New Venture Creation and Infrastructure in Developed and Developing World Countries.

by

Christopher T. Ghogomu

Thesis Submitted to the University of Essex
in partial fulfilment of the requirements for the degree of

PhD in Entrepreneurship

at

UNIVERSITY OF ESSEX BUSINESS SCHOOL

July 2020

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Author's Signature-----

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Abstract

Knowledge of contexts under which infrastructure affects entrepreneurship is often used as important policy tool to inform and improve infrastructural investments, and to boost entrepreneurial activities in developed and developing world countries (DDWC). Research has shown that scholars do not give infrastructure due importance in entrepreneurship studies. This thesis aims to critically evaluate nature and type of the relationships between infrastructure and new venture creation in DDWC in order to achieve the following objectives:

i) Further understanding, and develop extant knowledge about infrastructure; its definition, its classification and its importance.

ii) Highlight different infrastructure categories as a possible explanation to regional variations in the levels of entrepreneurial activities across DDWC.

iii) Demonstrate how to construct an index of the economic infrastructure category and apply it to rank some countries.

iv) Evaluate direct and/or indirect effect(s) of dimensions of the economic infrastructure category (aggregated and disaggregated) on some country-level entrepreneurial activities (e.g. entrepreneurial transition, necessity entrepreneurship etc.) in DDWC.

First, a systematic literature review (SLR) was undertaken and its findings used to define, then classify infrastructure into four categories, and nature/type of its reported relationships with new venture creation explored. Effects were largely positive and direct for economic and institutional categories, mixed for the social category, and unknown for the technological category.

Next, economic infrastructure (EI) index constructed from several secondary data sources (World Bank, IMF, GEM etc.) was used to rank 112 developing world countries. Subsequently, index effect was evaluated on nascent entrepreneurial transition on sample of 42 sub-countries. Ordinary Least Squares (OLS) and Two Stage Least Squares (2SLS) regression techniques were applied, and index was shown to affect said transition only indirectly, through corruption perceptions.

Index effect (disaggregate) was also evaluated on motivation-driven entrepreneurship. OLS and hierarchical multiple regression (HMR) techniques were applied on sample of 31 developed world countries. Findings suggested index attributes that enhanced opportunity-motivated entrepreneurship (OME) rather hurt necessity-motivated entrepreneurship (NME), and vice versa. Furthermore, state fragility was shown to mediate associations between some index attributes and OME, as well as NME.

Keywords: infrastructure, new venture creation, developed and developing world, entrepreneurial transition, corruption perception, opportunity-motivated and necessity-motivated entrepreneurship, state fragility.

Word Count: 49,274 (excluding bibliography and appendices).

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Dedication

I dedicate this thesis to my loving wife, Mrs. Delphine Nyifeh Epse Tanguong, for her constant psychological, moral, and technical supports provided to me throughout every challenging moments of the monumental walk to completion of this thesis. You truly are a darling. May the bond of our union grow ever stronger by every passing second!

This work is equally dedicated to my dear mother, Mrs. Paulina Manyi Epse Ghogomu, for a lifelong support in every dimension from when I was born till this day. A thought about her usual determination and hard work inspired my every step throughout this programme. May God grant her long life and prosperity!

Also, this thesis is dedicated to my late father, Papa S. T. Ghogomu of Blessed Memory. Thank you dad for sending me to school and , May your soul continue to RIP!

Finally, this manuscript is dedicated to my three children: Tanguong Excel F.; Tanguong Bright M.; and Tanguong Diamond T. Thank you all for providing me with a shoulder to lean on when I needed one.

Acknowledgements

My most sincere gratitude goes to Dr. Jun Li and Dr. Juan Carlos for mentoring and overseeing my PhD projects over the past three years. Their continuous encouragements and valuable suggestions filled me with positive energy and the invaluable driving force needed to realize this manuscript. I wish to thank Dr. Karim Shamsul for being a very professional and understanding board chair during each of the many panel sessions held throughout my study programme.

On a more personal note, I express deep gratitude to many great friends for inspiring and providing me with moral and psychological supports that kept me going when the programme got tougher: Dr. Fon Linus (RIP) and family, Prof. Yenkong Ngangjoh and family, Dr. Titahmboh Manases and family, Rev. Daniel Bara and family, Ms. Sidonia and family in Sweden, Mr. Remigius Akukwe in Sweden, Ms. Lauretta Nya, Ms. Victorine Betek and family, Mr. Marcelo Mbih and family, Mr. Mark kwabia and family; it would have been very difficult to achieve this milestone without these special individuals.

You all made my PhD journey enjoyable and memorable!

Chapter One

Thesis Overview

1.1   Introduction

New venture creation and infrastructure share some common features when it comes to socio-economic development. For example, increasing stock of reliable infrastructure in a location has potential to boost its economy (Stewart, 2010), and increasing entrepreneurial activities in the same location has the potential to boost economic wellbeing through job creation (Kritikos, 2014) and poverty reduction. In fact, infrastructure has potential to play an important role in the firm formation process (Fotopoulos and Spence, 1999) and further research is required to investigate if, and how the two constructs (new venture creation and infrastructure) are related. Understanding the mechanism through which infrastructure may boost an economy is imperative for policy and practice, and in this thesis, new venture creation is demonstrated as an indirect medium through which infrastructure could boost entrepreneurship, and the economy by extension. The author argues that provisioning individuals involved in new venture creation with suitable infrastructure has the potential to increase levels of their entrepreneurial activities, possibly resulting in more jobs being created, and by extension, reductions in poverty and unemployment rates.

Knowing that infrastructure may contribute indirectly to boost economic wellbeing of a location calls for others questions, for example, does infrastructure affect new venture creation only directly, only indirectly, or both directly and indirectly? This question is supported by statement by Alderete (2017) that much is not being done to understand nature and type of relationship between entrepreneurship and specific class of information communication technology infrastructure (ICT), such as broadband penetration. Answer to this

question will zoom direction and size of overall effect, and point future researchers to right direction. Such knowledge is also imperative to guide policy and practice on other factors to be taken into account when looking at relationships between infrastructure and new venture creation. In this thesis, over 78% of the 87 articles reviewed in chapter two are found to concentrate solely on direct new venture creation effects of infrastructure. This clearly is a gap in the literature and an indication that indirect new venture creation effects of infrastructure require further investigation.

Another question that emerges from above is as follows: do effect(s) of infrastructure on new venture creation (direct and/or indirect) depend on the types of infrastructure under consideration? This question is corroborated by statement from Holl (2004b) that only few studies distinguish various types of infrastructure in entrepreneurship related studies. More than a decade after Holl's declaration, Audretsch et al. (2015) confirmed that many more specific types of infrastructure are not being analysed in entrepreneurship research because they cannot be explicitly measured. This is certainly a gap in the literature that requires more attention. The author thinks provisioning entrepreneurial individuals in a given location with, for example, the economic category of infrastructure may trigger different levels of entrepreneurial activities than will the social category of infrastructure etc. This kind of knowledge will help policymakers and practitioners to promote new venture creation by investing more in those infrastructure categories shown to impact the firm formation process more, and less otherwise. Looking at new venture creation effect(s) of infrastructure by infrastructure category requires proper definition and classification of infrastructure. Definitions provided by some previous studies are unprecise, fragmented and limited in meaning (Buhr, 2003; Momoh and Ezike, 2018), therefore, generally failing to reflect the multidimensional nature of infrastructure. According to Prud'homme (2005), the meaning of infrastructure has been extended so much that it no longer means much. In this thesis,

information is gathered from most of the reviewed articles to establish a tentative taxonomy for infrastructure comprising of four categories, i.e., economic, social, technological, and institutional infrastructure categories.

Although, based on previously reported evidence, nature and direction of associations between all four infrastructure categories and new venture creation are explored in this thesis, only the association between new venture creation and the economic infrastructure category is empirically investigated. This is due to lack of data on other infrastructure categories, and time constraints. And from said exploration, effects of the economic and the institutional infrastructure categories on new venture creation are mostly direct and largely positive. Effect(s) of the social infrastructure category are mixed, while those of the technological infrastructure category are unknown.

According to Amorós et al. (2012), there appears to be a marked difference between different types of entrepreneurship with respect to the level of development attained by a given country. The next question of interest is as follows: are new venture creation effect(s) of infrastructure (direct and/or indirect) dependent on levels of development of economies under consideration? Infrastructure may only affect new venture creation if they at least exist; if infrastructure is completely absent in a location, it's difficult to talk about the impact of its availability. According to Snieska and Simkunaite (2009) availability of infrastructure have potentials to influence business establishments. This suggests possibility of more influences of business establishments with higher availability of infrastructure, and less influences otherwise. Moreover, Dethier and Moore (2012) stated that availability of most types of infrastructure are higher in the developed world economy compared to the developing world economy. Accordingly, in this thesis, all included countries are classified either as developed or developing in accordance with the Statistical Annex and Country Classification mechanism developed by WESP (2019). Although some may still argue that even within a block of

developed or developing world economy, availability of infrastructure still vary by country, such variabilities will certainly be moderate compared to situations in which countries classified under the developed world economy are mixed with those classified under the developing world economy in the same analysis. Therefore, in this thesis, developed world countries are considered separate from developing world countries in all reviews and analyses.

Although many individuals often have intentions to start a business or are actively taking steps to start a business, a good number of them never end up creating one. Another important question is as follows: does presence/absence of economic infrastructure influence entrepreneurial transitions in a country? Investigations on how individuals proceed in the process beyond nascent entrepreneurship is rare in the literature (Parker and Belghitar, 2006). Determining factors that promote or inhibit such transitions is important for both policy and practice, but rare in the literature. Van der Zwan et al. (2013, P. 804) described new venture creation as a process comprising of several entrepreneurial transitions where individuals often are expected to move from "never considered starting a business to thinking about starting a business", or from "thinking about starting a business to taking steps to start a business", or from "taking steps to start a business to owning a young business." Individuals involved in new venture creation are most likely to be faced with different challenges and levels of difficulties transitioning across these entrepreneurial ladders. In fact, it can be argued that such transitions could be facilitated by support from economic infrastructure endowment in a country. Hence, this thesis evaluates the possible effects of economic infrastructure endowment and perceived corruption on entrepreneurial transition from "taking steps to start up a business to owning a young business" in countries of the developing world economy. This specific type of transition is found to be positively and indirectly affected by economic infrastructure (aggregate) through corruption perceptions.

One final point to investigate is whether the effect(s) of infrastructure on new venture creation (direct and/or indirect) is dependent on the entrepreneurial motivation of involved individuals. Individuals motivated into new venture creation due to perceptions of existing entrepreneurial opportunity are different from those motivated into new venture creation by unemployment or lack of alternative actions. In fact, these two groups of individuals are different in the context of entrepreneurial motivation, and context could be an important determining factor in the association between new venture creation and economic infrastructure. Moreover, Calderón, and Servén (2004) demonstrated that economic infrastructure can be disaggregated into dimensions with attributes such as quality and quantity which, in a given country, could be very dependent on the quality of governance in place. In the context of opportunity-motivated entrepreneurship (OME) and necessity-motivated entrepreneurship (NME), knowledge on how the new venture creation effect(s) of economic infrastructure quality, for example, differ between the two groups is not documented in the literature. The same is true for the new venture creation effect(s) of economic infrastructure availability. In this thesis, the economic infrastructure dimensions effects of availability, accessibility, quality, and affordability on OME and NME are examined in developed and developing world countries (DDWC). Additionally, how associations between some economic infrastructure dimensions and OME and NME are facilitated or inhibited by state fragility (the extent to which a country is capable of exercising its governance role) are also evaluated. The findings suggest nature of the effect is sharply contrasting; most of the attributes of economic infrastructure that enhance OME actually hurt NME, and vice versa. State fragility is also confirmed in this thesis as medium through which some of these attributes (e.g. accessibility and affordability) affect the new venture creation process in countries of the developed world economy.

The remainder of this chapter is organised as follows: Section 1.2 thesis motivation, aim, and objectives. Section 1.3 an overview of each chapter in the thesis, Section 1.4 thesis structure and theoretical framework in brief, Section 1.5 methodology in brief, Section 1.6 summaries of the main results, and Section 1.7 is conclusion of the chapter.

1.2 Motivation, Aim, and Objectives

1.2.1 Motivation

It is imperative to devote more attention and seek better understanding of different types of infrastructure because of their usefulness in a location or country. The provisioning of broadband infrastructure to a community, for example, comes with benefits such as telemedicine, distance education, and improved interactions amongst community members (Kim and Orazem, 2017). In fact, infrastructure is often considered the wheels, if not the engine, of economic growth (Srinivasu and Rao, 2013) with benefits such as improved security and health systems, time saving, a cleaner environment and/or improved out-door recreation (Gramlich, 1994). Moreover, different types of infrastructure are said to actually benefit a given community differently. For example, Stewart (2010) and Henckel and McKibbin (2017) opined that economic infrastructure promotes private and public sector productivity by increasing competition, reducing business and market access costs, and facilitating more jobs creation. Social infrastructure, on the other hand, provides productive activity support environments, encourages capital accumulation, skills acquisition, and intervention and technology transfer (Hall and Jones, 1999).

As active members of the community, potential and incumbent entrepreneurs often use these infrastructure too, and their perceptions about infrastructure quality, affordability etc. could influence the attractiveness of infrastructure as support instruments in the new venture creation process. For example, Alderete (2017) revealed that the ease of use and portability of

emerging mobile communication infrastructure make them a useful support tool for entrepreneurship. However, despite these benefits, Bennett (2019) expressed regrets that investments in infrastructure and their possible effects on entrepreneurial activities have received sparse attention in the entrepreneurship literature.

The first motivation for this thesis comes from the recommendation made by Audretsch et al. (2015) that subsequent research should take infrastructure more seriously by creating new measures of more specific types of infrastructure. Their opinion is totally acceptable because, in entrepreneurship literature in general, and new venture creation in particular, it is not very uncommon to find studies investigating the effect(s) of infrastructure in which the word "infrastructure" is not even defined nor distinguished by category or type. Infrastructure is a multidimensional construct (Goodwin, 2018) and its effect(s) could likely differ by category; by making an effort to define and distinguish between infrastructure categories in a study, a researcher is taking infrastructure more seriously. The ability to create new measures of more specific types of infrastructure begins with defining and attempting to classify infrastructure correctly.

Thesis's second motivation comes from a recommendation made by Bergmann and Stephan (2013) that future studies should analyse the determinants of the transition from nascent entrepreneurship to new business ownership. This and the first motivation provided further inspiration to investigate how individuals proceed beyond the nascent entrepreneurship stage in the entrepreneurial process. Given that high corruption perceptions inhibit entrepreneurial activities (Luminita, 2013), this author is of the opinion that suitable economic infrastructure in the hands of nascent entrepreneurs could reduce corruption perceptions, and help them transition faster into new business owners than would be the case without suitable economic infrastructure.

Finally, a third motivation to undertake this thesis comes from regrets expressed by Van der Zwan et al. (2016) that studies have not yet compared opportunity and necessity entrepreneurs with respect to their perceptions of the entrepreneurial support infrastructure. This and the previous two motivations triggered a project that led to the realization of this thesis.

1.2.2 Aim and Objectives

The main aim of this thesis is to critically evaluate the relationships between infrastructure and new venture creation in DDWC. Infrastructure does not only support more rapid economic growth, its presence helps businesses to innovate, diversify, and improve productivity (Momoh and Ezike, 2018). And because infrastructure exists in several different categories (Buhr, 2003), its dimensions (e.g. quality, affordability etc.) could be hugely different across DDWC such that entrepreneurial activities are affected differently within them by these dimensions. Therefore, in order to accomplish the aim outlined above, this thesis has the following as principal objectives:

➢ To promote and further develop extant knowledge about infrastructure; its definition, its classification and its importance.

➢ To demonstrate how to construct an index from a specific infrastructure category and apply it to rank some countries.

➢ To highlight infrastructure as a possible explanation of regional variations in the levels of entrepreneurial activities across DDWC.

➢ To evaluate direct and/or indirect effect(s) of a specific infrastructure category (aggregated and disaggregated) on some country-level entrepreneurial activities (e.g. entrepreneurial transition, necessity entrepreneurship etc.) in DDWC.

Firstly, as mentioned earlier in this chapter, most previous studies failed to provide definition for infrastructure reflective of its multidimensional nature. This makes it not only difficult to properly investigate its effects on new venture creation, but also distinguishing those effects by infrastructure categories is practically not possible without proper definition and

classification of infrastructure. This justifies the choice of the first objective. Secondly, to be able to stimulate competition amongst countries in relation to infrastructure investments, it is imperative to rank countries according to their endowments in specific infrastructure categories. This could be done easily by constructing an index of a selected infrastructure category that is subsequently used to rank chosen countries. Accordingly, the second objective is justified. Thirdly, entrepreneurial activities are influenced by several different factors. Once infrastructure is broken down into different categories, it is imperative to separately investigate the effects of each of its categories on specific types of entrepreneurship (new venture creation in this case). Selecting economic infrastructure category for this investigation as opposed to social or other categories of infrastructure in this thesis is an encouragement for future researchers in this area to consider the multidimensional nature of infrastructure when evaluating its effects. This justifies the choice of the third objective. Finally, the systematic literature review of chapter two reveals that close to 80% of studies reviewed investigated solely the direct effects of infrastructure on new venture creation. In order to paint a complete picture in this area of the literature, it is imperative to also investigate indirect infrastructure effect(s) on new venture creation, a justification of the fourth choice of thesis's objective.

1.3   Description of Thesis

How is infrastructure associated with new venture creation in DDWC? The principal goal of this thesis is to answer this big question. However, it will be difficult to satisfactorily explain such associations without understanding properly what constitutes an infrastructure. Not only has infrastructure got multiple dimensions (Goodwin, 2018), but also, it constitutes a location-based support for people seizing and enacting entrepreneurial opportunity (Woolley, 2017), and individuals engaged in new venture creation for lack of alternative options. The fact that infrastructure exists in different forms suggests that, at a given point in time, while a user

may benefit more from one of its dimensions, s/he may benefit less or even be hurt by its other dimensions. This thesis looks at infrastructure dimension from two perspectives; dimension in terms of infrastructure type (category), and dimension in terms of infrastructure attribute. New venture creation often involves many individuals in different phases of the process at the same time, i.e., those thinking of starting a new business, those already taking steps to start a new business, those starting to operate new businesses that are less than 42 months old etc. These individuals are users or potential users of infrastructure, which suitability, effectiveness and/or benefit(s) depend on the dimension of infrastructure under consideration.

According to this two dimensions concept, it can be argued that both category and attribute of infrastructure have potentials to affect individuals involved in new venture creation process differently. Access to social infrastructure, for example, by latent entrepreneurs may have a completely different impact on their entrepreneurial activities compared to access to economic infrastructure by same class of entrepreneurs. Similarly, impact(s) of the quality and/or cost of a given infrastructure category on the entrepreneurial activities of nascent entrepreneurs may be largely different from their impact(s) on the entrepreneurial activities of young business owners, and vice versa. Therefore, in DDWC, dimensions of infrastructure are considered to be of utmost importance to studies looking at associations between infrastructure and new venture creation. Same opinion holds for countries with transitional economy, however, due to data limitation, that opinion could not be verified in this thesis.

In order to break down infrastructure by dimension and facilitate understanding of nature and type of its associations with new venture creation in DDWC, a systematic literature review (SLR) is undertaken in chapter two of this thesis to select studies that investigated relationship between new venture creation and infrastructure between 1980-2020. Only macro-level studies are targeted because of worries expressed by Baker et al. (2005) that, at the national level, our understanding of the factors influencing entrepreneurial dynamics and the

process of business creation is still limited. This exercise yields 87 articles from 44 countries published in 51 academic journals all having 2018 Scopus CiteScore value of at least 1.0. With these 87 articles, a definition and a four-category classification is realized for infrastructure, and each category is subsequently summarised based on previously reported nature and type of its relationship with new venture creation. Infrastructure categories are separated by DDWC to understand any differences between them. Gaps in the literature of infrastructure and new venture creation are identified on the bases of these summaries, and several recommendations are proposed for consideration by future researchers. Now, with infrastructure distinguished by type, one category is selected (economic infrastructure) and analysed critically for its association with new venture creation in DDWC.

In chapter three, as indicated above, main focus is solely on the economic infrastructure category, creating an index of it and using to rank and explore trend changes of some 112 countries of the developing world economy. In opinion of this author, the availability of any category of infrastructure in a country is the starting point when it comes to infrastructure support to individuals involved in new venture creation; infrastructure stock has to be present in a location for its inhabitants to benefit from it. Most previous studies in this area of research have investigated the new venture creation effect of disaggregated infrastructure endowment, but this thesis adopts a slightly different approach by considering an index of economic infrastructure. And based on available data from several sources (e.g. World Bank, GEM, IMF, WEF etc.), an economic infrastructure index (EII) is constructed and used to rank selected countries as mentioned above.

New venture creation is a process (Reynolds et al, 2005), and the probability of individuals involved in the process to move from one of its phases to another could depend on the presence/absence of economic infrastructure. Accordingly, EII is used to evaluate entrepreneurial transition (within a sub-sample of 42 countries selected from initial 112

countries) from "taking steps to start up a business" to "owning a young business." It can be argued that ability to transition across different phases in the entrepreneurial process is one of the key aspects of new venture creation. Imagine for a while, if individuals thinking of starting a new business never move beyond just thinking to start, there will never be any new businesses created. Therefore, all factors determinant to this and similar transitions in the entrepreneurial process is instrumental not only to new venture creation, but also to entrepreneurship as a whole. Although some factors may affect entrepreneurial transition singly, other factors act together (moderation) or through other factors (mediation). In this chapter, the effect of EII on entrepreneurial transition from "taking steps to start up a business" to "owning a young business" is also investigated, with corruption perception considered a mediator factor. In most developing world countries, national levels of corruption are very high such that their unavoidable perceptions by potential and incumbent entrepreneurs are not unlikely to influence their individual and collective transition(s) in the entrepreneurial process. This explains why corruption perception is considered a mediator in this chapter.

In chapter four, thesis continues looking at EII while shifting focus to countries of the developed world economy. And, following the two dimensions concept discussed earlier, attributes of economic infrastructure are considered in this chapter, to further look at its association with new venture creation. Therefore, author works with the disaggregated EII comprising of attributes such as accessibility, quality, affordability etc. to understand how each enhances or inhibits the new venture creation process. Here, two groups of individuals having different motives for getting involved in new venture creation, i.e., opportunity-motivated and necessity-motivated entrepreneurs are investigated. The author argues that suitability, effectiveness and/or benefit(s) of an economic infrastructure may not depend solely on its attribute(s), but also on its user(s) and motive(s) of use. Quality of economic infrastructure, for example, may be very enhancing for the entrepreneurial activities of one class of entrepreneurs,

yet very inhibiting for another class of entrepreneurs with different entrepreneurial motivation than the former class. Author evaluates how each of the outlined attributes influences new venture creation, separating opportunity-motivated entrepreneurs from necessity-motivated entrepreneurs. Author also argues that outlined attributes of the economic infrastructure are dependent on the quality of governance; deficiencies in one or more core state functions will definitely affect these attributes. State fragility measures levels of these deficiencies, and the influence(s) of some of these attributes on new venture creation are further examined with consideration given to quality of governance. This is done while still keeping opportunity-motivated and necessity-motivated entrepreneurs separate in the analyses.

1.4   Thesis Structure and Theoretical Framework

1.4.1 Thesis Structure

This thesis uses a three paper format that is preceded by a chapter with short introduction and background information to overall topics investigated, and postdated by another chapter with conclusion and implications for policy, as well as recommendations for further research. According to europhd.net, a PhD thesis that follows the 'three papers' model (as opposed to the conventional model) should consist of three separate publishable papers, each of which should be free standing, and of normal journal article length (say, between 5,000 and 10,000 words). In this thesis, the first of the three papers is a SLR while the other two are empirical based.

Each of these papers is at least 10,000 words, free standing and in publishable format, with well outlined aim and objectives, methodology, results, discussions, study limitations and recommendations for future studies. All three papers treat a common topic, i.e., a critical analysis of relationship between infrastructure and new venture creation in DDWC. While the first paper systematically reviews reported evidence of the stated relationship to identify gaps

in the literature, the next two papers build on these gaps to re-examine the relationship between the two constructs.

1.4.2 Theoretical Framework

Researchers often use existing theories as a guiding lens for the formulation and testing of hypotheses (Reeves et al., 2008) either to further confirm or to contradict the way variables interrelate. In order to confirm or reject previously reported evidence of relationships between infrastructure and new venture creation in DDWC, or hypothesize and test new relationships, arguments in this thesis are based on approved theories and established knowledge in the literature. In this thesis, except for chapter two, which is a SLR, chapters three and four are empirical investigations and author ensures each of them is theory grounded.

In chapter three, for example, entrepreneurship is described as a process (Shane and Venkataraman, 2000; Van der Zwan et al., 2010), with new venture creation being one of its forms. As an entrepreneurial process, new venture creation comprises of several stages in which individuals are either never considering to start a business, thinking to start a business, taking steps to start a business, or owning a young business (van der Zwan et al., 2012). Accordingly, new venture creation involves movements across highlighted stages on the entrepreneurial ladder (van der Zwan et al., 2013) by potential and incumbent entrepreneurs. Several factors determine the probability of such transitions including income growth, levels of risk tolerance, number of days required to start a business etc. (Armington and Acs, 2002; van der Zwan et al., 2013; Bergmann and Stephan, 2013). It can be argued that presence/absence of economic infrastructure in a location could also determine such transitions. Such argument is based on appropriability theory (Teece, 1986), which states that environmental factors govern an innovator's ability to capture the profits generated by an innovation. Infrastructure, being an external environmental support instrument (Momoh and

Ezike, 2018), could govern ability of individuals engaged in new venture creation to transition across its different phases. Arguably, associations between the two constructs could also be determined by the levels of perceived corruption in a country.

Similarly, in chapter four, author explains that, while some individuals engage in new venture creation to take advantage of a business opportunity, i.e., opportunity-motivated entrepreneurs, others engage in the process because of no better work choices, i.e., necessity-motivated entrepreneurs (Reynolds et al., 2005). Previous research findings (van Stel et al., 2007; Hessels et al., 2008) have demonstrated that factors which explain the engagement motives of one group of individuals are different than those that explain the engagement motives of another. For example, OME is determined by factors such as the need to learn, to challenge, and to achieve, the desire to be autonomous, the quest for recognition etc. (Van der Zwan et al., 2016), whereas necessity entrepreneurship is determined by unemployment, family pressure, and individuals' general dissatisfaction with their current situation (Stephan et al., 2015).

Therefore, it can also be argued that attributes of economic infrastructure such as its accessibility, its quality, its affordability etc. could influence differently the engagement motives of these two groups of incumbent entrepreneurs. This argument is based on theory of entrepreneurial motivation (Hessels et al., 2008), which stresses that access to appropriate economic infrastructure could facilitate opportunity recognition, evaluation and exploitation, hence, a booster of motivation to become opportunity entrepreneur. However, because easy access to economic infrastructure often comes at an increased cost, access to appropriate economic infrastructure could rather demotivate individuals from becoming necessity entrepreneurs because necessity entrepreneurship is influenced negatively by cost (Stephan et al. 2015). Additionally, author argues the influence of economic infrastructure dimension

could change for the two groups of individuals depending on the quality of governance in a country.

1.5   Methodology

In this thesis, three complementary investigations spanning chapters two, three, and four are undertaken. In chapter two, systematic literature approach is used to answer questions raised in the chapter. The next two investigations covered in chapters three and four are empirical based, and quantitative research approach with different techniques of analysis are used. In the "main results" section below, the author briefly explains how (method) each of these investigations were done.

1.6   Main Results

As mentioned earlier, recommendations made by Audretsch et al. (2015) and Bergmann and Stephan (2013), as well as regrets expressed by Van der Zwan et al. (2016), served as motivations for undertaking this thesis in order to answer questions raised in the thesis.

In chapter two, infrastructure is defined and classified into four categories, i.e., economic infrastructure, social infrastructure, technological infrastructure, and institutional infrastructure. From each category, at least two classes of infrastructure are identified and cross-examine previously reported empirical results of their relationships with new venture creation in DDWC. The results suggest that new venture creation effects of economic and institutional infrastructure are direct and positive in both the DDWC; these received the most studies on infrastructure effect of all the infrastructure categories. The new venture creation effects of technological infrastructure are the least studied, and empirical evidence suggest the effect(s) are still not well known in DDWC. Although mostly direct, reported evidence suggest the new venture creation effects of social infrastructure are mixed; while some researchers report direct and positive effect in developing world countries, others report direct and negative

effects in developed world countries, and vice versa. Evidence of no effect is not uncommon between social infrastructure and new venture creation in both economies. Overall, author finds studies looking at electricity effect on new venture creation highly skewed towards the developing world economy, and those looking at research knowledge effect on new venture creation highly skewed towards the developed world economy.

In chapter three, an index for the economic category of infrastructure is constructed and used to rank 112 countries of the developing world economy for an eight-year period beginning 2009. The results demonstrate that Singapore, South Korea, and Malaysia are the undisputed leaders in terms of overall economic infrastructure endowments throughout the observation period, and occupy first, second, and third places respectively. During the same observation period, Somalia consistently ranks worst, and is occasionally accompanied by Korea Democratic People's Republic, South Sudan, and Liberia at the bottom of the overall economic infrastructure endowments table. Similar rankings is done for the economic infrastructure attributes of availability, accessibility, quality, and affordability. Apart from the top and bottom three countries, the rankings are found less consistent over time especially for the affordability dimension.

Entrepreneurial transition is a potential facilitator of not only new venture creation but also its growth, so understanding its determinants is important for entrepreneurship as a whole. In this chapter, author also investigates, if the constructed EII mentioned above is a direct or indirect determinant of entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in countries of the developing world economy. Applying OLS and 2SLS regression techniques on a sub-sample of 42 developing world countries, evidence from the empirical results suggests that aggregated economic infrastructure is not a direct determinant of the said type of entrepreneurial transition. Rather, through corruption

perceptions, EII is found to be a positive determinant of the entrepreneurial transition from "taking steps to start up a business" to "owning a young business."

In chapter four, two groups of individuals often having different motives for engaging in the new venture creation process (opportunity-motivated and necessity-motivated entrepreneurs) are evaluated in countries of the developed world economy. For each of these groups, author evaluates if their entrepreneurial activities are enhanced or hurt by four attributes of economic infrastructure (availability, accessibility, quality, affordability) considered separately. Applying OLS and HMR regression techniques on a sample of 31 developed world countries, availability of economic infrastructure is without influence on the entrepreneurial activities of both opportunity and necessity motivated entrepreneurs. However, accessibility, quality, and affordability of economic infrastructure is each found to enhance the entrepreneurial activities of opportunity-motivated entrepreneurs, while the entrepreneurial activities of necessity-motivated entrepreneurs are hurt by each of these attributes as well. Author also finds that, taken together (moderation of accessibility by affordability), accessibility and affordability of economic infrastructure enhance the entrepreneurial activities of opportunity-motivated entrepreneurs faster than does accessibility of economic infrastructure alone, though levels of infrastructure affordability play an important role in this. On the other hand, accessibility and affordability of economic infrastructure taken together are without influence on entrepreneurial activities of necessity-motivated entrepreneurs in this thesis.

Moreover, according to OECD (2015), what matters to most governments and their citizens is having in place high-quality infrastructure that supports the delivery of effective public services. Therefore, in most countries of the developed world economy, it is possible all four attributes of the economic category of infrastructure could somewhat depend on the quality of governance in place; by establishing rules and regulations, for example, a

government may affect not only decisions about the availability, but also the affordability and right to access economic infrastructure by individuals living in that country. Quality of governance is captured by state fragility (Amorós et al., 2019), and estimates the ability of a state to establish and enforce regulatory rules, provide basic public goods and services (economic infrastructure included) etc. Therefore, it is highly probable that different levels of state fragility can affect highlighted attributes of the economic category of infrastructure and trigger different behaviours and actions by opportunity and necessity-motivated entrepreneurs. State fragility could be an appropriate medium (mediator) through which the entrepreneurial activities of both opportunity and necessity-motivated entrepreneurs are enhanced or hurt by most or all four attributes of the economic infrastructure category. In this chapter, empirical findings confirm that affordability and accessibility of economic infrastructure influence OME and NME only indirectly, through state fragility.

1.7 Conclusion

This chapter aimed to provide a short introduction and background information to overall topics investigated in the entire thesis. Having clearly stated motivations to undertake this thesis, as well as its aim and objectives, the methods adopted by the thesis are explained and the main findings are also summarily reported in this chapter. The thesis is organized in five chapters and we move next to chapter two, which is a SLR aimed to cross-examine previously reported evidence of infrastructure effect(s) on new venture creation in DDWC in order to identify any gaps in the literature and provide an agenda for future research.

Chapter Two

Infrastructure and new venture creation in Developed and Developing World Economies: A Systematic Literature Review and Research Agenda

2.1 Introduction

Policymakers and researchers have for a number of years recognized entrepreneurship as key driver of economic development (Hessels, 2008; Brixiova, 2010). Psychological and non-psychological characteristics of individual entrepreneurs and environmental characteristics are some of the important factors that determine the emergence of entrepreneurial activity in a country (Cuervo, 2005). Potential and incumbent entrepreneurs could be willing to take risks, have the right knowledge, skills, and experiences required to start or improve existing ventures, however, outcomes of their actions sometimes depend on the environments where entrepreneurial activities are undertaken (Edelman and Yli-Renko, 2010) in terms of the support such environments could offer them. For any support environment to function optimally, there are several conditions to be made such as entrepreneurship framework conditions (EFCs), entrepreneurial ecosystems (EEs), entrepreneurial systems (ESs) etc. (Van de Ven, 1993; Bosma et al., 2009; Woolley and Rottner, 2008). Woolley (2014) emphasized that environmental conditions into which ventures are started tend to influence their performances and survival over time. Accordingly, together with the World bank, some countries have designed and implemented business environment reforms as a means to boost their economic activities (Worlbank.org, 2020).

According to Momoh and Ezike, (2018), infrastructure is an important and major support instrument when it comes to business environment. Surprisingly, however, Venkataraman (2004) asserted the presence or absence of infrastructure does not adequately

explain regional differences in the level of technological entrepreneurship. This could mean that the support instruments themselves require reconceptualization in terms of proper definition and categorization because good measurements follow from such clarifications. This author thinks any effective and efficient support environment should offer latent, nascent and/or incumbent entrepreneurs with adequate and reliable infrastructure. Regrettably, investments in infrastructure and their possible effects on entrepreneurial activities have received sparse attention in entrepreneurship literature (Bennett, 2019). In fact, scholars have failed to give infrastructure due importance in entrepreneurship studies (Caceres-Diaz et al., 2019).

Infrastructure can be seen as a location-based support for people seizing and enacting entrepreneurial opportunity (Woolley, 2017) and/or those who engage into entrepreneurship for lack of other options. While some types of infrastructure may support the opportunity itself, others rather support processes which may result from those opportunities, or the environment where those processes occur. Rives and Heaney (1995) describe infrastructure as an amenity which plays the role of a magnet in the location decisions of firms and households. According to Stewart (2010), investments in reliable infrastructure facilitate free movements of people, goods/services and information and is very imperial for the economy to flourish. Availability and/or accessibility to infrastructure have potentials to influence migration and business establishment locations (Snieska and Simkunaite, 2009).

There seems to be some kind of functional similarities in the way infrastructure and entrepreneurship relate to socioeconomic development; increasing stock of reliable infrastructure has potential to boost the economy wherever they're located (Stewart, 2010), and increasing entrepreneurial activities also has the potential to boost location's economic wellbeing through job creation (Kritikos, 2014) and poverty reduction. Despite the potential important role of infrastructure (especially public) in the firm formation process, it has been

quite overlooked (Fotopoulos and Spence, 1999). Audretsch and Belitski (2017) asserted that only limited evidence exists on the relationship between physical infrastructure and entrepreneurship, and this is confirmed by Alderete (2017), who emphasized much isn't being done to understand nature and type of relationship between entrepreneurship and specific class of information communication technology infrastructure (ICT), such as broadband penetration. Following statement by Holl (2004b) that only few studies distinguish various types of infrastructure, Audretsch et al. (2015) recommended that subsequent research should take infrastructure more seriously by creating new measures of more specific types of infrastructure.

In order to create new measures for infrastructure, there is need to understand more of what constitutes an infrastructure; this SLR has as main aim to increase understanding of infrastructure and the nature of its effect on the new venture creation process. Therefore, the objective of this chapter is twofold:

- *First, to systematically explore and further develop extant knowledge about infrastructure; its definition, its classification and its importance.*

- *Second, to critically appraise and cross-examine nature of the effects of selected classes of different infrastructure categories on the new venture creation process in DDWC, then propose a research agenda.*

This chapter contributes to extant literature in two ways. First, it argues that definitions provided by most previous studies are unprecise, fragmented, and limited in meaning and often generally fail to reflect the multidimensional nature of infrastructure. This study doesn't only provide meaningful and extended definition of infrastructure, it also comes up with a tentative classification that can be very instrumental towards the understanding and creation of better measurements for different infrastructure categories. Second, by exploring nature and type of effects of selected classes of infrastructure categories on the new venture creation process, this chapter provides summaries that can help policy makers to decide on which type of

infrastructure investments to prioritize in developed versus developing countries for the sake of the new venture creation process.

Remainder of this chapter is organized in five sections. Section two describes methodology used in research. Section three presents review results. Section four discusses the results, and proposes an agenda for future research. Finally, section five concludes the review.

2.2 Methodology

2.2.1 Systematic Literature Review

A SLR provides a comprehensive and unbiased summary of available evidence on a given topic (Wallace et al., 2005), and minimizes drawing of wrong or misleading conclusions (Angela and James, 2005). In principles, systematic and explicit methods are used to identify, select, critically appraise relevant primary research studies and evidence that are based on clearly formulated questions are extracted from them and analysed. Within the field of management, Tranfield et al. (2003) emphasized the need to conduct scoping studies to assess the relevance and size of literature that take into consideration cross-disciplinary perspectives and alternative ways in which a research topic has previously been tackled.

2.2.2 Systematic Literature Review-Our Approach

After a scoping study, this research adopts a two-step conceptualization approach to SLR introduced by Cerchione and Esposito (2016). According to this process, review protocol and relevant studies for the research are defined, extracted and synthesized in the first step, then the main findings and research gaps are identified in the second step. This approach is attractive because it ensures that the scope of the study is taken into consideration, and a suitable synthesis technique is also identified when research question(s) are being formulated in the outset. This practice adds accuracy to the methodological design, and improves quality

of the evidence. This two-step approach to SLR has also been followed by Centobelli et al. (2017).

2.2.3 Search Strategy

First, appropriate and specialized electronic databases were identified to search for needed published evidence on topic of interest to eliminate or minimise selection bias. Two electronic data bases were spotted, i.e., Web of Science and Scopus. According to Chadegani et al. (2013), these two are not only the most extensive in the ranking of journals in terms of productivity and total citations, they are also popular choices amongst researchers and scholars. For simplicity, Scopus was chosen as the principal electronic database from which review articles were extracted.

In order to come up with a search string that could capture most relevant articles, synonyms to the exact phenomena under investigation were combined logically with the Boolean operators OR, AND, AND NOT. In this case, and consistent with the literature, seven synonyms to new venture creation were introduced, i.e., new firm formation, new firm creation, new business creation, new business ownership, self-employment, entrepreneurial activity, and start-up or start up. "Economic growth" was excluded from the search phrase (because more than 80% of studies on infrastructure is linked to it) to leave behind mostly studies that focus directly on the relationship between infrastructure and new venture creation.

Using Scopus document search engine for periods between 1980 and 2020, the constituted search string shown below was introduced, targeting article titles, abstracts and keywords.

"new venture creation" OR "new business creation" OR "new firm formation" OR "new firm creation" OR "new business ownership" OR "self-employ*" OR "entrepreneur* activity" OR " startup*" OR "start-up*" AND "infrastructure" AND NOT "economic growth."

The search period went from 1980 because, in the late 80ies, scholars had already begun to question what people mean when they refer to infrastructure and infrastructure investments. Musgrave (1990) even wondered if all infrastructure investment was public and whether all public investment was infrastructure, hence, to track studies in the field of entrepreneurship which investigated infrastructure, it was imperative to consider early rather than late 80ies.

The search result retained 2,286 documents and included book chapters, conference papers, e-books etc. In order to ensure that only documents published in journals were considered for the review, all documents that were not of "source type" journal were screened and excluded. Result, 1,237 documents excluded (conference proceedings = 765; books = 155; book series = 128; trade publications = 189) and 1,049 documents left for further screening and selection. In order to ensure that further screening was objective and transparent, inclusion and exclusion criteria guided further selection from the remainder documents into a list of potential review articles.

2.2.4   Inclusion and exclusion Criteria

Articles that successfully passed these check points were included for further analyses, else excluded:

- ➢ include only articles published in journals having a 2018 Scopus CiteScore metric value greater than 1.0 into the list of potential review articles; exclude otherwise.

- ➢ include only articles published in the English language; exclude otherwise.

- ➢ include only articles in which new venture creation (or its synonyms) is major variable of focus, either singly or together with other variables; exclude otherwise.

- ➢ include only articles focusing on infrastructure and new venture creation (or its synonyms) studied in the developed and/or developing world economies; exclude otherwise.

- ➢ Include any relevant and eligible studies identified from the bibliographies of any already selected relevant studies into the list of potential review articles; exclude otherwise.

- do not include any article into the list of potential review articles on the basis of relations with its author(s), or favour for the journal in which it is published.

- do not include dissertations, conference proceedings, book chapters etc. (found in bibliographies of already included articles) in the list of potential review articles.

Table 2-1: List of High Quality Journals and Number of Review Studies Extracted from Them

Journal Title	CiteScore	No. Article	Journal Title	CiteScore	No. Article
Science Advances	13.05	1	Journal of Information Science	2.97	1
Entre'ship Theory and Practice	10.04	3	American J. of Agricultural Econ	2.93	1
Journal of Business Venturing	9.79	3	Journal of Regional Science	2.75	3
Research Policy	6.56	4	Networks and Spatial Econ	2.70	1
Energy Policy	5.45	1	China Economic Review	2.63	1
J. of Product Innovation Mgt.	5.43	1	Telecommunications Policy	2.54	1
Journal of Small Business Mgt.	5.29	2	Regional Science & Urban Econ	2.43	1
Journal of Economic Geography	5.04	1	Land Economics	2.41	1
World Development	4.56	2	Pub. Performance & Mgt. Review	2.37	1
Review of Econ & Statistics	4.43	2	Entre'ship Research Journal	2.31	1
Journal of Transport Geography	4.41	1	J. of Business & Econ Statistics	2.26	1
Small Business Economics	4.19	13	J. of Small Bus. & Enterprise Dev'	2.12	1
Journal of Technology Transfer	4.08	1	Papers in Regional Science	2.07	1
Int. Entre'ship & Mgt. Journal	4.01	2	Journal of Dev'ment Studies	1.99	2
Regional Studies	3.94	5	Int. Regional Science Review	1.51	1
Transport Policy	3.93	1	Annals of Regional. Science	1.48	3
Urban Studies	3.89	1	Journal of Economic Studies	1.47	1
Economic Journal	3.70	1	Journal of Law & Economics	1.35	1
Ent. & Reg. Development	3.62	2	African Development Review	1.31	1
Journal of Development Econ	3.48	1	Empirical Economics	1.28	1
Journal of Urban Economics	3.29	2	Contemporary Economic Policy	1.17	1
Journal of Corporate Finance	3.25	1	Int. J. of Entre'ship & Small Bus.	1.14	1
Int. J. of Entre'rial Behav. & Resea	3.23	1	Transportation Research Record	1.11	2
Energies	3.18	1	Economics of Transition	1.03	1
Industry & Innovation	3.03	2	Journal of Regulatory Econ	1.02	1
Sustainability	3.01	1			

First, the criteria specified above were applied to article titles, abstracts, and keywords. This resulted to exclusion of 761 (journal CiteScore less than one = 373; study's main focus not new venture creation or synonyms = 295; studies not in English language = 77; reviews = 16) documents, and left us with 288 documents for final screening. Based on a Statistical Annex and Country Classification mechanism developed by World Economic Situation and Prospects (WESP), a further 187 documents were excluded such that only studies undertaken in DDWC were retained. The remainder 101 articles were fully read. Upon completion of articles reading, 41 were excluded from further analyses; twenty-nine deemed out of context and twelve others classified as reviews. A review of the bibliographies of retained articles yielded an additional

27 relevant articles. A total of 87 articles spread across 51 high quality multidisciplinary journals were retained for this systematic review. Find list of included Journals above.

2.2.5 Data Extraction and Synthesis Strategy

EXCEL spreadsheets were used for data extraction; columns for different sub categories of extracted data and each row represented an article. Further to being very careful, and resolving to generating a new spreadsheet each time a serious error was committed, maximum attention was paid to make sure multiple publications of same data was not included.

Data synthesis literally involves collating and summarizing the extracted data and evidence from included primary studies. Synthesis strategy explains how the collating and summarizing of extracted data was done. Descriptive and content analyses (non-quantitative synthesis method) was used for this review because extracted data were qualitative and unsuitable for meta-analysis.

Content analysis is a technique of research which allows the collected qualitative data to be analysed systematically and reliably so that generalizations can be made from them in relation to key categories of interest to the researcher (Haggarty, 1996). Hence, similar and dissimilar information related to regional categories were collated from all relevant studies and a summary was drafted to outline patterns and trends.

2.3 Results

2.3.1 Descriptive Analysis

Under this section, a summary account of the quality of reviewed papers is given with respect to studies distribution over time, across regions, and by journal subject areas. Research designs and analytic techniques generally adopted are cross-examined, as well as types and appropriateness of theories used to formulate research questions. Regional breakdown informs

on how researchers in developed versus developing countries embrace and investigate the relationship between infrastructure and new venture creation process over time. Breakdowns by subject areas covered by reviewed journals reveal the diversity and popularity of investigated topics amongst scholars, and a reflection of the need for evidence from such studies to fill policy and professional gaps in countries around the globe. A brief account of research stream(s) in this study domain is also presented. A summary of these and more is presented in table 2-2 of appendix 1 (page 77).

2.3.1.1 Regional Distribution of Study Over Time

This review is based on 113 (including multi-country) studies compressed within 87 articles across 44 (30 developed and 14 developing) countries. About 81% of reviewed studies were from developed world countries, and 19% from developing world countries. The average study per country was far greater in the developed world block, 3.1 points, than the developing world block, 1.5 points. The US provided the highest number of reviewed studies (24%), followed by Italy (11%), then Germany (6%). The G7 nations jointly contributed almost half (49%) of the entire sample of reviewed studies; the US was leader with 27 studies, while Canada, France, and Japan tailed the block with 2 studies each. China was leader in the developing world block with 5 reviewed studies.

From the 5-yearly study distribution chart below, limited research activity is observed in this area of study from 1980 to 2000. However, beyond the year 2000, a sudden and rapid spike is noticed not only in the overall number of studies undertaken, but drastic increases are recorded in both the developed and developing world blocks.
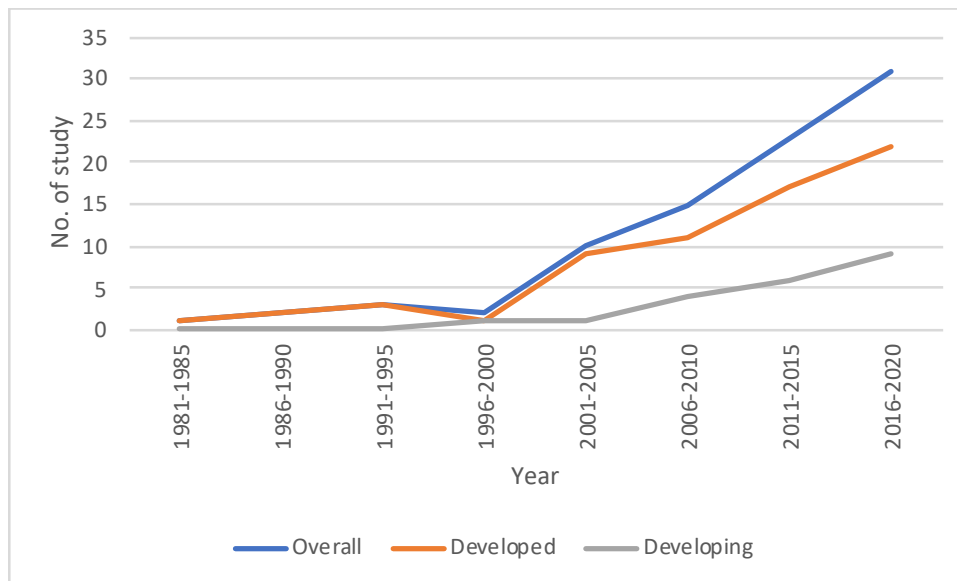
Figure 2-1: Study Distribution Across Developing and Developed World Over Time

Though spike is greater for studies in developed world than for developing world countries, the overall increasing frequency at which scholars and independent researchers make contributions to this topic suggests this topic falls under a promising area of research seemingly very attractive to most researchers worldwide. In fact, concentration of studies on this topic has been following an upward trend for the past two decades.

2.3.1.2 Study Distribution Across Journal Subject Area

Using the Scimago Journal and Country Rank platform SJR, 51 journals were classified according to their respective subject areas. This resulted to 11 relevant subject areas attracted to the study of relationship between infrastructure and the new venture creation process. The subject areas are: Agricultural and biological Sciences; Business, Management and Accounting; Computer Science; Decision Sciences; Economics, Econometrics and Finance; Engineering; Environmental Science; Mathematics; Social Sciences; Energy; Medicine. Notice that some journals cover multiple subject areas.
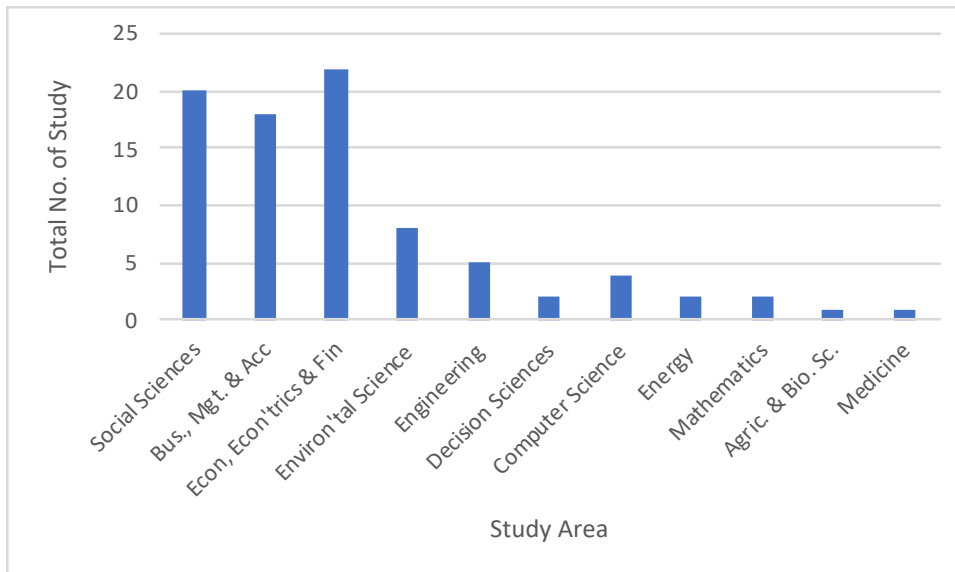
Figure 2-2: Study Distribution Across Journal Subject Area

New venture creation process is a form of entrepreneurship and entrepreneurship is firmly rooted in studies widely classified under the social sciences. Specifically, and as expected, most of reviewed studies are positioned under "Business, Management and Accounting" and "Economics, Econometrics and Finance" subject areas. However, there is sufficient evidence that this is a crossroad research topic, which attracts not only subject areas in agricultural and biological sciences, but also subject areas in mathematics and medicine. Scholars across many different disciplines are seeking to understand if, and how infrastructure is related to new venture creation. Therefore, this is clear proof of the multidisciplinary nature of entrepreneurship research in general, and its relationship with different categories of infrastructure in particular.

2.3.1.3 Principal Research Stream

Most reviewed studies focused on identification of determinants of spatial distribution of new ventures across regions and municipalities. Such studies generally explore characteristics that make certain parts of given regions most attractive and conducive, for

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people interested in the new venture creation process, than others. For example, some studies (Baptista and Mendonça, 2010; Coughlin and Eran, 2000; Bania et al., 1993; Ghio et al., 2016; Arauzo-Carod, 2005; McCoy, 2018) found evidence that the level of economic activity, level of employment, level of population growth/density, level of openness, presence of business incubator, level of wage, property and cooperate taxes, and municipal industrial diversity all have positive impacts on new venture location and industry distribution in municipalities. On the contrary, other authors (Naudé et al., 2008; Zhu et al., 2019; Colombelli and Quatraro, 2018; Okamuro and Kobayashi, 2006) found rather negative effects for high levels of economic activity, municipal industrial diversity, and high levels of wages, property and cooperate taxes.

Another research stream investigated by reviewed studies in this domain is location determinants of newly created ventures. Here, studies explored how locations of newly created businesses (rural and/or urban) facilitated or inhibited their abilities to maximize profits by creating or failing to create location-based competitive advantages. Regional variations in the levels of entrepreneurial and/or innovative activities are determined by the sizes and characteristics of the market, household incomes, and population density and growth. Consequently, large metropolitans often are more attractive than rural areas to people seeking to create new ventures. Urban cities attract not just financial capital, but also human capital to support these increasing entrepreneurial/innovative activities. Similarly, many other reviewed studies found localization economies, Urbanization economies, and market size to constitute positive location determinants of new ventures (Zhang, 2001; Chien-Hsun, 1996; Holl, 2004b).

2.3.2   Research Design and Theory Use

The choice of a particular design by a researcher depends, to a greater extend, on the study question; design elements such as data sources, sampling techniques, study approaches and data analysis techniques all stand to affect the nature, type, and reliability of reported

evidence. Even more is the ability to use existing theories as a guiding lens for the formulation and testing of hypotheses (Reeves et al., 2008), which helps researchers to further confirm or contradict the way variables interrelate.

2.3.2.1 Data Source

Data upon which most of the analyses are based are secondary, for example, national statistics offices, regional chambers of commerce and industry, country registrar of start-ups, country population census registers, non-government organizations like World Bank Development Indicators (WBDI), global entrepreneurship monitor (GEM) etc. High preferences for these databases, by researchers, is a justification of their high qualities, reliability and accessibility. Advantages include: drastic reduction in time needed for data collection at individual levels, a reduction in sampling and other errors, and above all, a reduction in the cost of research and promotion of knowledge creation.

2.3.2.2 Study Approach

In entrepreneurship research, two study approaches that are easily distinguished based on the time frame of investigation are longitudinal and cross-sectional. Although short time frame studies (cross-sectional) are simpler to design and easier to execute, they clearly lack the richness of insight that results from studying a phenomenon over a longer time period (Murray and Macmillan,1988). Malina et al. (2011) argued that combining qualitative and quantitative methods (mixed method) enables the exploration of more complex aspects and relations of the human and social world.

About 49% (43 out of 87) of the reviewed studies are based on the longitudinal research design and about 47% (41 out of 87) are based on cross-sectional design. Accordingly, both designs seem somewhat popular choices in studying relationships between infrastructure and

the new venture creation process. Although by integrating the strengths of both approaches, mixed method research can address a broader set of research questions than any single study method, its minimal use 2.2% (2 out of 87) in reviewed studies suggests its inappropriateness. Therefore, as a way to improve on the quality of research in this area, and for the sake of causal inferences, future researchers should prioritise longitudinal over other forms of research designs when and wherever financially possible.

2.3.2.3 Nature and Type of Effect

In most studies, researchers aim to understand relationships between two or more variables; often, the principal focus is to fit a model which estimates by how much one or more depend variables will change with a unit change in one or more explanatory variables. These types of studies actually look at the direct effect of the explanatory variables on the outcome variables. However, direct effects do not always explain all the variations in the outcome variables; some independent variables owe their effects on dependent variables through the mediation of other variables, resulting to indirect effects such that their total effect, (as in linear models), is the sum of both direct and indirect effects. In other cases, the relationship between two variables is better understood when one variable (the independent) is moderated or interacted by a third variable known as a moderator; the effect of the original relationship between the two variables is either made stronger or weaker by this interacting variables. From these perspectives, it is imperative for researchers to consider other forms of interactions and/or mediations when seeking to establish the types and magnitude of effects between two or more variables. Knowledge and understanding of relationships between variables will remain very limited if only direct effect is being analysed.

About 78.2% (68 out of 87) of reviewed studies analysed solely direct infrastructure effect on the location and spatial distribution of new venture. Only about 16.1% (14 out of 87)

of the reviewed studies queried effects other than direct; in eleven studies, the moderating effect of some variables on the infrastructure-new venture creation relationship was tested, and mediation effect was tested in three other studies. Just one study investigated both interaction and mediation effects. In two other studies, one form of infrastructure, (social), mediated the relation between another form of infrastructure, (economic), and new venture creation. No reviewed study looked at possible mediating effect(s) of infrastructure on association between new venture creation and variables other than infrastructure.

2.3.2.4 Analytic Technique

Various modelling approaches and levels of aggregation have been used to analyse the relationship between infrastructure and new venture creation process. For a complete list of these approaches, please see table 2-2 of appendix 1 on page 77. Because of the often discrete and nonnegative nature of the dependent variables, most studies in this area of research assume a negative binomial distribution of the underlying stochastic process, hence, the preference for count models.

Count models have proved more appropriate (Colombelli, 2016) to deal with nonnegative integers, and the popular choice is either a Poisson or a negative binomial model. In cases where the dependent variable is over-dispersed, the negative binomial estimator is often the more appropriate. Researchers usually perform a likelihood-ratio test for over-dispersion to further assess the appropriateness of the negative binomial estimator over the Poisson estimator.

About 90 techniques were used for analyses by reviewed studies. As expected, negative binomial model was most popular (23%) and more desired than Poisson model (10%), in this research domain. Other popular choices include: DID 12%, Logit 11%, 2SLS 4%, Tobit 3% and Probit 2%. Other analytic techniques used in reviewed studies constituted 25%.

2.3.2.5 Theory Use

The importance of theory in the study of relationships between variables and predictions of outcomes under given circumstances can't be emphasized enough; the ability to observe empirical evidence and systematically compare and make certain generalizations about them across studies promote the development of theories. Consequently, using existing theories as a guiding lens to the formulation and testing of hypotheses help researchers to further confirm or contradict the way variables interrelate.

About 88.5% (77 out of 87) of reviewed articles were theory-grounded. Some authors used more than one theory in a single study. A total of 94 theories were applied as follows: 28% location theory, 24% knowledge spillovers theory, 11% human capital theory, 11% institutional theory, 4% accessibility theory, 3% opportunity recognition and exploitation theory, 2% Resource-based view theory, and 17% Other theories. Ten reviewed studies (11.5%) were not theory-grounded. Briefly, we discuss below basic ideas that underly use of four most popular theories in this domain of study.

2.3.2.5a   Location Theory

Location theories explain industry birth, death, and relocation with respect to some set of characteristics that vary spatially (Melo et al., 2010). The traditional industrial location theory explains the location choices and patterns of firms. Two fundamental assumptions of this theory are production cost minimization and revenue maximization. Many studies argue that presence of infrastructures like roads and similar networks play key roles when it comes to deciding where to locate, for example, new logistic and transportation firms. Duration and cost of transporting production inputs to factories and final goods and services to markets don't only determine overall production costs, but also promote survival and growth of newly created ventures through possible increases in sales volume.

2.3.2.5b   Knowledge Spillovers Theory

Newly established firms in any location will require own knowledge and knowledge from other sources in both short and long terms. In fact, in any given location, the availability and affordability of new knowledge depend largely on the prevalence of outlets for Knowledge creation and development. Knowledge is one of such competences in skills set that can be created at universities and/or vocational training centres. Acs et al. (2009) were first to demonstrate that knowledge created endogenously results in knowledge spillovers, which allow entrepreneurs to identify and exploit opportunities. Even new knowledge created or first adopted by incumbent firms eventually spillovers to start-ups as opportunities. Many studies thus argue that the presence of universities and other knowledge creating institutions attract new ventures to a location to benefit from the spillovers effect of created knowledge and opportunities it may create.

2.3.2.5c   Human Capital Theory

Human capital theory suggests that individuals and society derive economic benefits from investments in people (Sweetland, 1996). Such investments usually include, amongst others, reinforcing peoples' skills and abilities through education and training. Although abilities often increase with experience, however, training is necessary tool for skills improvements. Education, experience, and skills set are vital components of human capital, which is itself an important production input. Labour cost is location dependent and is often influenced by quality of its attributes, such as levels of educational attainment, years of work experience, skills obtained etc. Studies often argue that it's highly probable for new entrants to choose locations where human capital is available, affordable, and of high quality.

2.3.2.5d   Institutional Theory

North (1990) states that institutions are humanly devised constraints that shape human interactions, and consist of formal rules, and informal norms and constraints. New businesses usually seek for agglomeration economies through urbanization and/or localization. These regroupings inevitably influence the behaviours and actions of involved stakeholders, which sometimes call for the review of certain rules and regulations, or bring changes to some codes of operation. Often, conflicts of interest result to expensive court cases and harsh rulings, especially, against the less financially viable new establishments. Under institutional theories, the debate is usually about rules and/or norms un/suitability, circumstances/locations, and results. Some studies, for example, argue that entrepreneurial activities by new ventures decrease under greater regulation, administrative burden and market intervention by government.

2.3.3   Content Analysis

As earlier mentioned, content analysis involves a systematic and reliable analysis of qualitative data in order for generalizations to be made from them in relation to key themes of interest to the researcher. Our themes of interest are: definition of infrastructure, tentative classification of infrastructure, importance of infrastructure, and summary effect of infrastructure on the location and spatial distribution of new venture.

2.3.3.1 Definition of Infrastructure

Prior to the creation of the federal highway system in the United States in the 1950s, literally not so much was known about the word "infrastructure" until after the military applied it to their permanent installations (Cain, 1997). However, from 1980, the meaning of infrastructure has been extended so much that it no longer means much (Prud'homme, 2005).

Aschauer (1989) was one of the earliest scholars who emphasized infrastructure investments be considered in productivity analyses, but failed to provide any specific definition for infrastructure. Referring to infrastructure simply as public investments, the author distinguished military from non-military capital stock and described some (e.g. streets, highways, airports, water systems, sewers among others) as "core infrastructure." In fact, definitions provided by most previous studies are not only unprecise, fragmented, and limited in meaning (Buhr, 2003; Momoh and Ezike, 2018), but often generally fail to reflect the multidimensional nature of infrastructure.

Moreover, while economic and policy work examined infrastructure more broadly as it is related to economic activity, most entrepreneurship scholars (Tseng, 2012; Van de Ven, 1993; Woolley and Rottner, 2008) adopted same narrow approach by examining infrastructure as it is related to entrepreneurial activity. These previous studies viewed entrepreneurial infrastructure as infrastructure for entrepreneurship, which strongly affects different outcomes of entrepreneurial behaviour (Galkina and Kock, 2011). For example, Van de Ven (1993) proposed an industrial infrastructure for entrepreneurship comprising of three components, i.e., Institutional Arrangements, Resource Endowments, and Proprietary Functions. Not only are characteristics of such an infrastructure limited to entrepreneurship, but also, the interrelation of its components are largely unknown. First, it's imperative to know what generally constitutes an infrastructure, especially given the limited attention on the subject in the field of entrepreneurship (Bennet, 2019). Such knowledge could help scholars to effectively understand and easily adapt existing stock of infrastructure to match specific needs of potential and incumbent entrepreneurs. Not surprisingly, Woolley (2014) expressed regret that development of infrastructure for entrepreneurship remains elusive.

Many studies (Amorós et al., 2013; Bosma et al., 2009) frequently identify factors said to be related to entrepreneurial infrastructure. Termed entrepreneurial framework conditions

(EFCs), these factors include financial support, government policy, government programmes, education and training, research and development transfer, commercial and professional infrastructure, market openness, access to physical infrastructure, and cultural and social norms. Curiously, the little known "physical infrastructure" also makes it to the list of said factors. In other related studies like entrepreneurship ecosystems (EEs), "support system/mentor" and "cultural support" are frequently included as forms of support services and pillars within the system (Stam, 2015). It's difficult to say "if, and how" the two classes of support are interrelated.

Be it EFCs, EEs or another type of support instruments, it's imperative to understand and distinguish between them to estimate their individual and collective effects on entrepreneurial activities in general and new venture creation in particular. Following statement by Audretsch et al. (2015, P.226) that "…there are clearly many more specific types of infrastructure that are not explicitly measured in our data base and therefore not analysed in our study", the claim above seems justified. What, therefore, is infrastructure? To answer this question, pieces of information extracted from reviewed studies are put together to craft a complete definition for infrastructure.

"Infrastructure is commonly conceptualized as a set of facilities that play a critical role in facilitating activities by individuals & organizations" (Bliemel et al., 2019, P.133). "Infrastructure represents these types of capital goods that serve the activities of many social and business needs…" (Krakowiak-Bal et al., 2017, P.906). Infrastructure is "part of basic framework in the province that must be in place before a community can be initiated…etc." (Cumming and Johan, 2010, P.864). "These capital-intensive investments seek to facilitate start-ups emergence by aiding access to markets and development of ideas" (Bliemel et al., 2019, P.133). In addition, infrastructure are physical conditions and amenities which either foster or constrain interaction between the agents of entrepreneurial ecosystem (Audretsch and

Belitski, 2017). Taken together, these statements suggest that infrastructure are physical conditions or capital goods which support processes such as start-ups, production and marketing, facilitating interactions between economic agents and promoting socioeconomic activities. Some infrastructure identified by reviewed studies include: roads, communication networks, financial support, energy, water supplies, bridges, police/fire stations, wastewater treatment, storm sewers, transport links, green spaces, museums, cinema, art galleries, universities, research institutions, and telecommunication technologies etc.

Statements by Woolley and Rottner (2008, P.793) that "…tangible infrastructure has a positive impact on related innovation, entrepreneurship…", and Neck et al. (2004, P.204) that "to differentiate from the intangible infrastructure found in the network, the physical infrastructure is defined as the tangible components of the country's infrastructure…", also suggest that infrastructure exists in two forms, i.e., tangible and intangible. Audretsch et al. (2015, P.221) state that "…investments in infrastructure are mostly of large scale, sunk and irreversible…typically made by the public sector or different kinds of public–private partnerships …." Arauzo-Carod (2005) reveals that the concentration of economic activity and access to public and private infrastructure or to labour markets is a booster of competitiveness and an attraction to firms. These statements suggest that, beyond its two forms of existence, infrastructure is either owned and funded publicly, privately or in partnership. While Bartik (1985) opined that public infrastructure are public services, Reynolds et al. (1995) stated that public infrastructure are not always provided by government organizations, adding that most are provided privately under the supervision of governments and often paid for with public funds. From above statements, it's clear that public infrastructure is different from both private infrastructure and those jointly owned and operated.

Going forward, Krakowiak-Bal et al. (2017) stated that infrastructure can generally be distinguished as physical (technical), social and economic infrastructures. This seems to

suggest that, like tangible and intangible, public, private, and jointly owned (a seeming sub-category of tangible and intangible) infrastructure can each be broken down and re-grouped under three categories. For example, public economic infrastructure can be differentiated from public social infrastructure, and public technical/technological infrastructure etc. With yet another statement by Ngoasong (2018, P.486) that "the institutional context (government policies) shapes the ICT infrastructure (mobile/internet penetration rates) and physical infrastructure (logistics and local distribution channels)", it seems some infrastructure also play a monitoring role within each of the three categories (economic, social, and technical) of infrastructure, introducing checks and balances as a means to uphold standards. Apparently, institutional infrastructure seek to institute laws and regulations across the various other sub-categories of infrastructure.

Holl (2004b, P.352) stated that "infrastructure is provided at a particular place and if it enhances firms' profit opportunities, then it will also enhance the attractiveness of that location relative to other places." Amorós et al. (2013, P.127) also stated that "it is very important to have public policy that promotes the decentralization of infrastructure investments." These statements suggest that infrastructure is location specific or centralized.

Krakowiak-Bal et al. (2017, P.906) opined that "socio-economic development can be facilitated and accelerated by the presence of adequate infrastructure." Moreover, Audretsch and Belitski (2017) stated that cities will thrive and grow if they provide amenities and infrastructure that are attractive to its high human capital residents. The authors stated further that infrastructure enhances connectivity and linkages that facilitate the recognition of opportunities. These statements do not only suggest that infrastructure is a network booster, but also that infrastructure is a booster of economic and social growth and development.

When all previous points stated above are taken into consideration, infrastructure is defined as: in/tangible conditions or capital goods present in a location, owned publicly,

privately, or jointly with the state, which support processes such as start-up, production and marketing, and facilitate social and economic activities. It is a network booster, often classified under three categories (economic, social, and technology), regulated by a local or national independent structure, and its presence renders a location attractive to various socio-economic, political, cultural, technological and ecological activities. It comprises of transportation links, communication networks, financial support, energy, water supplies, bridges, education, healthcare, police/fire stations, wastewater treatment, storm sewers, green spaces, museums, cinema, art galleries, research institutions etc.

2.3.3.2 Tentative Classification of Infrastructure

Infrastructure is somewhat different across regions and, given its broadness, any form of meaningful grouping is not easy thoughtless of a definitive classification. Therefore, a tentative classification from a national perspective is proposed in this chapter. Nijkamp (1986) stated that infrastructure comprises a natural endowment component, so first, man-made infrastructure is distinguished from natural occurring infrastructure. Next, man-made and natural occurring infrastructure is broken into two groups, i.e., tangible and intangible. Therefore, tangible man-made and intangible man-made are two categories of infrastructure separate and different from two other categories of infrastructure, i.e., natural occurring tangible and intangible infrastructure.

Intangible infrastructure is defined as the set of factors that develop human capability and permit the easy and efficient growth of business activity (Credit Suisse, 2008, P.7); can be essentially political, legal or socio-economic in nature. Intangible infrastructure accompanies risk capital in wealth production and includes access to novel ideas, role models, informal forums, region-specific opportunities, safety nets, access to large markets and executive leadership (Venkataraman, 2004, P.153).

Tangible infrastructure is the "hardware" that supports the intangibles (Suarez-Villa, RegionalInversion) and includes: sound legal systems, transportation systems, advanced telecommunications, transparent capital markets etc. (Venkataraman, 2004).

Tangible or intangible infrastructure may be owned publicly or privately. Public infrastructure is any facility, good or institution provided by the state, which facilitates the juncture between production and consumption (Martin and Roger, 1995). Two characteristics distinguish public infrastructure from other types of investments; first its social benefits far exceed what any individual would be willing to pay for its services and, second, it provides the basic foundation for economic activity (Eberts, 1990). Public infrastructure provides an environment in which private production is facilitated and includes highways, airports, mass transit facilities, water supplies, sewer systems, police and fire stations, courthouses, public garages etc. (Berndt and Hansson, 1992).

Public infrastructures are most important for the private economy than others (Conrad and Seitz, 1994). Referred to as "core", these most important infrastructures only include highways, airports, mass transit facilities, electric and gas plants, water supply facilities and sewer systems (Conrad and Seitz, 1994; Berndt and Hansson, 1992). Therefore, the less important private economy infrastructure may be referred to as "non-core." Although very subjective, national infrastructure comprises of both "core" and "non-core" public infrastructure sub-classes including: government operations (public works projects), telecommunications, transport, electricity (energy), water supplies, sewer systems, dams, tunnels, mass transit facilities, schools, hospitals, public building and offices, police and fire stations, courthouses, recreational facilities etc.
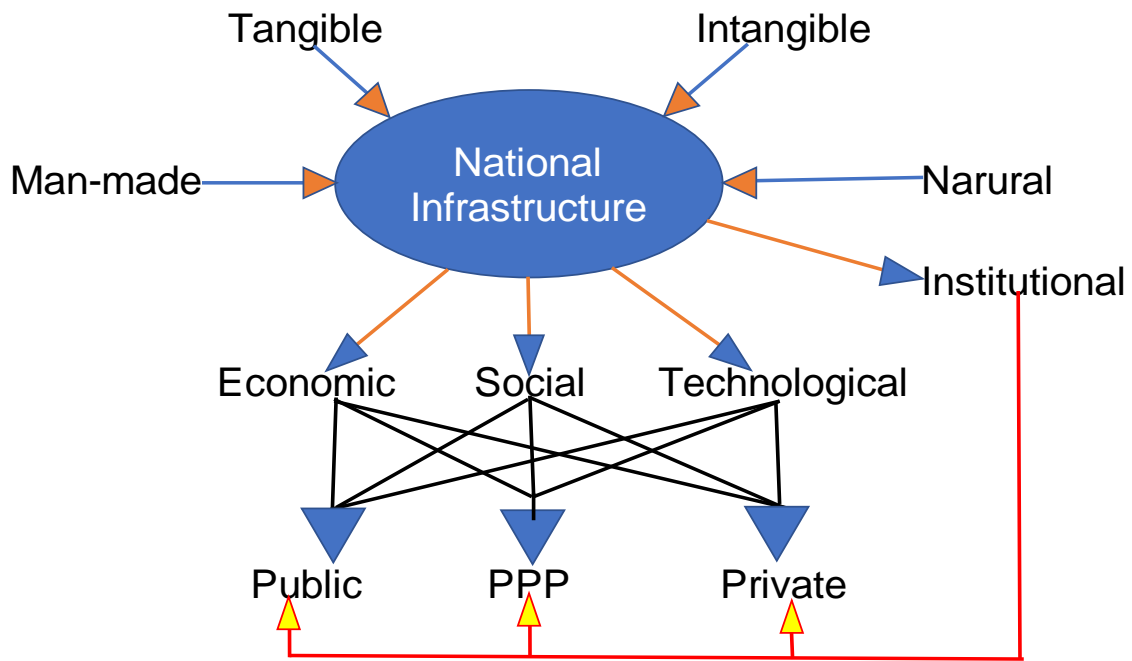
Figure 2-3: Tentative Classification of Infrastructure

Bennet (2019) stated that private infrastructure investments facilitate the creation of new businesses and jobs. The author highlighted also that private infrastructure include the following: buildings and structures for lodging, offices, commercial industries, healthcare, private education, religious organizations, amusement and recreation, transportation, and manufacturing facilities, private public safety, non-railroad transportation, highway and street, sewage and waste disposal, water supply, and conservation and development infrastructure projects.

Due to poor performances by public infrastructure in terms of cost blowouts, planning and construction delays, lack of innovation and technological advancement etc. (Henckel and McKibbin, 2017), a new form of organizations known as public-private partnerships (or PPPs) now exist and captures both the benefits and problems associated with private and public infrastructures. Grimsey and Lewis (2002, P.108) define PPPs as agreements where public sector bodies enter into long-term contractual agreements with private sector entities for the construction or management of public sector infrastructure facilities by the private sector

entity. With this additional concept, it can be established that tangible and/or intangible infrastructure could also be owned through PPPs. Unfortunately, extant literature does not cover PPP infrastructure investments.

Further, public, private and PPP infrastructure categories are divided into economic, social and technological sub-classes. According to Hahsen (1965), economic infrastructure is generally preferred closer homes and places of work by consumers, and is primarily oriented toward the support of directly productive activities or toward the movement of economic goods. Included but not exclusive are: transport networks, communication networks, water supply, gas and other energy supply, electricity supply, waste disposal networks and facilities, drainage and sewage systems, slaughter houses, irrigation systems and market places.

Social infrastructure increases productivity in a much less direct way than does economic infrastructure (Hansen, 1965). It includes the facilities and equipment directed at satisfying society's needs in terms of education, health, and community services (Chan et al., 2009) and, unlike economic infrastructure, consumers tend to be willing to leave their residences to make use of it (Hansen,1965). Some examples include: health and welfare institutions, schools, administrative offices, parks and athletic fields, public buildings and vehicles, garbage collection and waste disposal, home for the aged, fire and police protection, cemeteries and municipal beautification, research institutions, prisons etc.

Technological infrastructure is a sub system of National Innovation System comprising different kinds of public, semi-public and private centres and institutions of research and technology. It works as an institutional focusing device that helps to organize and guide the collective search for knowledge acquisition, learning, and transformation (Laranja, 2009). It includes universities' departments, public laboratories and R&D centres, databases, incubation centres, science parks, national technology and innovation centres, technology transfer offices etc.

Finally, institutional infrastructure is aligned to operate in conjunction with various sub-categories of infrastructure (Ngoasong, 2018). Some examples are legal framework that provide access to justice and the rule of law as well as labour and business rights, bankruptcy institutions, regulation of banking and securities markets, competition agencies, tax authorities, other regulatory and licensing bodies etc.

2.3.3.3 Importance of Infrastructure

Fox and Porca (2001) stated that little attention is devoted to the study of the importance of infrastructure. In response, evidence from reviewed studies are put together about infrastructure importance in this chapter. Mobile communication has emerged to offer more opportunities for business; their ease of use and portability make them a useful support tool for entrepreneurship such as new venture creation (Alderete, 2017). Local firms benefit from a region's technical infrastructure by hiring graduates from local universities, using faculty as consultants, becoming sponsors of joint university-industry research centres, using local universities for education and training of their workforce, utilizing university facilities such as laboratories, libraries etc. (Bania et al., 1993). Physical infrastructure also provide environmental services such as preserving of biodiversity, protecting water quality and availability, preserving air quality, reinforcing resilience to flooding and/or fire and maintaining landscape values (Krakowiak-Bal et al., 2017).

Broadband provision can provide other types of benefits such as telemedicine, distance education, broader range of goods and services choices and improvement of community interactions (Kim and Orazem, 2017). Economic infrastructure drives competitiveness and support economic growth by increasing private and public sector productivity, reducing business and market access costs, diversifying means of production and creating jobs (Stewart, 2010; Henckel and McKibbin, 2017). Social infrastructure favours high levels of output per

worker and provides an environment that supports productive activities, encourages capital accumulation, the acquisition of skills, intervention and technology transfer (Hall and Jones, 1999). The presence of reliable energy and suitable transportation systems can expedite the implementation of a new firm (Reynolds et al., 1995). Infrastructure is often considered the wheels, if not the engine, of economic growth (Srinivasu and Rao, 2013) with benefits such as improved security and health systems, time saving, a cleaner environment and/or improved out-door recreation (Gramlich, 1994). According to the National Meteorological Office of the UK (https://www.metoffice.gov.uk), in Indonesia and other countries where drought is very common, food security is threatened, but with the help of irrigation systems and the availability of sufficient energy to power these systems, mass production of food is possible.

2.3.3.4 Summary Effects of Infrastructure on Location and Spatial Distribution of New Venture

All reviewed studies were undertaken in specific countries (or group of countries) classified under one of two categories: developing world or developed world. The classification was based on a Statistical Annex and Country Classification mechanism developed by WESP.

2.3.3.4.1 Economic Infrastructure

Economic infrastructure is defined in this study as a special form of material infrastructure created, owned and operated privately or publicly or jointly, and principally oriented towards the support and promotion of business and other economic activities. It has the potential to influence the location and spatial distribution of new ventures in developing and/or developed world countries. In this sub-section, we cross-examine nature and type of effects of seven classes of economic infrastructure (airport, seaport, railway, highway, electricity, telephone, broadband internet) on firm formation.

2.3.3.4.1a   Airport, Seaport, Highway, Railway and Firm Formation

Several similar results were reported by a cross section of reviewed studies. Most reported evidence support a positive and direct association between new venture creation and following: airport access (Jiang et al., 2018; Holl and Mariotti, 2018; Sheard, 2019; Bilotkach, 2015), seaport access (Hong and Chin, 2007; Verhetsel et al., 2015), highway access (Shiferaw et al., 2015; Percoco, 2016; Holl, 2004a; Melo et al., 2010; Gibbons et al., 2019; Zhang, 2001; A-Carod and A-Pardo, 2013), and railway access (Chien-Hsun, 1996; Zhu et al., 2019; Kim et al., 2018; Chatman and Noland, 2016; Bartik, 1985). However, one study reported new venture creation wasn't associated with railway access (Arauzo-Carod, 2005), and airport access (Reynolds et al. 1995; Ihlanfeldt and Raper 1990).

2.3.3.4.1b   Telephone, Electricity, Broadband Internet and Firm Formation

Several similar results emerged here as well, though skewed towards developing world countries (electricity and telephone especially). Evidence support a positive and direct association between new venture creation and following: telephone access (Alemu and Adesina, 2017), electricity access (Peters et al., 2011; Vernet et al., 2019; Bahaj et al., 2019; Lenz et al., 2017), and broadband internet (Whitacre et al., 2015; Shoham and Baruchson-Arbib, 2006). However, at least one study reported electricity access was without effect on new venture creation (Aklin et al. (2017), and broadband internet was without effect as well (Fairlie, 2006). McCoy et al. (2018) also reported a negative impact of the broadband internet-firm formation relationship mediated positively by university knowledge, while Cumming and Johan (2010) reported negative effect only in smaller and more geographically remote internet communities.

2.3.3.4.1c   Summary Effects of Airport, Seaport, Highway and Railway in DDWC

Collectively, reported evidence suggest positive association between these classes of economic infrastructure and firm formation in both the DDWC. For example, reported airport effect is positive in China (Jiang et al., 2018), Spain (Holl and Mariotti, 2018), and US (Sheard, 2019; Bilotkach, 2015). Same is the case for highway effect that's reported positive in Ethiopia (Shiferaw et al., 2015), UK (Gibbons et al., 2019), and Belgium (Verhetsel et al., 2015). The author verified and validated for seaport and railway as well, and it's same as above.

2.3.3.4.1d   Summary Effects of Telephone, Electricity and Broadband Internet in DDWC

Here, the same conclusion cannot be drawn like above because of paucity of evidence on some classes of economic infrastructure included in this sub-section. For example, although reported telephone effect on firm formation is positive (Alemu and Adesina, 2017), cross-examination is limited to only one study from Ethiopia. The same is true for electricity wherein, all the reported evidence (though positive) have their origins in developing world countries (India, Kenya, Rwanda and Benin). Reported broadband internet effect, on the other hand, seems mixed; positive in US (Whitacre et al., 2015), positive in Israel (Shoham and Baruchson-Arbib, 2006), and negative in Canada (Cumming and Johan, 2010).

2.3.3.4.2   Social Infrastructure

Hall and Jones (1999, P.84) defined social infrastructure as institutions and government policies that determine the economic environment within which individuals accumulate skills, and firms accumulate capital and produce output. Hansen (1965) stated that social infrastructure increases productivity, though in less direct way than does economic infrastructure. Seemingly, social infrastructure has the potential to influence the location and spatial distribution of new ventures.

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Social infrastructure such as universities conduct their own research, produce technology, educate students, and assist people to acquire different types and levels of new knowledge (Acosta et al., 2011). In the literature, new knowledge generated at public schools, private schools, and R&D institutions is said to diffuse into the local community through two major mechanisms: graduates from colleges/universities residing in the community and/or research findings published in the community. Therefore, both the number of graduates present in a community or its workforce (proxied by level of education attainment) and the number of research institutions therein are considered determinants of new firm location and spatial distribution within it. The nature and type of effects of these two classes of social infrastructure, i.e., university knowledge and research knowledge respectively, on firm formation are cross-examined in this sub-section.

2.3.3.4.2a   University Knowledge and Firm Formation

Empirical evidence suggests that university knowledge effects vary by subject area of study (Audretsch and Lehmann, 2005), sectorial activities (Okamuro, 2008; Reynolds, 1994) and is localized (Bonaccorsi, 2014). Several dissimilar results of the relationship between university knowledge and new venture creation were reported. Some studies (Kirchhoff et al., 2007; Armington and Acs, 2002; Cheng and Li, 2011) reported positive and direct effect, others (Okamuro, 2008; Acosta et al., 2011) reported negative and direct effect, and one study (Spigel, 2012) was without effect on firm formation.

2.3.3.4.2b   Research Knowledge and Firm Formation

Empirical evidence suggests that research knowledge effects not only vary by industries (Bania et al., 1993), but also by the level of needed technology involved (Okamuro, 2008) and quality of the research knowledge itself (Bonaccorsi et al., 2014). Other studies reported

positive and direct effect of research knowledge on innovative start-ups (Fritsch and Aamoucke, 2013), knowledge intensive start-ups (Andersson and Hellerstedt, 2009), high science and technology start-ups (Woolley and Rottner, 2008) and green start-ups (Colombelli and Quatraro, 2019).

In fact, several dissimilar results of the relationship between research knowledge and new venture creation were reported. Some studies (Bania et al., 1993; Colombelli, 2016, 2013) reported positive and direct effect, others (Binet and Facchini, 2015; Chien-Hsun, 1996) reported negative and direct effect, and more yet (Audretsch et al., 2015; Reynolds et al., 1995) were without effect on firm formation.

2.3.3.4.2c Summary of University Knowledge and Research Knowledge Effects in DDWC

The effects of both classes of infrastructure are evidently mixed in developed like in developing world countries. For example, reported university knowledge effect is positive in Italy (Ghio et al., 2016), negative in France (Binet and Facchini, 2015) and without effect in Canada (Spigel, 2012). Similarly, reported research knowledge effect is positive in South Africa (Naudé et al., 2008), negative in Japan (Okamuro, 2008), and without effect in US (Reynolds et al., 1995). Most reviewed studies that investigated social infrastructure-firm formation relationship (especially research knowledge) focused on developed world countries. This suggests paucity of research on this topic in developing world countries as previous evidence are skewed towards the developed world block.

2.3.3.4.3 Institutional Infrastructure

Woolley (2017) highlighted institutional infrastructure as one of the many structures known to support economic activities such as entrepreneurship. It's one of the four categories of infrastructure earlier identified in the tentative classification of infrastructure. It is known

for shaping other categories of infrastructure (Ngoasong, 2018) by instituting checks and balances within them to regulate actions of economic agents, and facilitate and promote resulting economic activities and processes within a community. For example, Hall and Jones (1999) stated that thievery, squatting and mafia behaviour are examples of diversions undertaken by private agents such that any social institutions protecting these diversions, qualify to be considered a form of institutional infrastructure.

Buhr (2009) considered institutional infrastructure to encompass all customary and established formal rules and informal constraints (conventions, norms of behaviour) of the society and procedures of their guaranteed enforcement by the state. Aghion and Schankerman (1999) revealed that, in the event of poor or dysfunctional institutional infrastructure, firms usually find ways to adapt their behaviour, and often at the expense of competition with resulting social costs such as the restriction of market interactions to similar ethnic groups or even organizing market transactions at local level. Rule of law and de/regulation are the two classes of institution infrastructure under cross-examination in this sub-section.

2.3.3.4.3a   De/regulation, Rule of law, and Firm Formation

Law and regulation can be designed to promote or discourage a range of economic outcomes including firm formation. According to Djankov et al. (2002), in most countries today, legal entry is extremely cumbersome, time-consuming, and expensive for an entrepreneur. Institutional freedom is often necessary to encourage potential and incumbent entrepreneurs to confront risk and uncertainties involved in entrepreneurship. Reducing the regulatory burden is high on the agenda of policymakers interested in growing entrepreneurial economies around the world. Kosi and Bojnec (2013) recommended simple inexpensive administrative procedures, competitive product markets, and transparent and effective legal/judicial systems as methods to promote institutional freedom and encourage legal entry.

2.3.3.4.3b   De/regulation and Firm Formation

According to (https://www.ced.org), regulations are specific standards or instructions concerning what individuals, businesses, and other organizations can or cannot do. Additionally, they stated that regulations are also called administrative laws or rules, and are the primary vehicles by which the federal government implements laws and agency objectives. In this sense, the government and/or private institutions may need to develop instruments, strategies, and policies as necessary to implement these regulations across the country.

Braunerhjelm et al. (2015) referred to economic regulations as constraints on behaviours of agents in the market place, often codified in law, and enforced by courts or administrative agencies. Darnihamedani et al. (2018) described start-up regulations as procedures and requirements imposed by governments for starting a business in order to ensure that new companies meet minimum requirements to provide goods or services to the market. There is increasing evidence for a need to introduce reforms to cut down on some of these procedures and requirements; empirical results suggest excesses are counterproductive for new venture creation (Djankov et al., 2010).

Generally speaking, lighter regulatory burdens are associated with higher strategic entrepreneurial entry rates (Levie and Autio, 2011), while costly market entry regulations and/or requirements have mostly been found to affect the creation of new firms adversely (Klapper et al., 2006; van Stel et al. 2007). Sometimes, high entry costs rather promote than inhibit new firm formation process, for example, Darnihamedani et al. (2018) report that the likelihood of a start-up being innovative is positively associated with high entry cost. In some cases, empirical findings support the thesis of no association between the two constructs (e.g. van Stel et al., 2007; Dreher and Gassebner, 2013).

Aside actual and opportunity costs associated with procedures and requirements necessary to start new ventures (Cassar, 2006), the procedures and/or the requirements

themselves could actually impact new venture creation process differently. For example, Ardagna and Lusardi (2010) report that high levels of entry regulations have enhancing moderating effect on female necessity entrepreneurs in less financially developed countries, and negative effect on persons with business skills. Authors stated additionally that individuals who know other entrepreneurs are less likely to start large businesses in countries with higher levels of entry and contract enforcement regulations. Similarly, Minimum capital requirement and heavy labour market regulation effects on firm entry are both negative (van Stel et al., 2007; Nyström, 2008; Dreher and Gassebner, 2013). Some evidence from empirical studies are also mixed, for example, effects of number of procedures involved in regulatory processes and time needed to comply with entry regulation procedures and requirements are both negative on firm formation rate (Dreher and Gassebner, 2013; Papaioannou, 2007), while others are without effect (van Stel et al., 2007; Dreher and Gassebner, 2013).

In fact, various evidence seem to point to a common direction; de/regulatory decisions truly need to be made with a lot of care due to the potential damaging effects that could have on venture creation in particular and economic growth in general. Consistently, Djankov (2009) stated several empirical evidence confirm that easier regulation of start-ups not only raises productivity and cuts corruption, but also actually increases entrepreneurship. Looking from the perspective of developed versus developing world countries, the findings seem to hold consistently true that regulatory actions towards potential and incumbent entrepreneurs should be kept moderate.

2.3.3.4.3c   Summary of De/regulation Effects in DDWC

In the US, for example, more-regulated industries experienced fewer new firm birth (Bailey and Thomas, 2017) and bureaucratic regulations moderate relation between corruption and state entrepreneurial activities such that higher levels of bureaucratic business regulations

tend to magnify the negative effects of corruption on new business activities (Chen and Cheng, 2019). Consistently, in the UK, Becht et al. (2008) demonstrated empirically that a 2003 decision by the European Court of Justice (ECJ), which enabled entrepreneurs to select their country of incorporation independently of their real seat resulted to high incorporation of foreign firms due to relative low minimum incorporation capital requirement and start-up costs. In Germany, Susanne and Alexandra (2009) demonstrated empirically that the mandatory educational standard regulatory law introduced by Trade and Crafts Code reduced entry into self-employment, whereas, a 2004 reform of same law is also shown by Rostam-Afschar (2013) to have substantially increased entry probabilities in Germany. Finally, in Portugal, Lee et al. (2014) found empirical support that introduction of "on the spot firm" reform programme substantially reduced the cost of firm entry, with resulting increases in firm formation amongst small firms operating in the low-tech sectors.

According to studies reviewed in this chapter, regulatory reforms (deregulation) seem positive on firm formation in the developing world economy. For example, in Mexico, findings by Bruhn (2011) suggest the SARE initiative (a federal level programme) simplified required entry registration time and procedures, which contributed positively to creation of more new firms. The case is same in Brazil, where Monteiro and Assuncao (2012) demonstrated empirically that a reform which simplified entry regulation by combining company tax, and social security registry requirements increased entry in the retail sector by 13 percent points.

2.3.3.4.3d   Rule of law and Firm Formation

Carbonara et al. (2016) reported that anti-corruption law promotes higher rates of new firm formation. Goltz et al. (2015) demonstrated empirically that high rule of law not only promote female entrepreneurship, it also has enhancing moderating effect on the association between political empowerment and women's entry into entrepreneurship. García-Posada and

Mora-Sanguinetti (2015) found evidence that higher judicial efficacy has a positive impact on the entry of new firms. The effect of law on new venture creation could also depend on whether an entry is strategic or non-strategic, for example, Levie and Autio, (2011) found strong rules of law to have enhancing moderating effect on the association between regulatory burdens and strategic entrepreneurial entry rate, whereas the association between regulatory burdens and non-strategic entrepreneurial entry rate is not moderated by rules of law. Generally speaking, better laws and legal structures should be associated with increase rates of entrepreneurship (Nyström, 2008), however, "better" rule of law may still lead to lower rates of entrepreneurship in some countries (Hartog et al., 2010).

Bankruptcy is the legal process by which financially distressed firms and individuals resolve their debts (Paik, 2013). Today, bankruptcy and laws on how to facilitate entrepreneurship, despite the potential odds of bankruptcy on new venture creation process, is a major challenge facing policymakers the world over. Venture failures are a reality in entrepreneurship, and legal procedures associated with handling such unfortunate situations vary significantly across countries. While some countries provide only limited protection for entrepreneurs and managers of bankrupt firms, others have more entrepreneur-friendly bankruptcy laws. Specifically, depending on type of entrepreneurship, bankruptcy laws may have both negative and positive effects on firm formation. For example, Lee et al. (2011) demonstrated that lenient and entrepreneur-friendly bankruptcy laws significantly promote entry for non-innovative firm, whereas more generous laws are linked to lower levels of "innovative" entrepreneurship (Primo and Green, 2011).

2.3.3.4.3e   Summary of Rule of law Effects in DDWC

From the SLR, empirical evidence seem to support the view that access to justice and laws that promote quicker judicial resolutions of liquidation bankruptcies promote firm

formation in both DDWC. For example, in the US, Primo and Green (2011) found that bankruptcy laws more favourable to debtors lead to increased levels of self-employment, while in Italy, Melcarne and Ramello (2018) demonstrated that judicial delay of bankruptcy procedures effect on firm entry is negative especially on joint venture partnerships. Similarly, in another study on Brazil, Lichand and Soares (2014) demonstrated the creation of special civil tribunals led to better access to justice and an increase in entrepreneurship among individuals with higher level of education. Finally, in Pakistan, Chemin (2009) demonstrated empirically that access to Justice Programme (a 2002 judicial reform to minimize court case delays) caused new firm formation rate to double.

2.3.3.4.4   Technological Infrastructure

Technological infrastructure is "a set of institutional arrangements organised with the basic purpose of facilitating the disseminating of technology and other related knowledge, from relevant sources to business firms and other organisations, to help them to develop their technological capabilities and to adopt, produce and commercialize innovations" (Vedovello and Godinho, 2003, P.13). Created and/or maintained through provision of public funds, technological infrastructure often serves as a support for the provision of services such as contract research, technical assistance, certification, consultancy and training. We cross-examine nature and direction of relationship between new venture creation and business incubator and accelerator in this sub-section.

2.3.3.4.4a   Business incubator, Business Accelerators, and Firm Formation

Phan et al. (2005) described business incubators as property-based organizations with identifiable administrative centres focused on the mission of business acceleration through knowledge agglomeration and resource sharing. Ganamotse et al. (2017) viewed business

accelerators as a type of business incubator whose emphasis is to facilitate speedy development, commercialization, and exit of start-ups. Although accelerators and incubators may offer similar types of support, Bone et al. (2019) revealed that, compared to accelerators, incubators typically provide less intensive support. Additionally, they note that services by incubators last longer (around 2 years on average) than those provided by accelerators, which last on average around 6 months.

Business incubators and accelerators support start-ups to access funding quicker, grow faster, and increase their chances to survive the early and fragile stages of growth. Both have been shown empirically to have various impacts on different venture success metrics such as growths in number of employee, sales revenue, and firm survival rates. For example, compared to non-accelerated firms, while Yu (2016) reported accelerated firms as having lower survival rates and raising less revenues, Roberts et al. (2016) reported accelerated firms as realizing higher growths in revenue and investment, but without effect on employee growth. Furthermore, compared to non-incubated firms, Colombo and Delmastro (2002) found incubated firms positively associated with employee growth, and without effect on R&D intensity, whereas findings by Schwartz (2013) suggest no effect or even negative impact of business incubation on survival rate of incubated firms.

Generally speaking, evidence of association between venture success and business incubators or accelerators seems mixed; Lasrado et al. (2016) found firms that have been through an incubator or accelerator to have more employees and sales revenue than firms that have not participated in such programmes. However, Amezcua (2010) found incubators and accelerators affiliated with a university to not have any effects on growths in employment or revenue of participating firms, though impact on their survival is positive. Investigating determinants of venture success is important, however, interest in this section is rather the

association between business incubators and/or accelerators and new venture creation, not venture success.

2.3.3.4.4b   Business Incubator and Firm Formation

Although most start-ups consider the contribution of business incubators as significant or vital to their success (Bone et al., 2019), there is limited research on "if, and how" those infrastructure contribute to new venture creation in various localities. Almost three decades have passed, and the observation made by Udell (1990) that incubator impact upon the rate of new venture formation remains at best unknown seems still relevant today. Even long time question raised by Allen and McCluskey (1991) if incubators play a role in changing latent entrepreneurs' perceptions, attitudes, and behaviour about enterprise creation is yet to be answered convincingly.

An element of response emerged from the genealogical tree proposed by Neck et al. (2004) from a phase I genealogy study of Boulder County. The tree evidence suggested that four large corporations, the university, and two scientific government institutions are incubator organizations behind the multitude of related spin-offs created within the Boulder County. In addition, very recently, an empirical evidence from Italy suggests researchers are trying to fill this gap; in their study, Del Bosco et al. (2019) found innovative start-ups birth rate positively related to the number of incubators in the area. However, without more substantial evidence, claims by Şehitoğlu and Özdemir (2013) that worldwide emergence of business incubation programmes are an effective method for new business formation seriously requires more empirical investigation.

2.3.3.4.4c   Business Accelerator and Firm Formation

Similar claim holds for accelerator impact on new venture creation; despite empirical evidence of their influences on metrics of venture success as seen earlier, little or no available findings suggest "if, and how" they impact the rate of new venture formation. In fact, like business incubators, accelerators effects on venture creation rate is largely unknown in DDWC.

2.3.3.4.4d   Summary of Business Incubator/Accelerator Effects in DDWC

Effects of these classes of technological infrastructure on new venture creation is largely unknown in both DDWC due to paucity of study in this area of research.

2.4   Discussion and Research Agenda

2.4.1   Infrastructure for New Venture Creation in DDWC

The process of new venture creation is fraught with high uncertainty, impediments, failures and frustrations and requires a lot of courage and sacrifices by those who engage at it (Segal et al., 2005). The struggle to reduce constraints constitutes an integral part of starting and growing ventures; decisions about where, when, and how to start a new venture are important to a government, a community, nascent and incumbent entrepreneurs. Where a new venture is started, how fast it takes to actually get it up and running is largely dependent upon the availability/access to three key resources, i.e., non-financial capital, human capital, and business environment. However, the whole phenomenon of new venture creation is driven by the ability to identify or create entrepreneurial opportunities and the potential to develop and exploit those opportunities.

Entrepreneurship happens when products and services are created (Shane and Venkataraman, 2000). It sometimes results in creation of new businesses or improvements to pre-existing businesses (Ahmad and Seymour, 2008) in places where it occurs. In these places,

the activities of individuals involved in entrepreneurship are often influenced by a combination of factors known as entrepreneurial environment (Ahmad and Xavier, 2012). Wu and Mao (2020) suggested that entrepreneurial environment comprises of legal and institutional environment, market environment, financial environment, entrepreneurial infrastructure etc. In fact, from above, entrepreneurial environment can be considered as an assembly of factors (from within the firm or from outside the firm) that affect the rate of entrepreneurship in a location or country. The firm environment is likely to be less developed for newly created ventures such that most of the factors affecting the activities of individuals involved in the new venture creation process may originate from outside the firm.

Factors that could have causal effects on the process and outcome of entrepreneurship fall under the external environment such as political factors, market forces and resources (Shane et al., 2003). Some of these external factors, e.g., poor business climate, high taxation, and excessive start-up costs act as obstacles to the creation and success of new ventures (Brixiova, 2010) such that start-up rates and firm locations turn to vary substantially from one location to another due to huge differences in resource endowments/access across geographies (Gartner, 1989). Non-financial capital, such as infrastructure, is one key determinant of new firm location and the presence/access to some of its categories (transportation infrastructure) has been shown to positively and significantly influence the locational choices and spatial distributions of new ventures in Spain (Arauzo-Carod and Alañón-Pardo, 2013). Therefore, resource endowments (presence of infrastructure) can render a geographic location attractive (Dubini, 1989; Holl, 2004b) and their eventual access could stimulate the activities of individuals interested in creating new businesses there.

Getting the best quality products and services to customers at the lowest possible prices is not only the fruit of competitive smartness, but also the result of infrastructure endowments/access, which yield different types of entrepreneurial activities in organizations

(Kantur and eri Say, 2011). Not only is the ability to produce quality goods and/or services by newly created ventures considered competitive smartness, but the ability to also deliver them to customers at the lowest possible prices is part of being competitively smart. The ability to "deliver smart" could depend very much on how strategically a new firm is located, and as suggested by Christensen and Drejer (2005), firms co-located strategically benefit from specialised local labour markets and access to shared resources like infrastructure. Going by this analogy, non-strategic firm location can limit access to resources and constraint new businesses from successfully starting and running.

The location of a firm is not only dependent on the availability of direct production inputs such as labour (Hong and Chin, 2007), but the presence/access to non-financial capital (e.g. support from family and friend, networking etc.) is also imperative to improve the wellbeing of potential and/or incumbent entrepreneurs and promote business success (Hung et al., 2007). Following these viewpoints, it means strategic firm location could promote the founding of organizations in places where quality and sufficient infrastructure and other forms of non-financial capital exist to facilitate cheap and rapid movements of people and resources across the country or region. Owualah and Obokoh (2008) revealed that infrastructure availability is one of the factors rated important in influencing a career in entrepreneurship, and this seems to corroborate the idea that presence/access to different infrastructure types could actually render a location more attractive to entrepreneurial activities (Holl, 2004b).

Access to some classes of economic infrastructure present in a location, such as highways, railways, seaport etc. drives up entrepreneurial activities of new logistic firms in China (Hong and Chin, 2007) due to lower transportation costs, which reduces mortality rates, and improves standards of living for entire local population (Chapman, 2018). Furthermore, Presence/access to a social infrastructure like school in a location creates an environment that supports productive activities, encourages capital accumulation, skills acquisition, intervention

and technology transfer (Hall and Jones, 1999). Institutional infrastructure (e.g. the rule of law) present in a location may constraint people to respect established norms and codes of conduct (Waldron, 2016), while availability of technological infrastructure (e.g. incubators, accelerators, business parks etc) could promote start-ups (Del Bosco et al. (2019) through financial and non-financial supports. These amenities can definitely render a location a lot more attractive to different categories of entrepreneurs.

2.4.1.1 Presence/Access to Economic Infrastructure and Firm Formation

The search for entrepreneurial opportunities and marshalling of needed production inputs often cause entrepreneurs to move across cities (Bagwell, 2015), and during such instances, they may communicate with influential personalities, e.g., in the government, at the bank, or even other more resourceful and successful businessmen, to ask for useful information and benefit from their experiences. Furthermore, some countries are labour-abundant and others are labour-scarce, a phenomenon that causes flow of individuals with skills from locations of abundance to where most needed (Massey et al., 1993). The flow of people and/or goods across locations can be greatly facilitated by presence/access to some classes of economic infrastructure such as highway and railway stations. With increasing e-business activities, more virtual marketplaces are also being created every day to promote online marketing, making presence/access to broadband internet a must in some localities.

When different classes of economic infrastructure, such as transportation, telephone and other communication networks etc., are well developed and easily accessed in a location, economic growth is promoted (Rodrique and Notteboom, 2013), permitting economic operators to easily choose from several alternative infrastructure types according to their needs and financial capabilities. Not surprisingly, reported evidence from both DDWC in the SLR suggests that most economic classes of infrastructure are positively associated with the new

venture creation process. However, there are some few exceptions to the general positive effects, which seems to be explained by observation made by Fox and Smith (1990), that infrastructure decisions are often made locally regardless of funding sources.

Investment in most classes of economic infrastructure in any given location (especially public infrastructure) has an optimum point beyond which it becomes economically unproductive and a waste of resources (Bazel and Mintz, 2015). Accordingly, the local realities of any given country seems to actually shape the level of importance attached to different classes of economic infrastructure, and by extension, the need for them by those starting new ventures there. Thus, if access to an economic class of infrastructure, (e.g. railway, airport) is shown empirically to not have an effect on the location of newly created venture in a country, it could be indicative of the fact that more investment in that particular type of infrastructure does not add value to the venture creation process in that location. If the effect is rather negative, it could be an evidence of overinvestment in the particular type of infrastructure in question (Uhde, 2010). These neutral and negative effects should help policy makers to know when to shift or reduce investments on one class of economic infrastructure for another, or from one location to another, for the purposes of firm formation. For example, railway access is reported to be without effect on firm formation in Spain (Arauzo-Carod, 2005), and airport access is said to also be without effect on firm formation in US (Reynolds et al. 1995; Ihlanfeldt and Raper 1990). Access to electricity doesn't seem to be a problem anymore for countries of the developed world economies, consequently all reviewed studies focused on electricity effect on firm formation was from developing world countries, where such infrastructure still largely insufficient. All reported effects (with exception of India) of electricity were positively associated with firm formation.

In some cases, however, neutral or negative effects of certain classes of economic infrastructure on new venture creation process reflect types of industry and/or nature of

activities undertaken by new ventures rather than levels of infrastructure investments involved. For example, in Ireland, McCoy et al. (2018) found airport proximity important to foreign new firms operating in high-tech industry but less so (statistically insignificant) for indigenous firms operating in low-tech industry. Broadband internet is another class of economic infrastructure that has been found to sometimes influence firm formation negatively (Cumming and Johan, 2010) especially in remote areas of some developed world countries; such infrastructure promotes consumption of goods and services from other neighbourhoods, at the expense of locally made ones. Such practices have the potential to eradicate newly created local companies.

Therefore, extreme care must be given to the interpretation of economic infrastructure effects on new venture creation in a given regions because misinterpretation may rather cause policymakers to not understand which regional economic infrastructural factors facilitate new venture creation (Prieger et al., 2017).

2.4.1.2 Presence/Access to Social Infrastructure and Firm Formation

Education infrastructure is a type of social infrastructure which helps people not only to acquire new skills, but also to transfer new knowledge (Draghici et al., 2015). People acquire both tacit and codified knowledge either formally through a school setting, or informally outside a school setting (Acosta et al., 2011). Knowledge is created by the R&D activities of both public and private organizations (Colovic and Lamotte, 2015). Therefore, knowledge is crucial infrastructure acquired from universities and research institutes (Audretsch et al., 2015). Knowledge is distinguished into university knowledge and research knowledge.

Two well-known mechanisms through which knowledge spills over locally in an agglomeration of new and incumbent firms are local labour forces and local published research findings. Local university graduates are an embodiment of different types of knowledge

acquired from the university and transferred into new venture creation process through various entrepreneurial activities undertaken locally by these graduates. However, entrepreneurial activities are not equally driven by all types of university knowledge; in Germany, for example, Audretsch and Lehmann (2005) found the presence of social science graduates to affect firm births positively and directly, whereas the presence of natural science graduates in the same location was without effect. Similar variabilities in the literature were noticed across sectors and industries, however, Baptista and Mendonça (2010) found that university presence is capable of contributing to regional development through the increase of new firms in knowledge intensive sectors. Therefore, care must be taken to ensure that mostly knowledge relevant to new venture creation process is promoted in such learning institutions. Moreover, Bonaccorsi (2014) confirmed that university knowledge is localized, consequently, if wrong knowledge is created in a community, wrong knowledge will spill over to incumbent and across new ventures in that community. Such types of wrong knowledge are possible sources of reported negative impacts of university and/or research knowledge on new venture creation.

Similarly, published local research findings easily diffuse into knowledge-intensive industries, where their contributions are paramount for the creation of high-tech and innovative start-ups. Okamuro (2008) suggested that, for the promotion of start-ups in high-tech industries, it is useful to attract and support research institutes and build intellectual infrastructure in the region. However, knowledge is not shown to always contribute positively to new venture creation; some highly qualified university graduates will rather take up paid jobs than create new ventures, in which case presence/access to such knowledge negatively affect new venture creation (Bartik, 1985; Arauzo-Carod, 2005; Binet and Facchini, 2015). In some instances, absence of university knowledge or access to non-university knowledge drives firm formation. For example, in manufacturing industrial settings, large number of unskilled-labour is needed to accompany the skilled ones (Armington and Acs, 2002).

Finally, the SLR suggests reported evidence of effects of university and research knowledge are not uniform across DDWC. This was expected because regional educational policies are largely different. Most countries (especially in the developed world) not only invest a lot of financial and material resources in university education and research, they also maintain the standards of their outcomes very high. Consequently, quality of knowledge created is often superior to those from most developing world countries. Lack of good educational policies by governments of most developing world countries usually result to less available/access to useful new knowledge for their industries, and by extension, new entrants. This does not only account for some of the negative knowledge effects reported (Chien-Hsun 1996), but also paucity of evidence, especially on research knowledge effects on firm formation in developing world countries.

2.4.1.3 Presence/Access to Institutional Infrastructure and Firm Formation

Nascent and incumbent entrepreneurs enjoy communities with limited number of crimes. For example, in South Africa, crimes constitute a constraint to the starting and running of businesses (Mahadea and Pillay, 2008). Strategic locations are usually an assembly ground for both existing and potential entrepreneurs on account of the agglomeration economies provided by such locations. However, North (1990) suggests that such interactions require some constraint mechanisms to shape the behaviours of various stakeholders towards one another.

Institutional structures are often put in place to regulate (deregulate in some cases) the actions of economic agents (Zhura, 2017). By forcing people to respect local, national and/or regional laws and other established public norms, these structures seek to restore confidence and trust amongst those who come together to create, or promote existing businesses. Although excesses of such enforcements are shown to be detrimental, especially towards firm formation,

their absences are certainly even more precarious. Not surprisingly, reported evidence from the SLR were largely in favour of keeping institutional interventions moderate in the new venture creation process; not too little and not too much, just sufficient to drive entrepreneurial activities upwards.

This is another pointer to the fact that laws should be adapted to reflect the cultures and beliefs of people living in a particular location; some developing world countries often import foreign laws and add directly to their respective penal codes without refining them to match local realities. The result is usually unrealistic laws too harsh for the local population, and difficult to enforce. In other cases, the high frequency of changes to laws related to venture creation observed in some developing world countries often leave potential and incumbent entrepreneurs rather confused. In summary, laws and de/regulations that reflect the wills of the local inhabitants and the changing circumstances in a country, definitely shall promote new venture creation in both DDWC. This can be the fruit of "strong institutions" rather than "strongmen" prevalence in any given country.

2.4.1.4 Presence/Access to Technological Infrastructure and Firm Formation

Malecki (1993) opined that small firms (e.g. newly created ventures) are more likely to engage into informal arrangements with other small firms, as a natural consequence of structural similarities and familiarity between individuals across these firms. However, most newly created ventures often enter into formal arrangements with business incubators, accelerators, and other forms of technological infrastructure to facilitate speedy development and commercialization of their products (Ganamotse et al. 2017). In this regard, business incubators and accelerators are expected to support start-ups to access funding quicker, grow faster, and increase their chances to survive the early and fragile stages of growth. These kinds of supports are imperative because, with limited financial and non-financial resources, newly

created ventures wont easily find suppliers, business associates, and market to commercialize their products and/or services (if any).

As much as several empirical evidence are reported in the literature to suggest the positive impact of business incubator and/or accelerators on new venture success, the question related to new venture creation remains largely unanswered. Before anyone tries to cause the success of newly created ventures, they may worry first about their creation. Almost three decades since this concern was first raised in the US by Udell (1990), reported evidence from this SLR confirm that association between the two classes of technological infrastructure and firm formation is largely understudied. In the developed world economy like in the developing world economy, this relationship needs further investigation.

2.4.2 Research Agenda

Different studies have demonstrated that many factors are at the origin of local, national, or even regional variabilities in the location and spatial distribution of new firms around the world (Gartner, 1989; Armington and Acs, 2002). External environment is a big determinant not only of the level of entrepreneurial activity (Momoh and Ezike, 2018), but also quality of start-up activities (Fereidouni et al., 2010) in a given place. Most external environments are endowed with different types of resources (Brixiova, 2010), some of which may facilitate or inhibit the identification and/or creation of entrepreneurial opportunities and their subsequent exploitation. However, to access the wealth of resources that a location may have, new ventures need relevant economic and social structures (Woolley and Rottner 2008). In other words, process of new venture creation is not influenced by resource abundance only, but also by presence or absence of structures that impede or facilitate access to those resources. Infrastructure is one of such very influential structures (Audretsch and Belitski, 2017) capable of enhancing connectivity and linkages that facilitate the recognition of opportunities. Its

presence, adequacy and reliability not only facilitate/accelerate socio-economic developments (Krakowiak-Bal et al., 2017), the free movements of people, goods/services and information (Stewart, 2010), but also results in different investment decisions that have the potential to influence migration and location of business establishments (Snieska and Simkunaite, 2009).

Although all regional potentiality and mobile production factors are said to be influenced directly or indirectly by infrastructure (Nijkamp, 1986), this chapter found evidence mostly for direct infrastructure effects; in over 78% of reviewed studies, investigations were limited solely to the direct influence of infrastructure on new venture creation process. This is not only regretful, it is actually surprising. What about the possible indirect influences that infrastructure could have on the new venture creation process? The attitudes, abilities and willingness of people towards entrepreneurial activities have the potential to influence the outcome of entrepreneurial activities undertaken in a given place and time. New venture creation is an outcome of entrepreneurial activity, and entrepreneurial attitudes and entrepreneurial activity are closely related (Bosma and Schutjens, 2011). Therefore, variability in entrepreneurial attitudes have the potential to influence the new venture creation process. For example, Arenius and Minniti (2005) found such perceptual variables as alertness to opportunities, fear of failure, and confidence about one's own skills to significantly correlate with new business creation. This chapter asserts the presence/access to infrastructure can also influence new venture creation indirectly through entrepreneurial attitudes; presence or absence of infrastructure has the potential to in/directly influence the skills, abilities and willingness of people to engage at entrepreneurial activities. Therefore, future research should look at possible mediating and moderating roles that infrastructure could play in the process of new venture creation.

A cross-examination of reported evidence from the SLR reveals that, aside studying mostly direct influences of infrastructure, even the type of infrastructure commonly

investigated previously is biased towards certain categories and sub-classes. For example, relative to new venture creation, majority of reviewed studies are focused on effects of the economic category of infrastructure (mostly publicly owned). While few studies investigate effects of the social infrastructure category on new venture creation, effects of the technological category of infrastructure are almost inexistent in literature. Moreover, even within the economic infrastructure category, while associations between some classes (e.g., availability/access to internet, electricity, highway and railway) and new venture creation are widely researched, the opposite is true for other classes (e.g., availability/access to water, gas, telephone, Facebook, Twitter etc.). Therefore, future research in this domain should not limit investigations to the understudied classes of the publicly owned economic infrastructure category, but also extend to classes of the technological infrastructure category (e.g. business incubators, accelerators, science parks etc) and classes of the social infrastructure category (e.g. hospitals, police stations, prisons etc.).

Reynolds et al. (2005) stated that new venture creation is a multi-facet process; it is made up of different types and levels of activities, and undertaken by individuals of working ages wanting to, or already involved in new venture creation process. However, in most of the reviewed studies, new venture creation is considered as an instantaneous act rather than a multi-facet process. Although almost all reviewed studies investigated whether or not access to infrastructure influenced the locations and spatial distributions of new and matured businesses, one thing remains true, that entrepreneurial activities are not limited to the activities of new and matured businesses. Therefore, future studies should investigate how the presence/access to various infrastructure categories may influence nature and the levels of entrepreneurial activities undertaken by, for example, latent and/or nascent entrepreneurs, within the entrepreneurial process.

Remarkable difference exists in the overall level of infrastructure investments from one region to another, and developing world countries generally lag behind developed world countries in terms of investments especially in ICT infrastructure (Colovic and Lamotte, 2015). Whatever the reasons are for these investments lags, it's apparent from the literature that entrepreneurial decisions on new venture location are not guided solely by proximity to opportunities, but also the provisioning/access to necessary and adequate infrastructure to facilitate opportunity exploration, evaluation and exploitation. Although infrastructure is generally said to facilitate the establishment of new networks, easing business communications, bringing high-quality labour and new high-tech industries in cities (Audretsch and Belitski, 2017), not all types of infrastructure facilitate connectivity (Audretsch et al., 2015). Consequently, impacts of infrastructure on start-up activity are mostly dissimilar across geographies, bringing us to the question "what constitutes a necessary and adequate infrastructure?"

Entrepreneurs tend to start their new ventures in the same area in which they reside because geographically localized networks of contacts they develop are strongly embedded in the regional context (Tama ́sy, 2006). The types of infrastructure used by these entrepreneurs to facilitate the identification, evaluation and/or exploitation of entrepreneurial opportunities in their respective geographical locations are what is termed "necessary infrastructure." However, to be very useful, a necessary infrastructure also needs to be adequate such that its presence at a particular place enhances the attractiveness of that location relative to other places (Holl, 2004b). The types of infrastructure which these entrepreneurs perceive to be abundant, easily accessible, affordable and having the right qualities in their respective geographical locations are what is termed "adequate infrastructure." Necessary infrastructure can be distinguished in terms of their perceived adequacy by potential and active entrepreneurs. Accordingly, it's possible to also look at infrastructure in terms of "affordability" and "quality"

(Estache and Goicoechea, 2005), and investigate how the new venture creation process is impacted by these other attributes of infrastructure. Therefore, future researchers are called upon to distinguish infrastructure effects on entrepreneurial activities by attributes such as "infrastructure affordability" and "infrastructure quality."

Additionally, attributes of infrastructure as highlighted above are likely to be largely different depending on whether they are privately, publicly or jointly owned. For example, the quality of an infrastructure (be it economic, social, technological etc.) may be perceived as "high" or "low" by potential and/or active entrepreneurs. Such perceptions have the potential to positively or negatively influence their individual/collective attitudes towards the cost of a given infrastructure type; while most publicly owned infrastructure may generally seem less costly compared to similar and privately owned ones, their qualities often seem inferior, though comparatively more readily available. Therefore, infrastructure ownership structure may influence not only perceptions about their qualities, but also their costs and relative availabilities. Similar to assertion made previously about possible influences of infrastructure quality and affordability on entrepreneurial activities, future research should also find out if, and how infrastructure ownership may influence the new venture creation process.

Finally, the culture of a people (entrepreneurs included) could positively or negatively influence their perceptions of infrastructure ownership, which may in turn affect their likeness/hatred for attributes such as infrastructure costs, qualities etc. Therefore, future studies should investigate possible moderating/mediating roles of culture on association between various infrastructure types and/or attributes and new venture creation.

2.5   Conclusion

In this chapter, extant bodies of knowledge on infrastructure is explored with an intension to define and create a tentative classification for it. Infrastructure is defined and a

taxonomy proposed, which comprises of man-made and natural occurring infrastructures, tangible and intangible infrastructures, economic, social, technological and institutional infrastructures, and private, public and jointly owned infrastructures.

This chapter also aimed to cross-examine nature and effect types of selected classes of each of the four infrastructure categories on location and spatial distribution of new ventures in DDWC. That was successfully done and evidence from the SLR suggests that, for these selected classes of infrastructure, mostly their direct effects on firm formation were studied. Moreover, majority of reviewed studies were concentrated on specific (e.g. economic and institutional) infrastructure categories and, in some instances, were skewed towards the developed world economy (e.g. research knowledge) or developing world economy (electricity). Effects of included classes of the social infrastructure category on firm formation were mixed, while those of the technological infrastructure category were unknown. The effects were largely positive for the economic and the institutional infrastructure categories. Many recommendations were proposed for consideration by future researchers.

In the next chapter, an index for economic infrastructure is constructed and used to rank 112 developing world countries. The chapter also evaluates index effect(s) on entrepreneurial transition from nascent entrepreneurship to new business ownership in a selection of 42 of those countries. Further, chapter examines if, and how association between the index and said type of entrepreneurial transition is mediated by perceived corruption within same 42 developing world countries.

Appendix 1

Table 2-2: Detailed summary of all reviewed studies included in systematic review

Country and Citation	Theory	Research Design and Analytic Technique	Effect Type	Finding	Country and Citation	Theory	Research Design and Analytic Technique	Effect Type	Finding
A=27, Audretsch and Belitski (2017)	opportunity recognition and exploitation	CS, EFA, SEM	direct	physical infrastructure positive for business	Belgium, Verhetsel et al. (2015)	random utility	CS, multinomial logit reg.	direct	port and motorway access impact on new logistic firm location positive, railway no effect
Benin, Peters et al. (2011)		mixed, interview Probit reg.		substantial number of firms created after electrification	Brazil, Lichand and Soares (2014)	institutional	LT, FE DID reg.	direct	Special civil tribunals increase probability that individuals are self-employed
Brazil, Monteiro and Assuncao (2012)	institutional	LT, DID OLS reg.	moderated	simplified entry regulation increased entry in retail sector by 13 percent points	Cameroon Ngoasong (2018)	Human capital, opportunity recognition	CS, structural interview Cas-study		EDCs reduce -ve effect of resource scarcity on digital entrepreneurship
Canada, Spigel (2012)	knowledge spillovers	CS, OLS reg.	direct	high level education attainment without influence on venture creation	Canada, Cumming and Johan (2010)	knowledge spillovers	CS, Poisson reg.	direct	internet effect on firm location positive in urban centres, negative in remote communities
Chile, Amorós et al. (2013)	location and human capital	CS, PCA		general policy and government programmes positive for entrepreneurship	China, Chien-Hsun (1996)	location	CS, logit reg.	direct	railroad access impact +ve, research knowledge -ve on new FDI location
China, Hong and Chin (2007)	location	CS, nested logit reg.	direct	roadway, railway and seaway accesses on location of new foreign logistic firms positive	China, Zhang (2001)	ownership, location and internalization	LT, FE OLS, reg.	direct	highway and railway positively impact on foreign-owned firm creation
China, Jiang et al. (2018)	accessibility	CS, Poisson reg.	direct	Access to airport, seaport, railway and subway stations effects +ve on new firm location	China, Zhu et al. (2019)	knowledge spillovers	LT, logit reg.	moderated	high accessibility in high speed railway network impacts industry creation positively
Ethiopia, Shiferaw et al. (2015)	location	LT, NB reg.	direct	highway effect on firm entry positive	Ethiopia, Alemu and Adesina (2017)		CS, logit reg.	direct	access to telephone contributes positively to creation of NFEs
France, Binet and Facchini (2015)	human capital and knowledge spillovers	LT, FE reg.	direct	mixed university and research knowledge effects on firm location across sector and industry	Germay, Fritsch and Aamoucke (2013)	knowledge spillovers	LT, RE reg.	direct	university and research knowledge effects on firm location positive
Germay, Rostam-Afschar (2014)	Theory of public choice	CS, LPM, DID.	moderated	self-employment entry probability increased with educational entry req'ment exclusion	Germany, Audretsch and Lehmann (2005)	knowledge spillovers	CS, NB reg.	direct	university knowledge influence on technology Start-ups positive
Germany Audretsch et al. (2015)	opportunity recognition and exploitation	LT, tobit reg.	direct	startup activity effect positive on infrastructure, broadband more conducive than rail and roadways	Germany, Susanne and Alexandra (2009)	institutions	CS, LPM.	moderated	Entry regulation reduces entry into self-employment more in regulated occupations
Germany, Audretsch et al. (2005)	location, knowledge spillovers	CS, quantile reg.	direct	University knowledge influence on new firms positive	India, Aklin et al. (2017)		LT, FE 2SLS,reg.	direct	electrification without effect on business creation
Ireland, McCoy et al. (2018)	location	LT, Poisson NB reg.	mediated	internet effect on venture creation positively mediated by university knowledge	Israel, Shoham andBaruchson Arbib (2006)	Kirzner's theory of alertness	Exploratory	direct	internet effect on information search in start-up process positive
Italy,	institutional	LT, FE reg.	direct	Quicker liquidation bankruptcies impact on	Italy, Piva et al., (2011)	human capital	LT, RE reg.	moderated	university knowledge effect mixed across sector,

Melcarne and Ramello (2018)				firm entry differ by firm type					negatively moderated by local econ development
Italy, Colombelli and Quataro (2018)	knowledge spillovers, absorptive capacity entr'ship	LT, NB, FE reg.	direct	knowledge stock effect positive and significant on the creation of new firms at local level	Italy, Ghio et al. (2016)	Knowledge spillovers	CS, NB reg.	moderated	localized university knowledge influence on innovative firm creation positive
Italy, Colombelli (2016)	knowledge spillovers	LT, NB reg.	direct	locally available knowledge effect on new firm creation positive	Italy, Colombelli and Quataro (2019)	knowledge spillovers	LT, NB reg.	direct	effect of knowledge stock available positive on green start-ups.
Italy, Giudici et al. (2019)	knowledge spillovers	CS, NB reg.	direct	university knowledge in tech. sciences effect on venture creation positive	Italy, Ghio et al. (2019)	Knowledge spillovers	CS, NB reg.	moderated/ mediation	local universities, financial system, and residents' attitudes interact to determine local high-tech entrepreneurship
Italy, Bonaccorsi et al. (2014)	knowledge spillover, human capital and location	CS, NB reg.	direct	high and low quality external and internal knowledge effect on firm formation mixed	Italy, Del Bosco (2019)		CS, Multiple Reg.	direct	innovative startups birth rate is positively related to number of incubators
Italy, Percoco (2016)	location	LT, OLS, DID reg.	direct	access to a highway has a positive impact on firm entry	Japan, Okamuro and Kobayashi (2006)	human capital and accessibility	CS, linear multiple reg.	direct	university knowledge effect on regional start-up ratio is positive
Japan, Okamuro (2008)	human capital	CS, OLS reg.	direct	university and research knowledge effects mixed by industry	Kenya, Vernet et al. (2019)	resource-based view	LT, DID reg.	direct	electrification results in more new micro-enterprises created
Kenya, Bahaj et al. (2019)		Mixed, Interview DID	direct	Electrification influence positive on firm creation.	Mexico, Bruhn (2011)	Occupational choices	LT, FE OLS reg.	moderated	SARE initiative increased number of new firms by 5%
Pakistan, Chemin (2009)	Institutional and Opportunity cost	LT, FE DID reg.	direct	Judicial reform impact on entry rate of new firms positive	Poland, Krakowiak-Bal et al. (2017)	local development	CS, AHP	direct	communication accessibility influence positive for economic activity
Portugal, Lee et al. (2014)	institutional	LT, FE, DID reg.	direct	"On the spot" regulatory reform increased firm formation	Portugal, Holl (2004a)	location	LT, FE NB reg.	direct	highway effect of new firm location positive
Portugal, Melo et al. (2010)	Location and new economic geography	CS, NB reg.	direct	railway and motorway impacts on new plant openings positive	Portugal, Baptista et al., (2011)	location and knowledge spillovers	LT, DID and PSM	direct	Establishment of new university effect on knowledge based firm entry +ve
Portugal, Baptista and Mendonça (2010)	human capital, knowledge spillovers and location	LT, NB reg.	direct	knowledge access and human capital influence entry by knowledge-based firms positively	Rwanda, Lenz et al. (2017)	Theory of change	LT, DID, logit reg.	direct	new enterprises emerged in electricity connected communities
S. Korea, Kim et al. (2018)	location	LT, NB reg.	direct	railroad effect on new firm location is positive	S. Africa Naudé et al. (2008)	endogenous growth	CS, OLS, tobit reg.	direct	university knowledge influence on new firms positive
Spain, A-Carod and A-Pardo (2013)	location	LT, NB reg.	direct	Road access important for new industrial firm location decision	Spain, Arauzo-Carod (2005)	location	CS, Poisson, logit reg.	direct	highway access impact on new firms' location positive and negative for railway
Spain, Holl (2004b)	location	LT, Poisson, FE reg.	direct	Motorway access increases firm birth and impact differ across space/sector	Spain, Acosta et al., (2011)	location	LT, pooled Poisson reg.	direct	university and research knowledge have mixed effect on start-ups
Spain, Holl and Mariotti (2018)	Location	CS, Poisson, NB reg.	direct	effect of air, sea and motorway access on new logistic firm location positive	Sweden, Andersson and Hellerstedt (2009)	knowledge spillovers, absorptive capacity entr'ship	CS, NB reg.	direct	knowledge source generation effect on new KIS firms positive
UK, Becht et al. (2008)	Regulatory cost, institutions	LT, DID reg.	moderated	ECJ deregulation rulings increase incorporation from EU countries with high min. capital requirements and incorporation costs	UK, Gibbons et al. (2019)	location	LT, FE reg.	direct	highway accessibility improvements increase number of firms
US, Whitacre et al. (2015)		LT, OLS, SERM, DID	direct	broadband adoption effect positive on new venture	US, Tranos and Mack (2016)	location	LT, GCT, logit reg.	direct	positive bidirectional causal relationship between broadband provision and new KIBS firms
US, Sheard (2019)	growth theory	LT, OLS, 2SLS reg.	direct	airport size has positive effect on firm creation	US, Bennett (2019)	Opportunity creation and destruction	LT,	direct	private and public infrastructure investments

Study	Factor	Method	Effect	Finding	Study	Factor	Method	Effect	Finding
							panel system GMM		impact on businesses creation mixed
US, Reynolds, (1994)	agglomeration, human capital	CS, stepwise reg.	direct	university research effect on firm formation mixed across sector	US, Armington and Acs (2002)	human capital	CS, OLS reg.	direct	university knowledge influence on new firms positive
US, Plummer (2014)	knowledge spillovers	LT, 3SLS, FE reg.	moderated	new knowledge and entrepreneurial activity, moderated -vely by localized competition	US, Bania et al. (1993)	Knowledge spillovers	CS, Poisson reg.	direct	research knowledge effect on manufacturing establishments is mixed
US, Acs and Armington (2004)	knowledge spillovers	CS, OLS reg.	direct	higher and lower levels education attainment +vely influence firm startup	US, Woolley and Rottner (2008)	Knowledge spillovers	CS, NB reg.	direct	science and tech. research knowledge effects on increased nanotechnology firm formation rate +ve
US, Kim and Orazem (2017)	location	LT, Poisson, FE reg.	direct	broadband provision effect on location decisions of new firms in rural areas positive	US, Ihlanfeldt and Raper (1990)	location	CS, tobit reg.	direct	transport infrastructure effect vary depending if new independent or branch firm
US, Bailey and Thomas (2017)	institution	LT, FE reg.	direct	More-regulated industries experience fewer new firm births	US, Coughlin and Eran (2000)	location	CS, NB reg.	direct	university knowledge and transport infrastructure effects positive on new foreign-owned plant
US, Kirchhoff et al., (2007)	location and knowledge spillovers	CS, 2SLS reg.	direct	university and research knowledge effects on firm birth positive	US, Bartik (1985)	location	CS, logit reg.	direct	Road access effect on business creation significantly positive
US, Chen and Chen (2019)	institutional	LT, FE GMM, reg.	moderated	Bureaucratic business regulation magnifies negative corruption effect on new businesses	US, Powers and McDougall (2005)	resource-based view (RBV)	CS, NB reg.	direct	university and research knowledge effects on start-up formation positive
US, Neck et al. (2004)	theory of evolution, sociological theory of isomorphism	CS, SSE		physical infrastructure effect positive on high tech entrepreneurial activity	US, Udell (1990)		CS, Survey and Partial review		incubator impact on rate of new venture formation remains at best an unknown
US, Fairlie (2006)		LT, bivariate probit reg.	mediated	internet use without effect on firm creation	US, Reynolds et al. (1995)		LT, linear multiple reg.	direct	research knowledge and airport access without effect on venture creation
US, Mack et al. (2017)		CS, logit reg.	direct	broadband used for business visibility and information	US, Cheng and Li (2011)	Knowledge spillovers	CS, OLS reg.	direct	university knowledge has mixed effect by industry on start-ups
US, Chatman and Noland (2016)	accessibility	LT, RE, NB reg.	direct	Railway proximity increases firm births across almost all industrial sectors in study	US, Bilotkach (2015)	accessibility	LT, FE, 2SLS and GMM reg.	direct	A 10% increase in no. of destination served by non-stop flights increases new establishments by 0.1%
US, Primo and Green (2011)	institutional	LT, FE OLS reg.	direct	Bankruptcy law more favourable to debtors lead to increased levels of self-employment					

Key:

AHP: analytic hierarchy process
PSM: propensity score matching design
FE: fixed effect
NB: negative binomial
SERM: spatial error model
F2F: face-to-face
SSE: semantic structure analysis

LLM: log linear model
GCT:granger causality test:
RE: random effect
PCA: principal component analysis
EFA: exploratory factor analysis
reg.: Regression
DID: difference in differences

LT: Longitudinal research design
CS: cross-sectional research
OLS: ordinary least squares
2SLS: 2-stage least squares
3SLS: 3-stage least squares
GMM: Generalized method of moments
LPM: Linear Probability Model

A = Austria, Belgium, Bulgaria, Cyprus, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK.

<div align="center">

Chapter Three

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Economic Infrastructure, Perceived Corruption, and Entrepreneurial
Transition: Evidence From Developing World Countries

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3.1 Introduction

New businesses do not come into existence instantaneously, they are created through multiple stages by the actions and/or reactions of individuals or groups of individuals. In fact, many scholars advocate the view that entrepreneurship is a process (Shane and Venkataraman, 2000; Van der Zwan et al., 2010) comprising of several phases (Reynolds et al, 2005; Bergmann and Stephan, 2013) that are influenced by different factors across the entrepreneurial process (van der Zwan and Thurik, 2017).

The entrepreneurial process involves latent, nascent, new, and established phases of entrepreneurship (Reynolds et al., 2005). According to van der Zwan et al. (2012), latent entrepreneurs are often considered as individuals "thinking about starting up a business", whereas nascent entrepreneurs are considered as those "taking steps to start up a business." Similarly, new business ownership managers are considered as those "owning a young business", whereas established business ownership managers are considered as individuals "owning an established business." Although entrepreneurial activities and determinants are largely different across these phases (Brixy et al., 2012), Zwan and Thurik (2017) noted with regret that the study of determinants of entrepreneurship is often highly skewed toward a single stage in the entrepreneurial process.

Factors that may promote or inhibit entrepreneurial activities at a particular stage could be different than those which influence entrepreneurial transitions across different stages in the entrepreneurial process. For example, while some latent entrepreneurs never transition into

nascent entrepreneurs, many nascent entrepreneurs do succeed to set up a new businesses. In fact, Van der Zwan et al. (2013) demonstrated that transitions from "never considered starting up a business" to "thinking about starting up a business", and from "thinking about starting up a business" to "taking steps to start up a business" are much more difficult to take for women than for men. Also, Parker and Belghitar (2006) provided evidence that non-whites take longer time to transition from "taking steps to start up a business" than whites. Even Van Gelderen et al. (2005) found out 38% of nascent entrepreneurs had transitioned to new business-owner-managers after 3years while 22% had abandoned every efforts towards starting a new business.

Access to industrial infrastructure has been identified as an important determinant of entrepreneurial activity (Hayton et al., 2002); inadequate investments in infrastructure create bottlenecks that slow down economic growth (Perkins et al., 2005). However, high levels of perceived corruption have been proven to not only discourage investments in infrastructure, they slow down economic growth (Mauro, 1995) as well. Accordingly, infrastructure and corruption are two key problems facing developing-world countries (Gillangers, 2014); while competitive regions tend to be characterised by well-developed infrastructure that support entrepreneurial activity (Van der Zwan et al., 2013), countries rated as more corrupt tend to attract lower domestic and foreign investments, and suffer from reduced economic freedoms (Luminita, 2013).

Baker et al. (2005) stated that our understanding of the factors influencing entrepreneurial dynamics and the process of business creation at the national level is still limited. Parker and Belghitar (2006) called for investigations on how individuals proceed in the entrepreneurial process beyond nascent entrepreneurship stage. Investments in infrastructure could potentially influence such transitions, with possibility of levels of such influences being determined by perceived corruption. In fact, Bergmann and Stephan (2013) called on future studies to analyse the determinants of the transition from nascent

entrepreneurship to new business ownership, and this chapter is intended to answer that call.

In fact, this chapter aims to seek answers to the following three questions:

Does economic infrastructure endowment influence entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in countries of the developing world economy?

Does national level of perceived corruption influence entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in countries of the developing world economy?

Is the association between economic infrastructure endowment and entrepreneurial transition from "taking steps to start up a business" to "owning a young business" mediated by national level of perceived corruption in countries of the developing world economy?

Therefore, this study has three principal objectives. First objective: construct and use an index of economic infrastructure to rank and explore endowment trends in 112 countries of the developing world economy between 2009-2016. Index's influence on entrepreneurial transition from "taking steps to start up a business" to "owning a young business" is also examined in a selection (42) of said countries. Second objective: evaluate the effect of perceived national levels of corruption on entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in same selection (42) of said countries. Third objective: to find out if, and how association between the economic infrastructure index and entrepreneurial transition from "taking steps to start up a business" to "owning a young business" is mediated by perceived national levels of corruption in same selection (42) of said countries.

This study contributes to literature on entrepreneurship in two ways. First, from a policy perspective, the precision and adequacy of infrastructural intervention policy for early stage entrepreneurship may be further strengthened. Unlike most previous studies that investigated mostly late phases of the venture creation process, this study covers early phases of the entrepreneurial process by identifying determinants of transition across these phases. This paints a better picture of the dynamics of entrepreneurship as far as the process of new venture

creation is concerned. Second, this study ushers new knowledge by investigating mediating effect of perceived corruption on association between economic infrastructure (aggregate) and specific type of entrepreneurial transition in countries of the developing world economy, a rare knowledge in the literature.

The remainder of this chapter is organized as follows: Section two deals with empirical review, theoretical framework, and hypotheses development. Section three provides details on philosophy, strategy, and method of research. Section four presents results, and sections five is reserved for discussion, study limitations and conclusion.

3.2 Empirical Review, Theoretical Framework, and Hypotheses

3.2.1 Empirical Review

3.2.1.1 Entrepreneurial Process

Davidsson (2005, P.3) referred to entrepreneurial process as "all cognitive and behavioural steps from the initial conception of a rough business idea, or first behaviour towards the realization of a new business activity, until the process is either terminated or has led to an up and running business venture with regular sales." Entrepreneurship is known to be multi-facet (Reynolds et al., 2005) and the activities of those involved in the process can be distinguished into different phases such as latent entrepreneurship, nascent entrepreneurship, new business ownership and established business ownership.

According to van der Zwan et al. (2012), the intentions, attitudes and/or actions of individuals at any given point in time may qualify them as: 1) those never considering to start up a business, (2) those thinking about starting up a business, (3) those taking steps to start up a business, (4) those owning a young business, or (5) those owning an established business. These stages or phases are often distinguished in studies seeking to identify determinants of

entrepreneurial activity, especially in the new venture creation process. Determinants are not only expected to be largely different across these phases, they should also differ when it comes to entrepreneurial transitions from one stage to another. In this section, review of determinants of entrepreneurial activity is undertaken at three key points: i) early phases of the new venture creation process, ii) late phases of the new venture creation process and iii) transitions between early and late phases of the new venture creation process.

3.2.1.2 Determinants of Entrepreneurial Activity in New Venture Creation Process-Early Phases

Many studies in this sub-category follow a four dimensional framework proposed by Gartner (1985) to investigate factors that facilitate or inhibit entrepreneurial activities in latent and/or nascent entrepreneurship. For example, in their study, Arenius and Minniti (2005) empirically analysed the influence of some socio-demographic and economic factors (age, gender, work status, education, and household income) on the likelihood of someone becoming a nascent entrepreneur. They found age and gender negatively and significantly influential on the prevalence of nascent entrepreneurial tendencies; females are less likely than males, and younger people are more likely than older people in deciding to become nascent entrepreneurs. Levels of education attainment and work status are positive and significant, whereas household income is u-shaped in relation to decisions by individuals to become nascent entrepreneurs.

In a similar study, Kim et al. (2006) examined the importance of three forms of resources (financial, human and cultural) in the choices of individuals to become nascent entrepreneurs. They found human capital (level of education attainment and managerial experience) positively and significantly associated with the likelihood of individuals becoming nascent entrepreneurs; availability of cultural capital and financial capital (household income) are without effect and age effect is negative. In yet another study of the rate of nascent

entrepreneurship, Wennekers et al. (2005) found a u-shaped relationship for the level of economic development (measured as per capita income and innovative capacity index). They also found positive effects for population growth, tax revenues (as % of GDP), and incumbent business ownership rate, whereas social security expenditure has a negative effect.

3.2.1.3 Determinants of Entrepreneurial Activity in New Venture Creation Process-Later Phases

Studies in this sub-category are mostly related to new business ownership and established businesses, often investigating the influences of factors such as human characteristics on the locations and spatial distributions of these ventures. One of such characteristics is the level of education attainment by people living in the community. For example, while some empirical studies (Coughlin and Eran, 2000; Okamuro and Kobayashi, 2006; Pennings, 1982; Colombelli and Quatraro, 2018) found the level of education attainment of individuals in a community to positively influence firm formation, a large number of other studies found rather contradictory evidence; some studies (Bartik, 1985; Arauzo-Carod, 2005; Binet and Facchini, 2015) found high levels of education attainment to have a negative effect on firm formation, others (Spigel, 2012; Alderete, 2017; Reynolds, 1995) found levels of education attainment to not have any effect on firm birth.

External environments that surround newly started firms have features and resources that have been shown empirically by many studies to facilitate, or inhibit, the choices of these firms to locate in rural areas or urban centres. Some of these features and resources (macro determinants of new firm location) include: levels of economic activity (high or low), population densities and growths (high or low), tax rates (high or low), levels of un/employment (high or low), financial and non-financial resources (un/available, in/accessible, un/affordable, high/low quality), incubators (present or absent), agglomeration

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economies etc. For example, although Colombelli and Quatraro (2018) found population density to positively influence firm formation in Italy, Barrios et al. (2006) found it to not have any effect on new firm location in Ireland. In the US, Coughlin and Eran (2000) found the availability of highway positively associated with location of a new firm. Similarly, in Japan, Okamuro and Kobayashi (2006) found availability of both highway and railway positively associated with new firm location, whereas Bade and Nerlinger (2000) found both highway and railway availability to not have effect on new firm location in Germany. Also, while Audretsch et al. (2015) found broadband internet positively associated with newly created businesses in Germany, Fairlie (2006) found the adoption of internet to not influence newly created businesses in the US. Finally, while localization economies are positive location determinants of new ventures in Ireland (Barrios et al., 2006), urbanization economies are positive location determinants of new ventures in Spain (Arauzo-Carod, 2005).

3.2.1.4 Transitions Between Different Phases in the New Venture Creation Process

In this sub-category, researchers often seek to understand factors that not only influence entrepreneurial activities within the different outlined phases but also drive activities across them, thereby causing transitions from one stage to another. According to Van der Zwan et al. (2012), considerable cross-country variations exist between the earliest transition (from "never considered starting a business" to "thinking of starting a business") and latest transition (from "young business ownership" to "mature business ownership").

Grilo and Thurik (2005) examined effects of demographic variables (age, gender, and education level), availability of financial support and risk tolerance, country-specific effects and perceptions of administrative complexities on both an early-phase (latent entrepreneurship), and a late-phase (new and/or established business ownership) of the venture creation process. The effects were subsequently compared and contrasted between years 2000

and 2004 for the two phases studied. Their findings suggest that perceived lack of financial support has positive effect on early-phase entrepreneurship and no effect on late-phase, with 2004 effects more counterintuitive compared to those of year 2000. Perceived administrative complexities also has negative effect on both phases in both years, while country-specific effects revealed an increase in late-phase entrepreneurship for EU countries over the US in 2004, compared to year 2000. Also, Arenius and Ehrstedt (2008) investigated if, and how individual-level factors and national culture affect the entrepreneurial transitions rates between latent and nascent entrepreneurs (conception ratio), and between nascent entrepreneurs and new business owners (birth ratio). Their findings suggest that transition from nascent entrepreneur to baby business owner is likelier than the transition from latent entrepreneur to nascent entrepreneur.

Bergmann and Stephan (2013) investigated influences of some macro-level factors on entrepreneurial transition from nascent entrepreneur to baby business owner-manager. Their empirical results proved that number of days required to start a new business is positively associated with the transition, while GDP per capita growth is without effect. In a related study, Armington and Acs (2002) found firm birth rate (a proxy for entrepreneurial transition from nascent to baby business) positive and significantly associated with population and income growths, industry density, and levels of educational attainment of the population. They also found unemployment rate positively associated across all sectors but not all industries in the study.

Finally, in another study, Van der Zwan et al. (2013) found a negative effect of the level of economic development (measured by per capita income) on the likelihood of switching from "never considered starting a business" to "thinking about starting a business" and a positive effect on the likelihood of making the transition from "taking steps to start a business" to "young business owner." They also found risk tolerance to influence the transitions from

"never considered starting a business" to "thinking about starting a business" and from "taking steps to start a business" to "young business owner" whereas the stigma of failure is without effect on overall advancement in the entrepreneurial process. Contrary to findings of significant positive impact of levels of educational attainment on firm birth by Armington and Acs, Van der Zwan et al. (2013) found a mixed impact; education level is significantly positive for the first transition ('never considered' to 'thinking'), insignificant for the next transition ('thinking' to 'taking steps') and significantly negative for the final two switches on the entrepreneurial ladder ('taking steps' to 'young business' and 'young business' to 'mature business').

This study falls under transitions between phases in the new venture creation process, and looks at some determinants of entrepreneurial transition from "taking steps to start a new business" to "young business owner." Going by themes covered in previous studies reviewed above, neither relationship between entrepreneurial transitions and infrastructure endowments, nor investigations of possible influences of perceived corruption on entrepreneurial transitions are covered in the literature. This is a research gap and a justification for this study.

3.2.2 Theoretical Framework and Hypotheses Development

3.2.2.1 Entrepreneurial Activities (EA)

Ahmad and Seymour (2008, P.14) defined entrepreneurial activity as "the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets." It involves a dynamic process in which new firms are starting up, existing ones growing, while the unsuccessful ones are restructuring or closing-down (Korent, 2015). In this study, entrepreneurial activity is simply considered as a dynamic process in which new firms are starting up.

New venture creation is one of the most desired outcomes of entrepreneurial activity, which is described by Bergmann and Stephan (2013) as a process comprising of several phases. Failure in one or more phases of the new venture creation process is the undesired outcome facing latent, nascent, young and established entrepreneurs the world over. Most researchers opine that characteristics of entrepreneurs, entrepreneurial processes and entrepreneurial environments play determining roles with respect to the number of new ventures created in a community or region within a given time period, ceteris paribus. Consistently, entrepreneurial opportunity evaluation and exploitation abilities of individual or group of individuals involved in the venture creation process and external environments where the process of venture creation is undertaken, are factored into this study.

3.2.2.2 Entrepreneurial Activities (EA) and Entrepreneurial Opportunity

Shane and Venkataraman (2000) stated that entrepreneurial opportunities should precede entrepreneurship. Individuals involved in entrepreneurial activities are required to identify and exploit new products, processes or markets (Ahmad and Seymour, 2008). While the debate here is not whether such opportunities are created or discovered, Tang et al. (2012) suggested that the recognition and development of new opportunities are at the heart of entrepreneurship. Ardichvili et al. (2003) pointed three often overlapping and interacting concepts corresponding to the principal activities which take place before a business is formed or restructured: opportunity recognition, opportunity development and opportunity evaluation. This study focuses solely on opportunity evaluation and exploitation because, according to Ardichvili et al. (2003), it is considered an in/formal judgement to determine whether a developing opportunity will receive the resources to mature to its next stage, be revised, or be aborted. In author's opinion, a conducive external environment together with an effective and

efficient opportunity evaluation and exploitation system have the potential to trigger actual transitions across different stages within the entrepreneurial process in a given country.

3.2.2.3 Entrepreneurial Opportunity Evaluation and Exploitation

Shane and Venkataraman (2000) suggested that exploitation of opportunity by a potential/established entrepreneur should necessarily follow its discovery. However, the aborting of discovered opportunities is not uncommon, due jointly to the characteristics of some opportunities and the nature of some individuals involved in the process. For example, if an individual perceives s/he lacks the necessary skills, knowledge and needed talents to garner resources (non/financial) to bring a potentially rewarding opportunity to fruity, s/he has three options; exploit the opportunity in partnership, sell the opportunity to a more capable person/group of persons or organization, or simply abort the opportunity.

Shane and Venkataraman (2000) stated further that "the exploitation of an entrepreneurial opportunity requires the entrepreneur to believe that the expected value of the entrepreneurial profit will be large enough to compensate for the opportunity cost of other alternatives." This view seems to suggest that willingness of individuals to exploit opportunities depends solely on the expected values of opportunities. However, like Baker et al. (2005), it can be argued that willingness to exploit profitable entrepreneurial opportunities could also be driven by supportive benefits (e.g. government support, easy access to finance, availability and access to quality and affordable infrastructure etc.) that may become available to these individuals at the point of exploitation. From this perspective, a decision to exploit or to not exploit an entrepreneurial opportunity should be based on two rather than one principal values; first, the expected profit to result from exploiting the opportunity, and second, other factors necessary to ensure that the projected profit is actualized once an individual engages in the opportunity exploitation process. Factors mentioned above are important to consider in

decision to exploit or not to exploit an entrepreneurial opportunity and are known as appropriable benefits or benefits of appropriability.

3.2.2.4 Appropriability, Entrepreneurial Opportunity Evaluation and Exploitation

The term appropriability was first introduced by David Teece in 1986 as one of the three fundamental building blocks used to explain the distribution of profits from innovation between the inventor, his/her followers or imitators and his/her customers. Appropriability or regimes of appropriability is defined by Teece (1986, P.287) as the environmental factors, excluding firm and market structure, which govern an innovator's ability to capture the profits generated by an innovation. Amongst some of the dimensions of appropriability regime mentioned by Teece are nature of technology and the efficacy of legal mechanisms of protection available to an innovator. Two types of benefits may become available to the innovator, i.e., profit from the innovation and supportive external environmental factors such as efficient legal, financial, fiscal and education systems (Baker et al., 2005). These benefits can be distinguished into "intrinsic" and "extrinsic" values respectively, in this study.

Applying same logic to evaluation and exploitation of entrepreneurial opportunities, expected profit to potential and incumbent entrepreneurs is considered as "intrinsic" value and the environmental (supportive) factors available to them as the "extrinsic" value. In this study, intrinsic values will include transitioning across the various stages of entrepreneurial process that could result from effective opportunity identification/creation, quick opportunity evaluations and prompt actions by involved actors. Extrinsic values will comprise factors and/or conditions that facilitate effective opportunity identification/creation, rapid evaluations and prompt actions by involved actors. Therefore, in the entrepreneurial process, in order to decide whether or not to exploit an entrepreneurial opportunity, potential and established entrepreneurs need to consider both the "intrinsic" and "extrinsic" values of the opportunity.

Baker et al. (2005, P.497) referred to appropriable benefits as "the portion of the value of an opportunity that a potential entrepreneur expects to be able to capture for their own purposes." They cited the efficiency of basic supporting infrastructures such as a country's transportation, telecommunication networks, available sources of energy etc. as examples of appropriable benefits that matter when evaluating whether the benefits from an entrepreneurial opportunity are appropriable.

Audretsch et al. (2015) pointed that connectivity and linkages created by infrastructure can facilitate the recognition of entrepreneurial opportunities and the ability of entrepreneurs to actualize those opportunities. Dubini (1989) stated that infrastructure represent variations on the environment, and directly modify the attractiveness of the locations in which they are introduced.

In fact, Momoh and Ezike (2018) described infrastructure as the couch upon which industrialization efforts sit, adding that it governs the productive capacity of any nation, contributing and play a vital role in economic and social development. Given that entrepreneurs are often amongst some of the principal actors involved in pushing forward the industrialization initiatives of their respective nations, it is very likely the outcomes of their entrepreneurial actions could depend on the presence/absence of infrastructure. Furthermore, Alderete (2017) suggested that entrepreneurial activity could be affected differently by different infrastructure categories, for example, while the economic infrastructure category affects entrepreneurial activity directly (Stewart, 2010; Henckel and McKibbin, 2017), social infrastructure is said to affect entrepreneurial activity rather indirectly (Hall and Jones, 1999). In fact, empirical results by Perkins et al. (2005) suggested that the need to invest in economic infrastructure never goes away, and the ease of use and portability of some sub-classes of economic infrastructure make them a useful support tool for entrepreneurship (Alderete, 2017).

New venture creation is an outcome of entrepreneurial activity, and entrepreneurial transitions represent shifts along ladders in the new venture creation process (Van der Zwan et al., 2013). Such shifts could be facilitated of inhibited by the presence/absence of economic infrastructure in a given location. With the exception of Audretsch et al. (2015), most previous studies (Holl, 2004a/b; Berbegal-Mirabent et al., 2015) seem to have suggested that the influence of infrastructure on the location and spatial distribution of new ventures is solely dependent on its availability or presence. However, according to Estache and Goicoechea (2005), infrastructure can also be distinguished by attributes such as accessibility, affordability and/or quality. For example, infrastructure can be present and accessible somewhere but not affordable by the people who need it, in which case, its effect on new venture creation is likely going to be different from a case where it is affordable. Similarly, the presence, accessibility, and affordability of a high quality infrastructure could have a different impact on its users compared to that of an available, accessible, and affordable but low quality infrastructure. In other words, presence of economic infrastructure in a location does not say it all about its possible effects on shifts along ladders in the new venture creation process, its accessibility, quality and cost need to be considered as well. The same may be true for social, technological, and other categories of infrastructure, and a justification that their respective effects on entrepreneurial transitions in entrepreneurial processes within the same country may also be largely different.

Therefore, in order for people to have better comprehension of the possible effects of economic infrastructure endowment on entrepreneurial transitions in, for example, developing world countries, it is imperative to bring constituent dimensions of economic infrastructure together. The first objective of this study is to construct an index of economic infrastructure from four infrastructure attributes (availability, accessibility, quality and affordability). Subsequently, some 112 countries of the developing world economy will be ranked according

to their endowments in economic infrastructure, and the changes in their rankings over time explored. Economic infrastructure endowment is considered as an "extrinsic value" (external environmental resource) available to potential and incumbent entrepreneurs, and possible determinant of transitions across stages within the entrepreneurial process. Therefore, it can be argued that increasing endowments of economic infrastructure in a country could foster entrepreneurial transition. More specifically, it can be predicted that;

H1: economic infrastructure endowment will have a positive and direct effect on entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in countries of the developing world economy.
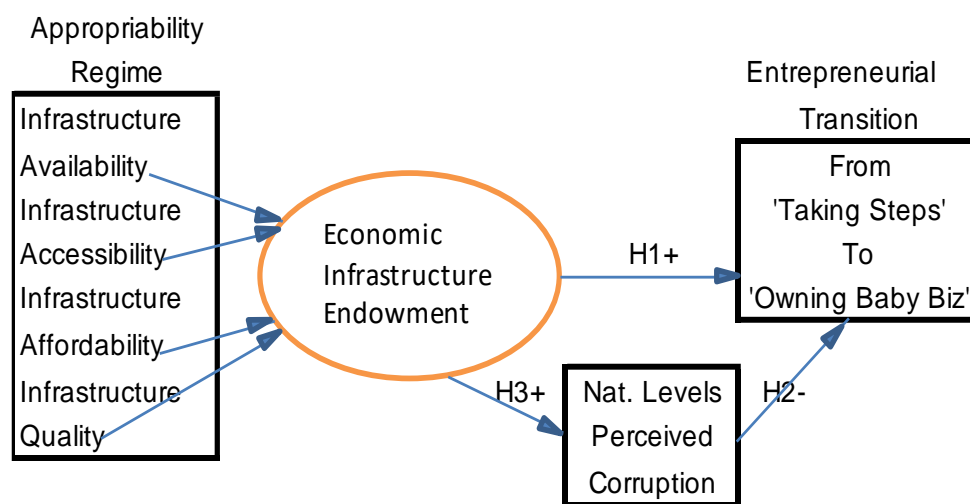
Figure 3-1: Theoretical Framework

Perceptual variables are important determinants of both early and late phases of the entrepreneurial process (Krueger and Brazeal, 1994; Arenius and Minniti, 2005; Koellinger et al., 2007). In entrepreneurship, high income volatilities and failure rates are not uncommon, causing many to view engagements in entrepreneurial processes as too risky. Perceptions may have positive, negative or no effect at all on attitudes and behaviours of potential and incumbent entrepreneurs. For example, empirical results by Arenius and Minniti (2005) show that decision to become a nascent entrepreneur is significantly and positively influenced by the subjective

perceptions of individuals or perceptual variables, and corruption is one of such variables documented to have negative effect on perception at macro levels (Boudreaux et al., 2018).

Luminita (2013, P. 170) defined corruption as the abuse of public power for private benefit/profit, or the use of public office for personal gain. Author distinguished between two forms of corruption, i.e., Political corruption (the practice of using wealth, power, or status to influence the political system in order to gain political advantage) and bureaucratic corruption (corrupt behaviour in the administration of public policy that influences governmental processes, such as obtaining permits or avoiding tariffs, or paying government enforcement officials).

Corruption affects equitable distribution of resources across the population, increasing income inequalities, undermining the effectiveness of the regulatory environment and social welfare programmes, and the efficiency of state institutions (Chêne, 2014). An increase in the perception of all or most of these highlighted corruption effects will likely inflict a corrosive impact on business operations, and reduce the ability and willingness of individuals to engage into entrepreneurial activities. In fact, perceived corruption had previously been found to not only erode trust in government officials, significantly lower levels of foreign and local investments and economic growth (Boudreaux et al., 2018; Luminita, 2013; Mauro, 1995), but also shown to hurt entrepreneurship (Dutta and Sobel, 2016). According to Muzurura (2019), direct effect of corruption is a reduction in entrepreneurial activities, and bureaucratic corruption discourages entrepreneurial activity through high entry barriers (Aparacio et al., 2016). Irrespective of the form of corruption considered, its perception may have serious consequences on economic development (Treisman, 2000), and by extension, serious impacts on peoples' ability to shifts along ladders in the new venture creation process (entrepreneurial transitions).

Many previous cross-country studies of corruption have reported a negative relationship between corruption and not only levels of firm creation (Jiménez and Alon, 2018), but also levels of economic development (Gouvea et al., 2019). Accordingly, not only are rich countries perceived to be less corrupt than poor ones, but failed development initiatives of some developing countries have been blamed on corruption (Treisman, 2000) because it creates an institutional environment that pushes entrepreneurs from productive to destructive activities (Boudreaux et al., 2018). For example, in some cases corruption cause entrepreneurs to not expand their activities or to not open businesses, rather opting to become a rent-seeker and extract rents from other activities (Dejardin and Laurent, 2016). Such destructive activities are very likely to slow down/stop entrepreneurial transitions across different phases within the entrepreneurial process in countries of the developing world economy. In fact, high corruption perception has the potential to erode trust within business creation centres, reduce incentives for entrepreneurial activities, and reduce peoples' ability to shifts along ladders in the new venture creation process Therefore, it can be predicted that;

H2: National levels of perceive corruption will have a negative effect on entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in countries of the developing world economy.

Good governance and transparency are crucial components in reducing government corruption (Carlos et al., 2019). According to Gouvea et al. (2019), the relationship between actual incidence of corruption and economic development is highly sensitive to covariates in governance, culture, and social development, and the factors that consistently explains perceived and actual corruption is a country's governance systems. The effectiveness of a governance system can also be evaluated through its ability to fight corrupt practices in order to reduce corruption perception. The internet is an important tool in the fight against corruption because its diffusion allows citizens (entrepreneurs included) to access relevant information on government performance, sheds light on corruption cases, and makes it possible to denounce

government officials' abuse and corruption activities (Carlos et al., 2019). Garcia-Murillo (2010) found internet diffusion negatively associated with perceptions of corruption around the world. That could be same case with other sub-classes of the economic infrastructure category, such as mobile phone, or even different categories of infrastructure (social, technological etc.) all together.

According to Van der Zwan (2013), corruption perception introduces barriers that can be dealt with by creating or improving awareness through provisioning of more and/or better quality information in a place. The presence of economic infrastructure in a community may not only provide potential and incumbent entrepreneurs with more and better quality devices to investigate, tract down and expose corrupt practices, but also enable and promote effective and efficient reporting standards by government authorities. Effective reporting and efficient information sharing could reduce both information asymmetry and levels of perceived corruption, pushing back entrepreneurs from destructive to productive activities. Such productive activities are likely to speed up/drive entrepreneurial transitions across different phases within the entrepreneurial process in countries of the developing world economy. Therefore, it can be predicted that;

H3: the association between economic infrastructure endowment and entrepreneurial transition from "taking steps to start up a business" to "owning a young business" in countries of the developing world economy will be positively mediated by national levels of perceived corruption.

3.3 Philosophy, Strategy and Method of Research

3.3.1 Research Philosophy

According to Collis and Hussey (2014, p.43), a research philosophy is a framework that guides how research should be conducted based on ideas about reality and the nature of

knowledge. These guides or beliefs represent fundamentally different ways researchers and other humans make sense of the world around them. These beliefs are classified under ontology and epistemology (Burrell and Morgan, 1979). According to Lincoln and Denzin (1994), ontology refers to the reality of the world, whereas epistemology is associated with knowledge and its validation as true or correct or accepted. Different paradigms may be associated with each class of beliefs outlined above. In fact, Neuman and Kreuger (2003) highlighted four main paradigms commonly used in research philosophies: positivism, post-positivism, realism and constructivism.

Positivism is regarded as most appropriate research philosophy in quantitative studies (Bessant et al. 2003), which focuses on scientific testing of hypothesis and finding logical or mathematical proof that derives from statistical analysis (Collis and Hussey, 2014). However, positivism is perceived inadequate to meet the needs of every social scientists, creating room for adoption of realism and constructivism or interpretivism paradigms by others (Collis and Hussey, 2014). Contrary to positivism, interpretivism paradigm uses relatively small sample sizes to explore complex social phenomena through an empathic understanding of how the research subjects view the world (Bryman and Bell, 2011; Saunders et al., 2012).

In fact, unlike interpretivism, where reality is seen as highly subjective due to researchers' perceptions, positivists use large sample sizes to produce precise, objective and quantitative data (Collis and Hussey, 2014). Therefore, positivist epistemology was the chosen philosophy for this study because it is based on quantitative data and seeks to validate knowledge about causal relationship between variables objectively.

3.3.2 Research Strategy

A research strategy is one of the components of research methodology that provides overall direction of research and the process by which the research is conducted (Remenyi et

al., 2003). Saunders et al (2009, P.600) defined research strategy as "the general plan of how the researcher will go about answering the research questions." According to Yin (1994), there are five major research strategies that have been identified, i.e., case studies, experiments, surveys, histories and analysis of archival information. These and other strategies (action research, grounded theory, ethnography, archival research, cross sectional studies, longitudinal studies and participative enquiry) are also used in business and management (Wedawatta et al., 2011). In fact, selection of an appropriate research strategy depends on many factors including types and objectives of research questions, availability of time and resources, the philosophical underpinnings of the researcher, as well as their knowledge on the subject area to be researched (Saunders et al., 2009).

According to Saunders et al. (2009), experimental research strategy involves study of casual links between an independent and dependent variable. Although this study also focuses on causal relationships between nascent entrepreneurial transition and some explanatory factors in developing world countries, the strategy used is actually non-experimental in design. A cross sectional research strategy was adopted for this study due to time constraint and the nature of available secondary data used.

3.3.3 Research Method: Approach, Estimations, and Analyses

3.3.3.1 Research Approach

Research approach is defined by Jankowicz (2005, p.220) as a "systematic and orderly approach taken towards the collection and analysis of data so that information can be obtained from those data." In the field of entrepreneurship, three research approaches are easily identified, i.e., quantitative, qualitative, and mixed method. Qualitative and quantitative research approaches are based on divergent theories and assumptions so that benefit of each to a researcher depends on nature of their research and data collection methods (Eyisi, 2016).

Mixed method result from combining qualitative and quantitative approaches, and said to enable exploration of more complex aspects and relations of the human and social world (Malina et al., 2011). The qualitative approach employs various strategies, such as biography, phenomenology, grounded theory, ethnography and case study (Creswell, 2009). Although qualitative research approach provides abundant data about real life people and situations, the problem of replicability, subjectivity, and non-use of numbers make it difficult and impossible to simplify findings and observations (Eyisi, 2016).

The technique introduced for the analysis of data is influenced by research approach adopted by the researcher. Inductive and deductive techniques are commonly used to analyse data in research studies (Soiferman, 2010) and suitability of each approach is dependent on the nature of data being analysed (quantitative or qualitative). The inductive technique process starts with gathering information from individuals to identify themes and develop theories (Creswell & Plano Clark, 2007), whereas the deductive technique process involves four steps, i.e., theory, hypothesis, observation, and confirmation respectively (Zikmund et al., 2013).

According to McDonald et al. (2015), quantitative research approach is predominant in entrepreneurship research. It places emphasis on numbers and figures in the collection and analysis of data (Bryman, 2001), saving time and overall resources needed to undertake research (Eyisi, 2016). This study aims partly to assess relationship between economic infrastructure (aggregate) and a specific type of entrepreneurial transition in developing world countries, evaluating further if, and how the relationship is mediated by national levels of perceived corruption. In this study, theory-backed hypotheses were formulated and tested to arrive at reported evidence, therefore, quantitative research approach and deductive analytic technique were adopted for this study.

Data upon which analyses are based in this study are secondary because the unit of analysis is country and there was not sufficient time and resources to collect primary data in

sizes big enough to be representative of the individual countries included in this study. According to Cowton (1998), use of secondary data not only offers advantages in terms of cost and effort, but in certain cases may overcome some of the difficulties faced by researchers in the gathering of primary data. Research approach associated with secondary data is almost exclusively quantitative in nature and have no qualitative equivalent (McDonald et al., 2015), and secondary data analysis (analysis of data that was collected by someone else for another primary purpose) is an empirical exercise that applies the same basic research principles as studies utilizing primary data (Johnston, 2014).

Data came from different information sources including the World Bank's World Development indicators and worldwide governance indicators (WDIs and WGIs), World Economic Forum (WEF), GEM, International World Trade Centre, International Monetary Fund (IMF), and much more. For this study, Statistical Annex and Country Classification mechanism developed by WESP (2019) was used to classify and select countries of the developing world economy. (See appendix 2, P. 126) for a complete list of included countries.

3.3.3.2 Variable Estimations

The table below summarizes important variables used in regression analyses to estimate parameters in this section of the thesis.

Table 3-1: Variables used in this study

Variable Name	Definition	Source
ETR_Log	Logged value of entrepreneurial transition from nascent entrepreneurship to small business ownership	Author's calculation (See Section 3.3.3.2.1)
EII	Index of economic infrastructure	Author's calculation (See Section 3.3.3.2.2i)
Pcorr	National level of perceived corruption	WGI database
IV	Lagged values of EII & Pcorr	Author's calculation and WGI database
GDPpcg_Log	Logged value of GDP per capita growth	World Bank database
TmRq	Number of days required to start a business	World Bank/Doing business database
Fdi	Foreign direct investment (net inflows, % GDP)	World Bank database
Pca	Percentage of 18-64 population who believe they have the required skills and knowledge to start a busine	GEM database

3.3.3.2.1   Dependent Variable

Logged entrepreneurship transition rate per million labour force (ETR_Log) is main outcome variable. This variable was computed with prevalence rates of nascent entrepreneurship (NE) and new business ownership (NBO) obtained from the GEM database, as well as national labour force obtained from WDI database for periods between 2009-2015.

GEM is a consortium of national country teams, primarily associated with top academic institutions, that carries out survey-based research on entrepreneurship around the world. GEM project generates data from two large surveys, the Adult Population Survey (APS) and the National Expert Survey (NES). It uses representative sampling techniques to choose at least 2000 adults in each member country to participate in the APS. In GEM database, national level indicators are harmonized, and early-stage and later-stage entrepreneurial activities also distinguished, making it suitable for our cross-country study.

According to Reynolds et al. (2005), measures of entrepreneurial activity like NE and NBO are derived from the APS, and the country is considered as basic unit of analysis. (Please, see Reynolds et al., 2005 for details on how each of these measures is calculated). Reynolds et al. (2005) defined NE as percentage of adults aged 18–64 who are setting up a business. They also defined NBO as percentage of adults aged 18–64 who are owner-manager of a young firm (up to 42 months old).

ETR was calculated as a ratio of NBO and NE, following Arenius and Ehrstedt (2008). However, unlike them, ETR used lagged NE (LNE) as the denominator term. This was in consideration of arguments by Bergmann and Stephan (2013) that cross section data from same year cannot appropriately reflect transitions across subsequent stages within the entrepreneurial process. Accordingly, the ERT is simply the ratio of NBO to LNE, i.e., 2009 NBO prevalence rate, for example, was divided by 2008 NE prevalence rate etc. The method proposed by Bergmann and Stephan (2013) could not be used here because it requires at least two

consecutive years' measures of NE prevalence rates for all included countries. Unfortunately, this study concerns countries of the developing world economy and sequential data is largely unavailable. ETR was computed as follows:

- For each of our 42 countries, harmonized national values of NBO were downloaded from GEM database for periods between 2009-2015.

- For each of our 42 countries, harmonized national values of NE were also downloaded from GEM database for periods between 2008-2014.

- Each country's NBO value in year t was divided by its corresponding NE value in year t-1. Ratios of NBO to LNE (ETR) were computed for each country beginning 2009.

- Total labour force for each of the 42 countries was downloaded from WDI database.

- Each country's ETR from above was standardised by dividing with their corresponding total labour force values for years 2009-2015, following Armington and Acs (2002).

- Each yearly standardized ETR for each country was multiplied by a million.

Finally, a seven-year arithmetic average of the standardized ETR, i.e., for 2009-2015, was computed and used as dependent variable in the analyses.

3.3.3.2.2   Independent Variables

Two explanatory variables (assumed endogenous) were involved in this study, aggregated economic infrastructure (EII) and national levels of perceived corruption (Pcorr). Let's first look at how EII was constructed, and next Pcorr's (mediator variable) computation.

i) Economic Infrastructure Index (EII)

Following the categorization of infrastructure in previous chapter, EII construction started with extraction of many potential indicators of the economic category of infrastructure for a total of 112 countries (guided by literature from previous studies, e.g. Donaubauer et al., 2016; Freudenberg, 2003) from various databases for periods between 2009 and 2016. Each

indicator was standardised to ensure comparability between countries. This was done by dividing variable values by their respective yearly population figures, population densities, and/or total surface areas, depending on the type of variable involved. Freudenberg (2003), Donaubauer et al. (2016) and African Development Bank (AFDB, 2018) did same in order to adjust for wide disparities in the sizes of countries included in the sample. Each standardized indicator was added to one of four groups representing dimensions of economic infrastructure based on what they have previously been documented to measure. This yielded over 60 variables that were subsequently normalized.

According to Freudenberg (2003), several normalization techniques exist and each has its advantages and disadvantages (see Freudenberg, 2003 for complete discussion on this). First, two normalization techniques (standardization and re-scaling) were selected and used on one dimension of economic infrastructure, then used subsequently to ranked and compared sampled countries. A rank correlation coefficient of 0.919 was obtained, suggesting both techniques were largely similar. Following Oswald et al. (2011), Min-Max technique was used to re-scale indicators within all four dimensions (availability, accessibility, affordability, and quality) of economic infrastructure for each of the 112 countries between 2009-2016.

For each of the four dimensions, a bivariate correlation matrix was computed and every variable pair with a value greater than 0.81 was excluded from the dimension. Result at the end was 40 normalized variables, i.e., availability = 14variables; accessibility = 11variables; quality = 8variables; affordability = 7variables. Details about retained variables and their definitions are found on table 3-11 of appendix 2, P. 128.

Next, approach used by the African Development Bank (www.afdb.org/2018) was followed to assign weights to retained normalized indicators within each of our four dimensions of economic infrastructure. This method of weighting was chosen to ensure each variable accounted independently to the overall variability of dimension to which they

belonged, especially, because some had more missing values than others within same dimension. Therefore, the sum of the inverses of standard deviations of normalized variables within a given dimension was used to reduce the influence of the most volatile components on the sub-composite index, to partly correct the bias caused by missing values, and to minimize volatility in country rankings. Donaubauer et al. (2016) used an alternative weighting technique (unobserved component model, UCM) to develop an infrastructure index similar to this one. They ranked some countries with both their index and the World Economic Forum's Global competitivity index (GCI) of infrastructure, and obtained a rank correlation coefficient of 0.72 in the process. Index developed from one of the four sub-dimensions in this study was used along with the GCI, to also rank 82 countries in 2016. In the process, a rank correlation coefficient (0.85) greater than that obtained by Donaubauer et al. (2016) was obtained. Clearly, this weighting technique produced an index closer to GCI than what resulted from the UCM technique. Therefore, weights were estimated based on the inverse of the standard deviation of each normalized component as follows:

$$Y_t = (\sigma_{tot}/\sigma_x)*x_t$$

where σ_{tot} is given by $1/\sigma_{tot}=\Sigma x(1/\sigma_x)$ and σ_x is standard deviation of normalized component x.

These weights were used to compute dimensional indexes for each of the 112 countries spanning the period between 2009-2016. Finally, geometric rather than arithmetic mean was used to agglomerate the four dimensions (sub-indexes) into a main index, the EII. The choice of geometric mean was motivated by the non-substitutional nature of some of the infrastructure dimensions in our study; for example, it is very difficult for a country to increase infrastructure quality without hurting infrastructure affordability. Cronbach's alpha of 0.703 obtained for the EII, suggests it's reliable and internally consistent. And due to data limitation by GEM database, only EII for 42 countries actually had corresponding values for dependent variable (ETR) .

ii) Pcorr (Mediator Variable)

WGI comprises both individual and aggregate measures of the six dimensions of governance since 1996-2018, covering over 200 countries and territories (Please, see Kaufmann et al. (2010) for details definition and also how each dimension is calculated and aggregated). Control of corruption (CC) is one of the six dimensions that captures both petty and grand forms of corruption, e.g., perceptions of the extent to which public power is exercised for private gain by elites and private interests (Kaufmann et al., 2010).

Measured at the national level, CC is suitable for macro-level analyses. It's a better proxy for corruption because it's based on perceptions of both experts and non-experts. In the WGI database, CC dimension is rescaled to run from zero to one, with higher values indicating better outcomes. In fact, national levels of perceived corruption actually drop with increases in CC values of involved nations and vice versa. Therefore, to use CC as proxy for Pcorr, CC values had to be multiplied by -1. It was computed as follows:

- Yearly aggregated values of the CC dimensions for each of the 42 countries were downloaded from WGI database for periods 2009-2015.
- Average of the sub-dimensions within it were calculated for period 2009-2015.
- Finally, a 7-year average for entire sample was computed and multiplied by -1 to get Pcorr.

3.3.3.2.3   Instrumental Variables

The two main predictors in this study were assumed to be endogenous variables and potential sources of endogeneity. According to Bellemare et al. (2017), lagged variables have been used in many previous non-experimental studies to remedy endogeneity problems. Reed (2015) demonstrated that "using lagged values of the endogenous explanatory variable and/or dependent variable as instruments can provide an effective estimation strategy if (i) the lagged values do not themselves belong in the respective estimating equation, and (ii) they are sufficiently correlated with the simultaneously determined explanatory variable." Instrumental

variable (IV) approach is used to analyse this study and, by means of overidentifying restriction and weak instrument tests, the validity of the two chosen instruments is established. Arithmetic averages (previous period scores) of 2007 and 2008 were computed for EII and Pcorr endogenous variables and used as their IVs. Statistical test results on them based on EndoS (an SPSS macro written by Ahmad Daryanto) are reported in table 3-6, P.118.

3.3.3.2.4 Control Variables

Based on literature reviewed in chapter two, the following four exogenous variables were used as controls in the analyses: Logged GDP per capita growth (GDPpcg_Log), number of days to start a business (TmRq), foreign direct investment (Fdi), and perceived capability (Pcab). These variables were estimated as follows:

- Each of the first three variables was downloaded from WDI for periods between 2009-2015.

- The last variable was also downloaded from GEM for same period as above.

The arithmetic average of each variable was computed for years 2009-2015 and used as control in analyses.

3.3.4 Model Specification and Strategy of Analysis

The EII was used to rank 112 countries of the developing world economy for an eight-year period starting 2009. Trend changes in both the main and sub-indexes were explored for the top and bottom 10 nations.

In this study, both descriptive and analytical methods are used. Due to presence of two potentially endogenous explanatory variables in study, both OLS and IV regression estimators were used, as well as a mediation model respectively to estimate slopes and test hypotheses (H1, H2, and H3) based on six equations shown below:

$M_i = \pi_0 + \beta_1 X + u_i$………..…….…..…….……1 $X_i = ¥_0 + ¥_1 Z_1 + v_i$.………..………..……4

$Y_i = \beta_0 + \beta_2 M + \beta_3 C_i + \varepsilon_i$………..……….……2 $M_i = \lambda_0 + \lambda_1 Z_2 + w_i$.………..……….…...5

$Y_i = \beta_0 + \beta_1 X + \beta_2 M + \beta_3 C_i + \varepsilon_i$…..………......3 $Y_i = \beta_0 + \beta_1 \hat{X} + \beta_2 \hat{M} + \beta_3 C_i + \varepsilon_i$..….…...6

Where X represents endogenous/exogenous regressor term (EII), M the endogenous/exogenous mediator term (Pcorr), C_i the ith exogenous control variable, Z_1 and Z_2 the IVs, and Y the outcome variable. Also, β_0 is the y-intercept, ε the error term, $\hat{X}$ and $\hat{M}$ fitted values of EII and Pcorr respectively, while β_1, β_2, β_3 are respective effect sizes of the two main predictors, and the control variables.

Two separate analyses were undertaken in this study, and a total of four models (models 1, 2, and 4 based on equations 1-3, and model 3 based on equations 4-6) were estimated. Model 1 was baseline to which only control variables were introduced. Models 2 and 3 included main predictors and only control variables found statistically significant in model 1. Using Andrew Hayes's PROCESS in SPSS (Shrout and Bolger, 2002), mediator Model 4 was estimated from a percentile bootstrap of 5000 samples, and comprised mediator, main predictor, and only statistically significant control variables.

OLS is suitable estimator for the first analysis, especially because of its operational simplicity on common software such as SPSS and MATLAB, and also its ability to take into account elements of diverse scale in samples under investigation (Huang and Chen, 2018). However, the OLS estimator could produce inconsistent parameter estimates in the presence of endogenous variables, in which case it becomes imperative to introduce IV approach. According to Daryanto (2020), Hausman's specification test compares OLS estimated regression coefficients with IV estimated ones, and because OLS variances are smaller than IV variances, IV estimated coefficients are only selected if they're significantly different from OLS estimated coefficients.

Following Hausman's specification test results (table 3-2 bellow), model 2 was chosen over model 3. Therefore, the first analysis was based on model 2 and verified the direct effect(s)

of EII and Pcorr on ETR_Log (H1and H2). The second analysis was based on model 4, and verified the indirect effect(s) of EII on ETR_Log through Pcorr (H3).

Table 3-2: Summary of selected tests in study

	F-value	Sig.
Hausman's specification test (Joint F test)	0.991	.383>.05
Ho: Instrumented variables are exogenous		
H1: Instrumented variables are endogenous		
Weak Instrument Tests (Cragg-Donald F-statistic)	56.2496	
	Stock-Yogo critica values	
	Size	Values
	0.10	7.03
Ho: Instruments are weak	0.15	4.58
H1: Instruments are strong	0.20	3.95
	0.25	3.63
Breusch-Pagan & Koenker tests of homoskedasticity		
BP	3.410	.637>.05
Koenker	4.667	.458>.05

3.3.5 Robustness Checks

EII was replaced with WEF's infrastructure index averaged for years 2013-2015, and Pcorr with Transparency International's CPI index averaged for years 2012-2013. When dependent variable (ETR_Log) was regressed on these new variables together with control variables, the results were similar to those obtained previously in model 2 (table 3-6, P. 118). Regional differences was also controlled based on the World Bank's classification of world countries into seven regions. The dummies of regional differences left estimated parameters unchanged in the regression equation (see table 3-10, P.128). These suggest the estimates are robust. With the help of Breusch-Pagan test (table 3-2 above), any presence of heteroscedasticity was stamped out from the sample. Durbin-Watson test gave values between 1,75 and 2.25. Furthermore, variance inflation factors (VIF) with each regression and values were always below 4, suggesting no multicollinearity problems.

3.4 Results

3.4.1 Economic Infrastructure Index, Country Rankings & Trends Exploration

3.4.1.1 Regional Composition of Ranked Countries and Economic Infrastructure Index (EII)
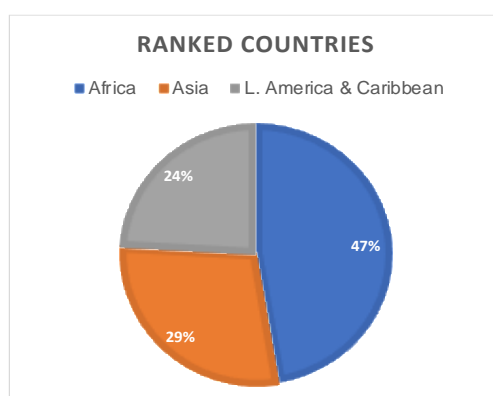
Figure 3-2: Composition of Ranked Countries by Region

A total of 112 countries are ranked in this study, with majority (53) from Africa.

Thirty two countries (29%) are from Asia, and rest twenty seven countries (24%) from Latin

America and the Caribbean.

Table 3-3: Descriptive statistics-dimensions of economic infrastructure

AFFORDABILITY	Mean	Median	Std Dev.	Min	Max	QUALITY	Mean	Median	Std Dev.	Min	Max
1. Mobile-broadban	6.5	3.1	8.7	0.8	37.9	1. Quality of port infr	4.3	4.0	0.9	2.6	6.8
2. Cost to import (U:	73.4	79.5	22.2	0.0	99.3	2. Secure Internet s	119.6	24.1	319.5	0.6	1898.9
3. Pump price for di	1.1	1.2	0.5	0.1	2.3	3. Quality of road	4.1	4.0	1.0	2.6	6.5
4. Average transact	9.9	8.0	4.9	4.6	22.7	4. Quality of electrici	4.3	4.6	1.4	1.7	6.7
5. Cost to get electr	86.0	94.6	25.7	0.0	99.9	5. Quality of railroad	2.8	2.6	1.2	1.3	5.7
6. Fixed broadband	11.0	4.1	16.9	0.7	74.9	6. Time required to g	88.4	79.0	52.5	18.0	226.0
7. Mobile cellular ba	4.0	2.8	4.3	0.2	19.6	7. Electric power trar	11.8	11.9	6.0	1.9	25.9
ACCESSIBILITY	Mean	Median	Std Dev.	Min	Max	8. CO2 emissions fr	39.4	39.9	16.1	2.6	69.2
1. Railways, passen	264.1	152.1	272.9	30.4	828.6	ACCESSIBILITY	Mean	Median	Std Dev.	Min	Max
2. Access to electric	82.5	97.5	27.5	7.4	100.0	7. Electric power cor	2591.9	1610.0	2580.7	156.7	10305.3
3. Air transport, regi	3787.3	873.8	7453.1	0.0	41780.7	8. People using safe	67.6	72.8	32.3	5.9	100.0
4. Container port tra	1304.5	4.4	7631.0	0.4	45817.3	9. Depositors with co	645.0	644.1	445.6	13.2	2183.0
5. Mobile cellular su	105.7	105.0	35.2	28.9	182.2	10. Individuals using	35.9	37.5	22.1	3.7	84.1
6. Fixed broadband	7.6	4.9	8.5	0.0	36.5	11. Personal remitta	2.4	0.8	3.4	0.0	14.7
AVAILABILITY	Mean	Median	Std Dev.	Min	Max	AVAILABILITY	Mean	Median	Std Dev.	Min	Max
1. Commercial bank	12.0	11.1	7.3	1.9	34.6	8. Aircraft, spacecra	48.5	13.0	164.0	0.0	1046.1
2. Computer, comm	91.4	92.5	5.7	77.7	99.4	9. Energy imports, n	-22.2	10.6	132.2	-589.5	97.6
3. Automated teller	42.6	36.7	47.2	2.3	288.5	10. Fuel imports (%	19.0	18.2	11.1	0.0	42.6
4. ICT goods import	7.9	6.1	6.0	2.2	24.8	11. Bank concentrat	58.5	54.4	17.7	28.8	98.2
5. Alternative and n	4.6	3.3	4.6	0.0	18.7	12. Bank capital to a	10.1	10.1	2.3	6.6	14.8
6. Rail lines (km/pop	133.4	99.5	153.3	3.1	460.8	13. Personal remitta	105.9	49.4	152.1	1.6	762.9
7. Renewable electr	33.1	19.8	32.6	0.0	99.9	14. Transport service	38.1	38.5	11.4	18.2	63.9

First, compared to World Economic Forum's Infrastructure Index, EII is closely identical. The rank correlation coefficient of some 82 countries ranked by these two infrastructure measurements is 0.85, making EII very robust. See scatter plot (figure 3-3) below.
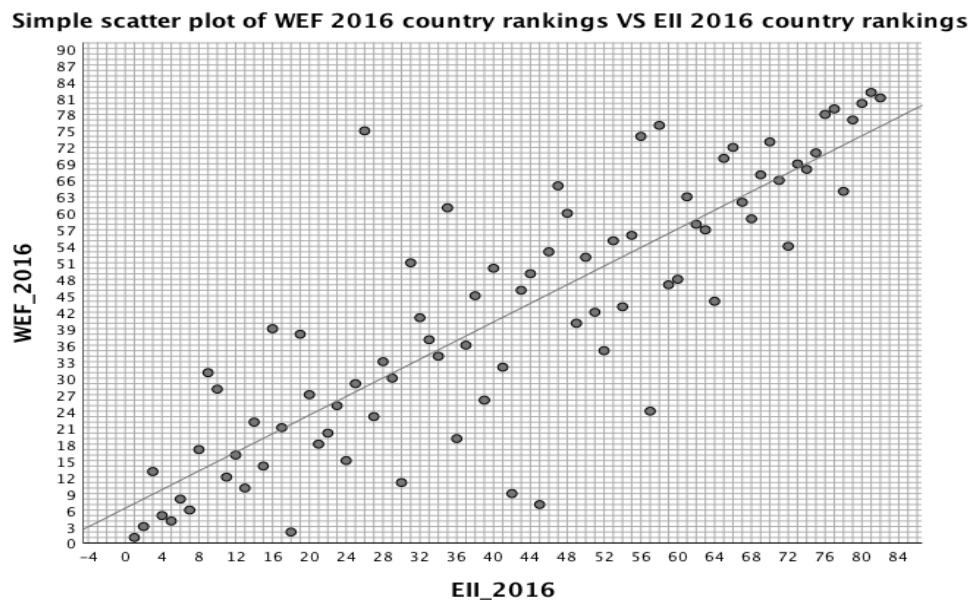
Figure 3-3: Rank correlation 2016 EII VS 2016 WEF's GII

3.4.1.2 Eight-Year Country Rankings and Trends Exploration

During eight years period (2009-2016), some countries gained rankings in economic infrastructure endowment for year 2016 compared to 2009, some dropped, and others maintained the same rankings in both years. Care must be taken when interpreting rank changes; gaining more spots in 2016 rankings compared to 2009 rankings does not necessarily mean a country is better than all others that gain less spots, and vice versa. Gaining no spot in the rankings does not necessarily indicate worst performance, for example, Singapore and South Korea show no rank gains in 2016 compared to 2009, however, they outperformed almost every other countries in different dimensions of economic infrastructure. The case is different for Turkey, Algeria, and Cote D'Ivoire that maintained 13th, 45th, and 50th positions

respectively in both years, however, though not worse performances compared to similar countries, they could do better than this.

Table 3-4: Ten top and bottom countries by EII ranking

Rank	2009	2010	2011	2012	2013	2014	2015	2016
1	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore
2	Korea, Rep.	Korea, Rep.	Korea, Rep.	Korea, Rep.	Korea, Rep.	Korea, Rep.	Korea, Rep.	Korea, Rep.
3	Malaysia	Malaysia	Malaysia	Malaysia	Malaysia	Malaysia	Malaysia	China
4	Saudi Arabia	Saudi Arabia	Bahrain	Saudi Arabia	Brazil	China	Israel	Seychelles
5	El Salvador	Costa Rica	El Salvador	Chile	China	Brazil	China	Malaysia
6	Uruguay	El Salvador	Jordan	Costa Rica	Costa Rica	Saudi Arabia	Seychelles	Qatar
7	Jordan	Panama	Saudi Arabia	Jordan	Jordan	Jordan	Brazil	Saudi Arabia
8	Panama	Tunisia	Panama	Brazil	Chile	Qatar	Saudi Arabia	Israel
9	Costa Rica	Thailand	Thailand	Panama	Saudi Arabia	Costa Rica	Jordan	Thailand
10	Chile	Chile	Tunisia	El Salvador	El Salvador	Colombia	Morocco	Brazil
103	Guinea-Bissa	Myanmar	Myanmar	Chad	Eritrea	Comoros	Comoros	Yemen, Rep.
104	Sierra Leone	Central Africa	Central Africa	Eritrea	Central Africa	Guinea-Bissa	Djibouti	Equatorial Guinea
105	Central Africa	Equatorial Gu	Equatorial Gu	Comoros	Chad	South Sudan	Central Africa	Congo, Dem. Rep.
106	Korea, Dem.	Chad	Chad	Central Africa	Korea, Dem.	Eritrea	Syrian Arab R	Chad
107	Equatorial Gu	Guinea-Bissa	Guinea-Bissa	Korea, Dem.	Guinea-Bissa	Central Africa	Yemen, Rep.	Central African Rep
108	Djibouti	Korea, Dem.	Korea, Dem.	Equatorial Gu	Comoros	Chad	Puerto Rico	Eritrea
109	Puerto Rico	Puerto Rico	Puerto Rico	South Sudan	South Sudan	Korea, Dem.	Korea, Dem.	Cuba
110	Chad	South Sudan	Liberia	Guinea-Bissa	Equatorial Gu	Puerto Rico	Cuba	South Sudan
111	South Sudan	Liberia	South Sudan	Puerto Rico	Puerto Rico	Liberia	Eritrea	Somalia
112	Somalia	Somalia	Somalia	Somalia	Somalia	Somalia	Somalia	Korea, Dem

Amongst countries that witnessed overall rank increases in economic infrastructure endowment over entire period, Seychelles (+60), Puerto Rico (+51), Israel (+48), Cabo Verde (+32), and Kuwait and Myanmar (+29) benefited the most. Similarly, amongst those that experienced rank decreases, Venezuela (-40), Yemen (-35), Syria (-34), Bahrain (-29) and Suriname (-25) suffered the most. A clearer picture of the situation emerges when the yearly fluctuations in these rankings are observed more closely. A demonstration, using ten top and bottom ranked countries for periods 2009-2016 inclusive, is shown on Table 3-4. A complete list of the overall and sub-index rankings of all involved countries is 26 pages long and could not be included in this thesis, however, it's available on request from the author.

Singapore, South Korea and Malaysia were the undisputed leaders in terms of infrastructure endowment throughout the observation period. Saudi Arabia never left the top ten and often fluctuated in ranking between 4th and 9th. Chile, Costa Rica, Jordan and Thailand moved in and out of the top ten class, while Panama and El Salvador both dropped from top ten after featuring consecutively for four and five years respectively. China and Brazil joined

and featured consecutively in top ten class within last four and five years respectively. China recorded the best move from 5th position in 2013 to replace Malaysia in 3rd position by 2016. Seychelles also recorded one of the best performances in the last two years and ranked 6th and 4th respectively. See Figure 3-4 below depicting trend changes for top ten countries within entire study period.
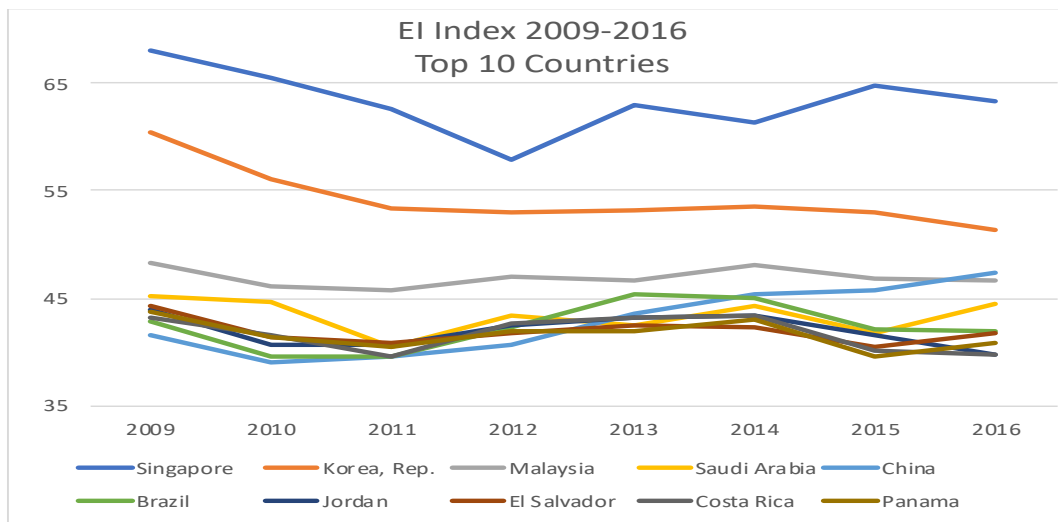
Figure 3-4: Overall EI endowment changes for top 10 countries over study period.

At the bottom of the classification table, Somalia features on the last position for six consecutive years. It just got replaced in 2016 by Korea Democratic People's Republic. South Sudan, Liberia and Puerto Rico are other regular bottom ranked countries. However, the highest escape from the bottom in the study is recorded by Puerto Rico from 111th position in 2013 to 58th in 2016. See Figure 3-5 below for more details.

Under availability of economic infrastructure sub-category, not surprising, Singapore took the lead and raked 1st position 63% of the times, followed by South Korea at 2nd position (50%) and Costa Rica at 3rd position 50% of the times. No surprises were observed at the bottom of the availability dimension; Somalia was noticeably present 88% of the times at the

last position, followed by Puerto Rico 63% of times. See Figure 3-7 in Appendix 2, P.126 for 8-year trend changes in top 10 countries in classification.
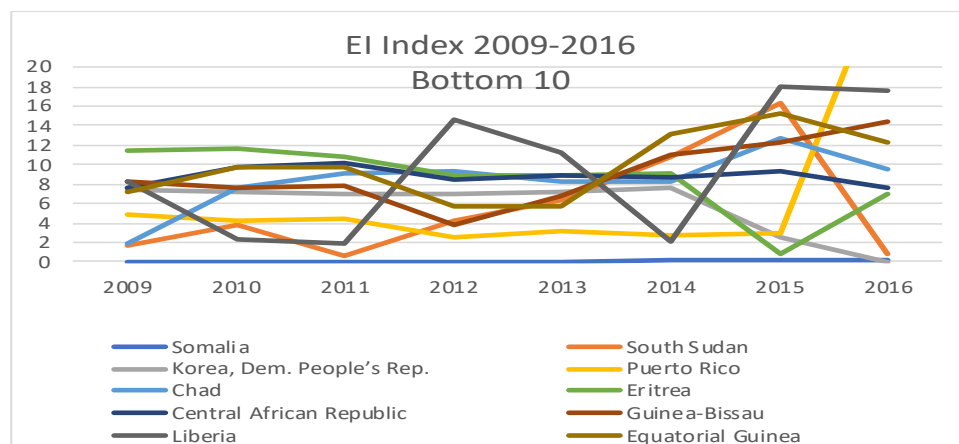
Figure 3-5: Overall EI Endowment Changes for Bottom 10 Countries over Study Period.

Under accessibility of economic infrastructure sub-category, not surprising, Singapore occupied the 1st position all through and South Korea occupied 2nd position 88% of the times. The 3rd rank was held by Israel 50% of the times and Bahrain 38% of the times. At the bottom of this dimension, Somalia is displaced at the last position by South Sudan, which occupied last rank 75% of the times followed by Chad 50% of times. See Figure 3-8 in Appendix 2, P.126 for 8-year trend changes in top 10 countries in classification.

Under economic infrastructure quality sub-category, without surprise, Singapore led the rankings all through, followed by South Korea, ranked 2nd all through as well. Malaysia, Israel and Panama ranked 3rd 37%, 25% and 25% of the times respectively. The worst ranks were reserved for South Sudan 50% of the times and Somalia 38% of the times, understandably destroyed by war. See Figure 3-9 in Appendix 2, P.127 for 8-year trend changes in top 10 countries in classification.

Finally, affordability of economic infrastructure sub-index reserves a lot of surprises; the all-time leader, Singapore, and all-time runner's up South Korea were flushed out of the 1st and 2nd positions by Bangladesh, Sudan, Colombia and some other countries. This may be

explained by the nature of relationship that exists between quality and cost; the higher the quality, the less affordable. Many different countries not previously highly ranked on other dimensions took the front ranks here, e.g. Venezuela, Angola, Senegal etc. The bottom was actually shared between many diverse countries both regular (North Korea, Somalia) and countries new to bottom (Puerto Rico, Myanmar, Israel) of the classification. See Figure 3-10 in Appendix 2, P.127 for 8-year trend changes in top 10 countries in classification.

The study also explored distribution of EI dimensions across three regions, i.e., Africa, Asia, and Latin America and the Caribbean. As evident from Figure 3-6 below, a comparison of top twenty five countries of each of these regions revealed that the Asian continent championed the classification table in accessibility and quality EI categories. During same period, Latin America and the Caribbean outperformed others in terms of EI availability, while the African continent finished best for EI affordability. The African continent occupied bottom positions for EI availability, EI accessibility and EI quality, while Latin America and the Caribbean occupied last place for EI affordability. Therefore, the Asian continent performed best overall in the top twenty five country classification in terms of EI dimensions, over entire study period.
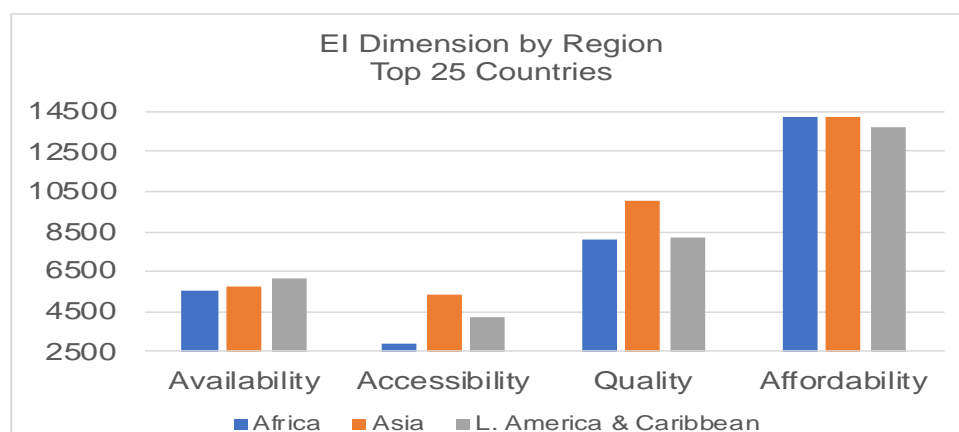
Figure 3-6: Distribution of EI Dimensions by Region over Study Period.

3.4.2 Correlation Matrix and Model Estimates

Below is a correlation matrix showing strength of the association between entrepreneurial transition (from nascent entrepreneurship to new business ownership), and selected control and explanatory variables. On average, a strong negative correlation seems to exist between said type of entrepreneurial transition and both levels of economic growth per capita and perceived national levels of corruption, in developing world countries. The other variables seem to be only weakly correlated

Table 3-5: correlation matrix and descriptive statistics, all variables in analyses

Variables	Mean	Std. Dev.	1	2	3	4	5	6
1: ETR_Log	-1.067	0.721						
2: GDPpcg_Log	0.587	0.226	-.452**					
3: Pcab	61.269	16.020	0.261	-0.156				
4: Fdi	3.631	3.458	0.293	0.179	-0.126			
5: TmRq	28.018	19.493	-0.129	-0.07	0.159	-.315*		
6: EII	34.313	11.026	0.033	0.157	-.512**	.348*	-0.144	
7: Pcorr	0.155	0.762	-.464**	0.096	.370*	-.630**	0.272	-.443**

Note: * = P<.05; ** = P<.01

Model 1 (table 3-6) is baseline model, and contrary to the no effect reported by Bergmann and Stephan (2013), economic growth is found to be a negative and statistical significant determinant of ETR. Also, perceived capability is positive and statistical significant determinant of ETR (Krueger and Brazeal, 1994; Arenius and Minniti, 2005; Koellinger et al., 2007). Contrary to reported positive effects of number of days required to start business on ETR by Bergmann and Stephan (2013), model 1 suggests rather a negative but statistically insignificant effect. Finally, FDI inflow (% of GDP) is also shown by model 1 to be a statistical significant and positive determinant of ETR.

In the first analysis, this study aimed to investigate the possible direct effects of EII and Pcorr on ETR in countries of the developing world economy. A positive effect had been predicted for EII (H1) and a negative effect for Pcorr (H2). As mentioned earlier, with the

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recommendation of Hausman's specification test (table 3-2, P.110), model 2 (table 3-6 below) was selected over model 3 to test hypotheses H1 and H2.

Table 3-6: Regression Estimates

In/Dependent Variables	Model 1 OLS	Model 2 OLS	Model 3 2SLS
GDPpcg_Log	-1.547***	-1.113***	-1.133***
	(.425)	(.403)	(.410)
Pcab	.011*	.021***	.016**
	(.006)	(.007)	(.007)
Fdi	.081***	.012	.021
	(.029)	(.033)	(.034)
TmRq	-.003		
	(.005)		
EII		.006	-.006
		(.012)	(.014)
Pcorr		-.491***	-.497***
		(.169)	(.175)
Constant	-1.052**	-1.844**	-1.207
	(.513)	(.773)	(.862)
R-Squared	0.405	0.539	
Adj. R-Squared	0.339	0.457	
Std. Error of Est	0.592	0.529	

$* P < .10, ** P < .05, *** P < .01$

Note: For all three models, ETR_log is dependent variable, coefficients are unstandardized and Std. errors are in brackets.

The results suggest no direct association between aggregated economic infrastructure and ETR, B = .006, SE = .012, ns. Therefore, hypothesis H1 was rejected. The results from model 2 also suggest that national levels of perceived corruption is a negative and statistical significant determinant of ETR, B = -.491, SE = .169, P<0.01. Therefore, hypothesis H2 was not rejected.

Table 3-7: Percentile bootstrap regression estimates

```
*************** PROCESS Procedure for SPSS Version 3.3 ******************
          Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
************************************************************************
OUTCOME VARIABLE:   Pcorr
Model Summary
 R           R-sq        MSE         F           df1         df2         p
 .7626       .5816       .2726       12.5110     4.0000      36.0000     .0000
Model
            coeff       se          t           p           LLCI        ULCI
constant    .4497       .7599       .5918       .5577       -1.0915     1.9908
EII         -.0218      .0111       -1.9602     .0577       -.0444      .0008
GDPpcg_l    .7970       .3752       2.1246      .0406       .0362       1.5579
Pcab        .0074       .0067       1.1157      .2719       -.0061      .0209
Fdi         -.1223      .0260       -4.6968     .0000       -.1751      -.0695
************************************************************************
OUTCOME VARIABLE:   ETR_log
Model Summary
 R           R-sq        MSE         F           df1         df2         p
 .7340       .5388       .2794       8.1766      5.0000      35.0000     .0000
Model
            coeff       se          t           p           LLCI        ULCI
constant    -1.8443     .7731       -2.3857     .0226       -3.4138     -.2749
EII         .0058       .0118       .4921       .6257       -.0182      .0299
Pcorr       -.4908      .1687       -2.9083     .0063       -.8333      -.1482
GDPpcg_l    -1.1134     .4029       -2.7633     .0091       -1.9314     -.2954
Pcab        .0205       .0068       2.9954      .0050       .0066       .0344
Fdi         .0124       .0335       .3704       .7133       -.0556      .0804
***************** DIRECT AND INDIRECT EFFECTS OF X ON Y ****************
Direct effect of X on Y
    Effect          se          t           p           LLCI        ULCI
     .0058       .0118       .4921       .6257       -.0182      .0299

Indirect effect(s) of X on Y:
         Effect      BootSE      BootLLCI    BootULCI
Pcorr    .0107       .0061       .0009       .0246
********************* ANALYSIS NOTES AND ERRORS ***********************
Level of confidence for all confidence intervals in output:   95.0000
Number of bootstrap samples for percentile bootstrap confidence intervals:   5000
Covariates: GDPpcg_Log, Pcab, FDI
```

In the second analysis, this study aimed to investigate if, and how Pcorr mediates the association between EII and ETR in countries of the developing world economy. A positive mediation effect had been predicted for Pcorr (H3) and, based on results from model 4 (table 3-7), a positive mediation effect of national levels of perceived corruption on association between EII and ETR was confirmed, B = 0.0107, SE = 0.0061, 95% CI = 0.0009, 0.0246. In fact, the association between EII and ETR was approximately 0.011 points higher due to mediation by national levels of perceived corruption. Therefore, hypothesis H3 was supported. Please, see table 3-8 below for a summary of hypotheses tested in this chapter and the respective outcomes.

Table 3-8: Summary of tested hypotheses and outcomes

Hypothesis	Definition	Outcome
Hypothesis 1	H0: EII affects entrepreneurial transition from nascent entrepreneurship to small business ownership positively H1: EII doesn't affect entrepreneurial transition from nascent entrepreneurship to small business ownership positively	H0 not rejected
Hypothesis 2	H0: Pcorr affects entrepreneurial transition from nascent entrepreneurship to small business ownership negatively H1: Pcorr does not affect entrepreneurial transition from nascent entrepreneurship to small business ownership negatively	H0 rejected
Hypothesis 3	H0: Pcorr mediates association between EII and entrepreneurial transition from nascent entrepreneurship to small business ownership positively H1: Pcorr does not mediates association between EII and entrepreneurial transition from nascent entrepreneurship to small business ownership positively	H0 rejected

3.5   Discussion, Conclusion, Study Limitations and Future Research

3.5.1 Discussion

In this study, two potential predictors (aggregated economic infrastructure and national levels of perceived corruption) of entrepreneurial transition from "taking steps to start a business" to "owner of young business" in countries of the developing world economy were examined. Economic infrastructure endowment was found to not directly affect the outcome variable, entrepreneurial transition. First possible explanation of this unexpected result could be the small sample size (42 cases) on which the analysis is based. With more available data in the future, further analyses could be undertaken to confirm or contradict this finding. The second and more logical explanation of this result is simply a confirmation of no direct relationship between the two constructs, at least in countries of the developing world economy.

It is common knowledge that various facets of entrepreneurial process (including entrepreneurial transition) are driven by entrepreneurial activities undertaken by potential and/or incumbent entrepreneurs. Given that a number of researchers have previously found some classes of economic infrastructure to be without direct effect on the new venture creation

process, it is not surprising that an aggregation of related indicators should give similar empirical results. For example, presence of highway and railway were not found to directly influence locations and/or activities of new firms in Germany and Belgium respectively (Audretsch et al., 2015; Bartik, 1985). McCoy et al. (2018) equally found airport proximity statistically insignificant on activities and locations of indigenous firms operating in low-tech industry in Ireland.

The abundance of economic infrastructure in most developed world countries often lead to saturation and a possible justification for their lack of influences on new venture creation. On the contrary, countries of the developing world economy are often short on economic infrastructure endowments, reason a positive effect was expected with their provisions. However, the often protracted absences, limitations and/or high costs of these amenities over the years might have caused potential and incumbent entrepreneurs in developing world countries to build their entrepreneurial initiatives around resources other than infrastructure or categories of infrastructure different than economic (e.g. social infrastructure). In which case benefits of economic infrastructure may require longer existence and continuous sensitization to show any direct and significant effects on entrepreneurial activities, and entrepreneurial transition by extension. Therefore, the effects of most classes of economic infrastructure may rather be indirect, especially in the short term.

National differences in levels of entrepreneurial activity could be important to explain variability in entrepreneurial transition rates; attitudes towards economic infrastructure may be influenced by their availability, affordability and suitability, which in turn may promote or discourage their accessibility and use by people currently engaged or looking to get involved in entrepreneurial process. According to Friedman (2011), trust in government effectiveness, political stability, rule of law, and voice in government affairs are relevant determinants for individuals willing to take the risks associated with investing, starting and managing new

businesses. Government effectiveness could also be evaluated from the perspective of a government's ability to reduce corruption. Above and beyond conventional wisdom, empirical findings suggest that the fostering of greater entrepreneurial activity in a given country is stimulated by better control of corruption, a solid and effective regulatory framework, clearly-define property rights, transparent and easy procedures for starting new ventures, as well as efficient political and economic institutions (Anokhin and Schulze, 2009; Klapper et al. 2006, 2007).

Another major objective of this study was to investigate nature of the relationship between national levels of perceived corruption and entrepreneurial transition from "taking steps to start a business" to "owner of young business" in countries of the developing world economy. A negative and direct relationship was hypothesized for the two constructs and results confirmed the nature and direction of the relationship. Corruption perceptions have been shown capable of not only magnifying uncertainties and risks associated with the venture creation process, they also have the potential to greatly negate attitudes of engaged persons, willing, and capable of transitioning to the next stage in the entrepreneurial process. Therefore, to promote entrepreneurial transitions, it will be in the utmost interest of every government in the developing world economy to put in place a mechanism to fight against corruption, and reduce levels of such perceptions amongst their citizens.

Furthermore, findings revealed that, for persons engaged in venture creation, perceptions of personal capabilities, skills, and experience are very important ingredients of entrepreneurial transition in developing world countries, especially for moving from "taking steps to start a business" to "owner of young business." Governments in developing world countries should strengthen the feelings/perceptions of potential and incumbent entrepreneurs through continuous human resource training and skill development programmes, and entrepreneurship education as a strategy to promote entrepreneurial process in their respective

countries. Foreign direct investment was also found to stimulate this type of transition in developing countries because of the possible increase in the levels of competition caused by such inflows. Therefore, governments should encourage foreign owned ventures in their countries as an additional strategy for entrepreneurial transition wherever and whenever necessary (care taken not to harm local start-up initiatives).

Finally, a third objective of this study was to find out if, and how the relationship between economic infrastructure (aggregate) and entrepreneurial transition was mediated by national levels of perceived corruption. A mediated relationship was predicted, and result confirmed that national levels of perceived corruption mediated the relationship between the two constructs fully. Although no direct effect of economic infrastructure was found on entrepreneurial transition in countries of the developing world economy, however, there was an indirect influence through national levels of perceived corruption. Early stages of the firm formation process is particularly marked by the activities of latent entrepreneurs, nascent entrepreneurs, or even new business owner-managers, who may not only be short on financial resources, but also in relevant information and related non-financial resources. The availability and easy access to some basic economic infrastructure (such as mobile phone, broadband internet, fixed telephone etc.) could facilitate networking, lower the cost, and improve quality of needed information imperative to steer transition across the early phases of the venture creation process.

Accordingly, Audretsch et al. (2015) opine that "infrastructure can enhance connectivity and linkages that facilitate the recognition of entrepreneurial opportunities and the ability of entrepreneurs to actualize those opportunities." Such connectivity and linkages are not short of what is needed and necessary to bridge and smoothen the working relation between an established system of government and a dedicated set of willing and capable individuals interested in undertaking entrepreneurial activities. Such connectivity and linkages do not only

serve as sustainable sources of social capital, but also form the foundation upon which effective and efficient measures are developed to monitor, track down and report corrupt practices by both government officials and potential and incumbent entrepreneurs. The availability and easy access to good roads, for example, permit government officials to move quickly around the country to investigate allegations of corruption and prompt report of such investigations also have potentials to reduce levels of perceived corruption within a given country.

Therefore, economic infrastructure promotes entrepreneurial transition from "taking steps to start a business" to "owner of young business" in countries of the developing world economy by contributing to lower levels of perceived corruption by citizens of said countries. Accordingly, it's imperative for central governments to work together with engaged and potential entrepreneurs in their respective countries to define corruption, and adopt strategies to promote the use of suitable classes of economic infrastructure to fight it. Finally, in order to introduce and promote competition between countries, they should be ranked regularly by their overall endowments in economic infrastructure. This competition has potential to indirectly increase both national and regional entrepreneurial transition rates from "taking steps to start a business" to "owner of young business", at least in countries of the developing world economy.

3.5.2 Conclusion

The main objective of this study was threefold: to construct and use an economic infrastructure index to rank over a hundred developing world countries, then examine nature and type of relationship between the index and entrepreneurial transition of some forty two of those countries; to evaluate nature of the effect of national levels of perceived corruption on entrepreneurial transition of same forty two countries of the developing world; and to find out if, and how relationship between the index and entrepreneurial transition rate from "taking steps to start a business" to "owner of young business" is mediated by national levels of

perceived corruption in those same countries of the developing world economy. All these were done and the hypotheses in the study were also successfully tested and the findings reported.

3.5.3 Study Limitations and Future Research

Limitations, especially related to the second part of this research, include small sample size (42 countries) due to limited country data availability from GEM between 2009-2016. Future studies of the relationship between economic infrastructure and entrepreneurship transition rate should consider investigating the possible influences of time, i.e., a longitudinal approach should be adopted. Future research should also exploit the possible interaction between culture and economic infrastructure on some other aspects of the entrepreneurial process within developing world countries.

In the next chapter, this thesis examines if, and how different dimensions of economic infrastructure (disaggregated EII) affect two categories of entrepreneurs often known to have different motives for engaging at entrepreneurship, i.e., opportunity and necessity-motivated entrepreneurs in developed world countries. In the same chapter, state fragility is also evaluated as a possible medium (mediator) through which some of these EII dimensions influence opportunity and/or necessity-motivated entrepreneurs in 31 countries of the developed world economy.

Appendix 2
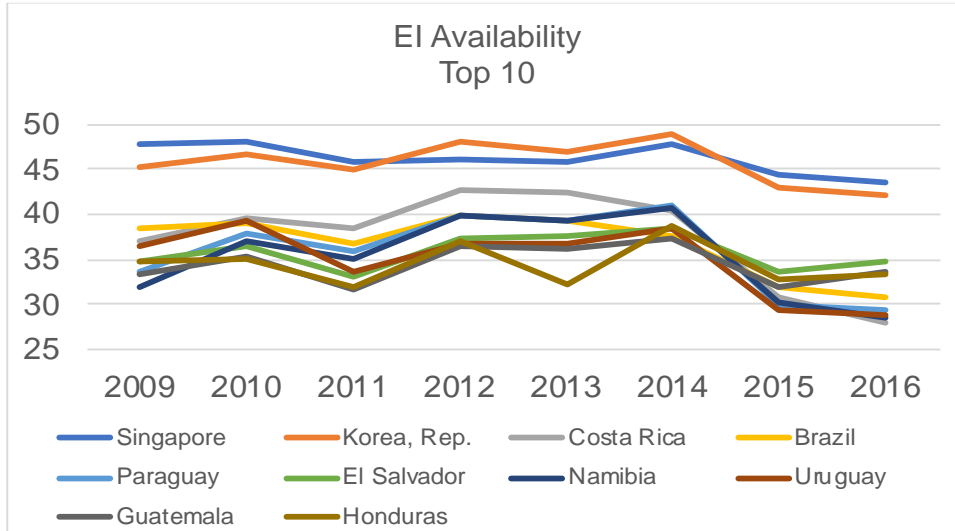
Figure 3-7: EI Availability Changes for Top 10 Countries over Study Period.
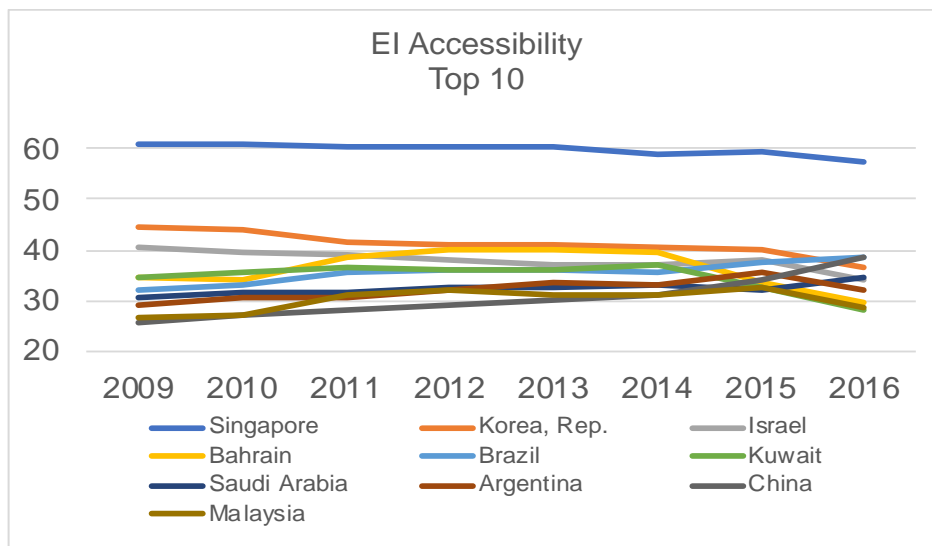
Figure 3-8: EI Accessibility Changes for Top 10 Countries over Study Period.

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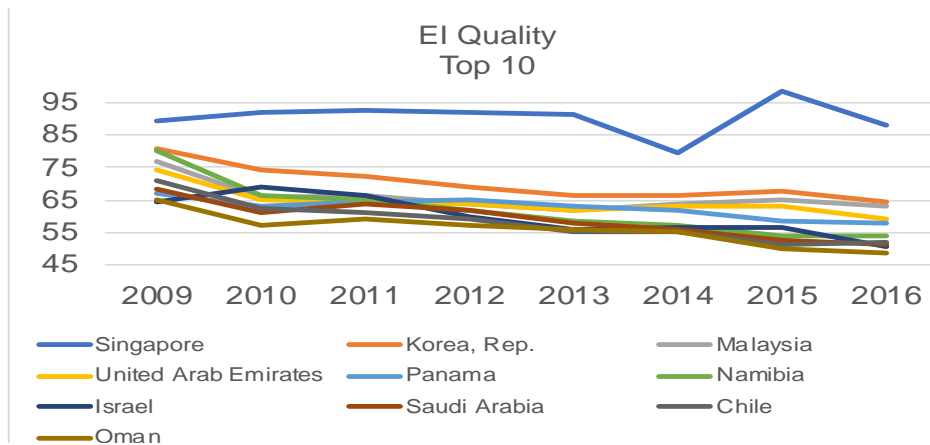
Figure 3-9: EI Quality Changes for Top 10 Countries over Study Period.
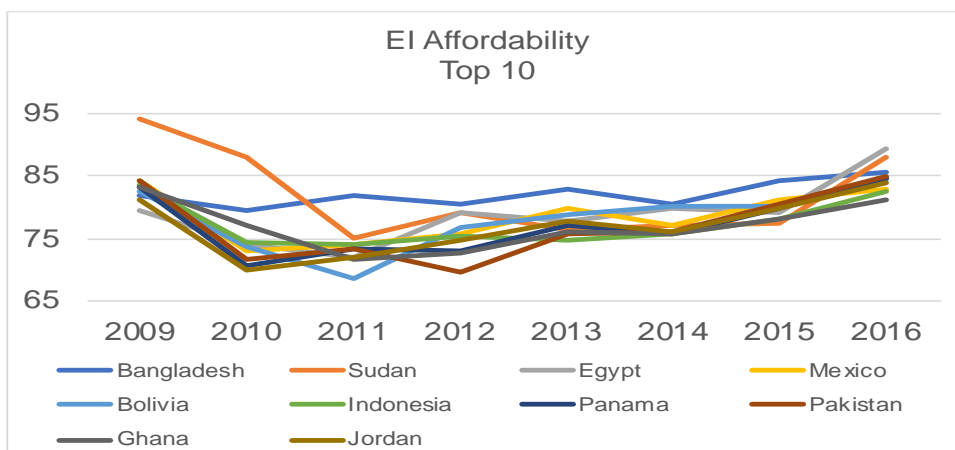
Figure 3-10: EI Affordability Changes for Top 10 Countries over Study Period.

Table 3-9: Pcorr and EII replaced by GCI and CPI in OLS regression

Model Summary

	R	R Square	Adj. R Square	Std. Error of Est
	.722[a]	0.521	0.453	0.53851

a. Predictors: GDPpcg_log , Pcab, Fdi, CPI, GCI

Coefficients[a]

	B	Std. Error	Beta	Sig.
(Constant)	-2.448	0.829		0.006
GDPpcg_log	-1.195	0.413	-0.372	0.006
Pcab	0.017	0.008	0.37	0.033
Fdi	0.021	0.033	0.102	0.524
CPI	-0.025	0.009	-0.505	0.008
GCI	-0.002	0.013	-0.03	0.879

a. Dependent Variable: ETR_log

Table 3-10: Regional Differences Controlled in OLS regression

<u>Model Summary</u>

	R	R Square	Adj. R Square	Std. Error of Esti
	.785[a]	0.616	0.505	0.51234

a Predictors: Pcab, ECA, Fdi, MENA, SA, LAC, GDPpcg_Log , Pcorr, EII
b Dependent Variable: ETR_log

<u>Coefficients[a]</u>

	B	Std. Error	Beta	Sig.
(Constant)	-2.081	0.848		0.02
Pcorr	-0.451	0.165	-0.474	0.01
EII	0.008	0.014	0.115	0.546
ECA	-0.075	0.544	-0.016	0.892
LAC	-0.196	0.226	-0.129	0.394
MENA	0.025	0.287	0.011	0.931
SA	-0.826	0.408	-0.247	0.052
GDPpcg_Log	-0.143	0.054	-0.367	0.012
Fdi	0.014	0.034	0.069	0.672
Pcab	0.019	0.008	0.426	0.023

a Dependent Variable: ETR_log

Note: ECA=Europe & Central Asia; LAC=Latin America & the Caribbean;
MENA=Middle East & North America; SA=South Asia

Table 3-11: Summary Definition and sources of indicators used in EI index

Indicator	Definition	Source
Availability of economic infrastructure	A dimension of economic infrastructure which captures its supply or presence, as well as spatial coverage and/or extension.	Author
Rail lines (total route in km/population density)	Total length of route in km divided by population density	Author's calculation, data from International Union of Railways (UIC)/World Bank.
Computer, communications and other services (% of commercial service imports)	Percentage of commercial service imports such as international telecommunications, postal and courier services, computer data, news-related service transactions, construction services, royalties and license fees etc.	International Monetary Fund/World Bank
Renewable energy electricity output (% of total electricity output)	Percentage of total electricity output of wind, solar PV, solar thermal, hydro, marine, geothermal, solid biofuels, renewable municipal waste, liquid biofuels and biogas. Hydro pumped storage excluded.	International Energy Agency/World Bank
Alternative and nuclear energy (% of total energy use)	Percentage of total non-carbohydrate energy use, e.g., hydro, nuclear, geothermal, and solar power etc.	International Energy Agency/World Bank
ICT goods imports (% total goods imports)	Percentage of total goods imports such as computers and peripheral equipment, communication equipment, consumer electronic equipment, electronic components etc.	UNCTAD/World Bank
Transport services (% of commercial service imports)	all transport services (sea, air, land, internal waterway, space, and pipeline) performed by residents of one economy for those of another.	International Monetary Fund/World Bank/Doing Business project.
Automated teller machines (ATM per 100,000 adults)	Number of computerized telecommunications devices providing access to financial transactions in a public place per 100,000 adults.	International Monetary Fund/World Bank
Commercial bank branches (branches per 100,000 adults)	Number of retail locations physically separated from the main office, but not organized as legally separated subsidiaries per 100,000 adults.	International Monetary Fund/World Bank/Doing Business project.
Bank concentration (%)	Assets of three largest commercial banks as a share of total commercial banking assets.	World Bank/Bankscope
Aircraft, spacecraft, and parts imports per capita	Annual importation of powered and non-powered aircraft (e.g. helicopter, airplanes, satellites, gliders, balloons and dirigibles), parachutes, and aircraft launching gears etc. expressed in thousands dollar per total population.	Author's calculation, data from International World Trade Centre
Personal remittances received per capita (current US$)	comprise personal transfers and compensation of employees; including all current transfers between resident and non-resident individuals	World Bank

Energy imports, net (% of energy use)	use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport A negative value indicates that the country is a net exporter.	IEA Statistics/World Bank
Fuel imports (% of merchandise imports)	Fuels comprise the commodities in SITC section 3 (mineral fuels, lubricants and related materials).	World Bank/UN Division
Bank capital to assets ratio (%)	Ratio of bank capital and reserves to total assets	International Monetary fund/International financial statistics
Accessibility to economic infrastructure	A dimension of economic infrastructure which captures its full and profitable usage, that is, the utilization ability and capacity to accommodate needs for which they are made.	Author
Air transport, registered carrier departures worldwide/Pop Dens.	Registered carrier departures worldwide are domestic take-offs and take offs abroad of air carriers registered in the country.	Author's calculation, data from International Civil Aviation Organization/World Bank.
Railways, passengers carried (ton-km per capita)	Number of passengers transported by rail times kilometres travelled relative to population.	Author's calculation, data from UIC/World Bank.
Individuals using the internet (% of population)	Persons who used the Internet from any location in the last 3 months.	International Union of Railways (UIC)/World Bank.
Access to electricity (% of population)	The percentage of population with access to electricity.	World Bank
Access to clean fuels and technologies for cooking (% of population)	the proportion of total population primarily using clean cooking fuels and technologies for cooking	World Bank
Personal Remittances, paid (current US$)	comprise personal transfers and compensation of employees; including all current transfers between resident and non-resident individuals	World Bank
Container port traffic (per sq.km)	Flow of containers from land to sea transport modes, and vice versa, in twenty-foot equivalent units	Author's calculation, data from UNCTAD/World Bank
Mobile cellular subscriptions (per 100 people)	Subscriptions to a public mobile telephone service that provide access to the PSTN using cellular technology	ITU/World Bank
Fixed broadband subscriptions (per100 people)	high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. Includes cable modem, DSL, fibre-to-the-home/building etc.	ITU/World Bank
Fixed telephone subscriptions (per 100 people)	Sum of active number of analogue fixed telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones.	ITU/World Bank
Electric power consumption (kWh per capita)	Production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants.	IEA Statistics/World Bank
Air transport, passengers carried (per 100 population)	Domestic and international aircraft passengers of air carriers registered in the country.	Author's calculation, data from International Civil Aviation Organization/World Bank.
Renewable energy consumption (% of total final energy consumption)	The share of renewable energy in total final energy consumption.	World Bank
People using safely managed drinking water services (% of population)	Percentage of population using drinking water from an improved source that is accessible on premises, available when needed and free from faecal and priority chemical contamination	WHO/UNICEF
Depositors with commercial banks (per 1,000 adults)	Number of deposit accounts held by resident customers (nonfinancial-corporations) and households at commercial banks	IMF/World Bank
Bank deposits to GDP (%)	Demand, time and saving deposits in deposit money banks as a share of GDP.	IFS/IMF/WORLD BANK
Quality of economic infrastructure	A dimension of economic infrastructure which captures its durability, reliability, timeliness and/or convenience e.g. service adequacy, suitability and promptness.	Author
Time required to get electricity (days)	The number of days to obtain a permanent electricity connection.	World Bank/Doing Business
Quality of port infrastructure	Business executives' perception of their country's port facilities where 1=extremely underdeveloped; 7=well developed and efficient by international standards	World Bank/World Economic Forum
Quality of road	Perceptions of extensiveness and condition of road infrastructure where 1 = extremely poor—among the worst in the world; 7 = extremely good—among the best in the world	World Economic Forum
Quality of railroad	Perceptions of railroad system condition where 1 = extremely underdeveloped— among the worst in the world; 7 = extensive and efficient—among the best in the world	World Economic Forum
Quality of electricity supply	Perceptions of the reliability of electricity supply-lack of interruptions and lack of voltage fluctuations where 1 = extremely unreliable; 7 = extremely reliable	World Economic Forum
Secure Internet servers (per million people)	Number of distinct, publicly-trusted TLS/SSL certificates found in the Netcraft Secure Server	Author's calculation, data from Netcraft/World Bank

Electric power transmission and distribution losses (% of output)	Losses in transmission between sources of supply and points of distribution and in the distribution to consumers, including pilferage	IEA Statistics/World Bank
CO2 emissions from electricity and heat production, total (% of total fuel combustion)	Emission of carbon dioxide from main activity producers, unallocated auto producers, and other energy industries producers of electricity and heat	IEA Statistics/World Bank
Affordability of economic infrastructure	A dimension of economic infrastructure which enables users to match its cost (both physical and services) to its value, i.e., prompt and valuable services provided at acceptable prices	Author
Cost to import (US$ per container)	The fees levied on a 20-foot container in U.S. dollars.	World Bank/Doing Business Project
1GB Mobile-broadband basket postpaid computer based(% GNI per capita)	Monthly entry-level fixed-broadband plan paid upfront. It is calculated as a percentage of a country's average monthly GNI p.c., and is also presented in USD and PPP$.	International Telecommunication Union (ITU)
Pump price for diesel fuel (US$ per liter)	Pump prices of the most widely sold grade of diesel fuel	German Agency for International Cooperation (GIZ)/World Bank
Getting electricity (% of income per capita)	The cost to get electricity	World Bank/Enterprise Survey
Average transaction cost of sending remittances to (% of average total cost)	The average of the total transaction cost in percentage of the amount spent for sending USD 200 to the country	World Bank
ICT price baskets-fixed broadband basket (% GNI per capita)	The price of a standard basket of mobile monthly usage for 30 outgoing calls per month (on-net/off-net to a fixed line and for peak and off-peak times) in predetermined ratios, plus 100 SMS messages	ITU
ICT price baskets-mobile cellular basket (% GNI per capita)	The price of a monthly subscription to an entry-level fixed-broadband plan. It is calculated as a percentage of a country's average monthly GNI p.c., and is also presented in USD and PPP$.	ITU
Bank overhead costs to total assets (%)	Bank operating expenses as a share of the value of total assets held	Global financial development/ Bankscope, Bureau van Dijk (BvD)
Economic Infrastructure Index	An aggregation of the weighted variabilities of economic infrastructure availability, accessibility, quality, and affordability	Author

Countries involved in this study:
Afghanistan, Algeria, Angola, Argentina, Bahrain, Bangladesh, Barbados, Belize, Benin, Bolivia, Botswana, Brazil, Brunei, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo Democratic Republic, Congo Republic, Costa Rica, Cote d'Ivoire, Cuba, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Indonesia, Iran, Iraq, Israel, Jamaica, Jordan, Kenya, North Korea, South Korea, Kuwait, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Puerto Rico, Qatar, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Somalia, South Africa, South Sudan, Sri Lanka, Sudan, Suriname, Syria, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, United Arab Emirates, Uruguay, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

Chapter Four

Economic Infrastructure Dimensions and Opportunity and Necessity Entrepreneurship: The Mediating Effect of State Fragility

4.1   Introduction

Starting a new business is a complex process that involves a variety of motivations and stimuli (Birley and Westhead, 1994; Stephan et al., 2015). The motivation for founding a business is known as entrepreneurial motivation (Hessels et al., 2008) and researchers often distinguish individuals involved in this type of entrepreneurship into two, i.e., those who start businesses because they see a business opportunity, and those who pursue entrepreneurship for lack of better employment options. According to Reynolds et al. (2005), individuals who engage in the venture creation process to take advantage of a business opportunity are considered opportunity-motivated entrepreneurs, whereas those who engage in the process because of no better work choices are considered necessity-motivated entrepreneurs. These two groups of entrepreneurs fall under opportunity-motivated entrepreneurship (OME) and necessity-motivated entrepreneurship (NME) respectively. Generally, studies in this area of research are grouped under two broad categories: individual-level and country-level. While former category studies explore whether and how entrepreneurs differ from the population in general or from managers, studies in the latter category look at motives on an aggregate level and focus on variance in entrepreneurial motivations across countries (Hessels et al., 2008). This study falls under the latter category.

New venture creation process often requires most entrepreneurs to, amongst other things, create opportunities and acquire needed resources (Renko et al., 2015), however, opportunity exploitation and resource acquisition may be more effective in some contexts and less effective

in others (Vecchio, 2003). In the context of OME, access to appropriate infrastructure could promote opportunity recognition, evaluation and exploitation, however, the case may be different in the context of NME. Consistently, Audretsch et al. (2015) suggested that infrastructure prevalence can enhance connectivity and linkages that facilitate the recognition of entrepreneurial opportunities and the ability of entrepreneurs to actualize those opportunities.

Krakowiak-Bal et al. (2017) stated that infrastructure can generally be distinguished into physical, social and economic infrastructure. In chapter two, infrastructure was broken into four categories, i.e., economic, social, institutional, and technological infrastructure categories, and it was argued that each category has the potential to influence entrepreneurial activity differently. Jimenez (1995) stated that economic infrastructure typically exists not for its own sake but rather to support various kinds of economic activity. Although new venture creation is one of such economic activities generally said to be supported by infrastructure prevalence, Van der Zwan et al. (2016) regretted that studies have not yet compared opportunity and necessity entrepreneurs with respect to their perceptions of the entrepreneurial support infrastructure.

Aside prevalence, Estache and Goicoechea (2005) suggested that infrastructure can also be distinguished by their quality, accessibility and affordability. For example, Fourie (2006) argued that cheaper electricity could reduce the input costs in the production process, and be of direct benefit to manufacturing industries, while improvements in water infrastructure may also lower the cost of irrigation, and be of direct benefit to farmers. Both electricity and water supplies fall under the economic infrastructure category, suggesting that affordability and quality of economic infrastructure have the potential to benefit their users directly. Necessity-driven and opportunity-driven entrepreneurs are potential users of economic infrastructure in

the entrepreneurial process and may behave differently if provided access to low quality affordable economic infrastructure, as opposed to high quality unaffordable ones.

Probably with support of adequate and reliable economic infrastructure dimensions, necessity-driven and opportunity-driven entrepreneurs contribute in keeping local and international trades alive, by creating goods and services, and/or improving on existing ones. Fourie (2006) stated that there can be no trade without adequate and reliable infrastructure, and Francois and Manchin (2013) confirmed that trade depends on institutional quality and ability of exporter and importer to access well-developed transport and communications infrastructure. In fact, infrastructure inadequacy in Nigeria, for instance, has resulted in sufferings among individuals and organisations, and raises the need for an urgent and rapid improvement of infrastructure quality by the government (Akinwale, 2010). According to findings by Portugal-Perez and Wilson (2012), improvement in infrastructure quality brings the greatest benefits in terms of trade gains. However, knowledge of whether such benefits differ in specific aspects of trade, such as new venture creation, in the contexts of OME and NME is rare in the literature.

In similar context, Amorós et al. (2019) reported that, studies that compare these two groups based on quality of governance and the effectiveness of existing institutions are scant. Although markets and private parties are increasingly playing important roles in the general provision of infrastructure, most governments across the world still lead as providers, coordinators, and regulators of economic infrastructure. Fourie (2006) pointed that, not only is the provisioning of economic infrastructure at a national level one key role of a government, but also, government intervention is required to provide an optimum level of infrastructure that would maximize the welfare of society. For example, the government is expected to ensure that economic infrastructure is properly managed and openly accessible to needy inhabitants (entrepreneurs included). However, this doesn't suggest that access is free; people actually

need to pay to gain access to economic infrastructure. For example, inhabitants pay telephone companies to have calls routed across their lines, inhabitants pay tolls to access highways, inhabitants buy stamps to send letters etc. The requirement to pay in order to gain access could actually serve as a constraint to some needy individuals willing to use them. Even more, quality is often closely associated with cost such that the better the quality of an economic infrastructure, the higher the cost is likely to be. Given that constraints, especially financial, have been reported to have negative influence on people's decision to start-up a business (Grilo and Irigoyen, 2006), it's highly probable that, through such government interventions, accessibility and affordability of economic infrastructure will impact OME and NME differently in countries of the developed-world economy.

Poor selection of infrastructure projects, poor maintenance of infrastructure, and poor ability to improve overall access to infrastructure are all linked to institutional choices (Estache, 2016). According to Fisher (2016), a government is capable to demonstrate its responsibility of ensuring that public infrastructure is sustainable, accessible, and affordable by instituting strong links between infrastructure development phase and the fiscal framework of the country. The inability of states to demonstrate such responsibilities for the benefit of their population has the potential to influence the attitudes and behaviours of incumbent motivation-driven entrepreneurs in a given country. State fragility is said to capture the extent to which the state is capable of exercising its governance role of establishing regulatory rules, enforcing them, and providing basic public goods and services.

Ault and Spicer (2014) define state fragility as the degree to which state power is unable and/or unwilling to deliver core functions to the majority of its people, i.e., security, protection of property, basic public services, and essential infrastructure. High levels of state fragility essentially depicts low quality of governance in which case established rules and regulations are non-existent or poorly executed, which has the potential to influence infrastructure related

decision-making over time. Therefore, state fragility is a possible mechanism through which some of the highlighted economic infrastructure dimensions could influence OME and NME in countries of the developed world economy. This author is not aware of any studies that link economic infrastructure in general, and/or its dimensions in particular, to motivation-driven entrepreneurship through state fragility, in the literature.

This chapter is intended to fill gaps outlined above, by analysing the differences between opportunity-motivated entrepreneurs and necessity-motivated entrepreneurs in terms of (1) their perceptions of the dimensions of a specific entrepreneurial support instrument (economic infrastructure); (2) their preferences for governance quality (state fragility), and how such choices tend to mediate (or to not mediate) associations between selected dimensions of economic infrastructure (accessibility and affordability) and OME and NME in countries of the develop world economy. More specifically, this study aims to provide answers to the following three questions:

a) Does availability, accessibility, quality or affordability of economic infrastructure influence OME and NME in countries of the developed world economy?

b) Does economic infrastructure affordability moderate the relationship between economic infrastructure accessibility and OME and NME in countries of the developed world economy?

c) Are associations between economic infrastructure accessibility and OME and NME, economic infrastructure affordability and OME and NME, in countries of the developed world economy, mediated by state fragility?

This study contributes to entrepreneurial motivation literature in two ways: first, it ushers a novelty in the manner of conceptualizing motives for undertaking entrepreneurial activities by scrutinizing how two types of entrepreneurial activities (opportunity-motivated and necessity-motivated) may change with provisioning of different attributes of economic infrastructure; this is original and not previously studied in the OME and NME literature. Second, it demonstrates that state fragility is not a concept entirely limited to the developing world economy but that a level of fragility is also present in the developed world economy and

serves as a mechanism through which various dimensions of economic infrastructure may indirectly affect incumbent entrepreneurs in the context of OME and NME. This revelation may assist policy makers in drawing up and instituting effective and efficient national regulatory frameworks, especially related to infrastructure policies.

The remainder of this chapter is organized as follows: theoretical framework, review of previous studies, and hypothesis development is presented in section two. Section three provides details on philosophy, strategy, and method of research. Section four presents results, and section five is reserved for discussion, conclusion, and study limitations.

4.2   Theoretical Framework, Previous Studies & Hypothesis Development

4.2.1 Theoretical Framework

4.2.1.1 Entrepreneurial Motivation (Motivation-Driven Entrepreneurship)

Psychologists have shown that different human motivations, such as need for achievement, locus of control, desire for independence, passion, drive etc., influence many aspects of human behaviour (Shane et al., 2003). In fact, Amorós et al. (2019) stated that motivations for taking entrepreneurial decisions are many and different; generally, human motivation is not always so clear cut such that researchers of entrepreneurship motivation often differentiate individuals who start businesses because they see a business opportunity from those who pursue entrepreneurship for lack of better employment options. Hessels et al. (2008, P.325) simply defined entrepreneurial motivation as motivation for founding a business, and Carter et al. (2003) distinguished between six categories of motivation: innovation, independence, recognition, roles, financial success and self-realization.

In entrepreneurship, motivations are generally distinguished into 'push' and 'pull' factors. Van der Zwan et al., (2016) described 'pull' motivations as positive factors that pull

people into entrepreneurship, and 'push' motivations as negative factors that push people into entrepreneurship. Some examples of 'pull' motivations include the need to learn, to challenge, and to achieve, the desire to be autonomous, the quest for recognition, and opportunities for social development. Moreover, 'Push' motivations may arise from unemployment, family pressure, and individuals' general dissatisfaction with their current situation (Stephan et al., 2015; Van der Zwan et al., 2016).

In the Global Entrepreneurship Monitor (GEM), Reynolds et al. (2005) made distinction between pull and push motivations by introducing the concept of OME and NME. Although various measures of OME and NME exist, it is a generally agreed fact that pull factors form the basis for opportunity entrepreneurs to set up a new venture, while necessity entrepreneurs are driven mainly by push motivations (Van der Zwan et al., 2016).

Motive to start a firm can be classified as either opportunity or necessity (Acs, 2006) and, by definition, opportunity entrepreneurship reflects start-up efforts ''to take advantage of a business opportunity'', whereas necessity entrepreneurship exists when there are ''no better choices for work'' (Reynolds et al., 2005 , P. 217). Accordingly, and from this perspective, OME can be distinguished from NME (Nikolaev et al., 2018).

In most studies on decision to become self-employed, motivation is usually connected to unemployment; however, the wish to be independent is generally agreed upon as the dominant factor explaining new venture creation (Van der Zwan et al., 2016; Stephan et al., 2015). There are other factors that may cause individuals to engage into new venture creation, for example, family pressure (Giacomin et al. 2011); individuals dissatisfied with their jobs (Hisrich and Brush 1986; Cromie and Hayes 1991), the prevalence of economic infrastructure (Holl, 2004), or even the level of state fragility (Amorós et al., 2019).

4.2.1.2 Economic Infrastructure and State Fragility as Entrepreneurial Motivators/Inhibitors

Many previous studies have demonstrated the positive contributions made by different sub-classes of economic infrastructure in the new venture creation process in some developed-world countries. For example, airport prevalence is positively associated with venture creation in Spain (Holl and Mariotti, 2018) and US (Sheard, 2019; Bilotkach, 2015). The same is true for the prevalence of highway in UK (Gibbons et al., 2019) and Belgium (Verhetsel et al., 2015), while broadband internet prevalence is positive in the US (Whitacre et al., 2015). As a location-based support for people seizing and enacting entrepreneurial opportunity (woolley, 2017), economic infrastructure is reported to benefit its users both directly and indirectly (Fourie, 2006). A reduction in transportation cost, for example, will decrease unit costs of moving material production inputs from markets to production centres, and finished goods to markets from production centres.

In fact, due to the reduction in transportation cost, overall cost of goods sold will drop as a direct benefit to manufacturers. Such reductions could result, for example, from improvements in road quality, which minimize traffic delays and fuel costs. Improvements in road quality, thus, benefit said manufacturers indirectly, through the reduction in transportation cost. In some circumstances, it's rather these and similar direct and indirect benefits to manufacturers and other entrepreneurs, which motivate or discourage them from getting involved in the new venture creation process. Moreover, not only are improvements in infrastructure quality said to bring the greatest benefits in terms of trade gains (Portugal-Perez and Wilson, 2012), but also, ability of governments, through high quality institutions, to facilitate access to these improved infrastructure is said to be at the very essence of trade (Francois and Manchin, 2013). Accordingly, the quality and contribution of government institutions in instituting and executing infrastructure regulatory policies in a country are potential entrepreneurial motivators/inhibitors.

Fourie (2006) suggested that government intervention is required to provide an optimum level of infrastructure that would maximize the welfare of society. Such interventions by local and central governments are often done through well-developed institutions. However, if those institutions are weak or inexistent, interventions may be poor or ineffective. The extent to which the state is capable of exercising its governance role of establishing regulatory rules, enforcing them, and providing basic public goods and services is known as state fragility (Ault and Spicer, 2014). High state fragility may result when a country is unable and/or unwilling to provide basic rules and sound regulations to ensure the smooth functioning of its economic and other sectors. Corruption and unemployment, for example, may result from poor labour market entry regulations, and have potential to influence OME and NME (La Porta et al., 2008). Even regulatory frameworks that guide the access, quality and cost of certain sub-classes of economic infrastructure are instituted and executed by state institutions. If these institutions are weak or inexistent, a country may end up with available but inaccessible economic infrastructure, high-quality but unaffordable economic infrastructure, affordable but inaccessible economic infrastructure etc. Therefore, the level of state fragility in a country can indirectly encourage or discourage individuals, who often have different motives for engaging into new venture creation.

4.2.1.3 Previous Studies

Previous studies suggested OME and NME are largely determined by the level of economic development in the long run and the actual state of the economy in the short run (Hessels et al., 2008). Some studies (Wennekers et al., 2005; Block and Wagner, 2010) reported that NME is more common in lower-income countries and/or regions and influenced negatively by Gross domestic product (GDP) per capita. Amorós and Stenholm (2014) stated that higher economic development together with better quality of institutions reduces the prevalence of

NME. However, contrary to these findings, van Stel et al. (2007) found GDP growth to not have any effect on NME and a positive effect on OME. The proportion of former employed individuals is lower within NME than OME (Block and Wagner, 2010), and social security contribution influences NME positively, and OME negatively (Hessels et al., 2008). Further, reports from empirical studies suggested that necessity entrepreneurs are less likely to be involved in product innovation than opportunity entrepreneurs (Darnihamedani and Hessels, 2016). Seemingly, the lone previous study that investigated the effect of state fragility in the context of OME and NME is that by Amorós et al. (2019). Their results suggested that the level of economic development moderates the association between state fragility and NME, whereas state fragility itself tends to promote NME, and inhibits OME. Few previous studies seem to have linked economic infrastructure directly or indirectly to OME and NME; neither direct effects of economic infrastructure dimensions nor their indirect effects (through, say state fragility) have been investigated in this particular context. This study is intended to fill said gap.

4.2.2 Hypothesis Development

4.2.2.1 Economic Infrastructure Dimensions

Investment in physical infrastructure development has received sparse attention in the literature of entrepreneurship (Bennett, 2019). Fox and Porca (2001) stated that little attention is devoted to the study of the importance of infrastructure. Rives and Heaney (1995) described infrastructure as an amenity which plays the role of a magnet in the location decisions of new firms and households. Although Audretsch et al. (2015) found the impact of infrastructure investments on overall regional firm start up rate in Germany to be generally positive, the question remains, which category of infrastructure investments? Consistently, Holl (2004) stated that only few studies distinguish various types of infrastructure. Infrastructure was

conceptualized into four (economic, social, technological, institutional) categories in chapter two, and in chapter three, the economic infrastructure category was broken into four dimensions to reflect attributes such as quality, affordability etc. In this chapter, these attributes are defined briefly as follows:

i) Availability is the dimension of economic infrastructure that captures its supply or presence, as well as spatial coverage and/or extension.

ii) Accessibility is a dimension of economic infrastructure that captures its full and profitable usage, that is, the utilization ability and capacity to accommodate needs for which they are made.

iii) Quality is the dimension of economic infrastructure that captures its durability, reliability, timeliness and/or convenience e.g. service adequacy, suitability and promptness.

iv) Finally, affordability is a dimension of economic infrastructure that enables users to match its cost (both physical and services) to its value, i.e., prompt and valuable services provided at acceptable prices.

4.2.2.2 Entrepreneurial Motivation and Economic Infrastructure Availability

Krakowiak-Bal et al. (2017) stated that the presence of adequate infrastructure facilitates and accelerates socio-economic development. Cities will thrive and grow if they provide amenities and infrastructure that are attractive to its high human capital residents (Audretsch and Belitski, 2017). Therefore, availability of adequate infrastructure does not only drive and support sustainable economic growth, it also determines the attractiveness of a region. Accordingly, inadequate investment in infrastructure has been shown to create bottlenecks that slow down economic growth (Perkins et al., 2005), with investments in reliable infrastructure shown to facilitate the free movements of people, goods/services and information (Stewart, 2010). Understandably, most developed world economies (e.g. UK, Japan, US) have, for many centuries, invested, developed, and used more infrastructure than developing world economies (e.g. South Africa, China, Brazil), to promote economic growth and development. And today, these developed world countries are still investing and developing infrastructure massively because they understand better how useful these resources

are at boosting economic growth. Some developing world countries are beginning to gain this awareness, but most of them are still less informed and/or concerned.

The contribution of entrepreneurship to economic growth and development is well documented and people involved in the entrepreneurial process often make use of support instruments, such as economic infrastructure, to create and sustain new businesses and/or restructure and develop existing ones. New venture creation process often involves the discovery, evaluation and exploitation of opportunities (Ardichvili et al., 2003; Shane and Venkataraman, 2000) and sometimes requires not only vision and financial capital (Jensen and Luthans, 2006), but also amenities to influence followers into supporting entrepreneurs' visions and mission statements to fruity. Economic infrastructure is one of such amenities which, according to Audretsch and Belitski (2017), enhances connectivity and linkages that facilitate the recognition of opportunities. Van der Zwan et al. (2013) stated that competitive regions tend to be characterised by well-developed economic infrastructure that support business activities. However, it can be argued that adequacy, attractiveness, and/or even usefulness of a "well-developed" economic infrastructure, for the sake of new venture creation, will also depend on its users and their motives for becoming entrepreneurs; either opportunity-motivated or necessity-motivated. "Adequacy" may be the case if an economic infrastructure sufficiently satisfies the purpose for which it's created, and when it is not lacking in terms of required quantity, required use, required quality, and/or required cost. In Nigeria, for example, infrastructure inadequacy has resulted in sufferings among individual and organizational users (Akinwale, 2010). However, even when an infrastructure meets, say the availability (quantity) requirements, it is not a guarantee that it will be attractive and/or useful to everyone.

Necessity-motivated entrepreneurs often engage into entrepreneurial activities due to unemployment or lack of something else to do, so it is very unlikely that availability or absence of economic infrastructure will actually enhance entrepreneurial activities undertaken by these

individuals, at least in the short term. Opportunity-motivated entrepreneurs, on the other hand, often engage into entrepreneurial activities to take advantage of a business opportunity. Although it's true that economic infrastructure can actually support opportunity-motivated entrepreneurs to recognize, evaluate and/or exploit entrepreneurial opportunities, it can be argued that knowledge of mere presence (availability) of economic infrastructure in a location may not influence the behaviours and attitudes of this category of entrepreneurs. However, after conditions and requirements needed to gain access to such infrastructure are known, as well as their costs, qualities etc., opportunity-motivated entrepreneurs can involve them in their new venture creation decisions. Going by this logic, mere availability of economic infrastructure will not enhance the entrepreneurial activities of both groups of entrepreneurs. Therefore, all else being equal, it can be predicted that:

H1a: Economic infrastructure availability will not influence OME in countries of the developed world economy.

H1b: Economic infrastructure availability will not influence NME in countries of the developed world economy.

4.2.2.3 Entrepreneurial Motivation and Economic Infrastructure Accessibility

According to Giannetti and Simonov (2009), access to infrastructure in a place may drive incentives to start new businesses, influencing overall entrepreneurial productivity there. Hayton et al. (2002) stated that access to industrial infrastructure has been identified as important determinant of entrepreneurial activity. According to Holienka et al. (2016), access to infrastructure is one of the main environmental drivers of productive entrepreneurial activity, from the macro-economic perspective. As previously argued elsewhere in this thesis, the possible effect(s) of infrastructure on entrepreneurial activity will depend not only on the category of infrastructure under consideration, but also on the entrepreneurial motives (opportunity-motivated or necessity-motivated) of those who elect to access those

infrastructure. Talking about economic infrastructure, its presence in a location does not automatically give right to its access; there are often costs involved, rules and regulations to be met, conditions to be fulfilled etc. before such resources could be accessed by potential and/or incumbent motivation-driven entrepreneurs. For example, without access to an available economic infrastructure (motorway) due to tollgate, promoting entrepreneurial initiatives by moving goods and services to markets will be impossible.

Moreover, going by observations by Snieska and Simkunaite (2009) that the availability of, and accessibility to infrastructure result in investment decisions with potentials to influence migration and business establishment locations, it becomes obvious that only when available economic infrastructure are also accessible, can they actually benefit opportunity-driven entrepreneurs in the discovery, evaluation and exploitation of opportunities. However, because access to economic infrastructure often comes at a cost, it's very unlikely that accessibility of availability economic infrastructure will enhance the entrepreneurial activities of necessity-driven entrepreneurs, as is the case with opportunity-driven entrepreneurs. Any additional cost associated with economic infrastructure access will rather hurt necessity-driven entrepreneurship. Therefore, all else being equal, it can be predicted that:

H2a: Economic infrastructure accessibility will enhance OME in countries of the developed world economy.

H2b: Economic infrastructure accessibility will not enhance NME in countries of the developed world economy.

4.2.2.4 Entrepreneurial Motivation and Economic Infrastructure Quality

Infrastructure quality has been repeatedly highlighted as key driver of firm foundation (Heger et al., 2011). Ghani et al. (2014) found quality of local physical infrastructure as one of the strongest predictor of entry in India. Similar evidence was reported in Indonesia where Vial (2011) concluded that better-quality transport services, in particular, could ease access to both

upstream and downstream markets, overcoming the liability of rural location and thus encouraging participation in entrepreneurship. In Nigeria also, inadequate stock and poor quality of infrastructure was found to pose serious challenges to growth of entrepreneurship in the country (Ubom and Ubom, 2014).

Limi (2011) stated that not only access but also quality of infrastructure affects firm productivity. Audretsch et al. (2015) emphasized future research should investigate the impact of infrastructure quality on start-ups. As seen above, quality of infrastructure is very important determinant of not only start-ups, but also different aspects of entrepreneurship as a whole in different countries around the world. Following the same logic, it can be argued that quality of economic infrastructure is instrumental for potential and incumbent individuals involved in the new venture creation process. In fact, Fisher (2016) stated that high-quality public infrastructure supports growth, improves well-being and generates jobs. The quality of economic infrastructure as a support instrument in the hands of an opportunity-motivated entrepreneur may be valued differently than in the hands of a necessity-motivated entrepreneur. The big question is to understand how impactful quality level (high/low) of an economic infrastructure may influence the entrepreneurial activities of one group of entrepreneurs compared to the other.

Quality is important when it comes to the ability of an instrument to effectively and efficiently perform task it's developed to accomplish. It is very likely that opportunity-driven entrepreneurs may need infrastructure that can assist them with the task of identifying/creating opportunity, then subsequently evaluating and exploiting them. Accordingly, to be considered by this category of entrepreneurs, quality level may be an important decision element in any support instruments. The opposite is likely the case for necessity-driven entrepreneurs because quality also often comes with additional costs and obligations that may not attract this category of entrepreneurs. Therefore, all else being equal, it can be predicted that:

H3a: Economic infrastructure quality will enhance OME in countries of the developed world economy.

H3b: Economic infrastructure quality will not enhance NME in countries of the developed world economy.

4.2.2.5 Entrepreneurial Motivation and Economic Infrastructure Affordability

The use of economic infrastructure like mobile phones has helped several entrepreneurs reduce costs and improve their business processes (Essegbey and Frempong, 2011). For example, farmers in many developing countries now use mobile phones to find best prices for their products (Kotelnicov, 2007). However, access, especially by people with low incomes, to this and other sub-classes of economic infrastructure, such as mobile broadband, often suffer major setbacks due to high tariffs (Alderete, 2017). It can be argued that the usefulness of an economic infrastructure as a support instrument for potential and incumbent entrepreneurs also depends on how affordable they are; once it's too costly to be acquired by needy individuals, it ceases to be very attractive especially to entrepreneurs facing financial constraints.

Household income seems to be higher among opportunity-motivated than necessity-motivated entrepreneurs (Stephan et al. 2015). Grilo and Irigoyen (2006) reported a negative influence of financial constraints on people's decision to start-up a business. Having little household incomes and often unemployed, necessity-motivated entrepreneurs will most likely face financial constraints that will reduce their abilities to afford any available and accessible economic infrastructure. Moreover, cost is often tied to quality directly such that the two regularly move in the same direction; the higher the quality, the higher the cost and vice versa. While necessity-motivated entrepreneurs may be willing to trade high-quality and costly infrastructure for the low-quality and cheap ones, opportunity-motivated entrepreneurs will likely not want to do so.

From perspective of the above concept, where affordability takes quality into consideration, opportunity-motivated entrepreneurs are well off. However, given that cost and not quality may be the focal point for necessity-motivated entrepreneurs, and also considering their high likelihood of financial constraints, any element of cost attached to economic infrastructure, because of quality, may just make it unattractive for this group of entrepreneurs. Therefore, all else being equal, and contrary to the findings of Alvarete (2017) that cost of economic infrastructure (mobile broadband) is positively associated with entrepreneurial activity, it can be predicted that:

H4a: Economic infrastructure affordability will enhance OME in countries of the developed world economy.

H4b: Economic infrastructure affordability will not enhance NME in countries of the developed world economy.

4.2.2.6 Entrepreneurial Motivation, Economic Infrastructure Accessibility, and Economic Infrastructure Affordability

According to Gil and Beckman (2009), ensuring that everyone has access to infrastructure at affordable costs is necessary to protect equity and public welfare. Unfortunately, there is a lack of systematic data collection regarding the cost and performance of infrastructure assets (Fisher, 2016). High quality economic infrastructure could be very strategic in the hands of opportunity-driven entrepreneurs, serving as a veritable source of competitive advantage. However, as earlier suggested by Alderete (2017), high acquisition costs can seriously harm the accessibility of an economic infrastructure, such as mobile broadband. For example, although access to broadband internet may promote the communication of entrepreneurial visions and reduce information asymmetry, the unaffordability of it (high monthly cost of broadband internet) may constraint internet use, and inhibit the communication of entrepreneurial visions. Consistently, a 2018 report by Alliance

<u>for affordable internet</u> states that "the inability to afford a basic internet connection remains one of the most significant and solvable barriers to internet access."

The ability to increase financial savings, access more technology and specialized expertise, and focus more on strategic issues all get better with outsourcing (Belcourt, 2006). Advancement in technology and entrepreneurial innovations have the potential to improve production processes and reduce production costs. For example, outsourcing of production inputs (labour and materials) often result to lowered overall production costs of most economic infrastructure, and nowadays it is not uncommon to find high-quality economic infrastructure selling very cheaply (e.g. infrastructure made in China) due to cheap labour cost and improved technology adopted by the companies that manufacture them. In fact, an easy-to-access high-quality economic infrastructure that is also cheap to acquire will definitely be attractive to both opportunity and necessity-motivated entrepreneurs. Remember that high-quality economic infrastructure is only unattractive to necessity-motivated entrepreneurs when high costs are involved. From the foregoing analogy, where low costs are involved, all else being equal, it can be predicted that:

H5a: Economic infrastructure affordability will enhance the association between economic infrastructure accessibility and OME in countries of the developed world economy.

H5b: Economic infrastructure affordability will buffer the association between economic infrastructure accessibility and NME in countries of the developed world economy.
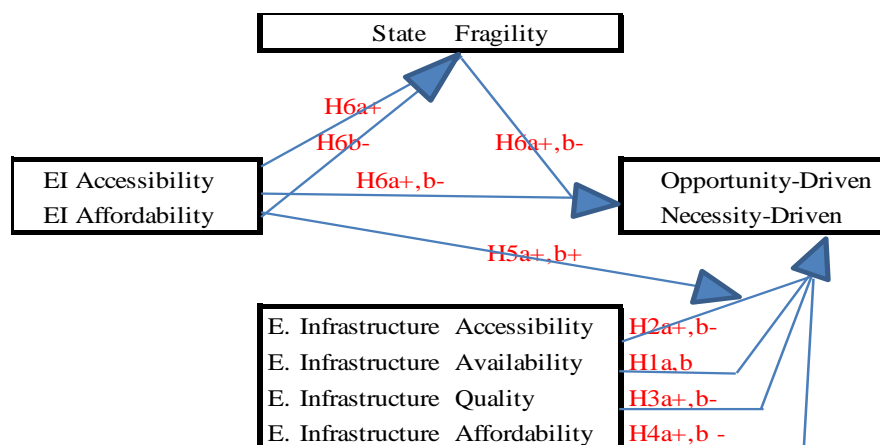
Figure 4-1: Study's theoretical Framework

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4.2.2.7 Entrepreneurial Motivation, Economic Infrastructure Accessibility, Economic Infrastructure Affordability, and State Fragility

State fragility is a concept based on the quality of governance and formal institutions; it captures the extent to which the state is capable of exercising its governance role of establishing regulatory rules, enforcing them, and providing basic public goods and services (Amorós et al., 2019). Zaija et al. (2019) defined state fragility as deficiencies in one or more of three core state functions, i.e., violence control, implementation capacity, and empirical legitimacy. Zaija et al. (2019) stated further that violence control is the state's ability to manage the uses of violence within society, and that state's ability to provide basic public services is considered implementation capacity, while empirical legitimacy refers to the population's consent to the state's claim to rule.

Different levels of state fragility could trigger different behaviours, prompt varying actions and corresponding reactions by individuals (incumbent entrepreneurs included) living in a society. State fragility results when institutions fail to sanction detrimental behaviours due to corruption, lack of accountability, a malfunctioning legal system etc. (Barro, 1991; Knack and Keefer, 1995; Amorós et al., 2019). State fragility comes with violence, theft, unlawful acquisition of others' property, and many other actions that may have negative effects on society at large. The reverse is true where the state is not fragile; its institutions lay the basis for economic exchanges to occur, and sanction behaviours that may have negative effects on the society (Baliamoune-Lutz and McGillivray, 2008; Ciravegna and Brenes, 2016).

Boudreaux and Nikolaev (2017) stated that when law enforcement is weak, and the legal rules are vague and contradictory, formal institutions can create more uncertainty instead of alleviating it. Under such conditions, authors add, it is difficult for any entrepreneurs to forecast, plan, and engage in essential activities necessary to manage their ventures successfully. Even some infrastructural reforms may involve price or supply strategies that hamper the access and affordability of infrastructure services for the poor in a country. In fact,

for a given country, appropriate reforms and regulatory frameworks have the potential to influence both accessibility and affordability of economic infrastructure. In UK, for instance, communication regulation (www.legislation.gov.uk) designed by the government sets out the rights and obligations that arise in relation to infrastructure. Amongst other things, it covers the provision of information about physical infrastructure, the surveying of physical infrastructure, access to physical infrastructure, and access to in-building physical infrastructure. The access to infrastructure portion of the regulatory act also emphasizes that access requests to certain physical infrastructure can be refused on grounds of national security, explaining how any disputes arising from such requests denials are resolved.

The choice of how infrastructure is delivered and who should be in charge of its development could affect its affordability. Consequently, government has the responsibility to ensure public infrastructure is sustainable and affordable, by instituting strong links between infrastructure development phase and the fiscal framework of the country (Fisher, 2016). All these support the argument that role of governance in establishing rules may affect not only decisions about the availability, but also the affordability and right to access economic infrastructure in developed world countries. In a country, high state fragility gives birth to an inability to exercise governance role of establishing efficient regulatory rules, and providing basic public goods and services. When regulations are numerous and fast changing, entrepreneurs and public officials have a more difficult time navigating through such legal uncertainty (Boudreaux and Nikolaev, 2017). Thai and Turkina (2014) stated that efficient regulations, together with other institutional factors, can promote opportunity-motivated entrepreneurial activity. In fact, evidence from study by Amorós et al. (2019) suggested that low levels of state fragility provide a stable and well-defined institutional framework where OME thrives, whereas high levels of state fragility create societies characterized by less-clear

rules and enforcement mechanisms that inhibit financial planning and investments, and promote NME.

Summarily, discussions from above suggest that high state fragility tends to favour the entrepreneurial activities of necessity-motivated entrepreneurs and disfavours the entrepreneurial activities of opportunity-motivated entrepreneurs. From this perspective, perception of higher state fragility will cause opportunity-motivated entrepreneurs to either take up paid jobs, or pressurize the government to institute effective and efficient governance structures in the country. According to Block and Wagner (2010), proportion of former employed individuals is lower within NME than OME, a suggestion that most opportunity-motivated entrepreneurs often quit highly-paid jobs to create own companies. Therefore, it is highly likely that determined entrepreneurs with clear visions of intended entrepreneurial projects, will choose to pressurize the government for better rules and regulations than to take up paid jobs. If, and when pressures cause the government to institute good laws and proper regulations, such structures will promote access and facilitate affordability of economic infrastructure.

Contrary to the above analogy, necessity-motivated entrepreneurs thrive with high level of state fragility (Amorós et al., 2019) and may have little interest to pressurize the government. Without any pressure on a failing government to improve governance structures in the country, vague rules and contradictory regulatory frameworks may emerge. According to Boudreaux and Nikolaev (2017), when law enforcement is weak and the legal rules are vague and contradictory, formal institutions can create more uncertainty instead of alleviating it. Increase uncertainty could result to not only bad policies on affordability and access to economic infrastructure, but may hurt entrepreneurial activities of incumbent necessity-motivated entrepreneurs. Therefore, following from these concepts, and all else being equal, it can be predicted that:

H6a1: state fragility will positively mediate the association between economic infrastructure accessibility and OME in countries of the developed world economy.

H6a2: state fragility will positively mediate the association between economic infrastructure affordability and OME in countries of the developed world economy.

H6b1: state fragility will negatively mediate the association between economic infrastructure accessibility and NME in countries of the developed world economy.

H6b2: state fragility will negatively mediate the association between economic infrastructure affordability and NME in countries of the developed world economy.

4.3   Philosophy, Strategy and Method of Research

4.3.1 Philosophy & Strategy of Research

The research philosophy adopted in this chapter is the same as that of the previous chapter, i.e., positivist epistemology. Guided by grounded theories in the literature, hypotheses were formulated and tested to reach conclusions, which are reported in this chapter.

Similar to chapter three, this chapter used a cross sectional research strategy that is non-experimental in design. Limited financial resources and lack of time constraint this author to use secondary data, which justifies the choice of strategy adopted.

4.3.2 Research Method: Approach, Estimations, and Analyses

4.3.2.1 Research Approach

Quantitative research approach and deductive analytic technique were adopted for this study, same as in the previous chapter for same reasons; available data was quantitative in nature and author adopted a positivist research philosophy. Furthermore, data upon which analyses are based in this chapter are secondary. The unit of analysis is country and there was not sufficient time and resources to collect primary data in sizes big enough to be representative of the individual countries included in this study.

Study was limited to those developed countries included in the Global Entrepreneurship Monitor (GEM) research consortium between 2013-2015 inclusive. Data was extracted from several databases including the World Bank's World Development indicators and worldwide governance indicators (WDIs and WGIs), World Economic Forum (WEF), GEM, International World Trade Centre, International Monetary Fund (IMF), and much more. Statistical Annex and Country Classification mechanism developed by WESP (2019) was used to classify and select included countries of the developing world economy. See appendix 3 (P. 178) for a complete list of included countries.

4.3.2.2   Variable Estimations

The table below summarizes important variables used in regression analyses to estimate parameters in this section of the thesis.

Table 4-1: Variables used in this study

Variable Name	Definition	Source
Opp	Percentage of those involved in Total Early-Stage Entrepreneurial Activity (TEA) who claim to be driven by opportunity to be independent or desire to increase their income.	GEM database
Nec	Percentage of those involved in TEA who are involved in entrepreneurship because they had no other option for work	GEM database
StateFrag	3-yr-average of six dimensions of worldwide governance indicators proposed by the World Bank, i.e., voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption	Author's estimate from World Bank's WGI data please see details below
Avail	Dimension of EI that captures its supply or presence, as well as spatial coverage and/or extension	Author's calculation based on multiple sources
Access	Dimension of EI that captures its full and profitable usage, accommodating needs for which they are made	author's calculation, please see details below
Qlty	Dimension of EI that captures its durability, reliability, timeliness and/or convenience	author's calculation, please see details below
Afford	Dimension of EI that enables users to match its cost (both physical and services) to its value	author's calculation, please see details below
Unempl	Percentage of total labour force that is without work but available for and seeking employment	World Bank database
Infla	The annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals	World Bank database

4.3.2.2.1   Dependent Variables

OME and NME are principal dependent variables in this study. Although several measures of entrepreneurial motivation exist, following Hessels et al. (2008), the one from the GEM Adult Population Survey between 2013-2015 is used. In GEM's APS questionnaire, respondents were asked to indicate whether they are involved in a start-up 'to take advantage of a business opportunity to increase wealth or be independent' or because they 'have no better

choices for work'. If they indicated 'to take advantage of a business opportunity to increase wealth or be independent' they are considered opportunity-driven entrepreneurs (Opp). Those who indicated 'have no better choices for work', are considered necessity-driven entrepreneurs (Nec).

Therefore, in this study, Opp is proxied by Opportunity-Driven Entrepreneurial Activity prevalence rate. It is defined as percentage of those involved in Total Early-Stage Entrepreneurial Activity (TEA) who claim to be driven by opportunity to be independent or desire to increase their income (Reynolds et al., 2005). Nec is proxied by Necessity-Driven Entrepreneurial Activity prevalence rate, and defined as percentage of those involved in TEA who are involved in entrepreneurship because they had no other option for work (Reynolds et al., 2005). In order to estimate Opp and Nec, the following was done:

- Downloaded annual prevalence rates of opportunity-driven and necessity-driven entrepreneurs between 2013-2015 inclusive for all 31 developed world countries involved at https://www.gemconsortium.org/data/key-aps.

- Used individual case weights developed for each country and aggregated data on all opportunity-motivated respondents from each country to created national level measure for Opp for years 2013, 2014 and 2015.

- Followed the same method to create national level measure for Nec for years 2013, 2014 and 2015.

Finally, a three-year average value was computed for Opp and Nec respectively and used in analyses.

4.3.2.2.2   Independent Variables

Economic Infrastructure Dimensions (Avail, Access, Qlty, Afford) and state fragility (StateFrag) are main predictors in this study. While StateFrag was estimated from six governance dimensions extracted from the World Bank's WGI Database, Avail, Access, Qlty,

and Afford, on the other hand, were computed from data extracted from several different information sources.

For economic infrastructure dimensions, and like in chapter three, logic similar to Donaubauer et al. (2016) and African Development Bank (ADB, 2019) was followed to:

- Disaggregate the economic category of infrastructure into four dimensions, using a total of 42 variables, selected and extracted from various databases for the years 2013, 2014, 2015.

- Variables in each dimension were first normalized using Min-Max technique, then their weighted averages were computed as a proportion of the inverses of their respective standard deviations (for more details, see chapter three and also ADB, 2019).

Each one of the four estimated dimensions of economic infrastructure serves as a predictor variable (Please see tables 4-12a,b,c,d in Appendix 3, P. 176-177 for constructs and indicators). Therefore, together with StateFrag, a total of five independent variables are involved in study. StateFrag is also the mediator variable.

4.3.2.2.3 Mediator Variable

According to Kaufmann et al. (2010), WGI comprises both individual and aggregate measures of the six dimensions of governance since 1996-2018, covering over 200 countries and territories. These dimensions of governance essentially cover the key aspects of state fragility (Ault and Spicer, 2014; Amorós et al., 2019). They include: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. (Please see Kaufmann et al., 2010 for detailed definitions and how each dimension is calculated and aggregated). WGI data have been previously used in entrepreneurship study as a measure of governance quality (Friedman, 2011; Kim and Li, 2014). The six dimensions mentioned above are highly correlated, therefore they are better aggregated to capture governance properly (Amorós et al., 2019).

StateFrag was proxied from the World Bank's WGI, following a method similar to Ault and Spicer (2014) and Amorós et al. (2019). Based on the list of same 31 developed world countries involved in this study, the following was done:

- Downloaded yearly aggregated values for each of the dimensions highlighted above at worldbank.org/governance/wgi/.

- And because each dimension is made up of other sub-dimensions, the average of each sub-dimension was first calculated within each of the six categories for a three-year-period (2013-2015).

- The average of all six dimensions previously calculated was computed next, for same three-year-period and countries.

Finally, the result was multiplied by -1 so that a higher value will denote a more fragile state and vice versa.

4.3.2.2.4   Control Variables

In most studies on decision to become self-employed, motivation is usually connected to unemployment (Van der Zwan et al., 2016; Stephan et al., 2015), making unemployment rate one of the principal determinant of motivation-driven entrepreneurship. For example, Nasiri and Hamelin (2018) suggested that opportunity entrepreneurs identify business opportunities when the unemployment rate is low and the economic conditions are good. Local unemployment also influences the transitions of low-ability individuals (necessity entrepreneurs) into self-employment positively (Deli, 2011). Moreover, in a recent study, Rusu and Roman (2017) highlighted inflation rate as one of the main macroeconomic determinants of entrepreneurial activity in the EU. Given that this study is based on developed-world countries, inflation rate, and unemployment rate were selected as control variables. Therefore, inflation and unemployment rates are control variables.

4.3.2.3   Model Specification and Strategy of Analysis

In order to estimate slopes and test hypotheses (H1a,b, H2a,b, H3a,b, H4a,b, H5a,b and H6a1and2 & H6b1and2), this study used ordinary least squares (OLS) and hierarchical multiple regression techniques based on five regression equations as expressed below:

$$Y_i = \beta_0 + \beta_1 X + \beta_2 C_i + \varepsilon_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

$$Y_{2i} = \beta_0 + \beta_1 X + \beta_2 C_i + \beta_3 M + \beta_4 (X * M) + \varepsilon_{2i} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2$$

$$Z_i = \emptyset_0 + \beta_1 X + \mu_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 3$$

$$Y_{3i} = \beta_0 + \beta_2 C_i + \beta_3 Z + \varepsilon_{3i} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 4$$

$$Y_{3i} = \beta_0 + \beta_1 X + \beta_2 C_i + \beta_3 Z + \varepsilon_{3i} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 5$$

Where X represents the main predictor term (economic infrastructure dimensions), C_i denotes the ith control variable, M stands for the moderator term, Z stands for the mediator term and Y_i the ith outcome variable. Also, β_0 is the y-intercept, ε the error term, and β_1, β_2, β_3 and β_4 are respective effect sizes of the main predictor, control variable, moderator and mediator terms and interaction term.

Three separate analyses were performed in this study; first analysis was based on equation 1 above, and verified the direct effect(s) of the different dimensions of economic infrastructure on both OME and NME. The second and third analyses were based on equation 2, and equations 3-5 respectively, and verified the indirect effect(s) of selected dimensions of economic infrastructure on both OME and NME. Seven models were estimated in total, and each model actually involved two analyses because of two sets of outcome variables (Opp and Nec) in the study.

The first analysis was based on five models (Model 1 - Model 5) estimated from Ordinary Least Squares (OLS) regressions. The second analysis was based on model 6 (estimated from hierarchical regressions), and the third analysis was based on model 7 (series of mediation models estimated from a percentile bootstrap of 5000 samples), all done in SPSS.

Model 1 was the basic model into which only control variables were introduced. Models 2 - 5 were used to test hypotheses H1a,b; H2a,b; H3a,b; H4a,b. Model 6 was used to test hypotheses H5a,b, and because interaction effects were involved, the two variables (accessibility and affordability) were first mean-centred before computing the product term. This was done to minimise the possibility of bias estimates due to collinearity problem, and PROCESS (developed by Andrew F. Hayes) in SPSS was used to confirm the results (see table 4-11 in appendix 3, P.175). Finally, model 7 comprised of four mediation models, also estimated with the help of PROCESS, and was used to test hypotheses H6a$_{1and2}$ and H6b$_{1and2}$.

4.3.2.4   Robustness Checks

The independent variables in this study were computed by combining and averaging different indicators/variables of sub-dimensions, so it was necessary that resulting new constructs were internally consistent. This was achieved by means of reliability analyses in SPSS on StateFrag, Avail, Access, Qlty, and Afford constructs. Cronbach's alpha values of 0.95, 0.71, 0.59, 0.84, and 0.43 respectively were obtained. The overall index of economic infrastructure also had an alpha value of 0.78, way above the acceptable threshold of 0.70. Please see table 4-2 below.

Table 4-2: Cronbach's alpha for study's constructed instruments

	Economic Infrastructure Index (EII)				StateFrag	EII
	EI Avail	EI Access	EI Qlty	EI Afford		
Cronbach's alpha	0.71	0.59	0.84	0.43	0.95	0.78

For both dependent variables and residuals, normality was tested using Shapiro-Wilk and Kolmogorov-Smirnov tests in SPSS and they were normally distributed. Multicollinearity was controlled by checking and ensuring variance inflation factors (VIF) in all models were below 3. Linearity between outcome variables and the predictors was also checked by means

of bivariate correlation matrix and/or scatter plots. Finally, care was taken to ensure residual terms from all final models were independent, identical, and normally distributed, to stay safe from heteroscedasticity. This was achieved by visualizing standardized residual versus fit plots to ensure observations were randomly and symmetrically distributed around zero. Histogram of the standardized residual terms, as well as the P-P and Q-Q plots were also checked.

4.4 Results

4.4.1 Correlation Matrix and Model Estimates

The correlation matrix below (table 4-3) suggests that, on average, StateFrag is strongly and negatively associated with Opp, but strongly and positively associated with Nec. Equally important is the observation that, on average, aside Avail, all three EI dimensions are strongly and positively associated with Opp, but strongly and negatively associated with Nec in developed world countries.

Table 4-3: correlation matrix and descriptive statistics for motivation-led entrepreneurship, EI dimensions, state fragility and control variables

Variables	Mean	Std. Dev.	Nec	Opp	Avail	Access	Qlty	Afford	Unempl	Infla	StateFrag
Nec	20.06	8.92									
Opp	51.29	11.32	-.605**								
Avail	34.64	4.37	0.131	-0.181							
Access	34.79	9.42	-.638**	.454*	0.125						
Qlty	58.24	16.40	-.656**	.606**	0.122	.874**					
Afford	60.16	13.01	-.636**	.476**	-0.202	.772**	.716**				
Unempl	9.37	5.24	.516**	-.626**	.411*	-0.316	-0.304	-0.328			
Infla	0.67	0.72	-0.324	.394*	-.540**	0.052	0.179	0.347	-.639**		
StateFrag	-1.18	0.49	.750**	-.728**	0.074	-.742**	-.826**	-.693**	.604**	-.382*	
N	31	31	31	31	31	31	31	31	31	31	31

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Model 1 is basic model to which only control variables (unemployment and inflation rates) were introduced for both Opp and Nec. Results supported previous findings, i.e., unemployment is positively related to NME (Deli, 2011), and negatively related to OME (Nasiri and Hamelin, 2018). Inflation rate was positive and significant for OME but negative and significant for NME. However, when the second control variable (unemployment rate) was added to the model, inflation rate became insignificant in both cases.

Table 4-4: EI dimensions effects on OME and NME in countries of the developed world economy

In/Dependent Variables	Model 1 Nec Ent.	Opp Ent.	Model 2 Nec Ent.	Opp Ent.	Model 3 Nec Ent.	Opp Ent.	Model 4 Nec Ent.	Opp Ent.	Model 5 Nec Ent.	Opp Ent.	Model 6 Nec Ent.	Opp Ent.
Unempl	.891**	-1.369***	.912**	-1.394***	.444	-1.065**	.591*	-1.052***	.724**	-1.246***	.559	-1.216***
	(.359)	(.414)	(.365)	(.421)	(.315)	(.424)	(.298)	(.361)	(.298)	(.395)	(.330)	(.423)
Infla	.127	-.172	-.523	.601	-1.595	.999	-.049	.014	1.696	-1.331	-.512	1.224
	(2.615)	(3.018)	(2.881)	(3.324)	(2.185)	(2.940)	(2.108)	(2.547)	(2.191)	(2.899)	(2.681)	(3.437)
Avail			-.228	.271								
			(.400)	(.461)								
Access					-.520***	.354*					-.329	.243
					(.135)	(.182)					(.239)	(.307)
Qlty							-.299***	.316***				
							(.075)	(.090)				
Afford									-.373***	.275**	-.124	-.078
									(.098)	(.130)	(.204)	(.262)
Access_Afford											.008	-.029*
											(.012)	(.015)
Constant	11.635**	64.222***	19.777	54.535***	35.080***	48.268***	31.983***	42.715***	34.579***	47.280***	14.479***	64.534***
	(4.897)	(5.652)	(15.094)	(17.417)	(7.283)	(9.800)	(6.425)	(7.765)	(7.273)	(9.624)	(4.669)	(5.987)
R^2	.266	.392	.275	.400	.527	.467	.541	.583	.521	.479	.550	.482
Adj. R^2	.214	.349	.195	.333	.474	.408	.490	.536	.468	.421	.481	.402
Model R^2											.557	.547
ΔR^2											.007	.065
P-Value											.532	.069

Note: Opportunity & Necessity Entrepreneurship as DVs; * represents significance at p<0.10; ** represents significance at p<0.05; *** represents significance at p<0.01; coefficients are unstandardized and Std. errors are in brackets.

The first analysis aimed to investigate if, and how the availability, the accessibility, the quality, and the affordability of economic infrastructure affect OME and NME in countries of the developed world economy. In first case (model 2), Avail was predicted to not influence any of the two forms of entrepreneurship in developed world countries. Results (table 4-4) fully supported study's hypotheses (H1a,b); Avail was without effect on both OME and NME,

respectively, in countries of the developed world economy: $B_1 = .271$, $SE_1 = .461$, ns; $B_2 = -.228$, $SE_2 = .400$, ns. Therefore, author fails to reject the hypotheses of no differences for B_1 and B_2 above.

In second case (model 3), Access was predicted to enhance OME and to hurt NME in countries of the developed world. Hypotheses (H2a,b) were fully supported by results (table 4-4); Access enhanced OME, $B_1 = .354$, $SE_1 = .182$, $P_1 < 0.10$, and hurt NME, $B_2 = -.520$, $SE_2 = .135$, $P_2 < 0.01$. Therefore, author rejects the hypotheses of no differences for B_1 and B_2 above.

In third case (model 4), Qlty was predicted to enhance OME and to hurt NME in countries of the developed world. Hypotheses (H3a,b) were fully supported by results (table 4-4); Qlty enhanced OME, $B_1 = .316$, $SE_1 = .090$, $P_1 < 0.01$, and hurt NME, $B_2 = -.299$, $SE_2 = .075$, $P_2 < 0.01$. Therefore, author rejects the hypotheses of no differences for B_1 and B_2 above.

In fourth case (model 5), Afford was predicted to enhance OME and to hurt NME in countries of the developed world. Hypotheses (H4a,b) were fully supported by results (table 4-4); Afford enhanced OME, $B_1 = .275$, $SE_1 = .130$, $P_1 < 0.05$, and hurt NME, $B_2 = -.373$, $SE_2 = .098$, $P_2 < 0.01$. Therefore, author rejects the hypotheses of no differences for B_1 and B_2 above.

The second analysis (model 6) aimed to investigate if, and how the affordability of economic infrastructure moderates the associations between economic infrastructure accessibility and the two forms of entrepreneurship in countries of the developed world economy. In this case, enhancement was predicted for Afford on associations between Access and Opp, while a buffer was predicted for it on associations between Access and Nec. However, the results (table 4-4) supported hypotheses (H5a,b) only partially, and in a reverse sense; the association between Access and Opp was rather hurt (buffered) by Afford, $B_1 = -.029$, $SE_1 = .015$, $P_1 < 0.10$, whereas there was no moderation effect in the case of Nec, $B_2 = .008$, $SE_2 = .012$, ns. Therefore, author rejects hypothesis of no difference for B_1 (H5a), and fails to reject hypothesis of no difference for B_2 (H5b) above. These results were also confirmed with

PROCESS macro in SPSS, please see table 4-11, appendix 3, P.175. In fact, the association between Access and Opp was approximately 0.065 points lower due to high affordability of economic infrastructure.

In trying to understand how different levels (high, medium, low) of economic infrastructure affordability actually affects the accessibility-Opp relationship, two interesting observations were made (see figure 4-2):

i) highly affordable economic infrastructure rather hurts OME through accessibility in the developed world economy. The reason could be that incumbent entrepreneurs within these countries belief quality is sacrificed by manufacturers to secure low prices, which in turn pushes up affordability. Given their taste for quality, as seen earlier, they prefer to not acquire them.

ii) only medium and low affordability levels of economic infrastructure actually enhance OME, through economic infrastructure accessibility. However, low affordability levels contribute more to this type of entrepreneurship than medium levels of affordability.
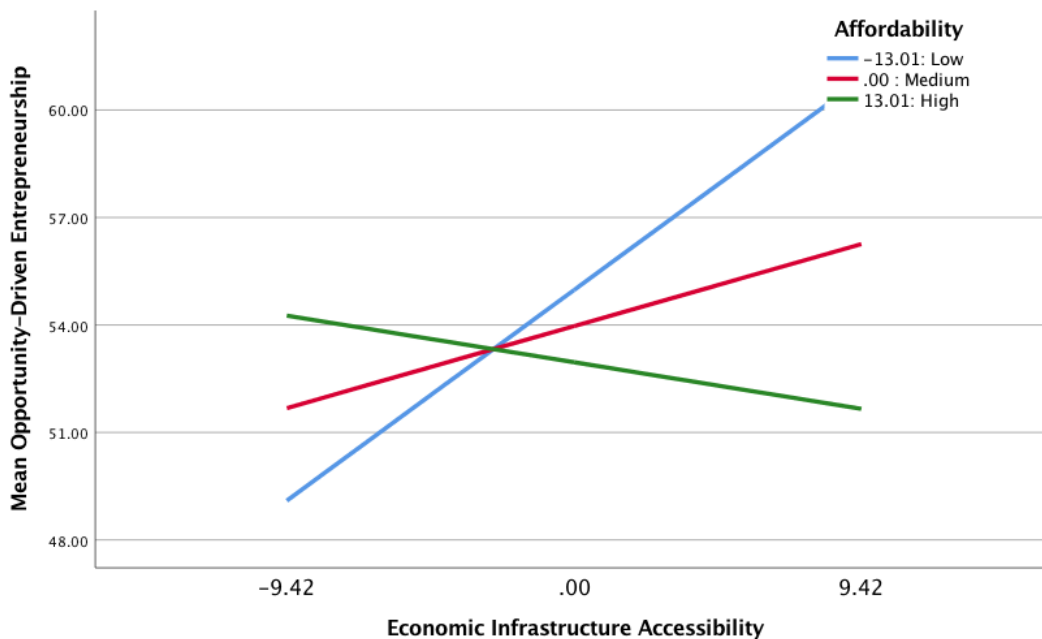

Figure 4-2: Moderating effect of EI affordability on the accessibility-OME relationship

Finally, the third analysis aimed to investigate if, and how associations between economic infrastructure accessibility and OME and NME, as well as economic infrastructure

affordability and OME and NME, in countries of the developed world economy, are mediated

by state fragility (please also see tables 4-7a,b in appendix 3, P.172 for further confirmation).

Table 4-5: Summary of mediation effects of state fragility on OME and NME

Direct effect of Accessibility on OME						Direct effect of Accessibility on NME				
Effect	se	P	LLCI	ULCI		Effect	se	P	LLCI	ULCI
-0.1521	0.2424	0.5359	-0.6503	0.3462		-0.2315	0.191	0.2364	-0.6242	0.1612
Indirect effect of accessibility via State fragility:						Indirect effect of accessibility via State fragility:				
Effect	BootSE	P	BootLLCI	BootULCI		Effect	BootSE	P	BootLLCI	BootULCI
StateFrag. 0.5061	0.2276		0.0029	0.886		StateFrag. -0.2888	0.1784		-0.7415	-0.0443

Direct effect of Affordability on OME						Direct effect of Affordability on NME				
Effect	se	P	LLCI	ULCI		Effect	se	P	LLCI	ULCI
-0.0013	0.1597	0.9936	-0.3296	0.327		-0.1826	0.1233	0.1507	-0.4361	0.0709
Indirect effect of affordability via State fragility:						Indirect effect of affordability via State fragility:				
Effect	BootSE	P	BootLLCI	BootULCI		Effect	BootSE	P	BootLLCI	BootULCI
StateFrag. 0.2768	0.1349		0.0084	0.5402		StateFrag. -0.1905	0.1094		-0.4624	-0.0387

Access and Afford were predicted to indirectly enhance Opp, through StateFrag. Hypotheses (H6a1,a2) were fully supported by results (table 4-5); StateFrag positively mediated, respectively, association between Access and Opp, B_1 = .5061, $BootSE_1$ = .2276, BootLLCI = .0029, BootULCI = .8860, and association between Afford and Opp, B_2 = .2768, $BootSE_2$ = .1349, BootLLCI = .0084, BootULCI = .5402. Therefore, author rejects the hypotheses of no differences for B_1 and B_2 above.

Access and Afford were also predicted to indirectly hurt Nec, through StateFrag. Hypotheses (H6b1,b2) were fully supported by results (table 4-5); StateFrag negatively mediated, respectively, association between Access and Nec, B_1 = -.2888, $BootSE_1$ = .1784, BootLLCI = -.7415, BootULCI = -.0443, and association between Afford and Nec, B_2 = -.1905,

BootSE$_2$ = .1094, BootLLCI = -.4624, BootULCI = -.0387. Therefore, author rejects the hypotheses of no differences for B$_1$ and B$_2$ above.

Table 4-6: Summary of tested hypotheses and outcomes

Hypothesis	Definition	Outcome	Hypothesis	Definition	Outcome
Hypothesis 1a	H0: EI Avail does affect OME H1: EI Avail doesn't affect OME	H0 not rejected	Hypothesis 4b	H0: EI Afford affects NME negatively H1: EI Afford doesn't affect NME negatively	H0 rejected
Hypothesis 1b	H0: EI Avail does affect NME H1: EI Avail doesn't affect NME	H0 not rejected	Hypothesis 5a	H0: EI Afford enhances relationship b/w OME & EI Access. H1: EI Afford doesn't enhance relationship b/w OME & EI Access	H0 rejected partially supported
Hypothesis 2a	H0: EI Access affects OME positively H1: EI Access doesn't affect OME positively	H0 rejected	Hypothesis 5b	H0: EI Afford buffers relationship b/w NME & EI Access H1: EI Afford doesn't buffer relationship b/w NME & EI Access	H0 not rejected
Hypothesis 2b	H0: EI Access affects NME negatively H1: EI Access doesn't affect NME negatively	H0 rejected	Hypothesis 6a1	H0: StateFrag mediates relationship b/w OME & EI Access positively H1: StateFrag doesn't mediate relationship b/w OME & EI Access positively	H0 rejected
Hypothesis 3a	H0: EI Qlty affects OME positively H1: EI Qlty doesn't affect OME positively	H0 rejected	Hypothesis 6a2	H0: StateFrag mediates relationship b/w OME & EI Afford positively H1: StateFrag doesn't mediate relationship b/w OME & EI Afford positively	H0 rejected
Hypothesis 3b	H0: EI Qlty affects NME negatively H1: EI Qlty doesn't affect NME negatively	H0 rejected	Hypothesis 6b1	H0: StateFrag mediates relationship b/w NME & EI Access negatively H1: StateFrag doesn't mediate relationship b/w NME & EI Access negatively	H0 rejected
Hypothesis 4a	H0: EI Afford affects OME positively H1: EI Afford doesn't affect OME positively	H0 rejected	Hypothesis 6b2	H0: StateFrag mediates relationship b/w NME & EI Afford negatively H1: StateFrag doesn't mediate relationship b/w NME & EI Afford negatively	H0 rejected

4.5 Discussion, Conclusion, and Study Limitations

4.5.1 Discussion

Investment in physical infrastructure development is one external environmental element that has received sparse attention in the literature of entrepreneurship (Bennett, 2019). Reliable infrastructure facilitate not only the free movements of people, goods/services and information (Stewart, 2010), but inadequate investment in infrastructure has also been shown to create bottlenecks that slow down economic growth (Perkins et al., 2005). Access to industrial infrastructure has been identified as important determinants of entrepreneurial activity (Hayton et al., 2002). This could be due to fact that entrepreneurship often involves discovery, evaluation and exploitation of opportunities (Ardichvili et al., 2003; Shane and

Venkataraman, 2000) that can be greatly facilitated with the help of infrastructure. In fact, opportunities change over time and infrastructural resources used to identify and exploit them also become obsolete and require replacement or maintenance in the long run, hence a cause for concern for opportunity-driven entrepreneurs. On the contrary, most necessity-driven entrepreneurs get involved into venture creation due to unemployment or lack of alternative options, in which case infrastructural resources may not necessarily serve as a source of motivation for them. Therefore, infrastructure have potential to influence some peoples' motives for engaging at venture creation.

Perkins et al. (2005) stated that inadequate investment in infrastructure has been shown to create bottlenecks that slow down economic growth. In Nigeria, for example, Akinwale (2010) demonstrated that infrastructure inadequacy resulted in sufferings amongst individual and organizational users. In new venture creation process, adequacy of infrastructure is very important; this could mean questioning not only the category of infrastructure involved, but also how much of it is available, accessible, of specific quality, or even how much of it is affordable. There are scenarios in which a particular infrastructure type is available but not accessible to the needy individuals (incumbent entrepreneurs included). In other cases, an available and accessible infrastructure of a particular category either fails to meet the expectations of needy individuals due to low quality and/or high cost. In the context of OME and NME, these highlighted scenarios could account for differences in levels of entrepreneurial activity across countries in the developed world economy.

Van der Zwan et al. (2013) revealed that competitive regions tend to be characterised by a well-developed infrastructure, which supports business activity. However, it can be argued that the fact that an infrastructure is well-developed does not cause it to support business activity automatically. For this to happen, well-developed infrastructure also needs to be easily accessed by those involved in business activities, which often involves costs, rules and

regulations to be met, conditions to be fulfilled etc. before such resources benefit most incumbent motivation-led entrepreneurs. In fact, this chapter has proven that, in countries of the developed world economy, mere availability of economic infrastructure (well-developed or not), does not influence entrepreneurial activities undertaken by both necessity and opportunity-motivated entrepreneurs. Snieska and Simkunaite (2009) stated that availability of, and accessibility to infrastructure result in investment decisions with potentials to influence migration and business establishment locations. This thesis supports the view point that only when available economic infrastructure are also accessible can they actually benefit opportunity-motivated entrepreneurs in the discovery, evaluation and exploitation of opportunities. Results from this study confirm this viewpoint. However, with necessity-motivated entrepreneurs, lack of alternative employment options often push them into entrepreneurship and access to economic infrastructure could instead provide them with motivation and alternative options (e.g. finding a job in the infrastructure sector) to quit the new venture creation process. Study results also demonstrated this scenario through a negative effect of economic infrastructure accessibility on NME. The results were similar for quality and affordability of economic infrastructure, and the possible reasons are same as explained above.

Now, for opportunity-driven entrepreneurs, sustaining created competitive advantages also means being able to continuously identify valuable entrepreneurial opportunities over time, which may require access to affordable and high quality economic infrastructure. Moreover, identified but unexploited opportunities, due to infrastructure resource inaccessibility/limitation, do not create competitive advantages for opportunity-driven entrepreneurs. Accordingly, study results also demonstrated that the other two dimensions of economic infrastructure (quality and affordability) enhance the entrepreneurial activities of opportunity-motivated entrepreneurs in countries of the developing world economy. Moreover,

as clearly demonstrated earlier, high levels of economic infrastructure affordability rather hurt OME. Only low and medium levels of affordability were shown in this study to enhance entrepreneurial activities of opportunity-motivated entrepreneurs, through economic infrastructure accessibility. Therefore, in order to encourage OME (said to contribute the most to economic growth through wealth creation), developed world operational governments should adopt policies that favour high quality and low to medium affordable economic infrastructure.

High-quality public infrastructure support growth, improve well-being, and generate jobs, but poor governance is often the major reason why infrastructure projects fail to meet their timeframe, and service delivery objectives (Fisher, 2016). Not only are good delivery services necessary, but also, fair regulatory designs, to ensure sustainable and affordable infrastructure over the lifespans of these assets, are imperative. Regulators play a key role to ensure attractiveness of infrastructure projects, however, unstable regulatory frameworks can prevent long-term decisions. As a consequence, corruption may set in or political dynamics, which undermine sound decision- making regarding fairness, fiscal prudence and cost-effectiveness. Furthermore, any uncertainty regarding the source and revenue flows of an infrastructure can erode confidence in its affordability. In short, trust in government effectiveness, political stability, rule of law, absence of corruption, and voice in government affairs are macro characteristics that are very important not only in defining the infrastructure policy of a country but also shaping the attitudes and behaviours of individuals towards the new venture creation process.

Friedman (2011) revealed that research linking governance directly to entrepreneurship is limited and conflicting, and called for further investigation. This author opines that even more limited is research linking governance indirectly to entrepreneurship in general, and new venture creation in particular. The government is expected to promote entrepreneurial

initiatives in a country by creating support policies, which foster environments conducive for new venture creation and growth. Actions taken by a government to regulate or improve the implementation of existing support mechanisms (e.g. funding policy) will likely influence the perceptions of its effectiveness by incumbent entrepreneurs living in the country. Such perceptions may actually influence their attitudes and behaviours, hence a possible motivator towards starting new businesses, or even growing existing ones. Indeed, trust in government effectiveness, political stability, rule of law etc. all influence risks associated with investing, starting and managing new businesses (Friedman, 2011).

As a concept based on the quality of governance and formal institutions, state fragility captures the extent to which the state is capable of exercising its governance role of establishing regulatory rules, enforcing them, and providing basic public goods and services (Amorós et al., 2019). Over time, regulatory frameworks can influence infrastructure related decision-making in a country such that failure/inability of a nation to provide an appropriate infrastructure regulatory framework can result in high levels of state fragility. The government even have responsibility to ensure public infrastructure is sustainable and affordable, by instituting strong links between infrastructure development phase and the fiscal framework of the country (Fisher, 2016). In fact, the role of governance in establishing rules may affect not only decisions about affordability, but also the right to access economic infrastructure in developed world countries.

In more-developed economies, starting a venture often requires formal registration, fees, or even taxes in some cases, however, average wages are also often higher in these economies. Accordingly, new venture creation in the developed world economy entails higher opportunity costs for opportunity-motivated entrepreneurs than necessity-motivated entrepreneurs. However, more opportunity-motivated entrepreneurs quit paid jobs to join new venture creation process than necessity-motivated entrepreneurs (Bolck and Wagner, 2010).

This suggests that perception of any increases in state fragility will probably cause opportunity-motivated entrepreneurs to pressurize the government for good laws and proper regulations, and these laws and regulations may actually define accessibility and affordability policies of economic infrastructure. The likely outcome of such pressures on a continuous basis is availability of highly accessible and easily affordable economic infrastructure, and potentially a motivator to engage in new venture creation. Necessity-motivated entrepreneurs may not pressurize the government because they thrive in conditions of high state fragility (Amorós et al., 2019). The likely outcomes of no pressure are bad laws, poor regulations, weak institutions etc.

The prediction, that state fragility positively mediates relationship between OME and accessibility and affordability of economic infrastructure, was supported in this study. This study also found a negative mediation by state fragility in the case of NME. Therefore, economic infrastructure accessibility and affordability each actually affects OME and NME indirectly, that is, through quality of governance.

4.5.2 Conclusion

In this study, OME and NME were considered as two different contexts in which entrepreneurial activities are undertaken in new venture creation process in countries of the developed world economy. Consequently, this chapter aimed to demonstrate that, for a given category of infrastructure (in this case economic), attributes such as accessibility, quality, affordability etc., also affect OME and NME differently. In fact, a sharp contrast was found in manner of the effects; most of the attributes that enhanced OME actually hurt NME, and vice versa.

This chapter also aimed to understand if quality of governance (state fragility) in studied countries serves as a medium for the improvement of these dimensions of economic

infrastructure, and how the consequences of such improvements enhanced or hurt the entrepreneurial activities of both OME and NME. This study found that state fragility was a medium through which some economic infrastructure attributes affected the new venture creation process. In fact, study results confirmed that affordability and accessibility of economic infrastructure actually affect OME and NME indirectly, through state fragility.

4.5.3 Study Limitations

One of the greatest limitations of this study is the small sample size used for analyses; future studies should consider using larger samples if, and when available. Also, it could be interesting to query how economic infrastructure dimensions effect(s) on OME and NME may change over time. Future studies on this topic should consider a longitudinal research design.

The chapter that follows will be concluding this thesis. It will be focused on providing a detailed account of the contributions (theoretical, practical and empirical) of entire thesis to entrepreneurship literature in this area of research. Furthermore, thesis's next chapter also highlights how policy makers, practitioners, and other researchers are implicated by its reported findings. Finally, overall thesis limitations are discussed, and recommendations are made for consideration by future related research works.

Appendix 3

Table 4-7a: Mediation effects of state fragility on accessibility-opportunity-motivated Vs affordability-opp.-motivated relationships

```
Run MATRIX procedure:   A1

***** PROCESS Procedure for SPSS Version 3.3 *****
          Written by Andrew F. Hayes, Ph.D.  www.afhayes.com
**************************************************************

Model  : 4
    Y  : Opportunity
    X  : Access
    M  : StateFrag

Covariates:
 Unemplymnt Inflation

Sample
Size:  31

**************************************************************
OUTCOME VARIABLE:
 StateFrag

Model Summary
      R      R-sq       MSE        F       df1       df2        p
  .8459    .7156     .0762   22.6420    3.0000   27.0000     .0000

Model
              coeff        se         t         p      LLCI      ULCI
constant    -.2170     .3107    -.6986     .4908    -.8545     .4204
Access      -.0333     .0058   -5.7744     .0000    -.0451    -.0214
Unemplym     .0285     .0134    2.1176     .0436     .0009     .0561
Inflatio    -.1054     .0932   -1.1311     .2680    -.2966     .0858

**************************************************************
OUTCOME VARIABLE:
 Opportun

Model Summary
      R      R-sq       MSE        F       df1       df2        p
  .7689    .5913   60.4101    9.4034    4.0000   26.0000     .0001

Model
              coeff        se         t         p      LLCI      ULCI
constant   44.9647    8.8264    5.0944     .0000   26.8213   63.1081
Access      -.1521     .2424    -.6273     .5359    -.6503     .3462
StateFra  -15.2206    5.4189   -2.8088     .0093  -26.3597    -4.0815
Unemplym    -.6317     .4089   -1.5447     .1345   -1.4722     .2089
Inflatio    -.6051    2.6855    -.2253     .8235   -6.1253    4.9151

************* DIRECT AND INDIRECT EFFECTS OF X ON Y *************

Direct effect of X on Y
    Effect        se         t         p      LLCI      ULCI
    -.1521     .2424    -.6273     .5359    -.6503     .3462

Indirect effect(s) of X on Y:
            Effect    BootSE  BootLLCI  BootULCI
StateFra     .5061     .2276     .0029     .8860

*************** ANALYSIS NOTES AND ERRORS ***************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX ------
```

```
Run MATRIX procedure:   A2

***** PROCESS Procedure for SPSS Version 3.3 *****
          Written by Andrew F. Hayes, Ph.D.  www.afhayes.com
**************************************************************

Model  : 4
    Y  : Opportunity
    X  : Afford
    M  : StateFrag

Covariates:
 Unemplymnt Inflation

Sample
Size:  31

**************************************************************
OUTCOME VARIABLE:
 StateFrag

Model Summary
      R      R-sq       MSE        F       df1       df2        p
  .8065    .6505     .0936   16.7476    3.0000   27.0000     .0000

Model
              coeff        se         t         p      LLCI      ULCI
constant    -.3773     .3419   -1.1035     .2795   -1.0787     .3242
Afford      -.0218     .0046   -4.7013     .0001    -.0313    -.0123
Unemplym     .0473     .0140    3.3731     .0023     .0185     .0761
Inflatio     .0961     .1030     .9332     .3590    -.1152     .3074

**************************************************************
OUTCOME VARIABLE:
 Opportun

Model Summary
      R      R-sq       MSE        F       df1       df2        p
  .7649    .5851   61.3243    9.1663    4.0000   26.0000     .0001

Model
              coeff        se         t         p      LLCI      ULCI
constant   42.4812    8.9441    4.7496     .0001   24.0957   60.8666
Afford      -.0013     .1597    -.0082     .9936    -.3296     .3270
StateFra  -12.7207    4.9250   -2.5829     .0158  -22.8446    -2.5968
Unemplym    -.6443     .4278   -1.5062     .1441   -1.5236     .2350
Inflatio    -.1080    2.6776    -.0403     .9681    -5.6121    5.3960

************* DIRECT AND INDIRECT EFFECTS OF X ON Y *************

Direct effect of X on Y
    Effect        se         t         p      LLCI      ULCI
    -.0013     .1597    -.0082     .9936    -.3296     .3270

Indirect effect(s) of X on Y:
            Effect    BootSE  BootLLCI  BootULCI
StateFra     .2768     .1349     .0084     .5402

*************** ANALYSIS NOTES AND ERRORS ***************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX ------
```

Tab. 4-7b: Mediation effects of state fragility on accessibility-necessity-motivated Vs affordability-necessity-motivated relationships

```
Run MATRIX procedure:    B1

*************** PROCESS Procedure for SPSS Version 3.3 ***************
          Written by Andrew F. Hayes, Ph.D.    www.afhayes.com
*********************************************************************

Model : 4
    Y : Necessity
    X : Access
    M : StateFrag

Covariates:
Unemplymnt Inflation

Sample
Size: 31

*********************************************************************
OUTCOME VARIABLE:
StateFrag

Model Summary
      R       R-sq      MSE        F       df1      df2       p
    .8459    .7156    .0762    22.6420   3.0000  27.0000   .0000

Model
             coeff      se        t        p       LLCI     ULCI
constant    .2170     .3107    -.6986    .4908    -.8545    .4204
Access     -.0333     .0058   -5.7744    .0000    -.0451   -.0214
Unemplym    .0285     .0134    2.1176    .0436     .0009    .0561
Inflatio   -.1054     .0932   -1.1311    .2680    -.2966    .0858

*********************************************************************
OUTCOME VARIABLE:
Necessity

Model Summary
      R       R-sq      MSE        F       df1      df2       p
    .7692    .5917   37.5199    9.4205   4.0000  26.0000   .0001

Model
             coeff      se        t        p       LLCI     ULCI
constant   36.9646   6.9560    5.3141    .0000   22.6660  51.2633
Access     -.2315     .1910   -1.2119    .2364    -.6242    .1612
StateFra    8.6846   4.2706    2.0336    .0523    -.0940  17.4632
Unemplym    .1972     .3223     .6118    .5460    -.4653    .8596
Inflatio   -.6791    2.1164    -.3209    .7509   -5.0295   3.6713

*********** DIRECT AND INDIRECT EFFECTS OF X ON Y ***********

Direct effect of X on Y
    Effect     se        t        p       LLCI     ULCI
    -.2315    .1910   -1.2119    .2364    -.6242    .1612

Indirect effect(s) of X on Y:
            Effect    BootSE   BootLLCI  BootULCI
StateFra   -.2888    .1784    -.7415    -.0443

*********** ANALYSIS NOTES AND ERRORS ***********

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

------ END MATRIX -----
```

```
Run MATRIX procedure:    B2

*************** PROCESS Procedure for SPSS Version 3.3 ***************
          Written by Andrew F. Hayes, Ph.D.    www.afhayes.com
*********************************************************************

Model : 4
    Y : Necessity
    X : Afford
    M : StateFrag

Covariates:
Unemplymnt Inflation

Sample
Size: 31

*********************************************************************
OUTCOME VARIABLE:
StateFrag

Model Summary
      R       R-sq      MSE        F       df1      df2       p
    .8065    .6505    .0936    16.7476   3.0000  27.0000   .0000

Model
             coeff      se        t        p       LLCI     ULCI
constant   -.3773     .3419   -1.1035    .2795   -1.0787    .3242
Afford     -.0218     .0046   -4.7013    .0001    -.0313   -.0123
Unemplym    .0473     .0140    3.3731    .0023     .0185    .0761
Inflatio    .0961     .1030     .9332    .3590    -.1152    .3074

*********************************************************************
OUTCOME VARIABLE:
Necessity

Model Summary
      R       R-sq      MSE        F       df1      df2       p
    .7760    .6022   36.5568    9.8400   4.0000  26.0000   .0001

Model
             coeff      se        t        p       LLCI     ULCI
constant   37.8815   6.9056    5.4856    .0000   23.6863  52.0767
Afford     -.1826     .1233   -1.4807    .1507    -.4361    .0709
StateFra    8.7544   3.8026    2.3022    .0296     .9378  16.5709
Unemplym    .3103     .3303     .9395    .3561    -.3686    .9892
Inflatio    .8545    2.0674     .4133    .6828   -3.3952   5.1041

*********** DIRECT AND INDIRECT EFFECTS OF X ON Y ***********

Direct effect of X on Y
    Effect     se        t        p       LLCI     ULCI
    -.1826    .1233   -1.4807    .1507    -.4361    .0709

Indirect effect(s) of X on Y:
            Effect    BootSE   BootLLCI  BootULCI
StateFra   -.1905    .1094    -.4624    -.0387

*********** ANALYSIS NOTES AND ERRORS ***********

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

------ END MATRIX -----
```

Table 4-8: Correlation matrix for indicators within econ. infrastructure availability component

EI AVAILABILITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1: Commercial bank branches														
2: Computer, communications	-0.09													
3: Automated teller machines	0.35	-0.14												
4: ICT goods imports (% total g	-0.44	0.27	-0.26											
5: Alternative and nuclear ene	-0.03	0.28	-0.10	-0.04										
6: Rail lines (km/pop density)	-0.02	-0.08	-0.31	0.34	-0.01									
7: Renewable electricity outpu	-0.07	-0.17	0.15	-0.43	0.29	-0.22								
8: Aircraft, spacecraft, and par	0.39	0.21	0.04	-0.18	-0.17	-0.09	-0.12							
9: Energy imports, net (% of er	0.34	0.16	0.02	-0.09	-0.15	-0.26	-0.43	0.14						
10: Fuel imports (% of mercha	0.09	-0.28	0.02	-0.18	-0.32	-0.01	-0.22	-0.23	0.31					
11: Bank concentration (%)	-0.39	-0.01	-0.23	-0.11	0.23	-0.31	0.38	-0.20	-0.30	0.02				
12: Transport services (% of co	-0.27	-0.73	-0.19	-0.10	-0.23	-0.06	0.12	-0.47	0.00	0.45	0.30			
13: Bank capital to assets ratio	-0.19	-0.27	-0.32	0.21	-0.21	0.28	0.10	-0.16	0.20	0.10	-0.16	0.32		
14: Personal remittances, rece	-0.04	-0.21	-0.30	-0.04	-0.17	-0.19	0.00	0.07	0.23	0.01	-0.20	0.21	0.68	

Table 4-9: Correlation matrix for indicators within EI availability component

EI ACCESSIBILITY	1	2	3	4	5	6	7	8	9	10	11	12
1: Railways, passengers carrie												
2: Container port traffic(per sq	0.21											
3: Mobile cellular subscription	0.23	-0.12										
4: Fixed telephone subscriptio	0.42	0.13	-0.32									
5: People using safely manage	0.23	0.27	-0.10	0.33								
6: Renewable energy consum	-0.15	-0.39	0.14	-0.38	-0.10							
7: Fixed broadband subscriptio	0.54	0.33	-0.17	0.50	0.41	0.04						
8: Access to clean fuels and te	0.36	0.16	0.05	0.29	0.46	-0.15	0.48					
9: Air transport, registered car	-0.33	-0.17	-0.52	0.18	0.17	-0.12	0.12	0.19				
10: Air transport, passengers c	-0.03	-0.07	-0.19	0.19	0.10	-0.22	0.07	0.21	0.06			
11: Personal Remitances	0.14	0.00	-0.14	0.41	0.23	-0.28	0.38	0.27	0.49	0.05		
12: Bank deposits to GDP (%)	0.09	0.18	0.28	0.30	0.25	-0.25	0.12	0.18	0.01	0.12	0.17	

Table 4-10: Correlation matrix for indicators within EI affordability and quality components

EI QUALITY	1	2	3	4	5	6	7	8	EI AFFORDABILITY	1	2	3	4	5	6	7	8
1: Quality of port infrastructur	1.00								1: Cost to import (US$/contai								
2: Secure Internet servers (pe	0.62	1.00							2: Pump price for diesel fuel (l	0.21							
3: Quality of road	0.67	0.42	1.00						3: Average transaction cost o	-0.13	-0.11						
4: Quality of electricity supply	0.62	0.59	0.71	1.00					4: Cost to get electricity (% ind	-0.27	0.11	-0.45					
5: Quality of railroad	0.59	0.38	0.74	0.64	1.00				5: Fixed broadband basket (%	0.22	-0.03	-0.23	0.30				
6: Time required to get electri	-0.29	-0.29	-0.40	-0.42	-0.31	1.00			6: Mobile cellular basket (% G	-0.22	-0.06	-0.01	0.70	0.53			
7: Electric power transmission	-0.28	-0.39	-0.14	-0.46	-0.28	0.43	1.00		7: Mobile-broadband basket	-0.10	-0.25	0.16	0.20	0.56	0.40		
8: CO2 emissions from electric	-0.09	-0.12	-0.32	-0.39	-0.34	-0.11	-0.17	1.00	8: Bank overhead costs to tot	-0.07	-0.08	-0.28	0.43	0.53	0.57	0.21	

Table 4-11: moderating effect of EI affordability on accessibility-opportunity-driven relationship

```
Run MATRIX procedure:


*************** PROCESS Procedure for SPSS Version 3.3 *******************
          Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
*************************************************************************
Model  : 1
    Y  : Opportun
    X  : Access
    W  : Afford


Covariates:
 Inflatio Unemplym


Sample
Size:  31


*************************************************************************
OUTCOME VARIABLE:
 Opportun


Model Summary
          R        R-sq        MSE          F        df1        df2          p
      .7399       .5474     69.5698     6.0476     5.0000    25.0000      .0008


Model
             coeff         se          t          p       LLCI       ULCI
constant    64.5336     5.9868    10.7793      .0000    52.2031    76.8641
Access       .2430      .3068      .7922      .4357     -.3888      .8748
Afford      -.0775      .2620     -.2959      .7698     -.6170      .4620
Int_1       -.0293      .0154    -1.8994      .0691     -.0610      .0025
Inflatio    1.2242     3.4374      .3561      .7247    -5.8555     8.3039
Unemplym   -1.2163      .4227    -2.8777      .0081    -2.0869     -.3458


Product terms key:
 Int_1     :        Access     x        Afford


Test(s) of highest order unconditional interaction(s):
      R2-chng         F        df1        df2          p
X*W      .0653     3.6079     1.0000    25.0000       .0691
----------
------ END MATRIX -----
```

Table 4-12a: Economic Infrastructure Availability Construct

Indicator	Definition	Source
Commercial bank branches (per 100,000 adults)	Number of retail locations physically separated from the main office, but not organized as legally separated subsidiaries per 100,000 adults.	IMF/World Bank
Computer, communications and other services (% of commercial Service Import)	Percentage of commercial service imports such as international telecommunications, postal and courier services, computer data, news-related service transactions, construction services, royalties and license fees etc.	IMF/World Bank
Automated teller machines (ATMs) (per 100,000 adults)	Number of computerized telecommunications devices providing access to financial transactions in a public place per 100,000 adults.	IMF/World Bank
ICT goods imports (% total goods imports)	Percentage of total goods imports such as computers and peripheral equipment, communication equipment, consumer electronic equipment, electronic components etc.	UNCTAD/World Bank
Alternative and nuclear energy (% of total energy use)	Percentage of total non-carbohydrate energy use, e.g., hydro, nuclear, geothermal, and solar power etc.	IEA/World Bank
Rail lines (km/pop density)	Total length of route in km divided by population density	Author, data UIC/World
Renewable electricity output(% total output)	Percentage of total electricity output of wind, solar PV, solar thermal, hydro, marine, geothermal, solid biofuels, renewable municipal waste, liquid biofuels and biogas. Hydro pumped storage excluded.	IEA/World Bank
Aircraft, spacecraft, and parts imports (per capita)	Annual importation of powered and non-powered aircraft (e.g. helicopter, airplanes, satellites, gliders, balloons and dirigibles), parachutes, and aircraft launching gears etc. expressed in thousands dollar per total population.	Author, data IWTC
Energy imports, net (% of energy use)	use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport A negative value indicates that the country is a net exporter.	IEA/World Bank
Fuel imports (% of merchandise imports)	Fuels comprise the commodities in SITC section 3 (mineral fuels, lubricants and related materials).	World Bank/UN
Bank concentration (%)	Assets of three largest commercial banks as a share of total commercial banking assets.	World Bank
Transport services (% of commercial service imports)	all transport services (sea, air, land, internal waterway, space, and pipeline) performed by residents of one economy for those of another.	IMF/World Bank
Bank capital to assets ratio (%)	Ratio of bank capital and reserves to total assets	IMF/IFS
Personal remittances, received per capita (current US$)	comprise personal transfers and compensation of employees; including all current transfers between resident and non-resident individuals	World Bank

Table 4-12b: Economic Infrastructure Quality Construct

Indicator	Definition	Source
Quality of port infrastructure	Business executives' perception of their country's port facilities where 1=extremely underdeveloped; 7=well developed and efficient by international standards	WEF/World Bank.
Secure Internet servers (per million population)	Number of distinct, publicly-trusted TLS/SSL certificates found in the Netcraft Secure Server	Author, data Netcraft/World Bank
Quality of road	Perceptions of extensiveness and condition of road infrastructure where 1 = extremely poor—among the worst in the world; 7 = extremely good—among the best in the world	WEF
Quality of electricity supply	Perceptions of the reliability of electricity supply-lack of interruptions and lack of voltage fluctuations where 1 = extremely unreliable; 7 = extremely reliable	WEF
Quality of railroad	Perceptions of railroad system condition where 1 = extremely underdeveloped— among the worst in the world; 7 = extensive and efficient—among the best in the world	WEF
Time required to get electricity (day)	The number of days to obtain a permanent electricity connection.	World Bank.
Electric power transmission and distribution losses (% of output)	Losses in transmission between sources of supply and points of distribution and in the distribution to consumers, including pilferage	IEA/World Bank
CO_2 emissions from electricity and heat prod., total (% of total fuel combustion)	Emission of carbon dioxide from main activity producers, unallocated auto producers, and other energy industries producers of electricity and heat	IEA/World Bank

Table 4-12c: Economic Infrastructure Accessibility Construct

Indicator	Definition	Source
Railways, passengers carried(ton-km per capita)	Number of passengers transported by rail times kilometres travelled relative to population.	Author, data UIC/World Bank.
Container port traffic(per sq. Km)	Flow of containers from land to sea transport modes, and vice versa, in twenty-foot equivalent units	Author, data UNCTAD/World Bank
Mobile cellular subscriptions (per 100 people)	Subscriptions to a public mobile telephone service that provide access to the PSTN using cellular technology	ITU/World Bank
Fixed telephone subscriptions (per 100 people)	Sum of active number of analogue fixed telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones.	ITU/World Bank
People using safely managed drinking water services (% of population)	Percentage of population using drinking water from an improved source that is accessible on premises, available when needed and free from faecal and priority chemical contamination	WHO/UNICEF
Renewable energy consumption (% of total final energy consumption)	The share of renewable energy in total final energy consumption.	World Bank.
Fixed broadband subscriptions (per 100 people)	high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. Includes cable modem, DSL, fibre-to-the-home/building etc.	ITU/World Bank
Access to clean fuels and technologies for cooking (% of population)	the proportion of total population primarily using clean cooking fuels and technologies for cooking	World Bank
Air transport, registered carrier departures worldwide/Pop Dens.	Registered carrier departures worldwide are domestic take-offs and take offs abroad of air carriers registered in the country.	Author, data ICAO/World Bank.
Air transport, passengers carried	Domestic and international aircraft passengers of air carriers registered in the country.	Author, data ICAO/World Bank.
Personal Remittances	comprise personal transfers and compensation of employees; including all current transfers between resident and non-resident individuals	World Bank
Bank deposits to GDP (%)	Demand, time and saving deposits in deposit money banks as a share of GDP.	IFS/IMF/World Bank

Table 4-12d: Economic Infrastructure Affordability Construct

Indicator	Definition	Source
Cost to import (US$/container)	The fees levied on a 20-foot container in U.S. dollars.	World Bank.
Pump price for diesel fuel (US$/liter)	Pump prices of the most widely sold grade of diesel fuel	GIZ/World Bank
Average trans, cost of sending remittances from (% average total cost)	The average of the total transaction cost in percentage of the amount spent for receiving USD 200 to the country	World Bank.
Cost to get electricity (% income per capita)	The cost to get electricity	World Bank.
Fixed broadband basket (% GNI per capita)	The price of a standard basket of mobile monthly usage for 30 outgoing calls per month (on-net/off-net to a fixed line and for peak and off-peak times) in predetermined ratios, plus 100 SMS messages	ITU
Mobile cellular basket (% GNI per capita)	The price of a monthly subscription to an entry-level fixed-broadband plan. It is calculated as a percentage of a country's average monthly GNI p.c., and is also presented in USD and PPP$.	ITU
Mobile-broadband basket postpaid computer based (1GB)	Monthly entry-level fixed-broadband plan paid upfront. It is calculated as a percentage of a country's average monthly GNI p.c., and is also presented in USD and PPP$.	ITU
Bank overhead costs to total assets (%)	Bank operating expenses as a share of the value of total assets held	Bankscope

Countries involved in this study: Australia, Austria, Belgium, Canada, Croatia, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States.

Chapter Five

Conclusion: Contributions, Implications, Limitations, and Future Research Directions

This chapter seeks to highlight the new knowledge contributed by this thesis to the literature on relationships between infrastructure and entrepreneurship in general, and economic infrastructure and new venture creation in particular, in DDWC. It vividly revisits thesis's main aim, its principal objectives, and provides summaries that clearly reflect the research findings and any new knowledge created in the investigation. The chapter also summarizes general limitations of studies covered under the different chapters of the thesis, and provides some recommendations for future work undertaken in this area of research.

5.1   Thesis Contributions

This thesis aimed principally to critically evaluate type and nature of the relationships between infrastructure and new venture creation in DDWC. Infrastructure is a multi-dimensional construct (Goodwin, 2018), however, some previous studies provided definitions that are unprecise, fragmented, limited in meaning, and often fail to reflect the fact that infrastructure exists in different categories (Buhr, 2003). Moreover, new venture creation is multi-facet process (Reynolds et al., 2005) that could be influenced directly or indirectly by different dimensions and/or categories of infrastructure under different contexts. For example, Momoh and Ezike (2018) stated that presence of infrastructure helps businesses to innovate, diversify, and improve productivity. However, two important questions to be asked are: which type of infrastructure (economic or social etc.) are involved? what contexts (developed or

developing world countries etc.) are being considered? In fact, according to Caceres-Diaz et al. (2019), scholars have failed to give infrastructure due importance in entrepreneurship studies. Therefore, in order to effectively evaluate nature and type of the relationships between new venture creation (a form of entrepreneurship) and infrastructure, it was imperative first to further develop extant knowledge about infrastructure, i.e., its definition, classification, and importance. Other objectives realized during the accomplishment of the principal aim of this thesis included the following:

 ➢ Highlighted different infrastructure categories as a possible explanation to regional variations in the levels of entrepreneurial activities across DDWC.

 ➢ Demonstrated how to construct an index of economic infrastructure category and apply it to rank some countries.

 ➢ Evaluated direct and/or indirect effect(s) of dimensions of the economic infrastructure category (aggregated & disaggregated) on some country-level entrepreneurial activities (e.g. entrepreneurial transition, necessity entrepreneurship etc.) in DDWC.

5.1.1   Infrastructure: Its Definition, Its Classification, and Its Importance

Although infrastructure has potential to play an important role in the firm formation process (Fotopoulous and Spence, 1999), only few studies distinguish infrastructure into different categories in entrepreneurship studies (Holl, 2004b), with many more specific types of infrastructure not being analysed in these studies (Audretsch et al., 2015). In fact, according to Bennet (2019), limited attention is given to infrastructure in the field of entrepreneurship, and development of infrastructure for entrepreneurship (new venture creation by extension) remains elusive (Woolley, 2014). In this thesis, the first important step taken, in order to better analyse nature and type of relationships between infrastructure and new venture creation in DDWC, was to pay more attention to infrastructure. It was Imperative to understand what generally constitutes an infrastructure, identify and classify infrastructure into different

categories, and highlight their possible importance especially for those involved in new venture creation in DDWC.

In order to achieve this first important step, author undertook a SLR in chapter two of the thesis to select studies that investigated relationship between new venture creation and infrastructure in DDWC between 1980-2020. The exercise yielded 87 articles from 44 countries published in 51 academic journals, which had 2018 Scopus CiteScore value of at least 1.0. Author explored those 87 articles and came up with a definition, and proposed a four-category classification for infrastructure. Based on same articles, importance of certain sub-categories of infrastructure for individuals involved in venture creation were highlighted.

5.1.1.1 Definition of Infrastructure

As one of the earliest scholars to emphasize that infrastructure investments should be considered in productivity analyses, Aschauer (1989) failed to provide any specific definition for infrastructure, and referred to it simply as public investments. Previously, many entrepreneurship scholars (Van de Ven, 1993; Woolley and Rottner, 2008; Tseng, 2012) adopted narrow views by describing entrepreneurial infrastructure as infrastructure for entrepreneurship. However, such narrow views slow down the investigation of infrastructure characteristics, forms, attributes etc., and knowledge of interrelationship between different infrastructure components becomes largely unavailable. For example, most studies (Amorós et al., 2013; Bosma et al., 2009) frequently identified factors said to be related to entrepreneurial infrastructure and termed them entrepreneurial framework conditions (EFCs). Physical infrastructure is considered an EFC, however, little is usually done in such analyses to account for differences that may result from using one category of physical infrastructure (e.g. economic) and not another (e.g. social). In related studies, like entrepreneurship ecosystems

(EEs), infrastructure is also frequently included as forms of support services and pillars within the system (Stam, 2015).

Be it EFCs, EEs or other types of support instruments, it's imperative to understand what the word "infrastructure" stands for, distinguish between its categories and dimensions before estimating individual and collective effects of these EFCS and/or EEs on entrepreneurial activities in general and new venture creation in particular. This can be achieved by adopting and exploring the following definition of infrastructure established from SLR in this thesis.

Infrastructure is defined as: in/tangible conditions or capital goods present in a location, owned publicly, privately, or jointly with the state, which support processes such as start-up, production and marketing, and facilitate social and economic activities. It is a network booster, often classified under three categories (economic, social, and technology), regulated by a local or national independent structure, and its presence renders a location attractive to various socio-economic, political, cultural, technological and ecological activities. It comprises of transportation links, communication networks, financial support, energy, water supplies, bridges, education, healthcare, police/fire stations, wastewater treatment, storm sewers, green spaces, museums, cinema, art galleries, research institutions, waterfall etc.

5.1.1.2 Tentative Classification of Infrastructure

Based on the outcome of the SLR, infrastructure was classified tentatively into four categories in this thesis, i.e., economic, social, technological, and institutional categories of infrastructure. The findings of the SLR also suggested that some infrastructure are man-made while others occur naturally (e.g. waterfall). Although most sub-classes of infrastructure are tangible in nature (exist physically), some sub-classes of infrastructure are rather intangible in nature, e.g. knowledge, leadership (cannot be easily expressed in monetary term, and lack physical existence). Above all, ownership of each infrastructure category was found to be either

private, public, or joint (i.e., public and private partnership). In fact, the characteristics of each category of infrastructure are different and may appeal to individuals engaged in new venture creation in DDWC differently. For example, while economic infrastructure category is primarily oriented toward support of directly productive activities or movement of economic goods, the social infrastructure category increases productivity rather indirectly (Hahsen, 1965). Therefore, studies investigating the effect(s) of infrastructure on entrepreneurial activities in specific contexts and countries should consider different categories of infrastructure separately.

5.1.1.3 Importance of Infrastructure

Little attention is devoted to the study of the importance of infrastructure in general (Fox and Porca, 2001), and in the field of entrepreneurship in particular (Bennet, 2019). Infrastructure is a set of facilities that play a critical role in facilitating activities by individuals and organizations (Bliemel et al., 2019). It develops human capability and permits easy and efficient growth of business activity (Credit Suisse, 2008). The presence of adequate infrastructure enhances the attractiveness of a location relative to other places (Amorós et al., 2013), and can facilitate and accelerate socio-economic development in that location (Krakowiak-Bal et al., 2017). For example, public infrastructure provides an environment in which private production is facilitated (Berndt and Hansson, 1992), and intangible infrastructure accompanies risk capital in wealth production (Venkataraman, 2004). In fact, infrastructure are physical conditions and amenities, which either foster or constrain interaction between the agents of entrepreneurial ecosystem (Audretsch and Belitski, 2017).

Individuals who engage in the creation of new ventures in DDWC are economic agents operating under different but related entrepreneurial ecosystems across the world; their activities are often enhanced, constrained or, in some limited cases, unaffected by presence of

infrastructure in locations where they undertake their entrepreneurial activities. The usefulness and/or effectiveness of infrastructure to entrepreneurs in different contexts may depend on the attributes of the type of infrastructure involved, amongst other factors. For example, cheaper electricity could reduce the input costs in the production process (Fourie, 2006), hence, economic infrastructure affordability (cheap electricity) is potential booster of entrepreneurial activities in new venture creation process. Furthermore, poor labour market entry regulations may foster corruption, which hurts entrepreneurial activities in some contexts (La Porta et al., 2008). However, availability of high quality institutional infrastructure (administrative laws) increases strategic entrepreneurial entry rates (Levie and Autio, 2011), and facilitates access to other types of infrastructure suitable for trade (Francios and Manchin, 2013). In fact, infrastructure is a location-based support for individuals seizing and enacting entrepreneurial activities (Woolley, 2017); attributes such as its access, its quality, its affordability etc. all stand to play very import roles in the way entrepreneurs and other users of infrastructure perceive its usefulness and/or its effectiveness in different contexts. For example, access to airport, highway, and broadband has each been demonstrated empirically to enhance new venture creation in Spain, US, UK, and Belgium (Holl and Mariotti, 2018; Sheard, 2019; Gibbons et al., 2019; Whitacre et al., 2015). Researchers should explore this and similar attributes of infrastructure in order to better understand the importance placed by entrepreneurs on different categories of infrastructure, and contexts under which such choices are being made.

5.1.2   Nature and Type of Relationships Between Infrastructure and New Venture Creation

Alderete (2017) revealed that much is not being done to understand nature and type of relationship between entrepreneurship and certain sub-classes of infrastructure in the literature. In this thesis, author reviewed and summarized previously reported evidence of nature and type of relationships between new venture creation (a form of entrepreneurship) and different

categories of infrastructure in DDWC between 1980-2020. This was intended to understand what was being investigated in order to highlight gaps in the literature. Results of the SLR undertaken in chapter two of this thesis revealed different categories of infrastructure as determinants of location and spatial distribution of newly created businesses in DDWC between 1980-2020. However, the SLR also revealed that over 78% of reviewed previous studies evaluated solely direct relationships between new venture creation and these different infrastructure categories. For example, most previous studies found a direct and positive effect (Gibbons et al., 2019; Jiang et al., 2018; Alemu and Adesina, 2017) or a direct and negative effect (Bailey and Thomas, 2017; Susanne and Alexandra, 2009) of infrastructure on new venture creation in the literature. Knowledge and understanding of relationships between variables will remain very limited if only direct effects are evaluated. In order to paint a complete picture in this area of the literature, it is imperative for future studies to also evaluate indirect infrastructure effect(s) on new venture creation in DDWC.

Summarily, the results of the SLR suggested that new venture creation effects of economic and institutional categories of infrastructure in both DDWC were direct and positive. However, new venture creation effects of the social category of infrastructure were mixed; while some researchers reported direct and positive effects in developing world countries, others reported direct and negative effects in developed world countries, and vice versa. SLR results also suggested that new venture creation effect of the technological category of infrastructure is not yet well known in DDWC. Furthermore, majority of reviewed studies evaluated the direct effect(s) of sub-classes of economic and institutional infrastructure categories on new venture creation in DDWC, while direct new venture creation effect of technological infrastructure was the least studied. Finally, based on SLR outcome, author found studies looking at electricity (sub-class of economic infrastructure category) effect on new venture creation highly skewed towards the developing world economy, and those looking at

research knowledge (sub-class of social infrastructure category) effect on new venture creation highly skewed towards the developed world economy.

5.1.3 Effects of Economic Infrastructure on New Venture Creation in DDWC

Infrastructure is a multi-dimensional construct (Goodwin, 2018), and to better evaluate its effect(s) on new venture creation, it was necessary to classify it into four categories, i.e., economic, social, technological, and institutional infrastructure categories. After distinguishing infrastructure by type (category) in chapter two of this thesis, some sub-classes of the economic infrastructure category were selected and their effect(s) on new venture creation in DDWC were critically evaluated. These evaluations were based on secondary data extracted from several different databases, and the choice of sub-classes of economic infrastructure was dependent on data availability. Direct and indirect effect(s) of aggregated and disaggregated sub-classes of economic infrastructure were evaluated on new venture creation process in both the DDWC within different time periods.

Most previous studies (Kim et al., 2018; Verhetsel et al., 2015; Vernet et al., 2019; Aklin et al., 2017) investigated the disaggregated effect(s) of selected sub-classes of economic infrastructure on new venture creation and reported contradictory findings in DDWC. For example, broadband internet effect on new venture creation positive (Whitacre et al., 2015), negative (Cumming and Johan, 2010), or even without effect (Fairlie, 2006). This thesis adopted a slightly different approach by introducing an aggregate of sub-classes of economic infrastructure in the form of an index for economic infrastructure. The index was evaluated on nascent entrepreneurial transition in 42 developing world countries (chapter three of thesis), and empirical results were without effects. Although these results were similar to those reported above by Fairlie, care must be taken when interpreting them; the contexts are somewhat

different in terms of the stage in the new venture creation process (transitional stage, in this case), and the level of economic development (developing world economy, in this case).

Furthermore, indirect effect(s) of some disaggregated economic infrastructure sub-classes on new venture creation have been reported in the literature. For example, McCoy et al. (2018) found new venture creation effect of internet access positively mediated by access to university knowledge. In the case of aggregation (index), mediation was very helpful at explaining how economic infrastructure affected entrepreneurial transition, especially in developing world economies. In fact, the findings in this thesis (chapter three) confirmed that economic infrastructure (aggregated) was not a direct determinant of entrepreneurial transition. Through corruption perceptions, the index was found to be a positive determinant of the entrepreneurial transition from "taking steps to start up a business" to "owning a young business."

Most other previous studies (Kim and Orazem, 2017; Tranos and Mack, 2016; Holl and Mariotti, 2018) estimated the effect(s) of availability of some sub-classes of the economic infrastructure category on entrepreneurial activities in different parts of the world. However, Calderón, and Servén (2004) demonstrated that other attributes of sub-classes of economic infrastructure, such as their quality, their accessibility etc. also influence their attractiveness and perceived importance by infrastructure users (entrepreneurs included). In this thesis, the motive for which individuals often engage in new venture creation process in the developed world economy (chapter four) was reviewed, and four important attributes (availability, accessibility, quality, and affordability) of economic infrastructure were highlighted as possible determinants of the entrepreneurial activities of these individuals. Although different categories of motivation are identified in the literature (Carter et al., 2003), motive to start a firm is easily classified as either opportunity or necessity (Acs, 2006). Necessity-motivated individuals were distinguished from opportunity-motivated individuals in thesis, and effect of

each of the four highlighted attributes (disaggregated) on entrepreneurial activities of the two groups were compared.

Empirical findings from this thesis revealed that economic infrastructure availability was without direct effect on the entrepreneurial activities of both necessity and opportunity-motivated entrepreneurs in developed world countries. However, accessibility, quality, and affordability of economic infrastructure were each found to directly influence entrepreneurial activities of necessity-motivated entrepreneurs in the developed world economy negatively. The effect of each attribute was opposite in the case of opportunity-motivated entrepreneurs, i.e., direct and positive. Moreover, some attributes of economic infrastructure were also demonstrated in this thesis to affect entrepreneurial activities of individuals engaged in venture creation rather indirectly. For example, economic infrastructure affordability was shown to negatively moderate association between entrepreneurial activities of opportunity-motivated individuals and access to economic infrastructure in the developed world economy. It was also found in thesis (chapter four) that economic infrastructure accessibility and affordability indirectly enhanced entrepreneurial activities of opportunity-motivated individuals, through state fragility. The opposite was true for entrepreneurial activities of necessity-motivated individuals, that is, effects of economic infrastructure accessibility and affordability on these individuals were negatively mediated by state fragility. Overall, empirical findings reported in this thesis (chapters three and four) could encourage researchers to not only separate infrastructure categories in entrepreneurship studies, but also to evaluate both their direct and indirect effect(s) on various entrepreneurial activities in different contexts.

5.1.4   Summary Contribution

Considering all the points discussed earlier in this chapter, the contribution made in this area of research by this thesis is threefold: First, the thesis provided a holistic definition of

infrastructure, and also separated infrastructure into categories and dimensions that could facilitate understanding of its relationship with new venture creation, as well as other forms of entrepreneurship. Second, unlike most previous studies that evaluated solely the direct infrastructure effect(s) of new venture creation, this thesis looked at the indirect infrastructure effect(s) of new venture creation in DDWC, and painted a complete picture of the nature and type of relationship between the two constructs. Third, this thesis provided a methodological contribution on how different infrastructure categories could be aggregated into an index, and used subsequently to rank countries of the develop and/or developing world economy.

5.2   Implication of Thesis

It was demonstrated in this thesis that, in the new venture creation process, perceptions by incumbent entrepreneurs of such infrastructure attributes like accessibility, quality, affordability etc. could be a strong motivating factor for some category of entrepreneurs, and a demotivating factor for others. Such perceptions by potential and incumbent entrepreneurs could also have similar influences on other forms of entrepreneurship (e.g. entrepreneurial growth). Therefore, from a theoretical perspective, the perception of infrastructure attributes by potential and incumbent entrepreneurs is a possible addition to the list of determinants of entrepreneurial motivation in the literature.

Empirical findings in this thesis suggested that state fragility is a mechanism through which various dimensions of economic infrastructure influence the entrepreneurial activities of opportunity-motivated and necessity-motivated entrepreneurs in countries of the developed world. Corruption perception was also shown empirically as medium through which nascent entrepreneurial transition is enhanced by economic infrastructure in countries of the developing world economy. Therefore, knowledge of the indirect influence(s) of various infrastructure categories on new venture creation seems a compulsory complement to entrepreneurship

research, and a theoretical addition to the literature. Moreover, from a practical perspective, knowledge of indirect infrastructure effect(s) on new venture creation in different parts of the world could assist policy makers to draw up and institute effective and efficient national infrastructure policy regulatory frameworks in those regions.

This thesis demonstrated also that usefulness and benefits of specific infrastructure categories could be different between opportunity-motivated and necessity-motivated entrepreneurs, DDWC, potential and incumbent entrepreneurs, etc. In fact, infrastructure was separated into four categories in this thesis to facilitate investigation of the new venture creation effect(s) of each. From a theoretical perspective, the classification of infrastructure in entrepreneurship literature facilitates its understanding, and promotes measurement and data collection on its various categories. Given that financial resources are often limited, therefore, from a practical perspective, it's very imperative for policymakers and practitioners to know if, and which types of infrastructures require additional investments at a particular point in time in any given community, and why.

Finally, this thesis equally emphasized that the ability of individuals involved in new venture creation to transition across one or more phases in the entrepreneurial process is very important not only for starting new businesses, but also for entrepreneurship as a whole. Knowing the factors that drive or inhibit various entrepreneurial transitions in a country is imperative, and could help policymakers and practitioners to design and institute policies needed to promote new venture creation and other forms of entrepreneurship.

5.3   Limitations of Thesis

Overall, the limitations of this thesis is twofold: First, data limitations caused the sample sizes of most thesis chapters to be small, a problem that could potentially bias some of the parameters estimated in some of the studies in the thesis. In the future, and with data on

several excluded countries becoming availability, researchers should conduct further analyses to confirm or infirm findings reported in some or all parts of this thesis. Second, time could be of significant importance when it comes to relationships between new venture creation and infrastructure. Throughout this thesis, the evaluation of different types of relationships between new venture creation and the economic infrastructure category in both DDWC were based on cross-sectional research designs. Such designs fail to take into consideration the effluxion of time, and won't actually paint a full picture of the dynamics of such relationships. Therefore, where possible, future researchers are encouraged to adopt a longitudinal research approach in the evaluation of relationships between new venture creation and infrastructure in DDWC.

5.4   Direction of Future Research

Knowledge of how categories of infrastructure different than economic are associated with forms of entrepreneurship other than new venture creation is also very crucial in the effort to paint a complete picture on the nature and type of relations between infrastructure and entrepreneurship. Not only is data on other types of infrastructure (social and technological infrastructure) limited, but appropriate measurement of them are not common. Researchers should initiate studies that could lead to measurement and collection of data, especially on availability, accessibility, affordability etc. of social infrastructure like prisons, police stations, hospitals etc. The realization of such initiative will facilitate investigations of their individual or collective effects on levels of entrepreneurship in a country or region. Similar knowledge is required of technological infrastructure such as business incubators, business accelerators, science parks etc., therefore, several opportunities for research exist in this area, and should be explored by entrepreneurship scholars.

Finally, future researchers should focus more attention on the indirect effect(s) of various other categories of infrastructure (plus economic infrastructure), wherever and

whenever data is available. In doing this, country-level studies should be prioritized and consideration also given to countries of the transitioning economy like Russia, Ukraine, Georgia etc., if possible.

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