higher tax rates consistently discourage entry. Further, although the direct influence of corruption on entry is also consistently negative, the interaction influence of corruption and tax rate is positive. This indicates that corruption can offset the negative influence of high taxes on entry.	Institutions	Entry rate	Formal and informal institutions	Empirical
Bjørnskov, C., Foss, N. (2013)	How strategic entrepreneurship and the institutional context drive economic growth	Neoclassical economic growth theory	Time series	There is a positive impact of self-employment and institutions on total productivity factor	Institutions	TFP	Self-employment, institutions	Empirical
Bjørnskov, C., Foss, N. (2016)	Institutions, entrepreneurship, and economic growth: what do we know and what do we still need to know?	Institutional economic theory	Literature review	The literature narrowly identifies entrepreneurship with start-ups and self-employment; does not theorize many potentially relevant inter-level links and mechanisms; and suffers from sample limitations, omitted variable biases, causality issues, and response heterogeneity. Theories in management research, such as the resource-based view, transaction cost economics, and strategic entrepreneurship theory, can fill some of the conceptual and theoretical gaps.	Institutions, Economic growth			Theoretical
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	Institutional approach	Literature review	Institutional theory has the potential to provide great insights for entrepreneurship and the broader management discipline. However, since the theory has matured, it is time to employ new and richer insights and uses of the theory.	Institutions			Theoretical
Bruton, G. D., Ahlstrom, D., Puky, T. (2009).	Institutional differences and the development of entrepreneurial ventures	Institutional approach	Grounded theory	The venture capital industry exhibits a strong consistency across many dimensions; yet institutions in these	Institutions	Business owners	Formal and informal institutions	Empirical

				two distinct settings result in significant differences in industry practice.				
Busenitz, L.W., Gomez, C. and Spencer, J.W. (2000)	Country institutional profiles: Unlocking entrepreneurial phenomena	Institutional approach	Structural Equation Modeling (SEM) to perform a confirmatory factor analysis (CFA)	The institutional profile should provide a useful tool to explain cross-national differences in entrepreneurship	Institutions	Business owners	Formal and informal institutions	Empirical
Castañero-Martínez, M.-S., Méndez-Picazo, M.-T., Galindo-Martín, M. Á. (2015)	Policies to promote entrepreneurial activity and economic performance	Schumpeterian theory	Partial least squares	Greater expenditure on R&D, education and stimulating entrepreneurial culture have a positive effect on entrepreneurship Countries with complex legal systems which regulate the start-up of an economic activity and where access to credit is complicated, present lower levels of entrepreneurship Societies with a greater number of innovative entrepreneurs present higher levels of entrepreneurial activity and economic performance	Economic growth	GDPpc	TEA	Empirical
Carlos Díaz Casero, J., Almodóvar González, M., de la Cruz Sánchez Escobedo, M., Coduras Martínez, A., Hernández Mogollón, R. (2013)	Institutional variables, entrepreneurial activity and economic development	Institutional economic theory	Cross section	The effect of institutions depends on the development stage.	Institutions	GDPpc	TEA, institutions	Empirical
Chowdhury, F., Audretsch, D. B., Belitski, M. (2015a)	Does corruption matter for international entrepreneurship	Regulatory capture theory and institutional theory	Panel data	The effect of regulations on international nascent entrepreneurship varies depending on types of regulation. Corruption plays a dual role, serving as both grease and sand for nascent international entrepreneurship. Corruption worsens the burden of regulations which have financial costs element. Also, corporate tax is not a significant deterrent factor for IE	Institutions	Export-oriented TEA	Formal and informal institutions	Empirical

				when corruption is low.				
Chowdhury, F., Terjesen, S., Audretsch, D. (2015b).	Varieties of entrepreneurship institutional drivers across entrepreneurial activity and country	Institutional approach	Panel data	Institutional factors influence the disparate varieties of entrepreneurship differently: property rights, freedom from corruption, and fewer start-up procedures are significantly positively related to nascent/new firm ownership. Property rights protection is significantly positively related to new firm startup. Tax and regulatory burden have significant positive impacts on self-employment but significantly negatively related to new firm start-up.	Institutions	Varieties of entrepreneurship	Formal and informal institutions	Empirical
De Clercq, D., Danis, W. M., Dakhli, M. (2010a)	The moderating effect of institutional context on the relationship between associational activity and new business activity in emerging economies	Institutional approach	Pooled regression	There is positive relationship between a country's associational activity and new business activity; this relationship is stronger for higher regulatory and normative institutional burdens and lower cognitive institutional burdens.	Institutions	TEA	Formal and informal institutions	Empirical
Dutta, N., Sobel, R. (2016)	Does corruption ever help entrepreneurship?	Institutional approach	Panel data	Corruption hurts entrepreneurship. The impact is smaller, but remains negative, when business climates are bad.	Corruption	New business density	Formal and informal institutions	Empirical
Estrin, S., Korosteleva, J., Mickiewicz, T. (2013)	Which institutions encourage entrepreneurial growth aspirations?	Institutional approach	Multilevel estimates	The relationship between aspiring entrepreneurs and institutions is complex; they benefit simultaneously from strong government (in the sense of property rights enforcement), and smaller government, but are constrained by corruption. Social networks mediate some but not all institutional deficiencies.	Institutions	TEA	Formal and informal institutions	Empirical
González-Pernía, J. L., Peña-Legazkue, I. (2015)	Export-oriented entrepreneurship and regional economic growth	Neoclassical economic growth theory	Panel data	Opportunity TEA and export-oriented entrepreneurship are positively correlated with Spanish regional growth	Export-oriented entrepreneurship	TFP	Opportunity TEA and export-oriented entrepreneurship	Empirical
Gnyawali, D. R., Fogel, D. S. (1994).	Environments for entrepreneurship development key dimensions and	Institutional approach		Proposed a framework consisting of five dimensions of entrepreneurial environments and links these dimensions to the new venture	Institutions			Theoretical

	research implications			creation process				
Hayton, J. C., Cacciotti, G. (2013).	Is there an entrepreneurial culture? A review of empirical research	Institutional approach	Literature review	Understanding the effect of national culture, alone and in interaction with other contextual factors, is important for refining our knowledge of how entrepreneurs think and act.	Institutions			Theoretical
Klapper, L., Laeven, L., Rajan, R. (2006)	Entry regulation as a barrier to entrepreneurship.\	Contract theory	Linear regression	Costly regulations hamper the creation of new firms, especially in industries that should naturally have high entry.				
Krasniqi, B. A., Desai, S. (2016)	Institutional drivers of high-growth firms country-level evidence from 26 transition economies	Institutional approach	Panel data	Interaction effects, rather than direct effects, are useful in explaining systematic variations in HGFs prevalence in transition economies.	Institutions	High-growth firms	Formal and informal institutions	Empirical
Krasniqi, B. A., Mustafa, M. (2016)	Small firm growth in a post-conflict environment: the role of human capital, institutional quality, and managerial capacities	Gibrat's Law; Jovanovic's Learning Theory; Resource Based; Institutional Theory	Probit; Tobit	Growth aspirations, managerial capacities and training are among the most significant variables associated with growth. Among the institutional quality variables, only corruption appears to be significant and negatively associated with growth.	Institutions	Small firm growth	Formal and informal institutions	Empirical
Kuckertz, A., Berger, E. S., Mpeqa, A. (2016)	The more the merrier? Economic freedom and entrepreneurial activity	Institutional approach	Fuzzy-set qualitative comparative analysis	The effects of Economic freedom (EF) vary according to the developmental stage of an economy and the type of entrepreneurial activity (EA) in question. Overall, high levels of EF trigger high levels of EA regardless of a country's developmental stage are inadequate.	Institutions	Opportunity/necessity TEA	Formal institutions	Empirical
Levie, J., Autio, E. (2008)	A theoretical grounding and test of the GEM model	Institutional approach	Panel data	In high-income countries, opportunity perception mediates fully the relationship between the level of post-secondary entrepreneurship education and training in a country and its rate of new business activity, including high-growth expectation new business activity. The mediating effect of skills perception is weaker. This result accords with the Kirznerian concept of alertness to opportunity stimulating action.	Institutions	TEA	Formal and informal institutions	Empirical
Liñán, Francisco;	National culture,	Institutional	Cross section	Cultural values and entrepreneurship	Economic	GDPpc	TEA	Empirical

Fernandez-Serrano, Jose (2014)	entrepreneurship and economic development: different patterns across the European Union	economic theory	(OLS)	can jointly help characterise income or development level	development			
Méndez-Picazo, M.-T., Galindo-Martín, M. Á., Ribeiro-Soriano, D. (2012)	Governance, entrepreneurship and economic growth	Institutional economic theory	Panel data	Governments could achieve a sustainable economic development by creating a desirable environment where entrepreneurs are able to change the structure of the economy	Economic growth	Growth	TEA	Empirical
Minniti, M., Lévesque, M. (2010)	Entrepreneurial types and economic growth	Neoclassical economic growth theory	Mathematical economics	There are positive effects of entrepreneurship on economic growth	Economic growth	Growth	Self-employment	Empirical
Manolova, T. S., Eunn, R. V., Gyoshev, B. S. (2008).	Institutional environments for entrepreneurship Evidence from emerging economies in Eastern Europe	Institutional approach	Structural equation model	There are important differences in the three dimensions (regulatory, cognitive, and normative) of the institutional profiles across the three emerging economies (Bulgaria, Hungary and Latvia), reflecting their idiosyncratic cultural norms and values, traditions, and institutional heritage in promoting entrepreneurship.	Institutions	Business owners	Formal and informal institutions	Empirical
Naudé, W. (2010)	Entrepreneurship, developing countries, and development economics: new approaches and insights	Institutional economic theory	Summarise	There are positive effects of entrepreneurship on economic growth	Economic development			Special issue
Noseleit, F. (2013)	Entrepreneurship, structural change, and economic growth	Endogenous growth theory	Cross section and panel data	Entrepreneurship is a conduit of knowledge and positive impact of entrepreneurship activity on economic growth	Regional economic growth	Regional growth	Start-up rate	Empirical
Pathak, S., Xavier-Oliveira, E., Laplume, A. O. (2013)	Influence of intellectual property, foreign investment, and technological adoption on technology entrepreneurship	Institutional approach	multi-level modelling approach	Regimes with strong intellectual property rights protection combined with high levels of foreign direct investment per capita decrease the likelihood of individuals' entry into technology entrepreneurship, whereas low barriers to technological adoption increase this likelihood.	Institutions	TEA	Formal and informal institutions	Empirical
Sternberg, R., Wenekers, S. (2005)	Determinants and effects of new business creation using	Schumpeterian theory	Literature review	There is a positive impact of entrepreneurship on economic growth	Economic growth			Special issue

	global entrepreneurship monitor data							
Stenholm, P., Acs, Z. J., Wuebker, R. (2013).	Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity	Institutional approach	Structural equation model	Differences in institutional arrangements are associated with variance in both the rate and type of entrepreneurial activity across countries. For the formation of innovative, high-growth new ventures, the regulative environment matters very little. For high-impact entrepreneurship an institutional environment filled with new opportunities created by knowledge spill overs and the capital necessary for high impact entrepreneurship matter most.	Institutions	TEA	Formal and informal institutions	Empirical
Urbano, D., Alvarez, C. (2014)	Institutional dimensions and entrepreneurial activity: An international study	Institutional approach	Logistic regression	A favourable regulative dimension (fewer procedures to start a business), normative dimension (higher media attention for new business) and cultural-cognitive dimension (better entrepreneurial skills, less fear of business failure and better knowing of entrepreneurs) increase the probability of being an entrepreneur.	Institutions	TEA	Formal and informal institutions	Empirical
Valliere, D., Peterson, R. (2009)	Entrepreneurship and economic growth: Evidence from emerging and developed countries	Endogenous growth theory	Cross section	There is a positive impact of entrepreneurship on economic growth	Economic growth	Growth	TEA	Empirical
van Stel, A., Storey, D. J., Thurik, A. R. (2007)	The effect of business regulations on nascent and young business entrepreneurship	Contract theory	Two equation model	The minimum capital requirement required to start a business lowers entrepreneurship rates across countries, as do labour market regulations. However, the administrative considerations of starting a business – such as the time, the cost, or the number of procedures required – are unrelated to the formation rate of either nascent or young businesses.	Institutions	TEA	Formal institutions	Empirical
Veciana, J. M.,	The institutional	Institutional	Literature review	An attempt is made to justify why	Institutions			Special

Urbano, D. (2008)	approach to entrepreneurship research. Introduction.	approach		entrepreneurship research using the institutional approach is promising.				issue
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Source: Aparicio (2017) and author's own work

APPENDIX 2: MEAN VALUES IN THE SELECTED EMERGING COUNTRIES

Country 2006-2014	NER ①	CC ②	PRO ③	TEDU ④	AC ⑤	TA ⑥	GDPg ⑦	GDPpc ⑧
1. Albania	0.89	-0.63	7.11	44.53	34.99	4.21	3.64	9251.88
2. Argentina	0.52	-0.45	13.78	73.90	13.02	4.28	3.35	18214.14
3. Armenia	1.41	-0.57	5.89	46.11	28.31	4.27	4.52	7047.82
4. Azerbaijan	0.63	-1.04	6.78	20.13	18.98	4.86	10.52	14816.65
5. Botswana	9.31	0.93	9.78	15.39	27.25	4.46	5.53	13713.43
6. Brazil	3.08	-0.09	13.76	31.98	52.56	5.07	3.55	14151.27
7. Bulgaria	6.15	-0.24	7.00	57.61	62.41	3.95	2.23	14856.06
8. Chile	4.66	1.45	8.00	68.52	70.72	5.27	4.05	19026.69
9. Colombia	1.13	-0.31	8.89	40.98	33.97	4.38	4.74	11046.17
10. Croatia	3.36	0.03	8.11	55.81	66.28	4.43	-0.12	20014.22
11. Czech Republic	2.94	0.27	8.78	61.19	45.33	5.22	1.78	28167.62
12. Estonia	13.12	0.98	5.00	69.29	81.56	5.43	1.81	23619.88
13. Georgia	3.88	0.06	4.22	33.11	32.78	4.00	5.36	6968.74
14. Ghana	0.73	-0.02	8.11	9.32	15.05	3.27	7.48	3177.83
15. Hungary	5.14	0.35	5.78	61.22	53.50	4.86	0.62	21708.62
16. India	0.09	-0.47	14.16	18.95	49.81	5.25	7.52	4330.82
17. Indonesia	0.17	-0.67	11.47	24.74	27.41	4.84	5.72	8427.76
18. Israel	3.25	0.81	5.00	56.28	68.56	6.09	4.09	29864.86
19. Jamaica	1.16	-0.39	5.44	19.66	27.87	4.79	0.00	8120.69
20. Jordan	0.81	0.19	7.56	32.93	77.88	5.38	4.72	9098.71
21. Kazakhstan	1.36	-0.90	7.78	33.61	42.81	4.43	5.98	20308.04
22. Korea Republic	1.76	0.45	6.67	95.80	137.6 7	5.88	3.65	30064.09
23. Kyrgyz Republic	0.96	-1.16	5.44	44.13	12.81	3.61	4.81	2805.86
24. Latvia	8.80	0.21	4.56	71.99	66.36	4.62	1.69	19492.01
25. Lithuania	3.31	0.22	6.44	80.24	45.49	5.05	2.76	21892.07
26. Macedonia, FYR	4.82	-0.11	5.67	33.82	41.95	3.76	3.17	11122.64
27. Malaysia	2.30	0.20	8.11	33.42	109.1 9	5.57	4.92	21310.62
28. Mauritius	7.45	0.52	5.22	32.64	86.71	4.88	4.67	15756.68
29. Mexico	0.83	-0.38	7.56	26.48	19.17	4.56	2.41	15210.65
30. Morocco	1.35	-0.34	5.78	16.47	63.41	4.68	4.49	6365.27
31. Nigeria	0.74	-1.07	9.00	2.17	19.61	4.55	6.33	4995.97
32. Pakistan	0.04	-0.92	12.33	6.94	21.56	4.50	3.61	4282.03
33. Peru	2.20	-0.33	7.78	8.32	26.18	4.54	6.14	9873.39
34. Philippines	0.18	-0.66	7.78	27.47	31.74	5.03	5.37	5598.52
35. Portugal	4.39	0.98	6.11	63.58	147.1 0	5.39	-0.33	26754.92
36. Romania	4.86	-0.19	6.22	59.84	35.10	4.31	2.65	16931.70
37. Russian Federation	4.49	-0.99	7.39	67.40	43.10	4.06	3.16	21329.08
38. Slovak Republic	4.36	0.22	6.89	53.44	43.69	5.05	3.67	24579.71
39. Slovenia	3.98	0.88	6.00	85.08	73.22	4.78	1.04	28496.37

40. South Africa	1.45	0.08	6.67	6.45	71.56	5.41	2.82	11960.00
41. Tajikistan	0.26	-1.08	8.78	22.74	13.33	3.49	6.89	2126.73
42. Thailand	0.71	-0.34	7.56	49.73	97.53	4.95	3.41	13308.16
43. Tunisia	1.23	-0.13	9.00	34.19	64.94	4.54	3.39	10028.42
44. Turkey	0.93	0.06	7.11	56.95	41.52	5.24	5.15	18133.47

- ① The number of newly registered firms with limited liability per 1,000 people of working age (ages 15-64) per calendar year.
- ② Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as the “capture” of the state by elites and private interests. The values are between -2.5 and 2.5, with higher scores corresponding to better outcomes of institutions.
- ③ Natural logarithm of the product between the number of procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business and the duration of these procedures.
- ④ Percentage of individuals who have business and entrepreneurial skills. It is obtained as the product of the percentage of tertiary graduates in the population multiplied by the percentage of tertiary graduates in social sciences, business and law.
- ⑤ Domestic credit indicator provided by the banking sector, which includes all credit to various sectors.
- ⑥ To what extent do businesses in your country absorb new technology? [1 = not at all; 7 = aggressively absorb].
- ⑦ Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 US dollars. GDP is the sum of gross value.
- ⑧ GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates.

Source: Own calculations