A model of entrepreneurial opportunity-seeking behavior: an investigation into its antecedents, consequences and boundary conditions.

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Donbesuur, F., Hultman, M., & Boso, N. Entrepreneurial Knowledge and New Venture Performance in Developing Economies: The Roles of Opportunity Discovery and Dynamic Capabilities. *Proceedings of the 2018 the Academy of International Business Sub-Saharan Africa Chapter Annual Conference*, Kigali, Rwanda, August 6 – 8.

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Dedication

To that Family I will forever cherish and love…

Abstract

Recent scholarly works in entrepreneurial opportunities have shifted towards the two main sources of opportunities – opportunity creation and discovery. Whilst some school of thoughts argue for the subjective nature of opportunities, others believe that entrepreneurial opportunities are objective. Despite an increase in research into the two views of entrepreneurial opportunities and most importantly, the potential contribution this debate brings to the entrepreneurship literature, a careful look at the current discourse in the extant literature points to several and important research gaps. Specifically, knowledge is lacking on the conceptual domain and empirical validation of these two sources of opportunities and their driving forces on the one hand, and how they both simultaneously and/or differentially impact on new venture performance on the other hand. Drawing from the literature on cognitive psychology and strategic management, this study proposes and tests a framework of entrepreneurial opportunity-seeking behavior, its antecedents, and performance outcomes and associated boundary conditions using a sample of new ventures a developing economy. First, empirical analysis shows that opportunities can occur as subjective and objective phenomena in the firm and that entrepreneurs can engage in them distinctively and in a non-contradictory way. Second, the findings indicate that entrepreneurial cognitive style drives both opportunity creation and discovery. Third, the study shows that opportunity creation and discovery have differential implications for new venture performance. Thus, while opportunity creation positively impacts on the performance of new ventures, opportunity discovery has no effect on new venture performance. Fourth, an analysis into the boundary condition effects shows that firms' dynamic capabilities, to some extent, moderate the opportunity creation/discovery – new venture performance relationships. Finally, by using a developing economy as a study setting, this research contributes to an important but rarely discussed context as far as the study and practice of entrepreneurship is concerned. The implications of such findings for the theory and practice of entrepreneurship are discussed, while providing valuable avenues for future research.

Key words:

Opportunity creation, opportunity discovery, cognitive style, dynamic capabilities and new venture performance.

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CHAPTER 1
INTRODUCTION

1.1 Overview of the study

Drawing from the literature on entrepreneurship, strategic management and cognitive psychology, this study proposes and tests a model of entrepreneurial opportunity-seeking behavior, its antecedents, performance outcomes and associated boundary conditions. After a review of relevant literature, the study adds to the extant literature and recent scholarly work on the nature of entrepreneurial opportunities by delineating the opportunity creation and opportunity discovery constructs. Second, it emphasizes the significant role entrepreneurial cognition plays in driving the process of opportunity creation and discovery, while highlighting the effects that such processes (opportunity creation and discovery), amid contingencies, will have on the performance of new ventures. Specifically, the study explains how entrepreneurial cognitive style drives opportunity creation and discovery on the one hand, while applying the tenets of the resource based-view and dynamic capabilities to determine the outcomes and boundary conditions of both opportunity creation and discovery on the other hand.

The remainder of the chapter begins by providing a background to the study and its context. Second, the chapter identifies the gaps in the extant literature on entrepreneurial opportunities that motivated the study. Third, the key research questions and objectives of the study are presented. Finally, the chapter enumerates the originality and the implication of the study to the theory and practice of entrepreneurship and strategy.

1.2 Research background

There is an increased awareness of the importance of entrepreneurial activities, especially to the economic growth and development of nations (Wennekers & Thurik, 1999). The pursuit of entrepreneurial activities is encouraged both at the national level (in terms of public policies and enterprise reforms) and at the organizational level (where continuous pursuit of opportunities is noted to be vital for firms' survival) (De Carolis & Saparito, 2006; Ireland & Webb, 2007). Classical research on entrepreneurship emphasizes that entrepreneurship drives innovation and economic growth (Schumpeter, 1934), and helps in the equilibration of demand and supply (Kirzner, 1997). In effect, there is the need for stakeholders, both in research and practice, to underscore the importance of the study and application of entrepreneurship across all nations and economies. In this study, *entrepreneurship refers to the process of opportunity identification/formation, evaluation and exploitation as well as the individual and institutions who engage in these activities (Shane & Venkataraman, 2000)*

Consequently, scholarly works on entrepreneurship have mostly been around two central aspects: (1) entrepreneurial orientation (e.g., Lumpkin & Dess, 1996) and (2) the process of forming and exploiting opportunities (e.g., Shane & Venkataraman, 2000), with both aspects, either within the context of small and medium size enterprises (SMEs) and new ventures, or corporate entrepreneurship. Entrepreneurial orientation refers to firms' ability to behave and act entrepreneurially such as the predisposition to innovate, take risk, be proactive, autonomous and be competitive aggressive (Dess & Lumpkin, 2005). These predispositions have been key stimuli to firm survival, especially for new ventures.

The process of forming and/or exploiting entrepreneurial opportunity, which is the main thrust of this study, is the second aspect of entrepreneurship research that has gained much attention in the literature. The entrepreneurial opportunity process has often been considered as being crucial to the entrepreneurship thought (Vogel, 2017; Eckhardt & Shane, 2003; Shane & Venkataraman, 2000). For example, some scholars have argued that an exposition on the process of entrepreneurial opportunity formation and exploitation helps distinguish the domain of entrepreneurship from other management disciplines (Venkataraman, 1997). Accordingly, entrepreneurship has been described mainly as the source of opportunities and/or the process of opportunity formation and exploitation (Ardichvili, Cardozo & Ray, 2003). Eckhardt and Shane define opportunities as 'situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends or ends–means relationships'… (Eckhardt and Shane, 2003, p. 336). Other definitions include the introduction and evaluation of creative ideas (Dimov, 2007a; Vaghely, & Julien, 2013); the introduction of innovative goods and services (Gaglio, 2004); the continuous shaping and development of venture ideas that are acted upon (e.g., Davidsson, 2012; Dimov, 2007b), among others. Thus, all these definitions point to a general definition of opportunities as *the existence of market imperfections in both product and factor markets or the creation of such imperfections by individuals or firms for new venture creation or wealth creating potentials*. By this definition of entrepreneurial opportunities, small firms, large firms, old and new firms all have the potential to engage in opportunity formation and exploitation process.

These descriptions have made the pursuit of opportunities an important path to the competitive survival of firms, such that it is done before, during and even after the venture creation process.

In recent times, the direction of research on the process of entrepreneurial opportunities has shifted to the sources and nature of opportunities. Specifically, the paradigm is on the creation (subjective) and discovery (objective) views of opportunities (e.g., Suddaby, Bruton & Si, 2014: Garud & Giuliani, 2013). Even though opportunity process is mostly synonymous with the discovery of opportunities (e.g., Eckhard & Shane, 2003), current literature has made attempts to espouse both views of opportunity creation and discovery. In this study *opportunity creation is defined as subjective phenomenon, products, services and resources that are endogenously enacted and acted upon by the actions of individuals or firms*, while *opportunity discovery refers to objective phenomenon, products, services and resources that exist in either the product or factor markets independent of the action of the individual entrepreneur or firms* (Alvarez & Barney, 2010). While some scholars argue that entrepreneurial opportunities are objective phenomena that exist (independent of the actions of the entrepreneur) waiting to be discovered (Shane, 2000), others believe that opportunities are subjective, such that entrepreneurs play an active role to help construct such opportunities (Alvarez & Parker, 2009; Wood & Mckinley, 2010). Yet, there are others who think the current debate can better serve the extant entrepreneurship literature, by proposing a middle ground between these two views of discovery and creation (e.g., Ramoglou & Tsang, 2016).

Thus, the literature points to the direction that entrepreneurial opportunities come in the form of creation/formed and discovery/found opportunities. The relevance of these two types of opportunities to firms' survival cannot be underestimated. For example, Alvarez and Barney (2007) argue that the two theories of entrepreneurial action are opportunity creation and discovery. Further, entrepreneurs plan and formulate business ideas through the process of creation and discovery **(**Eckhardt & Shane, 2013).

Despite the increase in research on opportunity creation and discovery over the years and, most importantly, the potential managerial and theoretical benefits this debate brings to the entrepreneurship literature, a careful look at the current discourse points to several gaps and important avenues for future research. For example, past literature has alluded to the seeming difficulty in empirically examining the opportunity types of discovery and creation (see Alvarez & Barney, 2010; Dimov, 2011). Because creation and discovery opportunities differ in terms of (1) the nature of the opportunity, (2) the nature of the entrepreneur, and (3) the decision-making context (Alvarez & Barney, 2007), one wonders of what significance is an examination into the type of opportunity and its associated push and pull effects to the theory and practice of entrepreneurship? Again, is it possible that the framework used in evaluating threats and opportunities when exploiting discovery opportunities will be different from the framework used when exploiting creation opportunities? (see, Alvarez and Barney, 2010)

Relatedly, given that entrepreneurship research has improved over the decades in terms of construct development, relevance and currency, it is important to incorporate context in the conceptualization of the entrepreneurship construct—especially regarding the current stream of research on opportunity creation and discovery. This is because context influences entrepreneurial actions and has the potential to impact the outcomes as well. Reuber, Dimitratos and Kuivalainen (2017) argue that it is important to contextualize entrepreneurship studies that are opportunity-based, since opportunities are very contextual. For example, certain contextual factors such as appropriability regimes and ownership of complementary assets influence entrepreneurial activities in terms of market entry (Gans & Stern, 2003) and the strategies adopted for opportunity formation and exploitation (Zahra, Wright, & Abdelgawad, 2014). Additionally, entrepreneurship may occur in different settings including the creating of new firms and/or within an existing firm

(whether small, medium or large-scale firms) as well as across different nations (be it developed, emerging and/or developing economies) (Lumpkin & Dess, 1996). Following the above summary to the background of the study, the preceding section and paragraphs explain in detail, the research gaps in the extant literature.

1.3 Gaps in the literature

From the introduction and the research context of opportunity creation and discovery, several gaps can be identified in the extant literature. The first research gap is lack of clarity of the conceptual domain of the entrepreneurial opportunity constructs of creation and discovery (Suddaby, 2010). Thus, recent scholarly debates on opportunities have focused on two primary sources: discovery and creation, leading to interesting research opinions with respect to whether entrepreneurial opportunity is an objective phenomenon that is independent of the entrepreneur or whether it is a subjective phenomenon created by the actions of the entrepreneur (Welter & Alvarez 2015; Alvarez & Barney 2007; 2010). Given these two views on the notion of entrepreneurial opportunity, arguments have been made that the study of discovery and creation opportunity should progress in separate directions since both views have unique epistemological assumptions (Alvarez & Barney, 2010). Nevertheless, some scholars have argued that entrepreneurial opportunity can be created and discovered at the same time (Chiasson & Saunders, 2005; Vaghely & Julien, 2010), and that the two views should not be oppositional but rather the focus should be on the orthogonal relationship between the two (Suddaby, Bruton, & Si, 2015). Thus, research examining the conceptual domain of entrepreneurial opportunity as an organizational behavior is needed. Recent work on the comparison of these two views of opportunity has been mainly conceptual (Hansen, Monllor & Shrader, 2016); hence, having a model that empirically tests the

opposing views, or otherwise, of opportunity creation and discovery is warranted and timely (see Hechavarria & Welter, 2015).

Second, the literature on antecedents of entrepreneurial opportunity creation and discovery is limited. While some studies have looked at the factors that separately drive creation (Foss, et al., 2008; Tocher, Oswald, & Hall, 2015; Wood & McKinley, 2010) and discovery (Corbett, 2007; Davidsson & Honig, 2003; Foss & Foss, 2008; Shane, 2000), very little research has examined the factors that drive simultaneously, both views of opportunities (Dutta & Crossan, 2005; Vaghely & Julien, 2010; Zahra, 2008). It is important to note that most of these studies, especially those that focus on understanding the forces that influence either form of entrepreneurial opportunity, are primarily conceptual and therefore provide little evidence by way of showing the extent to which the antecedent variables studied influence levels of opportunity discovery and/or creation. Consequently, there is a need for research to examine relevant antecedent variables that could drive both opportunity discovery and creation (Short, Ketchen, Shook, & Ireland, 2010). For example, Suddaby et al., (2015) relate reflexivity to the process of discovery and imprinting to creation, and suggest that, rather than emphasizing the differences between the two forms of entrepreneurial opportunity, researchers should focus on finding similarities in terms of common factors that drive them.

From the field of cognitive psychology, cognition is one of the many borrowed constructs used in entrepreneurship research (e.g., Baron, 2004, 1998; Ward, 2004). The cognitive process or mechanisms most often used in extant literature is *entrepreneurial cognitive style* (intuitive and analytic cognitive style). Cognitive style has been linked to key entrepreneurial concepts including entrepreneurial orientation (Chaston & Sadler-Smith, 2012), entrepreneurial success and firm performance (Levine, Bernard & Nagel, 2017; Chen, Chang & Lo 2015), opportunity

identification and evaluation (Kickul, Gundry, & Barbosa, Whitcanack, 2009; Keh, Foo & Lim, 2002) among others. However, some studies have shown that there is limited knowledge around entrepreneurial cognitive style and other relevant opportunity processes (see Kickul et al., 2009). For instance, Baldacchino et al. (2015) argue that the relative significance of intuitive and/or analytic cognitive style in taking some entrepreneurial decisions and actions such as the venture creation process has been ignored in the entrepreneurship literature. Such entrepreneurial actions during the venture creation process include the two views, opportunity creation and discovery (Alvarez and Barney, 2007). Thus, despite an increase in research on the opportunity creation and discovery concepts in recent times, little effort has been made to examine these concepts from an entrepreneurial cognitive-style perspective.

Additionally, knowledge on how the entrepreneurial opportunity processes of creation and/or discovery impact organizational outcomes (such as firm performance) is limited. The literature on entrepreneurship–firm performance relationship has mostly focused on entrepreneurial orientation (e.g., Lumpkin & Dess, 2005; Wiklund & Shepherd, 2005; Boso, Story & Cadogan, 2013) and sometimes other form of entrepreneurial attributes, such as entrepreneurial style (Sadler–Smith, Hampson, Chaston, & Badger, 2003), entrepreneurial efficacy and improvisational behavior (Hmieleski & Corbett, 2008), opportunity confidence and optimism (Dimov, 2010; Hmieleski & Baron, 2009), with little theoretical argument or empirical evidence to link actual entrepreneurial opportunity process and behaviors such as creation and discovery to start-up performance and venture creation (Short et al., 2009; Lumpkin & Dess, 1996). The many studies (e.g., Chiasson & Saunders, 2005; Dutta & Crossan, 2005; Suddaby et al., 2015; Vaghely & Julien, 2010; Zahra, 2008) that have thoroughly debated the entrepreneurial opportunity process of creation and discovery, have fallen short of examining their performance consequences for venture growth,

even though, it is usually argued that the performance of entrepreneurial firms depends on their ability to continually exploit new opportunities (Webb et al., 2011). Again, Alvarez and Barney (2007) posit that the nature of opportunity creation (characterized by uncertainty) and discovery (characterized by risk) has very significant implications for how firms grow. Yet, such significant impact is not known, at least according to the current literature. Thus, just as debates on the nature and sources of entrepreneurial opportunity have increased, it is equally important for researchers to examine how and when these two opportunity processes of creation and discovery influence performance and firm growth. Although some studies have conceptually implied competitive advantage as the outcome of discovery and/or creation forms of entrepreneurial opportunity (Alvarez & Barney, 2007, 2010), the logic backing such a relationship has not clearly been articulated. By modelling performance outcomes as part of the opportunity framework, this study extends the current literature from *what are opportunities* to include *what opportunities do*, such as the creation of new products and ventures (Klein, 2008).

Related to the opportunity discover/creation – firm performance gap, the extant literature is silent on how the link between opportunity-seeking behavior and firm performance is shaped by relevant conditioning factors external or internal to the firm (Short et al., 2010). However, an argument can be mounted that there may be some contingency variables that have the potential to condition the relationship between the pursuit of opportunities and performance (e.g., Zahra & Hayton, 2008). The few studies (e.g., Dimov, 2010; Hmieleski & Baron, 2008b) that have linked some aspects of entrepreneurial opportunity process to an outcome variable, have done so without paying attention to the boundary conditions that could influence the relationship. Past entrepreneurship literature provides some evidence that the relationship between certain entrepreneurial constructs (e.g., entrepreneurial orientation) and firm performance is conditional on some organizational and

external environmental factors (e.g., Stam, Arzlanian & Elfring, 2014; Lisboa, Skarmeas, & Lages, 2011). Further from the international marketing literature, Sundqvist et al., (2012) conceptualize Kirznerian (discovery process) and Schumpeterian (e.g., creation of new combinations, innovativeness) entrepreneurial-oriented behaviors and argue that both behaviors impact on international business performance depending on how dynamic and stable the environment is.

Using these extant works as a backdrop, one can argue that knowledge on the theoretical link between entrepreneurial opportunity creation and discovery and performance outcomes can be broadened if empirical studies incorporate relevant constructs to explain the boundary conditions of such relationships. In sum, just as there is poor understanding of the conceptual domains of the opportunity creation and discovery construct, its drivers and performance outcomes, knowledge is also limited on the boundary conditions of the discovery/creation – firm performance relationship.

Lastly, the relevance of context to the theory and practice of entrepreneurship cannot be underestimated – as it has influence on the outcome of certain entrepreneurial actions and processes (Reuber et al., 2017). In the last three decades, sub-Saharan Africa has witnessed significant business transformation through market openness and favourable market regulations (Amankwah-Amoah, 2016). Consequently, the continent has been experiencing major developments in entrepreneurial activities and business growth from both domestic and international firms. For example, recent studies have shown the potential of studying international entrepreneurship across countries within the African region (e.g., Boso, Oghazi & Hultman, 2017). Despite these developments, extant research on the process of opportunity formation and exploitation are mostly on developed markets. However, the uniqueness of African markets in terms of environmental complexities and socio-cultural issues, suggest that there may be different theories and models in understanding the same entrepreneurship phenomenon. Thus, given the

important recognition of the varying market, institutional and structural characteristics of developing economies, it has become imperative for an increase in entrepreneurship research within these contexts that aims to understand the dynamics of the creation and discovery of opportunities by firms and how this behavior impacts on organizational outcomes.

From the tenets of the resource based-view (RBV) and its dynamic capabilities extension, this study argues that firms' creation and usage of relevant capabilities such as absorptive and adaptive capabilities have the potential to shape the relationship between opportunity creation and/or discovery and firm performance. The choice of dynamic capabilities as boundary conditions is not arbitrary. Unlike ordinary or substantial capabilities, dynamic capabilities are higher-order routines which, when combined with other firm activities, can impact strongly on performance outcomes. Previous entrepreneurship studies have emphasized the significance of dynamic capabilities in shaping and seizing opportunities and subsequently enhancing the performance of entrepreneurial firms (e.g., Arend, 2014; Zahra et al., 2007). Because dynamic capabilities per se do not lead to high firm performance (Eisenhardt & Martin, 2000), it will be significant to the theory and practice of entrepreneurship to model the complementary effect of process of discovery and/or creation and dynamic capabilities on performance outcomes.

Considering the research gaps identified, this study draws from three research areas to propose and test the relevant framework. Adding to the fact that the study is originally situated within the entrepreneurship literature, it borrows from cognitive psychology to propose intuitive and analytic cognitive styles as antecedents of opportunity creation and discovery. Additionally, it draws extant works and theories from the strategic management literature on how to effectively exploit such opportunities to enhance firm performance and growth.

1.4 Research aim and questions

Given the above research gaps in the literature, this study's main objective is to: propose the notion of entrepreneurial opportunity-seeking behavior, comprising opportunity creation and discovery, as well as develop and test a theoretical framework of antecedents, consequences and boundary conditions. To achieve this broad objective, the following specific research questions are investigated:

1. What is the conceptual domain of entrepreneurial opportunity-seeking behavior?
2. To what extent do elements of entrepreneurial cognitive style (intuitive and analytic cognitive style) function to drive opportunity creation and/or discovery?
3. How does opportunity creation and/or discovery impact on firm performance? and
4. How is the relationship between opportunity creation and/or discovery and firm performance dependent upon degrees of absorptive and adaptive capabilities?

1.5 Contributions of the study

By answering the research questions, the study aims to make several contributions to the entrepreneurship literature. First, the study extends knowledge on entrepreneurial opportunity theory by proposing the notion of entrepreneurial opportunity-seeking behavior and conceptualizes it as an entrepreneurial action (Jones & Barnir, 2018; Shane, 2003) that makes firms act in an opportunity-related way (Mathias, Williams, & Smith, 2015) either to create or discover entrepreneurial opportunities. Considering the various discourses on opportunity creation and discovery, this study adds to the debate and the current literature through an empirical analysis of both creation and discovery. Such analysis brings clarity to the theories of creation and discovery.

Second, the study develops a theoretical model of the antecedents, outcomes and boundary conditions of entrepreneurial opportunity-seeking behavior. The study draws insights from

cognitive psychology to theorize how entrepreneurial cognitive style drives opportunity creation and discovery. Even though some studies have linked some aspects of entrepreneurial cognition to opportunity identification (e.g., Kickul et al., 2009), this study is the first of its kind (to the best of the author's knowledge) to develop and test a model that focuses specifically on the intuitive and analytic cognitive styles of entrepreneurial cognition and their relationship with opportunity creation and discovery. Specifically, the current study fills this gap and adds to the literature on entrepreneurial opportunity and cognition by examining the differential impact of intuitive and analytic cognitive styles on opportunity creation and discovery. In effect, the author extends the literature on opportunity creation and discovery by demonstrating that cognitive style is useful in discriminating between objective and subjective opportunities and by implication answers current research calls to investigate the use of both intuition and analysis in certain entrepreneurial tasks (see Baldacchino et al., 2015; Kickul et al., 2009). Findings of the study have significant managerial implications for entrepreneurial firms. For example, firms that are only interested in exploiting objectivized opportunities may only need to rely on developing and applying their intuitive cognitive processes during the opportunity-searching stage of the venture creation process.

The third contribution of the study is how the different entrepreneurial opportunity actions of creation and discovery impact certain performance outcomes. Such an examination is relevant in establishing the differential impact (if any) of creation and discovery on the performance of entrepreneurial firms. For example, some research contends that, since discovery is characterized by risky decision-making context and creation is characterized by uncertainty, creation opportunity is more likely to result in sustained competitive advantage than discovery opportunity is, as far as their performance outcomes are concerned (Alvarez and Barney, 2010). With such findings, firms

will know which of these two behaviors, creation or discovery, they should channel their limited resources into.

A fourth contribution is examining the boundary conditions for the opportunity-seeking behavior–firm performance relationship. Knowledge is currently lacking on how such relationship can be strengthened or weakened. To shed light on this issue, this study draws on the dynamic capability theory to identify absorptive and adaptive capabilities as potential moderators of the relationship. The study argues that absorptive capability encapsulates the ability of a firm to leverage, assimilate and apply external knowledge internally, to exploit new opportunities (Cohen & Levinthal, 1990). To this end, this study argues that absorptive capability would complement creation behavior, and therefore strengthens the performance effect of creation behavior. On the other hand, the study argues that, because adaptive capability explains firms' ability to adjust to external and/or environmental shocks in terms of their managerial, strategic and operational processes (Zollo & Winter, 2002), it can be viewed as leveraging this knowledge capability to effectively exploit discovery opportunity. Thus, the study contends that adaptive capability may function to strengthen the effect of discovery behavior on performance. By examining the performance impact of discovery and creation, and how firms' dynamic capabilities condition the performance benefits of discovery and creation, the study contributes to the entrepreneurship literature by showing how firms can rely on the best-fit between discovery and creation and absorptive or adaptive capabilities to drive performance. Finally, by using a developing economy as a study setting, this research contributes to an important but rarely discussed context and environment as far as the study and practice of entrepreneurship is concerned.

In sum, the study shows that, rather than having a generic argument on how opportunity exploitation leads to firm success, managers can know how and when to specifically determine which opportunity-seeking behavior is beneficial or successful.

1.6 Chapter summary and thesis outline

This chapter has presented a general overview of the study including a background, research gaps in the literature, research questions, and the study's contribution to the current knowledge on entrepreneurial opportunity and strategic management research. In brief, the chapter has demonstrated the urgent need for current studies to begin a discussion on the antecedents and performance implications of firms' opportunity creation and discovery. The rest of the study is organized as follows. Chapter two reviews all relevant literature on entrepreneurial opportunity, chapter three presents the theoretical framework, conceptual model and development of hypotheses, chapter four discusses the study's methodology, chapter five presents data analysis and results and, finally, chapter six discusses the study's results and implications for theory and practice.

Table 1. 1: Outline of thesis chapters

Chapters	Thematic areas
Chapter 1	Introduction to the research, research objectives, key questions and contributions
Chapter 2	Review and synthesis of entrepreneurial opportunity literature
Chapter 3	Theoretical underpinnings, conceptual model and hypotheses development
Chapter 4	Philosophical foundations and methodological processes followed
Chapter 5	Data analysis and results
Chapter 6	Discussion of results, theoretical and managerial implications, research limitations and conclusions

CHAPTER 2
LITERATURE REVIEW
2.0 Introduction

This chapter reviews the relevant literature – both empirical and conceptual, on the processes of entrepreneurial opportunity creation and discovery, and their attendant organizational outcomes. Specifically, the areas under review include: the debate on opportunity creation and discovery, the antecedents and outcomes of the discovery and/or creation process, as well as relevant theories underpinning the conceptual domain of entrepreneurial opportunity process.

2.1 Entrepreneurship and entrepreneurial opportunity

The entrepreneurship discipline has continued to receive growing scholarly, practitioner, and policy attention due to its increasing recognition as a major vehicle to economic growth and prosperity. While there is no universal single definition of entrepreneurship, the term has become synonymous to the notion of opportunity. For example, entrepreneurship has been described as the process of discovering, evaluating and exploiting new entrepreneurial opportunities for the creation of new value (Alvarez & Barney, 2004; Edelman & Yli-Renko, 2010; Shane & Venkataraman, 2000). By this description, it can be argued that the pursuit of opportunities holds the anchor of the entrepreneurship discipline. Without continuous identification and subsequent exploitation of opportunities, entrepreneurship will not be sustainable and might seize to exist as a phenomenon (Ardichvili et al., 2003; Eckhardt & Shane, 2003). Indeed, the concept of opportunity and its associated conceptualization has changed the direction of entrepreneurship research (Shane, 2012) from studying entrepreneurs to studying the nature, sources, and characteristics of opportunities (e.g., Mitchell et al., 2004; Dutta, & Crossan, 2005).

It has been argued that, identification and exploitation of opportunities require action (whether active or passive) from the individual entrepreneur (making up the entrepreneurial firm), which makes the idea of entrepreneurship an 'Individual-Opportunity nexus' (Shane, 2000). Accordingly, entrepreneurship involves the sources and identification of profitable opportunities and the individuals who engage in exploiting or making use of these opportunities (Shane & Venkataraman, 2000; Venkataraman, 1997). Following some seminal papers on entrepreneurship (Kirzner, 1997; 1973; Shane & Venkataraman, 2000), recent scholarly works, have flourished with efforts to explain the crucial role of opportunities in entrepreneurship research (Hansen, Shrader, & Monllor, 2011). This development has led to various conceptualization of opportunities based on varying, yet important, distinctions. For example, entrepreneurial opportunity has been differently explained as; introducing new products into the market (Dutta & Crossan, 2005; Lee & Venkataraman, 2006); developing ideas into new business (Ardichvili et al., 2003; Dimov, 2007); finding novel solutions to problems (Hsieh, Nickerson, & Zenger, 2007); and a cognitive process of recognizing and exploiting a business idea (Lumpkin & Lichtenstein, 2005), among many other definitions.

The different conceptualizations of entrepreneurial opportunity can be categorized based on; (1) the sources or the nature of entrepreneurial opportunity and (2) the opportunity related processes (e.g., opportunity exploitation and evaluation). The former, '*the sources or the nature of entrepreneurial opportunities'* is the main thrust of this study. The nature of opportunities, explains opportunities as either being created or discovered (see Ács, & Audretsch 2010; Garud & Giuliani, 2013). The next section reviews literature on opportunity discovery and creation.

2.2 Entrepreneurial opportunity creation and discovery schools of thought

Research on opportunity creation and discovery surfaced in the entrepreneurship literature many years ago (see Casson, 2003). The genesis of this can be attributed to the classical works of Kirzner (1971; 1997) and Schumpeter (1934), with these scholars being respectively associated with what is now referred to as opportunity discovery and creation.

The discovery approach to understanding entrepreneurial opportunity holds the view that opportunities are *objective* phenomena and exist independent of an entrepreneur's actions. It is argued that, this objective opportunity exists because of changes in pre-existing markets and demand (Alvarez & Barney, 2007, 2010). Such arguments, make entrepreneurial opportunity a function of objective and autonomous artefacts (such as pre-existing resources), exogenous market imperfections (Alvarez et al., 2013) that exists independent of the entrepreneur (Murphy, 2011). For the proponents of this view, opportunities exist in the objective environment and can be discovered and exploited by any individual or firm with peculiar entrepreneurial characteristics such as alertness (Shane, 2012; Shane & Venkataraman, 2000) and prior knowledge (e.g., Shepherd & DeTienne, 2005). In effect, past research argues for the continuous exploration of environmental, firm, and individual level characteristics that may lead to the discovery and exploitation of objective opportunities (e.g., Dutta & Crossan, 2005).

On the other side of the debate, is opportunity creation. Proponents argue that, opportunities do not exist as an objective phenomenon independent of the entrepreneur, but are constructed and enacted upon by the entrepreneur (Goss & Sadler-Smith, 2017; Wood & McKinley, 2010; Gartner, Carter, & Hills, 2003). This view of opportunities is synonymous to the tenets of effectuation or bricolage – which are not in support of the existence of resources or opportunities exogenous to the entrepreneur's action (Foss & Klein, 2017). Accordingly, there are no pre-existing conditions

to objectively identify an opportunity, rather, the opportunities are subjective phenomena that are endogenously perceived and enacted by the actions, reactions, social interactions and learning process of the entrepreneur (Tocher, Oswald & Hall, 2015; Alvarez & Barney, 2010; Edelman & Yli-Renko, 2010). This subjectivism, also implies that the opportunity could depend on the environment, but individuals interpret, judge, and make meanings out of the environment to create the opportunity (Companys & McMullen, 2007). Thus, even though some objective situations may exist in the environment or market, it is the creative and social construction skills of the entrepreneur that eventually determines what is interpreted to be an opportunity (Suddaby et al., 2014).

There have been concerns in the extant literature for a need to distinguish the two major sources of entrepreneurial opportunity and study them accordingly. Based on epistemological assumptions, Alvarez and Barney (2010), distinguished creation and discovery views of opportunity. They argued that, discovery theorists are critical realists who study opportunities based on critical realism, whiles creation is solely based on evolutionary realism. Thus, the critical realism for opportunity discovery and the evolutionary realism for opportunity creation are two different views and any attempt to put them together will amount to 'mixing oil and water' (Alvarez & Barney, 2010, p. 575). Differences also exist in terms of the decision-making context of forming and exploiting discovery and creation opportunities. Uncertainty and risky decision-making contexts characterize creation and discovery opportunities respectively (Alvarez & Barney, 2007; 2010). For Alvarez and Barney, even though the two views have something in common (i.e., the actions entrepreneurs take to form and exploit opportunities), the main theories, nature of opportunities and the decision-making contexts do differ; hence the need to study them base on their limitations and conditions.

2.3 Is entrepreneurial opportunity both discovered and created?

Despite the distinction between objective and subjective notions of entrepreneurial opportunity, there others who believe that opportunities are both discovered and created (Hechavarria & Welter, 2015, Venkataraman et al., 2012). Thus, the apparent differences between opportunity creation and discovery can be reconciled, combined or integrated (e.g., Ramoglou & Tsang, 2016). Subsequently, depending on the theory, approach or context of the study, many researchers have attempted to find a middle ground in studying creation and discovery process of opportunity. For example, Zahra (2008) makes a case within the context of technological firms and argues that through knowledge conversion, technological prospecting and absorptive capacity, there exist a virtuous cycle of discovery-creation. That is, creation leads to discovery and back to creation, in that other.

Further, using imprinting as the process by which opportunities are discovered and reflexivity for creation, Suddaby et al., (2014) suggest that, instead of highlighting the differences between the two processes, future researchers should concentrate on where there can be a point of agreement or similarity between the two constructs of imprinting and reflexivity. For example, the authors cited human cognition (that is socially shared cognition) as being common for both imprinting and reflexivity, and by extension entrepreneurial opportunity. Chiasson and Saunders (2005) make similar arguments using structuration theory. According to the authors, just as structuration theory helps solve the dichotomy between structure and agency, the same theory can be used to bring together creation and discovery. Their conclusion is that, both discovery and creation are 'recursively implicated', and could complement each other. Using business scripts as a proxy construct, the point of convergence is that, the action of the entrepreneur, are both accepting and modifying the business script. Additionally, Dutta and Crossan (2005) argue that, entrepreneurial

opportunity encompasses both creation and discovery because both views go through the process of *intuiting, interpreting, integrating,* and *institutionalizing*. Thus, through these processes, there can be a common ground of bringing opportunity creation and discovery under one umbrella.

A recent qualitative study by Maine, Soh and Dos Santos (2015) shows that, entrepreneurs' decision making regarding opportunity creation and recognition involves both effectuation (creation) and causation (discovery). Specifically, entrepreneurs can shift from effectuation to causation, use a single mode at a time, or adopt a combination of the two. This assertion is synonymous to other studies that hold a conceptual view that opportunities are both made and found and that both creation and discovery are part of the entrepreneurial opportunity process (Venkataraman et al., 2012; Garud & Giuliani, 2013).

From the above review, debates in the extant literature are still unclear and inconclusive as to whether opportunity creation and discovery ought to be studied together; if firms can simultaneously engage in both behaviors of creation and discovery and at what costs; does the occurrence of one contradict the other; is entrepreneurial opportunity a higher order construct with multi dimensions; among many other unanswered questions. For example, in the case of the structuration theory of Chiasson and Saunders, what possible conditions will lead to entrepreneurial firms accepting and modifying business scripts at the same time; and are there different organizational outcomes (if any at all) associated with these sources of opportunities?

2.4 Antecedents of opportunity creation and discovery

This section begins with a review of literature that has proposed antecedents, which have the potential of simultaneously driving opportunity discovery and creation. The literature on opportunity discovery and creation with regards to antecedents (see table 2.1) has been limited and mainly conceptual contributions. Moreover, of these studies, few have attempted to provide

antecedents that have the potential of driving both opportunity creation and discovery. Dutta and Crossan (2005) explains how some characteristics of entrepreneurs and their level of intuition influence both processes of creation and discovery. Relating the Schumpeterian and Kirznerian views of opportunity to creation and discovery respectively, they argue that the entrepreneur's intrinsic personal traits are more associated with creation while the entrepreneur's idiosyncratic knowledge base drives discovery. Again, based on intuition, they proposed expert intuition, which describes pattern recognition as a driver of opportunity discovery; and entrepreneurial intuition, which describes entrepreneurs' creative capacity as a driver of opportunity creation. In addition to the above study, Zahra (2008) proposes a conceptual framework explaining a virtuous discovery-creation cycle of entrepreneurial opportunity. Situating the study in a technological context, Zahra argues that, discovery will thrive in conditions where the industry knowledge base is young, where technology is emerging and where the firm is specialized in a specific area of technology. Creation, however, is more conducive in firms that are technologically diversified and where the technology portfolio is maturing. Thus, at an emerging level of technology, discovery is more pronounced, while firms that are mature in terms of technology will do more creation activities. Apart from these conceptual studies, Vaghely and Julien (2010) present a case study in which they modelled an opportunity-construction framework using human information processing; namely pattern recognition and trial-and-error type of information processing. They conclude that pattern recognition type of information processing, drives discovery opportunity, while trial-and-error or heuristics type of information processing, drives opportunity creation or construction. From table 2.1, it is evident that, there is a deficit of research that clearly explains and test factors (being firm or individual level factors) that can simultaneously drive opportunity creation and discovery. For example, literature (e.g. Ramoglou & Tsang, 2016; Suddaby, 2014) that has studied together, both

views of creation and discovery as not being oppositional, did so with less attention on the antecedent factors and mechanisms. Recently, Upson et al., (2017) identify different forms of entrepreneurial networks as possible drivers of opportunity creation and discovery. However, the conceptualization and measurement of creation and discovery was the environmental context within which the entrepreneur operates and not the actual behavior/action.

The other side of the literature, is antecedents that separately drive discovery and creation. For discovery process, factors such as alertness, possession of prior knowledge or information, cognitive properties, entrepreneurial human and social capital, have all been examined as possible antecedents of opportunity discovery (Ardichvili et al., 2003; Corbett, 2007; Davidsson & Honig, 2003; Shane, 2000; Shane & Venkataraman, 2000). Others have found evidence for how entrepreneur role congruence and identity aspiration strength drive the discovery behaviors of nascent entrepreneurs (Farmer, Yao & Kung-Mcintyre, 2011). Again, based on the economics of property rights, Foss and Foss (2008) in their conceptual study, propose that property rights and transaction cost are key antecedents of opportunity discovery. They argue that when property rights are not well enforced to protect entrepreneurs who do discoveries, they will have negative impact on future discoveries. Similarly, if transaction cost is high, it will not encourage discovery. Additionally, Hsieh et al., (2007), conceptualizes discovery as identifying novel problem and pairing it with a novel solution. Their study identifies governance modes such as markets, authority based and consensus-based hierarchies as factors that can help in the identification and solving of problems. In effect these governance modes can lead to the discovery of novel solutions.

With respect to opportunity creation, the general view is that it is endogenously enacted by the actions of the entrepreneur. Nonetheless, there are other studies that have proposed some specific and contextual factors that can successfully drive opportunity creation. For example, using social

capital theory or resources, Tocher, Oswald, & Hall (2015) propose that social capital and social competence drive the process of opportunity creation. Each aspect of social resources (social capital and social competence) plays a role in shaping each stage (opportunity ideations, objectification and enactment stages) of the opportunity creation process as conceptualized by their framework. Similarly, in a social constructivist view of opportunity creation, the entrepreneur's social ties and reputation, as well as cognitive properties, have been examined to influence opportunity creation (Wood & McKinley, 2010). Depending on the stage of the process, each of these factors, they argue; drive the entire process of opportunity creation. Other conceptual studies have proposed factors such as team dynamics and mental models (Foss et al., 2008), organizational development, and evolution (Buenstorf, 2007) as having impact in the process of opportunity creation. In a recent study, using the case of Sir Richard Branson (founder of Virgin Group), Goss and Sadler-Smith (2017) conceptualize how emotional intensity of social interactions can help drive entrepreneurs to act decisively to create or construct opportunities for business formation and development.

Table 2.1 shows a review of literature on the antecedents of opportunity creation and discovery. The table ('both creation and discovery' sections) clearly shows how the literature is limited in terms of a more nuanced studies that propose factor(s) that can simultaneously drive opportunity creation and discovery as well as an empirical validation of same.

Table 2. 1: A Review of Extant Literature on the Entrepreneurial Opportunity creation and discovery, Antecedents and Consequences

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
			Discovery only			
Shane and Venkataraman (2000)	conceptual	Opportunity discovery	Possession of prior information Cognitive properties	Opportunity exploitation either through markets or hierarchies.	----------	A framework of entrepreneurial opportunity discovery, evaluation and exploitation. These opportunities are objective phenomena
Shane (2000)	Empirical	Opportunity discovery measured as recognition and exploitation	Prior knowledge Attributes of technology	----------	----------	Opportunities are discovered through recognition and not actively searching and significantly influenced by prior knowledge
Davidsson and Honig (2003)	Empirical	Opportunity discovery and exploitation	Human capital Social capital	Sales and profitability	----------	Social capital predicts discovery and exploitation but human capital is only significant at the start-up process

Author(s)	Type of study	key construct	antecedents	outcome variables	boundary conditions	Key findings/comments
Corbett (2007)	Empirical	Opportunity discovery measured as number of opportunities identified	General human capital Specific human capital Information acquisition preference	----------	----------	Differences in individual learning account for the abilities to discover opportunities.
Hsieh et al (2007)	Conceptual	Opportunity discovery involves paring novel solutions to problems	Information transform preference Cognitive searching via theorizing	----------	----------	Both the deliberate search and recognition (serendipity) views of discovery can co-exist on the same theoretical framework
Foss and Foss (2008)	Conceptual	Discovery of new valued resource attributes	Property right Transaction cost Experiential knowledge	Sustainable advantage	----------	Property right and transaction cost are key antecedents to opportunity discovery

Author(s)	Type of study	key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Farmer et al (2011)	Empirical	Opportunity discovery measured by gestational behaviors	Entrepreneur role congruence Identity aspiration strength	----------	----------	Identity aspiration strength drives discovery behaviors of nascent entrepreneurs.
Murphy (2011)	Conceptual	Discovery (deliberate search and serendipity)	----------	----------	----------	Discovery is multidimensional (orthogonal) involving deliberate search and serendipity
Shua, Renb and Zheng (2018)	Empirical	Discovery (number of opportunities identified)	Entrepreneurial network capability	----------	----------	Entrepreneurial network capability drives opportunity discovery
			Creation only			
Buenstorf (2007)	Conceptual	Opportunity creation through evolutionary market process	Organizational development Evolution of industries	----------	----------	Opportunities are created by human activities and those who pursue the opportunities may be different from those who created them.

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Alvarez and Barney (2007)	Conceptual	Creation theory	Endogenous market imperfection	Competitive advantage.	----------	Creation theory explained that opportunities are subjective phenomena and an alternative to the discovery theory of opportunities
Dimov (2007)	Conceptual	Opportunity creation is described as opportunity development	Individual's immediate context (task environment) The social context (social audience)	----------	----------	Opportunities are creative product whose development is shaped by contextual and social influences
Foss et al (2008)	Conceptual	Subjective opportunities	Heterogeneous mental models Positive team dynamics organizational environments	Entrepreneurial rent	----------	Opportunities are subjective that result from creative team acts
Mitchell et al (2008)	Empirical	Opportunity creation measured by motivation to start a new venture	Recognition of failure Transaction mind-set	Perceived chance of venture success	----------	Recognition of failure impact on transaction mind which in turn enable opportunity creation

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Wood and McKinley (2010)/ Strategic Entrepreneurship Journal	Conceptual	Opportunity creation described as opportunity production (constructivist perspective)	Entrepreneurs' experiences and social ties Entrepreneurs' cognitive evaluation Entrepreneur's reputation Perceived ability of enacting new ides	----------	----------	Through these drivers opportunities are created, this does not however oppose but rather complements the discovery view
Tocher et al (2015)/ Strategic Entrepreneurship Journal	Conceptual	Opportunity creation is a socially iterative, path dependent multistage process (social constructivist)	Social capital Social competence	----------	----------	Through social resources entrepreneurs are able to go through all the processes of creation to market realities.

Author(s)	Type of study	key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Goss and Sadler-Smith (2017)	Qualitative/conceptual	Opportunity creation (individual opportunity creation/construction)	Social situations Affect/emotion	----------	----------	A conceptualization of how emotional intensity of social interactions can help drive entrepreneurs to act decisively to create or construct opportunities for business formation and development.
			Both creation and discovery			
Chiasson and Saunders (2005)	Conceptual	Structuration approach to discovery and creation	----------	----------	----------	By adopting structuration theory, both opportunity recognition and formation are complementary processes and occur at the same time.

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Dutta and Crossan (2005)	Conceptual	The 41-organisational learning framework of opportunity creation and discovery	***Creation*** Intrinsic personal traits Entrepreneurial intuition ***Discovery*** Idiosyncratic knowledge base Expert institution	----------	----------	Reconciled opportunity creation and discovery by applying the 41-organisational learning framework, discovery and creation all involve the process of Intuiting, interpreting, integrating and institutionalizing
Klein (2008)	Conceptual	Opportunity imagination	----------	----------	----------	Opportunities are neither created nor discovered, they are subjective phenomena that are imagined

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Alvarez and Barney (2010)	Conceptual	Epistemological approach to opportunity creation and discovery	***Creation*** Endogenous imperfection ***Discovery*** Competitive imperfection (caused by exogenous shocks)	Competitive advantage ----------	---------- ----------	The two views are studied from two mutually exclusive epistemological assumptions and there may be difficult and limited efforts to reconcile them.
Vaghely and Julien (2010)	Empirical	A dichotomy opportunity discovery-enactment	***Creation*** Trail-and-error information processing ***Discovery*** Pattern recognition	----------	----------	Opportunities are discovered and constructed at the same time through information processing

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Venkataraman et al (2012)	Conceptual	Opportunities made and found	----------	----------	----------	Opportunities are both made and found. Both processes of making and finding are intertwined by suggesting a tripod interaction of objective, subjective and intersubjective.
Alvarez et al (2013)	Conceptual	Opportunity creation and discovery	***Creation*** Endogenous market imperfections ***Discovery*** Exogenous market imperfection	Competitive advantage	----------	The two views differ in terms of theory and epistemology. These seeming differences should encourage future theoretical and empirical research.
Garud and Giuliani (2013)	Conceptual	Opportunity creation and discovery	----------	----------	----------	Discovery and creation occur simultaneously and both are part of the entrepreneurial opportunity process.

Author(s)	Type of study	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Suddaby et al, (2014)	Conceptual	Imprinting and reflexivity	----------	----------	----------	The two constructs of creation and discovery should not be seen as oppositional but orthogonal relationship depending on the source or the driver of the opportunities
Hechavarría and Welter (2015)	Empirical	Found opportunities (idea for the business came first) Formed opportunities (decision to start the business came first)	----------	Firm innovativeness	----------	Opportunity types, whether formed or found does not necessary lead to innovativeness
Ramoglou and Tsang (2016)	Conceptual	Creation and discovery	----------	----------	----------	There is tension between creation and discovery and that subjective actualization of opportunity process does not contradict the objective existence of opportunities.

Author(s)	Study context	Key construct	Antecedents	Outcome variables	Boundary conditions	Key findings/comments
Upson et al., (2017)	Empirical	Creation and discovery measured by environmental contexts	Similar network ties and different network ties	----------	----------	The context of opportunity realization depends on the entrepreneurs strategic network ties. Discovery context relates to similar network ties, while, creation context relates to network ties that are relatively different from the entrepreneur
Jones and Barnir (2018)	Empirical	Creation and discovery measured by environmental contexts and product innovativeness	Search activities, formal funding and entrepreneurial experience	----------	----------	Search activities and formal funding is relevant in discovery context, while entrepreneurial experience is appropriate in creation context

2.4.1 Cognition and entrepreneurial opportunities

Over the past decades, scholars have borrowed from other disciplines in constructing various entrepreneurship research frameworks. Key among such disciplines is psychology – specifically, cognitive psychology. Research on cognition and entrepreneurship has increased in recent times particularly in areas such as cognitive processes and/or mechanisms and business failure (Shepherd & Cardon, 2009; Yamakawa, Peng & Deeds, 2015), new venture success and firm performance (Hmieleski & Baron, 2009; Chen, Chang, & Lo, 2015; Levine, Bernard & Nagel, 2017), and entrepreneurial orientation (Chaston & Sadler-Smith, 2012), among others. Thus, entrepreneurs are generally regarded to possess certain cognitive properties that are relevant to their entrepreneurial dispositions and subsequent activities. For example, comparing the thinking styles of entrepreneurs and non-entrepreneurs, Groves, Vance, and Choi, (2011) found that entrepreneurs have a balance of both linear (analytic, rational, logical) and non-linear (intuitive, creative, emotional) thinking styles than other professionals like accountants and frontline managers.

Specific to entrepreneurial opportunity processes, past studies have differentiated between entrepreneurs and non-entrepreneurs based on their cognitive properties. In their study of founders of high growth companies, Allinson, Chell and Hayes (2000), differentiated between two forms of cognitive style – intuitive and analytic cognition. Findings show that owner managers that can identify and exploit opportunities successfully are more intuitive in their cognitive style than the other general managers. Using the cognitive style index by Allinson and associates (2000), similar findings show that, entrepreneurs are more intuitive and less analytic than non-entrepreneurs, such that entrepreneurs who are intuitive in their thinking styles tend to show high propensity in engaging in entrepreneurial activities (Armstrong & Hird, 2009). Accordingly, cognitive style has become a useful tool in differentiating between

potentially successful and non-successful entrepreneurs. Some research has also shown a relationship between entrepreneurial cognition and opportunity evaluation.

Additionally, entrepreneurs' cognitive processes such as illusion of control and belief in the law of small numbers are found to influence how entrepreneurs evaluate opportunities during the venture creation process (Keh et al., 2002). Further, Barbosa, Gerhardt and Kickul (2007) investigated how intuitive cognitive style and risk preference of entrepreneurs influence their entrepreneurial intentions and self-efficacy. From a sample of entrepreneurial students, Barbosa et al., (2007) found that individuals with intuitive cognitive style have lower perceived self-efficacy concerning certain entrepreneurial activities (e.g., management of the new venture, and the capacity to tolerate ambiguity), while intuitive individuals who had a high preference for risk tend to have high levels of opportunity identification efficacy. Relatedly, Kickul et al., (2009) demonstrate that, both intuitive and analytic cognitive style influence entrepreneurs' self-efficacy and their intention of new venture creation. Specifically, the authors found that entrepreneurs with intuitive cognitive style are more confident in identifying opportunities, while less confident in their ability to assess, evaluate, and marshal resources during venture creation. However, analytic individuals demonstrated high ability to assess, evaluate, and marshal resources and less abilities in the identification of opportunities.

Despite the enormous efforts by past studies in linking entrepreneurship to cognitive processes, a careful look at the extant literature shows the absence of opportunity creation and /or discovery – cognition relationship. The role of cognition in entrepreneurship research and the recent calls for its inclusion in entrepreneurial opportunity research (e.g., Baldacchino et al., 2015), explains the significance of such a gap in the literature. Thus, the paucity of such knowledge in the current literature calls for a framework that will integrate the apparent difference in the sources of entrepreneurial opportunity (creation and discovery) and entrepreneurial cognitive style.

Considering the success of cognition in other aspects of entrepreneurship research, it is safe to argue that, it will yield positive implications for theory and practice if modelled against the process of creation and discovery. Consequently, the question to ask perhaps, is how much do entrepreneurship scholars know about the role of intuitive and analytic cognitive style in the process of opportunity creation and discovery?

As demonstrated by the general introduction chapter, this study is also interested in examining the effect of opportunity creation and discovery on the performance of entrepreneurial firms. The preceding section of the review looks at the extant literature on the performance outcome of entrepreneurial opportunity discovery and/or creation to firms.

2.5 Entrepreneurship and performance of entrepreneurial firms

The literature on the entrepreneurship–firm performance relationship has often been on some aspects of entrepreneurship at the expense of entrepreneurial opportunity creation and discovery (see Table 2.2). Terms and processes such as entrepreneurial orientation (Boso et al., 2013; Wiklund & Shepherd, 2005), corporate entrepreneurship (Vanacker, Zahra & Holmes, 2017; Yiu & Lau, 2008), opportunity characteristics (Douglas, 2013; Dencker & Gruber, 2015), entrepreneurial style (Sadler–Smith et al., 2003), entrepreneurial cognition (Hmieleski & Baron, 2008a), entrepreneurial team characteristics (Jin et al., 2017), entrepreneurial efficacy, and improvisational behavior (Hmieleski & Corbett, 2008), opportunity confidence and optimism (Dimov, 2010; Hmieleski & Baron, 2009) among others, have been linked to various measures of firm performance.

A critical review of some of these studies, also shows that where the term ‘opportunity’ was mentioned, the operationalization of the concept was not that of opportunity creation or discovery. For example, Dencker and Gruber (2015) investigated the effect of opportunity characteristics on new venture performance. However, the conceptualization and measurement

of opportunity characteristics is that of the industry-specific risk rating of the opportunity being exploited, rather than the subjectiveness (creation) and/or subjectiveness (discovery) of the opportunity. At best these terms and processes describe intentions, orientations, contexts and depositions to behave in a way and not the actual behavior of opportunity formation and exploitation. It becomes problematic when some scholars imply that opportunity is only an opportunity if it generates wealth (Eckhardt and Ciuchta 2008), hence its outcome is predetermined. Such assumption limits the possibility of examining the potential effects of 'profitable' and 'non-profitable' opportunities on firm performance (see Alvarez et al., 2013). Thus, it is imperative for entrepreneurship scholars to investigate how opportunity discovery or creation as an independent variable affect the performance of entrepreneurial firms, since the performance of entrepreneurial firms almost entirely, depends on the firm's ability to recognize and exploit opportunities (see Webb et al., 2011).

Additionally, the few studies (e.g., Alvarez, Barney, & Anderson, 2013; Ireland, Covin, & Kuratko, 2009) that have implied opportunity process– performance relationship are mainly conceptual. Further, even though some studies imply and conceptualize opportunity creation and discovery, the operationalization of these constructs are not same (e.g., Hmieleski, Carr & Baron, 2015).

Other studies have also argued for competitive advantage as a possible outcome variable for firms that either engage in discovery or creation (Alvarez & Barney, 2010; Alvarez et al., 2013), even though competitive advantage might not always lead to firm performance (see Coff, 1999). Hechavarría and Welter's (2015) explore how found opportunities (idea for the business came first) and formed opportunities (decision to start the business came first) was linked to firm innovativeness. Their results indicate that both opportunity types, whether formed or found does not necessary lead to innovativeness. Even though this study is very different to this current thesis (for example, in terms of the conceptualization and measurement

of the opportunity creation and discovery), it takes the extant literature forward in terms of modelling possible consequences of opportunity discovery and creation to firms.

Another aspect of the opportunity creation/discovery – firm performance relationship is the possible boundaries that condition such relationship. A review of the literature on the boundary conditions of entrepreneurship-firm performance relationship show extensive work on entrepreneurial orientation (see Covin, Green & Slevin, 2006; Lisboa, Skarmeas & Lages, 2011) rather than opportunity creation and discovery. Specifically, using dynamic capabilities (as mentioned in chapter one of this thesis) as possible contingency mechanisms, some studies have explained the significance such capabilities in constructing various entrepreneurial opportunity frameworks (Eshima & Anderson, 2017; Jaskiewicz et al., 2016). However, as can be seen in the sixth column of table 2.1, the extant literature is silent on the possible significant boundary conditions of the opportunity creation/discovery – firm performance relationship.

In sum, as shown by the review (see table 2.1), most of the studies that examine opportunity discovery and/or creation did so without consideration the possible outcomes associated with these opportunities seeking behaviors. Secondly, table 2.2 shows that where entrepreneurial opportunity has been linked to performance outcomes, the constructs used are not that of opportunity creation and/or discovery. It is important to note that, the resultant effect of continuously seeking to exploit opportunity is to effect change in an entrepreneurial ventures' economic fortune. The different forms of opportunities as shown in this review demonstrates how significance it is for firms to know how and when different opportunity types impact on performance and growth.

Table 2. 2: A review of selected literature on the entrepreneurship-firm performance relationship

Author(s)	Study context	Opportunity creation/discovery	Outcome variables
Zahra and Garvis (2000)	A survey and secondary data of US manufacturing companies who are engaged in global business activities	----------	Overall performance ROA Sales growth Foreign performance Foreign profitability Foreign growth
Lerner and Haber (2000)	An in-depth interview of Israel's tourism ventures.	----------	Firm performance measured by Revenue Profit and Entrepreneur's income
Ireland et al (2003)	Conceptual	----------	Venture creation through competitive advantage
Sadler-Smith et al (2003)	A survey of SMEs across different industries in the UK	----------	Firm growth
Hmieleski and Baron (2008)	A survey of US businesses across industries	----------	New venture performance measured by Lagged values of revenue and Employment growth
Schindehutte et al (2008)	Conceptual	**Opportunity recognition process** measured by discovery and exploitation	Measures include Sustainable superior performance

Author(s)	Study context	Opportunity creation/discovery	Outcome variables
Yiu and Lau (2008)	A survey of Chinese firms across various industries	----------	Relative firm performance
Hmieleski and Baron (2009)	A survey of new ventures comprising different industries in the US	----------	Venture performance Growth in revenue and Growth in employment
Ireland et al (2009)	Conceptual	**Corporate entrepreneurship** opportunity recognition and exploitation	Consequences of CE Competitive capability Strategic repositioning
Dimov (2010)	Analysis of data from PSED on US entrepreneurial activities	----------	Venture emergence measured on a continuum of Operating business Still active in business Inactive in business No longer worked on
Webb et al (2011)	Conceptual	**Opportunity recognition and exploitation**	Performance measured Customer satisfaction Profits and Growth

Author(s)	Study context	Opportunity creation/discovery	Outcome variables
Douglas (2013)	A survey of MBA students in Thailand	**Opportunity characteristics**	Performance measured Growth oriented intentions Independence oriented intentions
Wales et al (2013)	A survey of small Swedish firms	----------	Firm growth
Patel et al (2015)	A longitudinal study of high technological firms	----------	Innovation outcomes
Dencker and Gruber (2015)	A survey of start-up firms by unemployed individuals in Germany	**Riskiness of opportunity**	Start-up performance measured by sales revenue
Martin and Javalgi (2016)	A survey of international new ventures in Mexico	----------	International new venture performance
Vanacker, Zahra and Holmes (2017)	A quantitative study of manufacturing firms of some selected European countries	----------	Immediate, intermediate and long-term firm performance
Eshima and Anderson (2017)	A survey of SMEs in South Korea	----------	Firm growth measured by revenue and assets growth

2.6. Conceptualization of entrepreneurial opportunity discovery and creation

The preceding sections discuss the extant literature on the conceptualization of opportunity discovery and creation.

2.6.1. Conceptualizing opportunity discovery

Beginning with opportunity discovery, an account of the literature shows that it is been explained and conceptualized in different ways. Zahra (2008), in his creation-discovery cycle of opportunities, describes opportunity discovery as involving scanning, searching and sensing the environment in other to identify market gaps. Further, Foss, Lyngsie and Zahra (2013), describe opportunity discovery as the actions of individuals in identifying neglected opportunities. These conceptualizations, implies a deliberate attempt to search and identify opportunities (Fiet, 2007) within preexisting markets (Alvarez et al., 2013) rather than the opposite argument of a surprise element in the opportunity discovery process (Shane, 2000). Nevertheless, there are others (e.g., Murphy, 2011) who believe that discovery is multidimensional that involves both search and serendipity. Using the 41[1] organizational learning framework Dutta and Crossan (2005) describes the process of opportunity discovery to include intuiting; interpreting; integrating, and institutionalizing. Thus, the study conceptualizes opportunity discovery based on individual, group, and organizational learning. Intuiting involves recognition of pattern and is usually the first phase of the discovery process driven by expert intuition. From intuiting, the process moves to interpreting, where what has been recognized is refined or clarified. The next stage, integrating, does not differ much from interpreting according to Dutta and Crossan (2005), except the former moves beyond individual understanding to a more collective understanding and action where other social actors or players get involve. The last stage, institutionalizing allows learning (and by extension

[1] A framework for the process of organizational learning (Crossan, Lane & White, 1999)

discovery) to move to the organizational level. This institutionalized learning according to them, will help firms demonstrate high levels of corporate entrepreneurship as opposed to individual or group levels of entrepreneurship. Another process-oriented definition of discovery is seen in the work of Shane (2000), where he describes and measures opportunity discovery to include opportunity recognition and exploitation. In this case, discovery does not only require recognizing the opportunity but also exploiting the recognized opportunity. This process conceptualization opportunity discovery requires some time and resources by firms or entrepreneurs to spot and exploit opportunities. Thus, for firms to engage in discovery, they might have committed resources into determining the value of that discovery (Denrell et al., 2003). Foss and Foss (2008), argue that discovery requires a lot of knowledge, effort and investment, for example from the idea generation state through to the evaluation state. They are, however, quick to add that these phases of opportunity discovery are overlapping. As described by Kirzner (1997) the process of search, discovery, evaluation, and exploitation are basically one process. When previously unknown opportunities are perceived, they need to be evaluated either by the individual or firm to see if it is profitable or future demand exist for it. Dimov (2007), argues that opportunities whether created or identified begins with an initial idea. This idea is developed (e.g., Martin & Wilson, 2016) to reduce uncertainty and eventually get exploited. From the forgoing, it can be argued that opportunity discovery involves at least two phases before final exploitation.

Consequently, this study conceptualizes opportunity discovery as a process that involves *(1) perceiving an opportunity idea through searching, scanning, sensing, and responding to markets; (2) evaluating this opportunity, and (3) subsequently enacting the opportunity*. As already argued, these opportunities are objective, hence such activities mostly take place within the boundaries of existing industries and markets (see Jones & Barnir, 2018).

2.6.2. Conceptualizing Opportunity Creation

Opportunity creation has been referred to by different names/terms in the literature. Different terms such as opportunities are imagined (Klein, 2008), opportunity production (Wood & McKinley, 2010), opportunity construction or enactment (Vaghely & Julien, 2010), opportunity development (Ardichvili et al., 2003), reflexivity (Suddaby et al., 2015) have all been used to describe opportunity creation, albeit almost same explanation given to each term used. Past literature (e.g., Tocher et al., 2015; Wood & McKinley, 2010), have described opportunity creation as a process that involves opportunity conceptualization, objectification, enactment, and opportunity abandonment (Wood & McKinley, 2010). Again, Dutta & Crossan (2005) describe opportunity creation as involving intuiting, interpreting, integrating and institutionalizing. In this scenario creation is conceptualized as a learning process within the firm. Likewise, sensing, developing and evaluation have also been used to describe the opportunity creation process (O'Connor & Rice, 2001)

Entrepreneurial opportunity creation goes beyond idea generation and recognizing an already existing opportunity, to finding and developing novel ways that can make the idea get into the market and consumers (Zahra, 2008). Most of the studies in the extant literature recognize this, and have accordingly, conceptualized opportunity creation as beginning from conceptualizing an idea and developing it until exploitation.

Therefore, based on the opportunity production and construction framework (Goss & Sadler-Smith, 2017; Tocher et al., 2015), this study conceptualizes opportunity creation as comprising *(1) opportunity idea conceptualization, (2) opportunity objectification and construction, and (3) opportunity enactment.* Just as in the case of the conceptualization of opportunity discovery, the opportunity creation process overlaps and involves entrepreneurial behaviors such as unbounded innovativeness, problem solving, uncertainty and causally ambiguous paths to creating new products and services.

2.7 New ventures and new venture performance

The pursuit of opportunities either in established firms or new ventures by entrepreneurs is to achieve certain organizational outcomes including economic, financial and non-financial. Therefore, it is important for this study to clearly explain the performance outcomes associated with opportunity creation and discovery. First, the study is suited within the context of new ventures. Even though there are established firms like family businesses, it's been a common and accepted practice for researchers to conceptualize and analyze entrepreneurship in terms of new venture creation (Parker & van Praag, 2012; Zahra, 2004). For example, it's been argued that entrepreneurs go through processes such as generating new ideas, recognizing business opportunities and obtaining resources for the purposes of new venture creation (Baron, 2007). This study is suited within the context of Small and Medium Size Enterprises on the one hand and within a developing economy on the other hand. Therefore, it's appropriate to make a case for new ventures as the unit of analysis. For example, it's been argued that in situations where institutions are mostly weak (like the case of developing economies), new ventures become an ideal context for entrepreneurship studies (Klotz et al, 2014).

Zahra (1996) defines new ventures as profit-oriented firms that have been in existence for few years after their inception. Further, early stage firms (in terms of growth and development) are sometimes used to connote new ventures (Klotz et al, 2014). Thus, the number of years a firm has been operating are usually used in defining a new venture, yet, there is no particularly cut-off age for defining a firm to be new or old in the entrepreneurship literature. Generally, within the literature, a firm is regarded as a new venture if it is 6 (e.g. Kuivalainen, Saarenketo & Puumalainen, 2012; Robinson, 1999), 8 (e.g. Atuahene-Gima & Li, 2004; McDougall, 1989), 10 (e.g. Khavul, Pérez-Nordtvedt & Wood, 2010) or 12 years of age (Covin & Slevin, 1990). From these age classifications, this study defines new ventures as profited-oriented firms that are not more than 12 years old and subsequently, conceptualizes the performance outcomes of

opportunity creation and discovery as *new venture performance*. The next section assesses new venture performance in the entrepreneurship literature.

2.7.1 Assessing new venture performance

Firm performance outcomes have often been described as having several components and viewed under different lenses such as shareholder versus employees' outcomes, long-term versus short-term outcomes, and market share versus profit outcomes (e.g., Snow & Hrebiniak, 1980). Just as in other management fields, the field of entrepreneurship needs to clearly explain its performance outcomes (i.e. new venture performance) in entrepreneurship studies. There have been many inconsistencies in the conceptualization and operationalization of new venture performance in most entrepreneurship research, with common measures being growth and profitability (Jin et al., 2017).

The literature has documented different facets of performance indicators when measuring the performance outcomes of new venture. They include; financial performance (e.g., economic, accounting and market outcome-based performance variables), operational performance (e.g., product-market and process outcome-based indicators), and overall firm effectiveness (e.g., reputation, survival and perceived overall performance) (Gerschewski & Xiao, 2015). Despite these varied measurements, the extant studies in new venture performance do not capture all these performance aspects. Robinson (1999) argues that research on new venture performance mostly, (1) use one or two measures of new venture performance and/or (2) failed to provide any justification for the measures selected. For example, a careful look at the literature indicates that new venture performance has been measured either by growth measures (Hmieleski & Baron, 2009); financial performance and overall performance (Li & Zhang, 2007); average gross profit (Zhao, Song & Storm, 2013); or employment growth (Burke, Fraser & Greene, 2010), with most studies not providing a justification for the choice of measurement used. Such discrepancies in measuring new venture performance and lack of justification, often

provide conflicting results and difficulty in having robust findings to move the literature forward.

From the forgoing arguments, it's important that researchers have clear guidelines in selecting indicators of new venture performance in entrepreneurship studies. Accordingly, from the review of the relevant literature (see, Katsikeas et al, 2016; Jin et al, 2016; Robinson, 1999), this study is guided by the following, in selecting the performance measures of the sampled new ventures;

1. *Treat scale items (for new venture performance) indicating different aspects of performance separately rather than "overall" performance outcomes;*
2. *Clearly depict the theoretical rational for selecting the performance variables such that they become relevant and meaningful to the different independent variables and different levels of analysis (if any).*
3. *Select one or more indicators from within each chosen performance aspect to operationalize new venture performance*

Following the works of previous authors (e.g., Jin et al., 2016; Hult et al., 2008), this study conceptualizes new venture performance consisting of three performance categories; (1) financial, (2) operational and (3) overall effectiveness to create a multidimensional measure. For a justification, these performance categories are rotted in strategy and the resource-based view (as shown by the hypothesis development section of chapter 3). Thus, the conceptualization and subsequent measurement is (will be) in relation to the firms' competitors (see, Wiklund and Shepherd, 2003).

With such a well thoughtful rationale and an evaluation of other alternatives (performance indicators), the selected independent variables can effectively predict the performance of the

sampled new venture firms. Details of indicators and criteria justification is given in the measurement development section of chapter 4 of this thesis.

2.8 Summary of theories underlining opportunity creation and/or discovery

The theories underlining entrepreneurial opportunity creation and/or discovery can best be categorized based on the research interest or the stance the respective authors take with respect to whether opportunities are subjective or objective. Alvarez and Barney (2010) use critical realist and evolutionary realist perspectives to argue that the two processes are studied from two different epistemological assumptions. Structuration theory has also been used to reconcile the two views of opportunities. Based on this theory, opportunities are both formed and recognized, and the two can occur at the same time (Chiasson & Saunders, 2005). Similarly, Dutta and Crossan (2005) applied the 41-organizational learning framework and proposed that both creation and discovery go through the learning framework, hence opportunities encompass both creation and discovery. Zahra (2008) adopted and improved the behavioral theory of the firm to propose a virtuous cycle of discovery-creation framework. Others have also used a narrative perspective in trying to bring a middle ground to the two sources of opportunities (Garud & Giuliani, 2013). A recent conceptual framework by Ramoglou and Tsang (2016) adopted a realist perspective to argue that the occurrence/existence of both opportunity creation and discovery do not contradict each other. Thus, depending on one's conceptualization or belief of the sources of opportunities, scholars have applied theories that are appropriate to their line of arguments and conceptualization of the nature of opportunity.

For studies that are on either side of the creation or discovery divide, the choice of theory is based on the proposed antecedents for creation or discovery. Theories such as economics of property rights (Foss & Foss, 2008), social resources (Tocher et al., 2015), information processing (Corbett, 2007), and cognition (Baron & Ensley, 2006) have all been used in explaining one form of antecedents or the other.

2.9 Chapter Summary

A look at the above review shows that knowledge and understanding is sparse as far as the study of entrepreneurial opportunity process is concerned. Firstly, the argument on whether opportunities are created or discovered or are both created and discovered is quite inconclusive. Secondly, there is little evidence as to what factors have the potential of successfully impacting on entrepreneurial firms' ability to engage in opportunity creation and discovery or both at the same time. The few studies that have attempted this, are mainly conceptual. Again, the extant literature is less forthcoming with organizational outcomes (for example new venture performance) associated with either creation or discovery and the possible boundary condition(s). As already discussed, studies on entrepreneurship – firm performance relationship are mainly on other constructs such as entrepreneurial orientation, entrepreneurial characteristics or resources and not the actual process of opportunity formation or discovery.

CHAPTER 3
THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES DEVELOPMENT

3.1 Introduction

This chapter discusses the theoretical framework underlying the study by delineating the relationship among the drivers of opportunity discovery and creation, their outcome variables and boundary conditions. First, the theories of Cognition and Resource-based views are discussed and specifically within the context of new ventures. Finally, based on these theories, the study's hypotheses are argued for and derived.

3.2 Theoretical background

Different theories across various disciplines have been used in studying one entrepreneurship phenomenon or the other. Thus, depending on the purpose of the study and the entrepreneurship construct under study, scholars have applied theories from disciplines such as management, marketing, organizational behavior, economics, and psychology among others, for theorizing and testing various entrepreneurship frameworks. This study applies two major theories to motivate the proposed conceptual framework: (1) cognitive theory from cognitive psychology and the (2) resource-based view (RBV) and its attendant dynamic capabilities from the strategic management literature. Cognitive theory is used to explain how variations in entrepreneurial cognitive styles drive the process of opportunity discovery and opportunity creation. The RBV and dynamic capability is used to explain the mechanisms through which processes of creation and discovery influence new venture performance and the contingency effects of adaptive and absorptive capabilities.

3.3 Cognitive theory

Cognitive theories usually involve human cognitive activities and processes such as thinking, reasoning, information processing and storage, use of language and symbols, and decision making (Barsalou 1992; Runco & Chand, 1995). These cognitive processes are usually not

rational, as they are mostly influenced by existing thoughts or minds, biases and errors (Baron, 1998). For instance, people usually suffer from confirmation biases by more easily noticing and processing information that confirms their extant beliefs than those that disconfirms their beliefs, or even believing more in negative information than positive ones (see Baron, 2004).

Despite these biases and errors, cognitive structures and processes imbedded in individuals help in the performance of different tasks across different endeavors including science, music, technology, and arts (Ward, 2004). Cognitive structures can also be applied to certain aspects of organizational studies. More specifically, the literature is quite clear on how human cognition such as reasoning and information processing, can impact on creativity both at the individual and organizational levels (e.g., Runco, 1995). Thus, human cognition helps in providing a framework for individuals to understand the processes involved, for example, in idea generation or development (Ward, 2004). Since cognition describes thinking and information processes, it has often been argued that, there are different ways through which individuals can think, learn, organize, process a given information or solve a problem (Streufert & Nogami, 1989; Witkin et al., 1977).

Accordingly, one important aspect of human cognition is *Cognitive Style* – which includes, but not limited to, four facets: perception; cognitive controls and processing; mental imagery; and personality (Rayner, 2000). Cognitive style refers to the individual differences in perceiving, thinking, learning, information processing and problem solving (Witkin et al., 1977). Emphasis is put more on the form it takes rather than the content of the said cognitive activity (Armstrong & Hird, 2009). Cognitive style influences the way individuals can scan the environment for information and the interpretation of this information (Allinson & Hayes, 1996). In effect, it describes the information gathering and processing style, problem solving style and/or consciousness style of individuals. Such differences in individuals' styles of information processing and problem solving are often attributed to the differences in left/right hemispheric

specialization of the brain (see Riding et al., 1993). Although some researchers have questioned this brain split as being oversimplified (e.g., Rao, Jacob, & Lin, 1992), it gives the basis for human cognition to be categorized into two: *analytic and intuitive* cognitive style (Hayes & Allinson, 1994; Allinson & Hayes 1996).

It is contended that analytic people tend to have logical and sequential thinking and prefer a structured and step-by-step approach to problem solving. Intuitive people on the other hand, are usually nonconformist and do not rely on structured logical reasoning during decision making or problem solving (Allinson et al., 2001; Lynch, 1986). Similarly, Ornstein (1977) describes two forms of consciousness; (1) *analytic*, which is viewing individual parts in a sequential manner, and (2) *holistic*, which is viewing the whole at once. Thus, decision making and problem-solving falls within these two modes of cognitive process. Cognitive style is regarded as an important determinant of individual behavior such as problem solving and decision making (Sadler-Smith & Badger, 1998), and has been conceptualized as "a high-order heuristic that individuals employ when they approach, frame, and solve problems" (Brigham, De Castro, & Shepherd, 2007, p. 31). Accordingly, Brigham et al. (2007) posit that cognitive style has the following characteristics: (1) it is a pervasive dimension that can be assessed using psychometric techniques; (2) it is stable over time; (3) it is bipolar; and (4) it may be value differentiated.

The use of human cognition in general and cognitive style specifically in organizational behavior, innovation and entrepreneurship studies cannot be underscored (Armstrong & Hird, 2009). Hayes and Allinson (1994), emphasize the significance of cognitive style in organizational studies by explaining how cognitive style can influence task and learning performance; internal communication; career guidance and counselling; team building; conflict management; and training and development. Additionally, past studies have posited the human resource implication of cognitive style, by explaining how it can influence work place

innovation, versatility of employees and team performance and productivity (Kirton & de Ciantis 1994; Sadler-Smith & Badger 1998; Volkema & Gorman, 1998).

The study of entrepreneurship and certain entrepreneurial behavioral tendencies using cognitive structures or processes has attracted scholarly attention in the entrepreneurship literature. For example, it is argued that human cognition has an important contribution to make to the study of entrepreneurship (Allinson, Chell, & Hayes, 2000; Baron, 1998; Mitchell et al., 2002). Accordingly, the extant literature has proposed and/or test the role human cognition play in the activities of entrepreneurs (e.g., Brigham et al., 2007). Along this line, entrepreneurial cognition is defined as "the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth" (Mitchell et al., 2002, p. 97). Thus, through various cognitive structures and processes, entrepreneurs can process information about market and demand gaps, which ultimately leads to the formation and exploitation of existing and/or new market opportunities. Taking a cue from previous studies that have used cognition in entrepreneurship research such as opportunity recognition (Kickul et al., 2009) and opportunity evaluation (Sadler-Smith 2016; Keh et al., 2002), this study adopts entrepreneurial cognitive style and make arguments for its effect on the processes of opportunity creation and discovery.

By focusing on entrepreneurial cognitive style, this study borrows important constructs from mainstream cognitive psychology literature and argues for its relevance on key opportunity processes. In developing hypotheses for this study, arguments are made to explain how the two cognitive styles of intuition and analytic influence opportunity creation and opportunity discovery.

3.4 Resource-Based View

The conceptual article of Wernerfelt (1984), is among those that first introduced the concept of the resource-based view to the strategic management literature (herein referred to as RBV). Wernerfelt defines resources as anything that can be considered as a strength or weakness of a firm and cites examples as brand names, knowledge, technology, efficient procedures among others. The thrust of the RBV is on the uniqueness of firm resources as antecedents to competitive advantage and firm performance. The RBV operates in line with some significant assumptions. For a given resource to lead to competitive advantage and superior firm performance, it must be valuable; the resource must be rare and idiosyncratic to a given firm, it must be immobile; it must be non-substitutable, and inimitable or tacit in nature (Barney, 1991; Teece, Pisano, & Shuen, 1997).

Resources are valuable when they help firms implement strategies for efficiency. According to the 'strengths-weakness-opportunities-threats' model, firms' resources are valuable when they are used in exploiting opportunities or neutralizing threats within the external environment (Barney, 1991). For resource rarity, certain attributes and processes such as branding, packaging and distribution channels must not be common across firms (Hart, 1995). Another feature of the RBV for achieving competitive advantage is that, resources must be inimitable and not easily duplicated. These resources are assumed to be causally ambiguous and/or tacit and socially complex hence should be difficult to replicate by other firms (Barney, 1986; Hart, 1995; Reed & DeFillippi, 1990). It is these characteristics and assumptions of the RBV that explain why some firms perform better than others. It is significant to emphasize at this point that, the resources being described refer to the VRIN (valuable, rare, inimitable and non-substitutable) resources and not non-VRIN resources (e.g., firms' financial capital and firms' equipment). Such resources have better explanatory power on firm performance than non-VRIN (Lin & Wu, 2014).

By the nature and characteristics of entrepreneurial opportunity, some of the assumptions and characteristics of RBV are applicable to the notion of entrepreneurial opportunity. For example, the concept of "resource position barrier" used by (Wernerfelt, 1984, p. 172) is synonymous to when opportunities are discovered or entry barrier in the product market. Thus, when the decisions and actions of entrepreneurs, such as opportunity creation and discovery lead to insights that are rare, valuable, and difficult to imitate, then these insights can become sources of sustained competitive advantage (see, Alvarez & Busenitz, 2001).

This study is of the view that firm's entrepreneurial opportunity is synonymous to this RBV classification that could potentially lead to firms' competitive advantage and consequently performance outcomes. Barney (1991) distinguished between competitive advantage and sustained competitive advantage. What differentiates the two is that, with sustained competitive advantage, potential and current competitors are unable to duplicate the benefits, process, or strategy the firm is using, whilst for competitive advantage, firms can duplicate. Without considering time in these two types of competitive advantage as opined by Barney (1991), this study contends that, through the RBV, the processes of opportunity creation and discovery can impact on the performance of new ventures.

3.4.1 Dynamic capabilities

Dynamic capability has been explained as an extension of the RBV, which involves the process of building a firms' internal and external competencies to withstand environmental changes (Teece et al., 1997), for the purposes of achieving superior performance. Eisenhardt and Martin (2000), explain dynamic capabilities as a set of processes such as product development, decision making and alliancing. For this study and within the context of new ventures, dynamic capability is formally defined as firm capacity (1) to shape market opportunities and threats, (2) to exploit opportunities, (3) to maintain competitive advantage through enhancing, combining and reconfiguring resources and assets and (4) to reconfigure or alter existing

substantive capabilities (Teece, 2007; Zahra, Sapienza & Davidsson, 2006). Thus, the RBV is regarded as static and unable to explain how resources can be created, reconfigured and used to achieve competitive advantage (Kuivalainen et al., 2010) especially in rapidly changing environmental conditions. Consequently, the dynamic capability concept was developed to explain how firms can "integrate, build and reconfigure internal and external competencies to address rapidly changing environments" in other to generate value creation (Teece et al., 1997, p. 516).

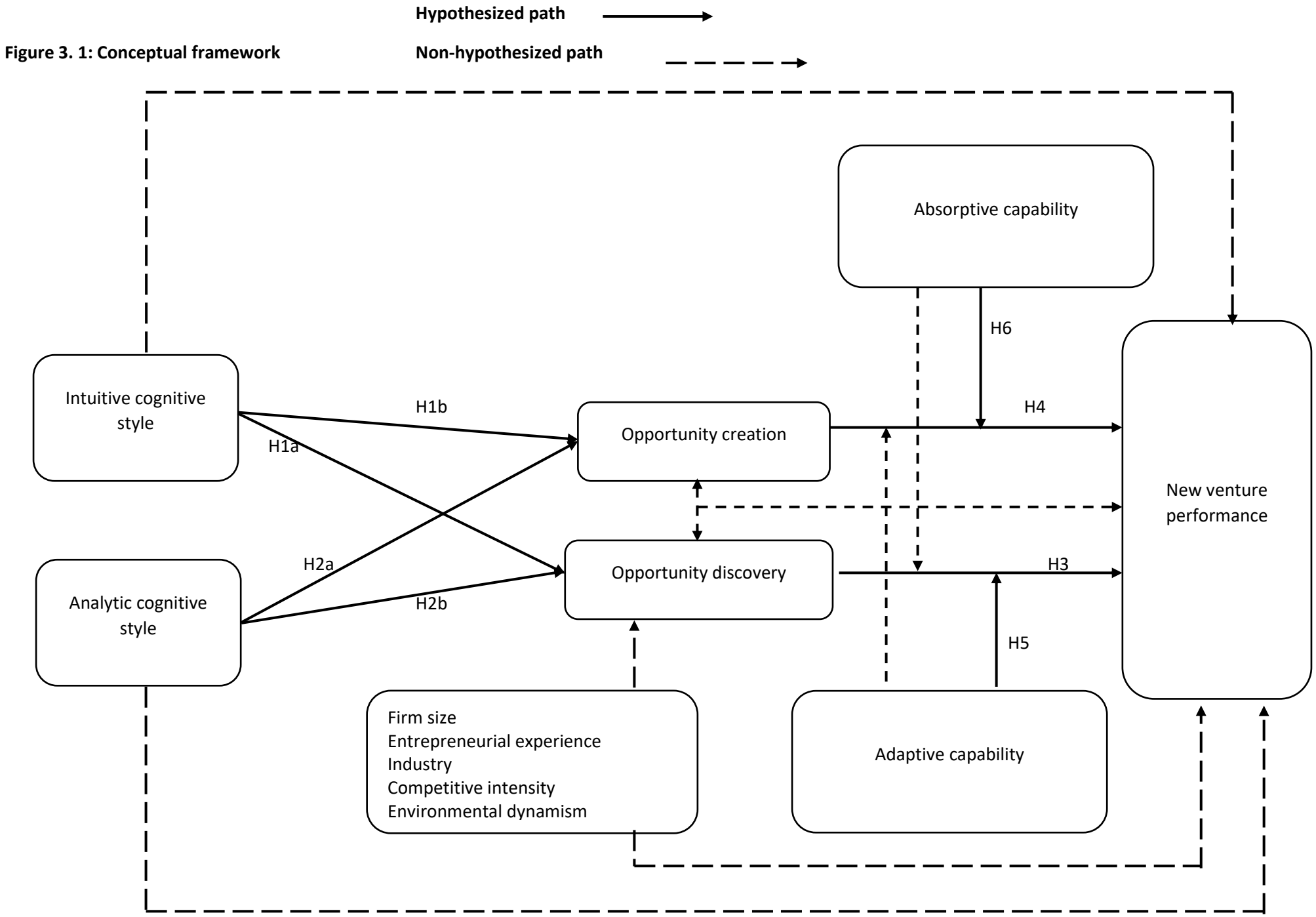
Teece (2007), disaggregated dynamic capabilities into capacities that can help firms to; sense and shape both opportunities and threats, to exploit or seize opportunities, and to remain competitive in the business environment. In effect, firms require dynamic capabilities in all areas of venturing, including effective opportunity exploitation. The literature on dynamic capabilities have discussed many forms and processes (such as product development, strategic decision making, and alliance) that describe it (Eisenhardt & Martin, 2000).

The relevance of this theory extension to the current thesis is that, entrepreneurial firms need to develop and maintain strong dynamic capabilities, such as absorptive and adaptive capabilities, in addition to their opportunity seeking behavior in other to remain competitive. As explained by Teece (2007), one way of achieving competitive advantage when homogenous firms compete in a competitive environment is through developing and having dynamic capabilities. In sum, as entrepreneurship research grows, it has become necessary for scholars to adopt theories from more established fields and disciplines in other to better understand some entrepreneurial venture processes (Ireland, Webb, & Coombs, 2005). Consequently, this study adopts theories from cognitive psychology and strategic management to develop and test the current framework. Figure 3.1 shows the conceptual framework (consisting of hypothesized and non-hypothesized paths) of the current study.

Figure 3.1 depicts a model of entrepreneurial opportunity-seeking behavior, its drivers, outcome and associated boundary conditions. Specifically, the framework shows opportunity creation and discovery as the study's central constructs, intuitive and analytic cognitive style as drivers of opportunity creation and discovery, new venture performance as outcome of opportunity creation and discovery and dynamic capabilities (adaptive and absorptive capabilities) as moderating factors of the opportunity creation/discovery – new venture performance relationship. Cognitive psychology is used to explain the relationship between entrepreneurial cognitive style and opportunity creation and discovery, while the RBV and dynamic capabilities are used to explain the effect of opportunity creation and discovery on new venture performance and the boundary conditions thereof. The preceding sections develop sets of hypotheses to justify each of these hypothesized paths.

Further, per the study's context and as with most entrepreneurship studies, relevant firm and individual level control variables are included in the model. These control variables, otherwise could explain variations in the respective outcome variables. Justification and rationale for the selection of each control variable is provided in chapter four of this report.

Figure 3. 1: Conceptual framework



3.5 Hypotheses Development

3.5.1. Cognitive style and Entrepreneurial cognition.

From the cognitive theory explained in section 3.3, this section develops sets of arguments to explain how entrepreneurial cognition drive opportunity creation and discovery. Entrepreneurial cognition describes the knowledge structures and cognitive processes that entrepreneurs use in making certain entrepreneurial decisions such as opportunity identification and new venture creation. Like other individuals, entrepreneurs' decision making concerning learning, knowledge, and information gathering are affected by their preferred way of thinking (Barbosa et al., 2007). According to Shane and Venkataraman (2000), the possession of necessary cognitive properties is one of the reasons why some people will discover opportunities whilst others would not. Foss and Klein (2017) posit how internal cognitive factors and some external factors can interact to help explain outcomes such as whether entrepreneurs achieve profits or have personal satisfaction. Thus, like in other fields of study, cognitive style is important when it comes to entrepreneurial decision making and making judgement on successful and unsuccessful entrepreneurs.

Specifically, cognitive style has been used extensively in the entrepreneurship literature to distinguish between entrepreneurs and non-entrepreneurs (e.g., Allinson et al., 2000; Busenitz & Barney, 1997), successful and unsuccessful entrepreneurs (Armstrong & Hird 2009), to describe managerial behaviors and actions such as innovative behaviors (Scott & Bruce, 1994), and to describe its implication on new venture outcomes (Baron, 2004; Mitchell et al., 2007). Just as managerial cognition theories emphasize on habitual ways of information processing and decision making, so is the case with entrepreneurial cognition.

It is important for a formal conceptualization of entrepreneurial cognitive style to be established before the development of the study's hypotheses. Accordingly, taking a cue from the definitions of cognitive style (Streufert & Nogami, 1989) and entrepreneurial cognitions

(Mitchell et al., 2002), entrepreneurial cognitive style is conceptualized as an *'entrepreneur's preferred or habitual way of venture creation decision making regarding opportunity seeking behaviors such as creation and discovery'*. As already explained, such entrepreneurial cognitive style (habitual way of decision making) constitute intuitive and analytic cognition. An entrepreneurs' cognitive style may influence learning and information gathering preferences, as well as decision making, on the existence of opportunities and the process of exploitation. The preceding sections develops hypotheses on how the different cognitive styles can drive opportunity discovery (objective opportunities) and opportunity creation (subjective opportunities).

3.5.1.1 Intuitive style of cognition, opportunity discovery and creation

Intuition is described as "analyses frozen into habit" (Simon, 1991, p. 324). Intuitive psychologists have often explained intuition to be, the knowing of something with a deliberate effort to reasoning. Intuitive responses and behaviors are those that are made with low efforts, slow learning and without any conscious awareness (Sadler-Smith, 2016; Hogarth, 2001). In effect, intuition does not require logical reasoning and/or systematic analysis. In such cognitive style, information regarding a phenomenon is usually formal, well ordered and explicit. Also, intuitive cognitive style is usually basic and begins with effortless activities such as recall of information and pattern recognition (Baron & Ensley, 2006; Vaghely & Julien, 2010), signal detection (Baron, 2004); gut feelings, and hunches (Kickul et al., 2009).

Even though such cognition is effortless and often made unconsciously, it plays a crucial role in the success of entrepreneurs in terms of the formation and exploitation of objective opportunities. Pattern recognition, for example, helps individuals make a connection between independent trends such as changes in government policies, changes in consumer demands, and changes in technologies. These detections, recognition and quick information recall are a useful process when there are pre-existing events or phenomenon. For example, in the case of

government policies, there must be an existing policy for an individual to detect changes in such policies before taking advantage of such changes/market gaps. Also, Baron (2006, p. 109) argue that "individuals notice various events in the external world and then utilize cognitive frameworks they have developed through experience to determine whether these events are related in any way—whether, in short, they form a discernible pattern.". Discovery opportunities are objective realities that pre-exist in the external environment (Alvarez & Barney, 2007; 2010), and are ready to be acted upon by individual entrepreneurs who are alert to such pre-existing market gaps. Thus, being alert to opportunities and being predisposed to recognizing patterns and market gaps are key ingredients to the process of opportunity discovery. Entrepreneurs who possess the cognitive style of quick pattern recognition, information recall and signal detection are most likely to spot and exploit discovery opportunity which are mostly objective, explicit and codified. For example, Baron and Ensley (2006) argue about the importance of pattern recognition to opportunity recognition.

On the other hand, opportunity creation is subjective, hence requires more cognitive processes and efforts by entrepreneurs to be able to form and exploit it. The tacit and causally ambiguous nature of opportunity creation make it difficult to be formed and exploited by entrepreneurs who possess intuitive style of cognition. Thus, higher order cognition (see, Sadler-Smith & Badger, 1998) such as analysis, evaluation and synthesis are mostly relevant to opportunity creation (cf. Lauren, 1987). Further, arguments have been made that entrepreneurs with intuitive cognitive style are more confident in identifying opportunities but less confident in opportunity creation processes such as evaluation, planning and marshalling of resources in the new venture creation (Gundry, Barbosa, & Whitcanack, 2009). In effect, the processes of intuitive cognition are not enough to drive opportunity creation activities within the firm.

Accordingly, this study argues that intuitive cognitive style is more related to opportunity discovery than it is, to opportunity creation because discovery activities rely on the recognition

of patterns and prototypes, heuristic processing, active scanning, and connecting the dots (Vaghely & Julien, 2010; Tang, Kacmar, & Busenitz, 2012. The above argument leads to the following:

H1a: there is a positive relationship between intuitive cognitive style and opportunity discovery
H1b: there is no relationship between intuitive cognitive style and opportunity creation

3.5.1.2 Analytic style of cognition, opportunity creation and discovery

The analytic style of cognition usually involves linear and sequential processing of information (Oslon, 1985). Decision making and problem solving with such cognitive style is characterized by formal analysis, precision, and rigor. Unlike intuitive cognitive style, the analytic style involves quite complex and effortful form of cognition like conceptual combination (Ward, 2001), creative thinking (Runco & Chand, 1995), counterfactual thinking (Baron, 1998), cognitive structural alignment (Grégoire, Barr, & Shepherd, 2010), explicit, and conscious efforts (Sadler-Smith, 2016). Opportunity creation is subjective with no pre-existing conditions to objectively identify them. Rather, they are endogenously constructed and acted upon by the entrepreneur (Wood & McKinley, 2010; Alvarez & Barney, 2010). With such characteristics of opportunity creation, such as novelty and innovativeness, and the actions required, entrepreneurs who want to engage in opportunity creation should possess cognitive properties rooted in problem solving, technical know-how, and analytical skills (e.g., Levine, Bernard & Nagel, 2017). Such cognitive properties go beyond mere pattern recognition and signal detection (as in the case of intuitive cognitive style and opportunity discovery) to a much complex cognitive process.

Thus, the uncertain nature of opportunity creation requires confidence, analytical, sequential, and carefully planned actions from entrepreneurs. For instance, Ward (2004) argues that entrepreneurs who wants to be creative in their new product development and the detection of

market niches, require cognitive processes like analogical problem solving and conceptual combination. In effect, conceptual combination (mentally merging or integrating previously separate ideas) (Ward, 2004) and analogical reasoning (extending knowledge from a familiar domain to a novel space) (Holyoak & Thagard, 1996) are all part of the opportunity creation process. Again, structural alignment, another aspect of analytic cognitive style, was found to be an important determinant of scientific innovation, new product development and strategy making (Dahl & Moreau, 2002; Gavetti & Rivkin, 2005; 2007). Thus, the above evidence suggests that for entrepreneurs to be involve in successful opportunity creation, they require high, complex and abstract reasoning style of cognition.

On the other hand, opportunity discovery is objective phenomenon that exist in the environment independent of the action of the entrepreneurial. As already argued in hypotheses H1a and H1b, opportunity discovery requires less and lower order cognitive efforts of entrepreneurs for it to be spotted. By implication, entrepreneurs who possesses analytic cognitive can engage in both opportunity discovery (which requires effortless cognition) and opportunity creation (which requires more cognitive processing). In effect, this study argues that analytic cognitive style will drive both opportunity creation and discovery. Accordingly, it is hypothesized that;

H2a: there is a positive relationship between analytic cognitive style and opportunity creation.
H2b: there is a positive relationship between analytic cognitive style and opportunity discovery

3.5.2 Entrepreneurial opportunity and new venture performance

Entrepreneurship does not only involve opportunity seeking but also transforming this opportunity into outcomes such as new venture formation and success, wealth creation and entrepreneurial rent (Hitt et al., 2001; Alvarez & Busenitz, 2001). There is, therefore, the need for this study to clearly link the construct of entrepreneurial opportunity seeking behavior to

an outcome variable. From the framework of the RBV (see Alvarez & Barney, 2007; 2010), this study develops hypotheses in the preceding sections in explaining how opportunity discovery and creation influence new venture performance**.**

3.5.2.1 Opportunity discovery and new venture performance

The possible outcomes of discovery opportunity are as important as its antecedents. Past studies have shown how entrepreneurial activity impacts on the performance of firms (e.g., Vanacker, Zahra, & Holmes, 2017; Lumpkin & Dess, 1996). Similarly, the entrepreneurial orientation literature has demonstrated how entrepreneurship, through for example risk taking, proactiveness, and innovation, among others, improve the performance of entrepreneurial firms (e.g., Wales et al., 2013) albeit with inconsistent findings (Wiklund & Shepherd, 2005). These studies give the researcher a basis to begin an argument on how opportunity discovery creates competitive advantage for firms and subsequent superior performance.

Like every other resource, discovery opportunities need to be exploited and made available to the market before they can be translated into performance outcomes. There are many mechanisms through which opportunity discovery can generate firm performance. These mechanisms include temporal competitive advantage, first mover advantage, and barriers to entry creation. First, discovery opportunity is codified, hence information to its exploitation are readily available to entrepreneurs who are alert to them (Tang et al., 2012). Entrepreneurs who are the first to be alerted to the existence of objective opportunities will exploit these opportunities through first mover advantage (Walter, Auer, & Ritter, 2006; Wiklund & Shepherd, 2005), target premium market segments ahead of competitors (Zahra & Covin, 1995), arbitraging (Sundqvist et al., 2012), erecting barriers to entry and speed (Alvarez & Barney, 2007). Second, discovery opportunities are market level phenomena exploited within risky context, and are usually characterized by less information asymmetry. This makes it difficult for the firm to develop causally ambiguous processes (e.g., Peteraf, 1993). From these

characteristics, any possible benefit emanating from opportunity discovery is dependent on the process of erecting barriers and for example creating a niche as a first mover in the market.

For instance, Wernerfelt (1984) explains that firms who have resource position barrier have the potential of achieving above average returns. Because discovery opportunities are exogenous and can be easily recognized by an alert entrepreneur, the benefits (performance outcomes) mostly depend on how firms could defend their competitive position. Extant research in RBV argues that it is through competitive advantage that some firms can perform better than others. Peteraf & Barney (2003), explain that, firms with competitive advantage can create more economic value.

Thus, through the processes of first mover advantage, arbitrage, and erecting of barriers to entry, opportunity discovery, when exploited will influence firm performance. In effect, this study hypothesizes that:

H3: opportunity discovery is positively related to new venture performance

3.5.2.2 Opportunity creation and new venture performance

Like exploration (as in organization ambidexterity), opportunity creation involves processes such as variation, risk taking innovation and experimentation (Holmqvist, 2004; Powell, Koput, & Smith-Doerr, 1996; Rothaermel & Deeds, 2004). The exploitation of creation opportunities relies more on unique path resulting in valuable, rare and difficult to imitate resources, ways of serving the markets, distribution channels, and product offerings among others. The path-dependency nature of opportunity creation (Alvarez & Barney, 2010) makes firms heterogeneous in their opportunity creation process.

Drawing insight from the tenets of the RBV, argument can be made that because the opportunity creation process is firm specific, it leads to the development of a market offering that is idiosyncratic to the creating firm, more likely to be unique and new to the market,

generate above-average market value, and costlier for market rivals to imitate (Im & Workman Jr, 2004). For instance, it's been argued that because the creation process originates from within the boundaries of a firm, it is likely to generate tacit learning and knowledge that is inaccessible and ambiguous to outsiders and as such costly to imitate or substitute (Alvarez & Parker, 2009; Alvarez et al., 2013) regardless of the information diffused. The authors further posit that these characteristics of created opportunities make it likely for opportunity creation to be a good source of sustained competitive advantage and superior firm performance. Thus, this study argues that such entrepreneurial innovativeness, creativity and tacitness arising from opportunity creation can lead to higher economic performance.

Additionally, the subjectiveness of opportunity creation process leads to the generation of new ideas, and patents that are unique to the originating firm (Martin and Wilson, 2016; Artz, Norman, Hatfield, & Cardinal, 2010), and the production of differentiated and novel new products that may be difficulty to be copied by competitors (Im & Workman Jr, 2004; Thornhill, 2006). Such outcomes translate opportunity creation, into high performance outcomes based on the uniqueness of market values created from the opportunity creation process. For example, Im and Workman Jr (2004), argue that due to product differentiation, firms can keep their customers satisfied and loyal – which in turn can lead to an increase in firm performance. Consequently, the study argues that through these unique characteristics that opportunity creation offers, firms can defend their competitive advantage such that, opportunity creation will lead to high performance outcomes for new ventures. In effect, the following is hypothesized;

H4: opportunity creation is positively related to new venture performance.

3.5.3 Contingency Roles of Dynamic Capabilities

Entrepreneurs strive to build internal capabilities to leverage effectiveness of their resources to generate superior performance (Shane & Delmar, 2004). Depending on the context within which the entrepreneur operates, different capabilities maybe developed and used in exploiting and transforming business opportunities into successful performance outcomes. From the dynamic capabilities perspective, this study explores the relevant strategies that firms can use to transform discovery and creation opportunities into successful performance outcomes. Dynamic capabilities are often considered as (1) a transformer of resources into successful performance outcomes (Lin & Wu, 2014) and (2) one of the main sources of differential firm performance (Wang, Senaratne & Rafiq, 2015). Indeed, recent entrepreneurship studies have examined the significance of certain capabilities such as absorptive and adaptive capabilities on firm performance (Patel et al., 2015; Eshima & Anderson 2017). Against this backdrop, the current study argues that adaptive and absorptive capabilities have potential moderating effects on the relationship between opportunity creation and/or discovery and new venture performance. The mechanisms and building blocks for such prepositions are argued in the sections that follow next.

3.5.3.1 The contingency role of adaptive capability

Business environments are usually not static and occasionally shift from one condition to another, especially in times of turbulence and uncertainties. The ability of firms to adjust their activities to fit into new equilibrium conditions of the outside world as well as respond to the rapid changes in market expectation is what is known as adaptive capability (Lengnick-Hall & Beck, 2005; Carmeli & Sheaffer, 2008). Its conceptualization covers many facets of the organization including marketing adaptive capability (e.g., Atuahene-Gima & Ko, 2001), technological adaptive capability (e.g., Hansen & Serin, 1997), and organizational design adaptive capability (e.g., Neill, McKee, & Rose, 2007). Firms that do not possess these

capabilities are likely to not benefit from long-term competitive performance, while those that adapt survives the business environment (Friedman, Carmeli & Tishler. 2016).

The development and utilization of adaptive capabilities within entrepreneurial firms can help drive performance. Although the discovery of opportunities may be key to the success of new ventures, they become less useful over time (Karra, Phillips, & Tracey, 2008). The preceding arguments explains how the relationship between opportunity discovery and new venture performance is stronger for firms that possess adaptive capabilities.

First, entrepreneurial activities are in most cases risky and unpredictable; hence the success of a new venture is likely to be determined by degree of flexibility in adapting and responding to changing market conditions (Yiu, Lau & Bruton, 2007). Firms with adaptive capabilities can (1) search for new markets opportunities; (2) adjust and reconfigure structures and routines quickly; and (3) explore and exploit new knowledge simultaneously (Staber & Sydow, 2002; Teece, Pisano, & Shuen, 1997). Although some have argued that firms must not just be adaptive to the environment (Teece, 2007; March, 2006), it is important to guard against the unpredictable nature of the environment through development of adaptive capabilities – especially, because firms have no control over the environment and the actions of their stakeholders.

Second, the discovery view of entrepreneurial opportunity attributes entrepreneurial opportunity to exogenous shocks and environmental changes such as changes in technology and market conditions (e.g., Alvarez & Barney, 2010). Consequently, entrepreneurial firms with the ability to complement their opportunity discovery capability with a stronger capability to respond to environmental shocks and complexities will remain competitive. Thus, an adaptive capability should not be regarded a substitute to entrepreneurial opportunity discovery capability, but rather as a complement (Arthurs & Busenitz, 2006), in the sense that a greater

capability to adapt internal routines and processes to fit the exigencies of the external environment may convert an entrepreneurial opportunity into marketplace success. In recent times, arguments have been made about how increases in firms' adaptive capability can help transform new entrepreneurial activities to new value creation (Eshima & Anderson, 2017).

In effect, adaptive capability helps firms to understand and continually alter their market expectations so that they can appropriately exploit their discoveries through products and services that serve the dynamic and latent demands of customers. From the foregoing arguments, this study hypothesizes that;

H5. The positive effect of opportunity discovery on new venture performance is stronger at high levels of adaptive capability.

3.5.3.2 The contingency role of absorptive capability

Absorptive capability refers to firms' abilities to assimilate and utilize knowledge for commercial purposes (Cepeda-Carrion et al., 2012). Such capabilities enable firms to transform external knowledge into new products and processes and innovative activities (Harrington & Guimaraes, 2005). Thus, it is important for entrepreneurial firms to develop absorptive capability that helps them assimilate and utilize external knowledge in addition to their entrepreneurial activities, especially for firms that engage in the exploitation of subjective opportunities (opportunity creation). This study contends that absorptive capability will have a significant influence on the sustainability of firms' performance in terms of new product and process creation (Zahra & George, 2002). Past literature argues that absorptive capability, improves firms' abilities in understanding new ideas while encouraging creativity at the same time (e.g., Chesbrough, 2003) as well as aiding them to be successful in international markets (Kuivalainen et al., 2010). Opportunity creation is subjective, firm specific and an internal

activity, therefore, the firm's ability to exploit external knowledge to combine with the internal process of opportunity creation will translate into superior performance.

Thus, firms require external knowledge, such as external technological sourcing, knowledge of the markets and customers to complement the already ongoing opportunity creation process in the firm. Such capability in acquiring and utilizing external knowledge will make business more creative and innovative in their opportunity creation activities on the one hand, while successfully exploiting these opportunities on the other hand. For example, Foss, Lyngsie and Zahra (2013) argue that, firms' interaction with external knowledge sources is very key to the exploitation of recognized opportunities. Further, it's been documented that, higher levels of absorptive capabilities enable firms to create and exploit novelty (Caloghirou, Kastelli, & Tsakanikas, 2004), while improving innovation, product development processes, and long term competitive advantage (Cepeda-Carrion et al., 2012; Ireland, Hitt, & Vaidyanath, 2002). Such openness and the utilization of absorptive capability will complement the opportunity creation activities of firms to enhance performance levels.

Finally, lessons can be learnt from other studies on the relevance of absorptive capability to some entrepreneurship process and constructs. For example, there is evidence that the effect of entrepreneurial orientation on firms' performance, is dependent on the absorptive capabilities (e.g., Patel et al., 2015; Engelen et al., 2014). Thus, without effective development and utilization of absorptive capacity, entrepreneurial firms stand to loss on gaining new knowledge relevant to the exploitation of opportunity creation. In effect, this study models that firms who engage in opportunity creation activities and also possess dynamic capabilities in the form absorptive capacity are more likely to improve and sustain their performance outcomes. This leads to;

H6. The positive effect of opportunity creation on new venture performance is stronger at high levels of absorptive capability.

3.6 Chapter summary

This chapter presented the theoretical underpinnings of the study. From cognitive theoretic angle, the chapter explains how entrepreneurial cognitive style impacts on the process of opportunity creation and opportunity discovery. Additionally, from the tenets of RBV and its attendant's dynamic capabilities, the chapter develops hypotheses to explain the effect of opportunity creation and opportunity discovery on new venture performance at varying levels of absorptive and adaptive capabilities.

CHAPTER 4
RESEARCH METHODOLOGY

4.1 Introduction

This chapter describes the research method and design adopted for the study's data collection. Given the objectives and hypotheses of the study, it is crucial to explain in detail the processes through which data is collected and analyzed – thus, the congruence or otherwise between the proposed framework and empirical evidence is very much dependent on the suitability of the research design employed. The chapter discusses four pertinent issues. First, the chapter briefly describes the philosophical underpinnings of the current study. The second section looks at issues of data collection with specific emphasis on cross-sectional research design and its justification. Third, there is a discussion on the process of exploratory interviews, questionnaire design and survey administration method. Finally, discussions on pre-testing and the processes of ensuring measure validity and reliability are provided.

4.2 Philosophical Perspectives of Social Science Research

In social science research, the choice of the method of study usually depends on how the researcher view the existence of knowledge. Different methods are used for different studies depending on the objectives of the study and the philosophical thoughts of the researcher and/or the discipline under study. With respect to the philosophy that guides social science research and the choice of method, one can distinguish among three major methods of study—*Positivism, Constructionism* and *Pragmatism*. According to Tashakkori and Teddlie (1998), these philosophical views differ with respect to the ontology and epistemology of a social science phenomena.

Positivism or logical positivism is one of the first paradigms of philosophy of social science research. It originates from pioneers such as Auguste Comte in rejection to beliefs such as metaphysics and religion. Proponents of this view argue that knowledge is external and

objective in nature. According to positivism, there should be empirical observation of phenomena through hypothesis testing, mathematical analysis and some experimental designs (Lee, 1991). Just as it has been argued for natural sciences, these methods of studying phenomena can be applied to social science research as well (Hempel, 1969). By applying the methods of natural or physical sciences, social scientists will be able to explain, predict and control phenomena like the natural scientist do (Lee, 1991). Some of the key features of this approach include value-free knowledge and the independence of the observer from the observed (Johnson & Onwuegbuzie, 2004). The present day quantitative methods of studying social science through means of hypothesis testing, statistical analysis, and mathematical formulation to determine cause and effect, originates from this positivist philosophical perspective of social science research.

The second school of thought is the constructivist/interpretive view on the study of social sciences. This group of philosophers rejects the calls by positivists. For them, ideologies such as constructivism, humanism, hermeneutics, and idealism are much better way of looking at what knowledge and reality are (Lincoln, Lynham, & Guba, 2011; Schwandt, 2000). Thus, rather than having a passive way of writing, there should be rich, thorough and thick description of phenomena (Johnson & Onwuegbuzie, 2004). They see theory as an act of generation and argue that reality is socially constructed and generated by the researcher (Mir & Watson, 2001). In other words, the constructivist ontology assumes that the social world is produced by the actions and interactions of humans, rather than if it exists independent of social actors. With this group of thinkers, qualitative approaches or interpretative methods are usually used in understanding and analyzing phenomena and are usually less generalizable.

The pragmatism school of thought is the third and most recent thought on the philosophical approaches to research and mostly uses deduction, induction, and abduction in its inquiries. Rather than limiting the choices of researchers in their research (dogmatism), it argues for the

use of multiple (pluralistic) approaches (Johnson & Onwuegbuzie, 2004). The pragmatism wave is a way of combining the two divergent philosophical views to social science research, thereby providing a framework for researchers and methodologists to conduct a research using mixed methods (quantitative and qualitative).

4.3 Philosophical foundation of the current study

This study involves examining the antecedents and consequences of opportunity seeking behavior of entrepreneurial firms. By the nature and the complexity of the model, adopting one philosophical method of study will not be an appropriate way of finding answers to the research questions and objectives of the current study. For example, constructivism alone, is ineffective when it comes to expanding the application of existing theories and is not in 'support' with the ideology of certain strategy research (Mir & Watson, 2001). Accordingly, this study adopts the pragmatism view of combining qualitative and quantitative research approach in answering the study's research questions. Johnson and Onwuegbuzie (2004) argue for the combination of qualitative and quantitative approach to research in other to have more effective and nuanced research findings that could be generalized. Similarly, having a pragmatic or pluralist approach to research can help bridge the gap between positivisms and constructivism in advancing knowledge in various disciplines (Maxcy, 2003). Besides, both approaches share some basic assumptions about social science research. For instance, both approaches describe the data used, try to get meanings out of the data and attempt to explain an observed outcome (Sechrest & Sidani, 1995).

Most importantly, the subjective and objective nature of entrepreneurial opportunities give credence to using this mixed method approach. Thus, on the one hand, discovery has been explained as an objective reality independent of the entrepreneurs' actions, while opportunity creation is endogenous and enacted by the entrepreneur on the other hand. With such attributes

of the study's main constructs, it becomes imperative to employ such method of study. At the initial stages of the study where a deeper understanding of some of the constructs (for example, the conceptual domain opportunity creation and discovery) are needed, the study will employ a qualitative approach such as structured and semi-structured interviews in exploring new concepts as well as validating existing scales that lack clarity in the extant literature. Additionally, to confirm and/or test the various proposed theoretical hypotheses, the study employs the positivism quantitative approach. In effect, the study will adopt a mixed-method approach in answering its research questions.

4.4 Method of study and research design

The significance of a study's results and contribution largely depends on the appropriateness of the research method and design chosen. The initial stage of the study involved a qualitative research in the form of exploratory interviews where managers, CEOs, entrepreneurs and owner managers are interviewed on certain aspects of the research topic. Such an exploratory qualitative research, aids in the understanding the dynamics of the research topic and its associated constructs as well as the development of a suitable conceptual framework. For a greater portion of the study, quantitative data collection and analysis procedures is used mainly for scales validation and hypothesis testing. In line with many research in business and management, the study uses cross-sectional research design – where data is collected from large sample of respondents at a single point in time. Details of these processes and procedures as well as justification for them are discussed in subsequent sections of this chapter.

4.4 Scope of the study

This section describes in detail, the study sample, context of the study, unit of analysis and the characteristics respondents used at the various data collection stages.

4.4.1 Study setting

The research setting of the study is mainly two folds. The first of the two settings relate to new ventures. The second is in respect of undertaking the studies within the context of a developing economy. The study specifically chose new ventures because the topic sentence is on the opportunity seeking behavior of entrepreneurial firms. And the choice of new ventures is influenced by (1) entrepreneurship and the pursuit of opportunities are synonymous to the creation of new ventures (2) majority of entrepreneurial firms within developing economies are new ventures.

First, the study is suited within the context of new ventures who portrays entrepreneurial characteristics. Previous researchers have conceptualized firms with entrepreneurial characteristics in many ways (e.g., Daily et al., 2002). Sharma and Chrisman (1999: p. 18) used the term independent entrepreneurship and defines it as "the process whereby an individual or group of individuals, acting independently of any association with an existing organization, create a new organization". Similarly, Boso et al., (2013) within the context of developing countries, explain entrepreneurial firms as firms that are independent entities and not part of any company group. This study modifies these two explanations of entrepreneurial firms and describes entrepreneurial firms as firms that act independently and/or on behalf of group of companies or organizations that they belong to with the principal goals of achieving profitability, growth, innovation, and strategic management practices (Carland et al., 1984).

From these explanations, firms must (1) exhibit these entrepreneurial characteristics and (2) must not be more 12 years old since their formation[2] in other to be part of the study. It is expected that such clarification will guide the researcher in constructing the study's sample frame.

[2] As per the conceptualization of new ventures in chapter 2 of this thesis.

The choice of a developing economy (Ghana) to test the proposed model is not arbitrarily. Most developing economies including Ghana are low income economies but show characteristics of a rapid growing country (Hoskisson et al., 2000).

The extant research on entrepreneurial opportunity process have largely been on developed economies in North America and Europe with sparse theoretical and empirical evidence on developing and emerging economies even though there are a lot of business potentials in such economies. Developing economies are characterized by institutional and social structures as well as market orientations which are significantly different from the developed economies (Deng & Dart, 1999). These differences present researchers and managers with diverse lenses in the process of strategic entrepreneurship — simultaneously seeking and exploiting opportunities. According to Zahra (2007), it is important for researchers in entrepreneurship to factor in the contextual nature and differences of different economies in development of entrepreneurship theory. For example, Peng (2003), cautions researchers on the likelihood of making assumptions that, research findings in developed economies can be applied in transition economies. Thus, certain assumptions used in developing a theory for developed economies maybe relaxed or tightened when using them in an underdeveloped economy.

Similarly, in a review of entrepreneurship research in emerging economies, Bruton, Ahlstrom, and Obloj (2008), demonstrate that there has been absence of entrepreneurship research in areas like sub-Saharan Africa, Latin America, and the Middle East. In effect, there is the need for entrepreneurship research to now look in the direction of sub-Saharan African countries.

The study uses Ghana as a model of a developing economy because of some of its recently acquired characteristics and transformation. For some time now, the Ghanaian economy has been on a good trajectory with increases in major economic indicators and has been described as one of the seven emerging economies in sub-Saharan Africa (Hoskisson et al., 2000). With

a GDP of about US$42.69billion and GNI per capita income of US$1,380 in 2016 (World Bank, 2018), the economy is the second largest to Nigeria in the ECOWAS sub-region with so many investment opportunities and growth potentials. With the commercial production of oil over the last few years, the country's GDP has increased by 5.3 percentage points in 2011, and has been experiencing substantial growth in most of its sectors. For example, a recent World Bank report titled, "Global Economic Prospects: Sub-Saharan Africa," forecasted that growth in Sub-Saharan Africa will get to about 32% in 2018, and Ghana's economy has been predicted to lead the rest of the countries with a growth of about 8%.

The major sectors of the economy include agricultural, industry or manufacturing and the service sector, with the service sector contributing about 50% of the country's GDP (IndexMundi, 2015). Again, the economy has been a subject of institutional transformation and restructuring over the decades. Some of these transformations include but not limited to banking reforms, removal of price controls and granting of subsidies and privatization of certain state-owned enterprises (Acquaah, 2007). These institutional reforms bring a lot of opportunity in terms of local and foreign investments and perhaps threats to the already existing markets and entrepreneurial success (Amankwah-Amoah, Boso & Antwi-Agyei, 2016). Additionally, per the remarkable growth in opportunities and investments in the Country's service and manufacturing sector over the years, the study limits its focus to only these two sectors of Ghana. From the above arguments, it is evident that data from such a context, will provide interesting academic and managerial findings.

Table 4.1 shows a comparison of developed and developing economies in terms of basic business outlook and entrepreneurship activities. The comparison is derived from highlights from the Global Entrepreneurship Monitor (GEM) reports for 2016 and 2017. Among the selected entrepreneurship indicators, *Perception of societal values related to entrepreneurship* and *Entrepreneurial activity indicators* are more prevalent in developing countries than they are in developed countries. This shows how firms and individuals in developing countries are becoming increasingly entrepreneurially-oriented. However, developed countries are ranked higher than developing countries regarding metrics such as *favorable business environment; legal and commercial framework*; and *entrepreneurship outcome variables such as innovation and employment.*

Table 4. 1 Comparison of key entrepreneurship and business indicators between developed and developing economies

Basis for comparison/indicators	Developed countries	Developing countries
Firm sizes	A mixture of multinationals, large corporations and small and medium sized enterprises	Usually dominated by small and medium sized enterprises
Sources of revenue	Revenue generation is usually form industrial sectors	Generates more revenue from the service sector
Perception of societal values related to entrepreneurship	Most developed countries, especially in Europe show less belief in entrepreneurship as a good career.	Developing countries report the most positive attitudes towards entrepreneurship. Entrepreneurship is considered as a good career with most entrepreneurs being admired in societies
Entrepreneurial activity indicators/measuring entrepreneurial activities	Entrepreneurship activities such as *total early-stage entrepreneurial activity*; *established businesses ownership* and *entrepreneurial employee activity* are less common in these countries.	Entrepreneurship activities such *as total early-stage entrepreneurial activity*; *established businesses ownership* and *entrepreneurial employee activity* are more prevalent in these countries.
Business failure/discontinuance	Very low in developed economies	High in developed economies
Perceived quality of the entrepreneurship ecosystem	Entrepreneurship ecosystem such as physical infrastructure, commercial and legal frameworks, and social and cultural norms are most developed and effective in developed economies	Entrepreneurship ecosystem such as physical infrastructure, commercial and legal frameworks, and social and cultural norms are less developed and mostly ineffective in developed economies
Impact of entrepreneurial activities such as job creation, innovation and industry participation	▪ High job creation ▪ Entrepreneurship activities is characterised by high innovative activities ▪ The most prevalent entrepreneurial activity is in ICT, financial and other services sectors	▪ Low job creation ▪ Usually less innovation is involved in the entrepreneurial process ▪ Most entrepreneurs engage in the wholesale/retail, ICT and financial services sectors

Source: GEM Reports, 2016; 2017

4.4.2 Unit of analysis

Hill and Birkinshaw (2010) contends that one of the problems in the study of antecedents and outcomes of opportunity recognition is the measuring of the appropriate unit of analysis in such studies, hence, it is important to explain the unit of analysis for the current study. In entrepreneurship and management research, unit of analysis refers to the levels at which data is aggregated (Davidsson & Wiklund, 2001), such as firm or individual levels. Entrepreneurship research has distinguished between micro and macro levels of analysis. Micro levels are the individual entrepreneurs and/or teams, who are described in terms of roles or membership. The macro level is the firm of the entrepreneur. A typical macro level analysis variable is firm performance outcomes. The distinction in the unit of analysis is important for the design of empirical studies as well as the appropriate applicability and testing of theories (Davidsson & Wiklund, 2001; Gartner & Brush, 1999). Following past entrepreneurship studies, (e.g., Hmieleski & Corbett, 2008; Hmieleski, Corbett & Baron, 2013), this study adopts both individual and firm levels of analysis. The study's hypotheses as already stated, require variables that are conceptualized and measured at both individual and firm levels. For example, while cognitive style is measured at the individual level, new venture performance and dynamic capabilities are measured at the firm level. By so doing, the study looks at both individual and organizational level factors involve in the process and outcomes of opportunity creation/discovery as past research have suggested (see Short et al., 2010).

4.5 Data and Data Collection Instruments

This section describes the sources and types of data for the study, as well as the process of designing the data collection instruments such as interview guides and survey questionnaire.

4.5.1 Qualitative procedure

The first phase of the data collection process is the use of qualitative procedures to develop new scales for some of the constructs used in the study. In other to understand and clearly

delineate the conceptual framework of the study, the researcher personally organized a face-to-face interview with 15 entrepreneurs in Ghana. The purpose was to better understand some of the entrepreneurship constructs as used in the framework. Further, this became particularly important as the opportunity creation construct does not have empirically validated scales in the extant literature. Hence, in addition to the conceptual meanings in the literature, the researcher needed to engage entrepreneurs in the development of new scales for the opportunity creation constructs.

The first part of the interview required entrepreneurs to answer questions based on the initial framework and constructs used while the second part asked for the opinions and comments of same entrepreneurs on a re-drafted version of the conceptual framework. Table 4.1, shows some of the questions that were asked on each construct. Detailed interview guide can be found at the appendix of this report (appendix 4A). Some of the study constructs exist already and have been validated in several studies. Accordingly, only some selected constructs were used in designing the interview guide. The constructs on which sampled entrepreneurs and new ventures were interviewed include the opportunity formation process, environmental factors and new venture success (performance). Since opportunity creation is a newly developed construct in the study, details of the processes involved in scale development is described in section 4.6.1.2 of this chapter.

Table 4. 2: Summary of questions for interview guide

NO	Intended constructs	Some questions asked
1	Opportunity discovery/creation process	➢ What does new business opportunity mean to you as a business man/woman? ➢ What types of new business opportunities are there in your industry? ➢ How do you go about looking for these new opportunities in your industry? ➢ Do you use existing ways of serving the demands of your customers? How do you go about doing this? ➢ Does your company pursue opportunities that are characterized by high risk or great uncertainties? What are the processes in doing this? ➢ Does your company show any novelty in introducing products/services to the markets? If yes, how does this show in your new product offerings? ➢ How many new opportunities have you identified in your industry over the last three (3) years?
2	New venture performance	➢ What are the key issues that compel you to try to discover new business opportunities in and beyond your industry? Could you kindly be more detailed on the issues? ➢ Could you think about situations when you tried to craft a new business opportunity yourself? What did you intend to achieve with that? ➢ So, in the end, what do you get (or benefit) from these efforts you put in trying to discover or create a new business opportunity? ➢ Can you think of issues that make the opportunities you have exploited eventually more or less successful?
3	Environmental factors	➢ To what extent is the industry where you source your opportunities dynamic? ➢ Do you have any other thing to say about your business environment? How do they influence your decisions to exploit or not to exploit a new business opportunity? ➢ How do the action of competitors influence your business activities?

NO	Intended constructs	Some questions asked
4	Cognitive characteristics	▪ How often do you encounter problems in your business? ▪ How do you think about creating business opportunities? ▪ Do you analyses problems before making decisions? ▪ How does gut feelings or hunches affect your decision making concerning business opportunities?

After completion of the interviews, transcripts of the responses were coded manually to select and highlight key themes and phrases that came up. Several statements and terms were used throughout the interview which confirm to some extent the relevance of the initial proposed conceptual framework. Key amongst them is how they (entrepreneurs) go about sourcing for new business opportunities, the benefit they expect from such business opportunities and how some personal and environmental factors affect them as they venture into new business areas. Below are some of the statements made by the interviewees;

When asked about what new business means to them, most of the respondents emphasized that, anything either completely new or that requires improvement which has the potential of bringing them some extra income is considered as a business opportunity to them. Some striking responses include,

'…an opportunity other than an existing one that brings income.

For me……new business opportunities are found within the various supply chain points in the already existing process. Either new points are created or the old ones are improved'

Also, the sampled entrepreneurs were asked about how they about sourcing of business opportunities within their markets. Salient themes and statements that came out as results of their response include, searching; look around what other business man are doing; observe

people; experiment with ideas; market research and survey; I combine different ideas to form a product or service; I do something new and different.

These statements are worth noting…

'…sometimes the opportunity is there, all you need is the ability and the brains(mind) to identify and grab it…, I know some people who are fast and smart to identify them'

'…for me, there are some things in my business I spent a lot of time and thinking to create them myself because I want it new and different, but for some just a little idea and they become great business'

The words, *ability, thinking and my mind* came up many times when the interviews were asked personal factors they use most in sourcing for one business opportunity or the other. For example, one respondent explained…, *if I want something new from what my competitors are doing, then…. I have to think and think.*

For the next set of questions, the study wanted to know what the expectations of the entrepreneurs are once the go about sourcing for different opportunities and sometimes across different industries. The common responses given by the interviewees are*; I want to be better than the rest, so that I can have more revenue; because I still want to be in business; I want to have a big company; and I don't want to fail* among others. In sum, the responses gathered concentrated on the performance of their firms (financial, yet, relative to their competitors) and the continuous survival of their business ventures. In the final phase of the interview, the researcher wanted to know what factors could possibly help or frustrate the entrepreneurs quest to successfully exploit the opportunities they pursue. Most of the answers given to this question clustered around regulatory factors and certain resources that their firms already have. One entrepreneur recounted that '*my marketing people already had the capability and know the work around of selling one particular product, so when we created this new one, it was simple to market to our customers in a similar way….'*

Accordingly, results of the interviews gave the researcher further insights into both new and existing constructs and how the conceptual framework could be re-design to reflect the views of the entrepreneurs. For example, words and phrases such as *experiment, combine ideas, do something different...,* were common in the opportunity creation literature and were eventually useful in developing scales for opportunity creation. Secondly, the interviews helped in confirming and validating the operationalization of other constructs as they have been used in the existing literature.

4.5.2 Quantitative Procedure

After the exploratory interviews, the next step was to adopt a quantitative method to empirically validate the study's conceptual framework. The preceding sections describe in detail the processes and procedures used in achieving such an outcome. First, the cross-section design used is described.

4.5.2.1 Cross-sectional design

Several research designs such as experimental, longitudinal, cross-sectional, factorial designs have been identified as possible designs researchers could use (Kerlinger, 1973). Among these designs, cross-sectional and longitudinal designs are regarded as the most frequently used in business and management research (see Churchill, 2005). Cross-sectional design is where data is collected from large number of respondents at a single point in time. Usually large data set is collected from respondents with different characteristics and background information. On the other hand, longitudinal studies involve the collection of data from same respondents over long periods of time in other to establish a pattern of behavior or changes over time. Between these two dominant research designs, this study adopts cross-sectional design. Many factors informed the decision to use this design. Cross-sectional design is commonly used in management and entrepreneurship studies because of its ability to use large sample size of respondents (e.g., Ucbasaran et al., 2009) and the inferences that can be made from such

sample. Of the many studies in entrepreneurship, especially those on the entrepreneurial opportunity process, more than half of them are cross-sectional in nature (see Short et al., 2010). Additionally, considering the time involve in using longitudinal design, the current study finds it appropriate to use cross-sectional design in its data collection. Despite these advantages and its popularity in the entrepreneurship research, cross-sectional design has many challenges that requires that attention of it users.

Unlike, longitudinal surveys, cross-sectional surveys are likely to lead to (1) the occurrence of common method variance (CMV) in data – a situation which makes research findings inconsistent (Podsakoff et al., 2003) and (2) a difficulty in making causal inference of the relationship between an independent and dependent variable. To reduce the occurrence of CMV, the literature has suggested the use of multiple respondents or multiple data sources and other procedures (Rindfleisch et al., 2008; Podsakoff et al., 2003). Applicable to this study, several steps, both ex-ante and post-ante were taken to ensure that CMV does affect the data collection and subsequent findings. For example, a retrospective questionnaire was used in which respondents were asked to answer questions based on previous scenarios in their minds, while focusing actual behaviors rather than belief (Golden, 1992). Additionally, the formats and sequence of the questions were mixed and varied to prevent respondents from guessing an inherent relationship. Further to these remedies during the data collection process, other statistical methods suggested for testing CMV in the literature are employed during the data analysis stage[3].

[3] These are different statistical analysis done to test for the presence of CMV in the data. Details are given in chapter four of this report

4.5.3 Survey Administration method

The second and the most important part of the data collection method is the use of survey questionnaire. After the interview process in delineating the conceptual framework, it was important to quantitatively collect data on all the constructs through survey questionnaire. When using questionnaire, there are many methods of data collection such as face-to-face and telephone interviews, online questionnaires and mail questionnaires. Based on the merits, demerits and most importantly the peculiar features of the study settings and convenience of the researcher, the study adopts both the mail and face-to-face approaches to questionnaire administration. Given the number of new ventures operating in Ghana and the disadvantages of using only face-to-face method, the researcher found it convenient to use both methods of emails and face-to-face. Whiles the face-to-face approach generally produce relatively high response rate (Bryman, 2004), the mail questionnaire approach takes away pressure from respondents by allowing them to work at their own time and convenience (Churchill, 2005). Even though there are some challenges such as low response rate and non-response bias especially with the mail method (Rindfleisch et al., 2008), the given advantages are preferred to the setbacks. Consequently, these two methods were chosen over the telephone interviews and online questionnaire methods.

4.5.4 Sampling frame and choice of respondents

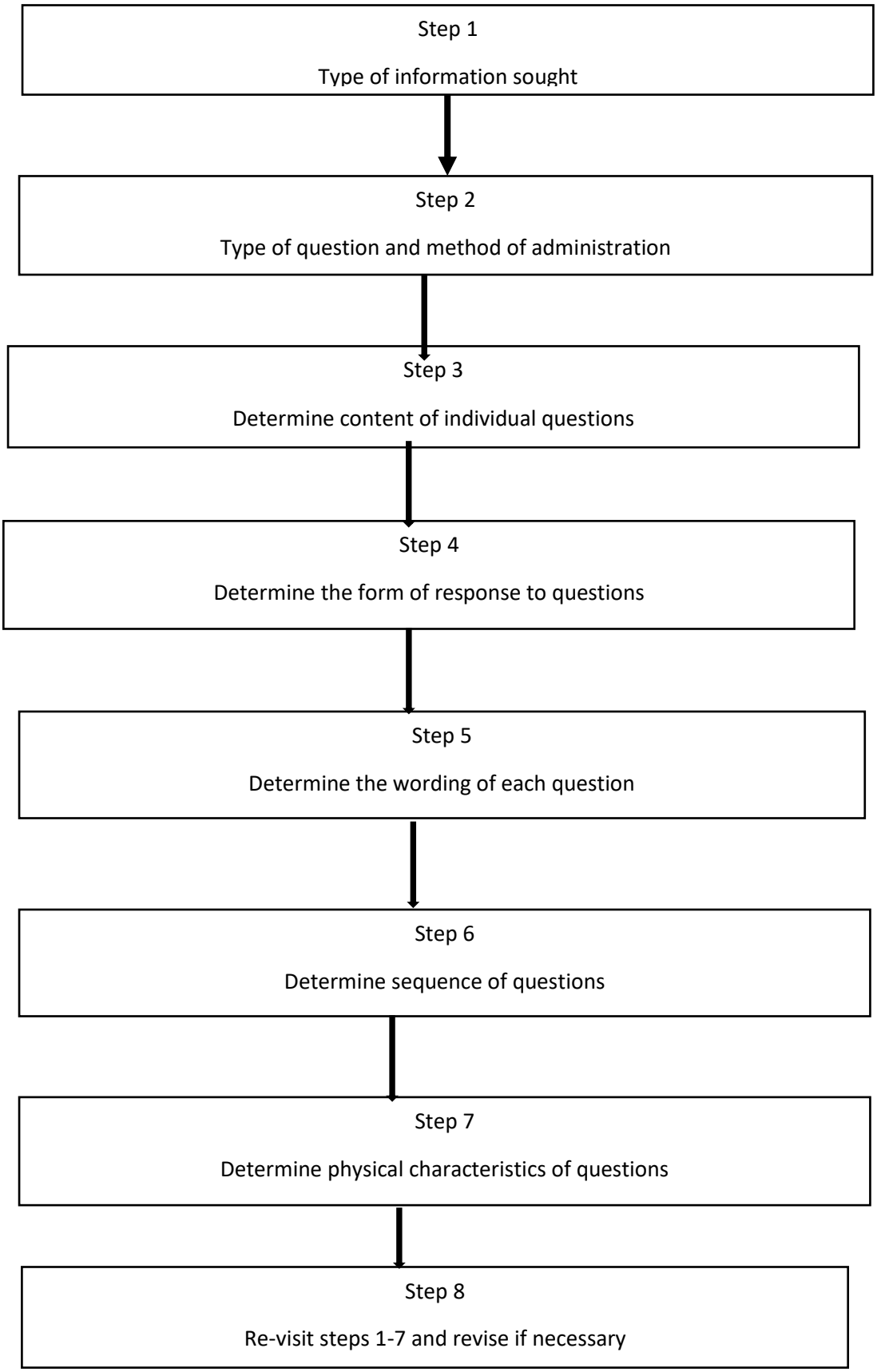
The main aim of the study is to investigate antecedents, outcomes and boundary conditions of opportunity creation and discovery among new ventures. Accordingly, the sample frame comprises new ventures operating in a multi-industry context in Ghana. The researcher developed the study's sample frame by compiling data from the Ghana Business Directory, Ghana register database, the Ministry of Trade and Industry and the Ghana Exports Promotion Council. From such a diverse sample frame, the study has many sources from which potential new ventures could be sampled. In all, over 12,000 businesses were found that meet the sample

criteria of new ventures that exhibit entrepreneurial characteristics. Next was the selecting of key respondents. The choice of key respondents or otherwise can greatly influence the quality of the data and subsequently the research findings. Respondents for the current study includes Managers, founding CEOs/CEOs, Entrepreneurs, Owner-Managers and individuals (teams) that make entrepreneurial decisions in the selected firms. Additionally, Accountants, Finance Managers/Officers and/or performance evaluators are selected to answer questions relating to the performance aspect of the study. These respondents were assumed to have an in-depth knowledge on the questions being asked and must be involved in making key entrepreneurial decisions in the surveyed firms. Several scholars in entrepreneurship studies have either used one or more of these respondents in their surveys (e.g., Hmieleski et al., 2015; Ucbasaran et al., 2009; Byrne & Shepherd, 2013). Thus, in other to get accurate and vivid description of entrepreneurial activities in the chosen firms, it is important to adopt the key informant approach in administering the survey questionnaire (Kumar, Stern & Anderson, 1993).

4.6 Questionnaire Design

It is important to adopt a comprehensive questionnaire design approach in other to avoid errors associated with sampling, measurements and non-response biases. Accordingly, the procedure for designing a valid questionnaire is explained. The study adopted the highly recommended psychometric procedure by Churchill (1979) in developing the questionnaire. Thus, these recommendations were followed to ensure that every scale or group of items in the questionnaire seeks to measure the construct(s) it ought to measure. In all, eight (8) steps are described and followed accordingly. Figure 4.1 shows the steps in a sequential other.

Figure 4. 1: **Recommended procedures for questionnaire development**



Adapted from Churchil (1979)

4.6.1 Type of information sought from respondents

To adequately achieve the study's objectives, it is important the most relevant and current information is obtained for the development of scales and/or questionnaire. There was an extensive and detailed search of the literature for existing scales for the selected constructs. Most especially for the opportunity creation construct which has not been measured empirically in the extant entrepreneurship literature, it was crucial to do a thorough search of relevant related literature that can help the study develop relevant and valid scales.

In respect of the other constructs in the model, there are already existing scales in the literature that measure them. Nonetheless, as already mentioned in section 4.5.1, there was a face-to-face interview with some entrepreneurs to seek their views, understanding and clarity on these existing scales. Also, due to the context of the research and some institutional variations, some of these scales were adapted to reflect current happenings, contextual issues and in the 'language' of new ventures owners. Table 4.2 show the kind of information that was sought from entrepreneurs during the survey administration.

Table 4. 3: Information sought from respondents

Main constructs
Opportunity discovery
Opportunity creation
Drivers
Entrepreneurial cognition
Intuitive cognitive style
Analytic cognitive style
Contingencies/moderators
Firms' adaptive capabilities
Firms' absorptive capabilities
Knowledge acquisition
Knowledge assimilation
Knowledge transformation
Knowledge exploitation
Outcome variable
New venture performance
Controls
Environmental dynamism
Competitive intensity
Experience of entrepreneurs
Size of firm
Industry types

4.6.1.1 Opportunity discovery

The construct of opportunity discovery has been operationalized in many ways in the extant literature. Terms such as opportunity identification and recognition (e.g., Ucbasaran et al., 2009) have all been used to describe and measure opportunity discovery. However, to specifically measure opportunity discovery as conceptualized by this study, appropriate items (six items) were adapted from Ozgen and Baron (2008) and Wu, Chen, and Jiao, (2016). Consequently, respondents were asked to indicate the extent to which the selected items/statements describe their opportunity discovery activities. The scales were anchored on a on a seven-point Likert scale ranging from 1 = not at all to 7 = to an extreme extent.

4.6.1.2 Opportunity creation

The researcher follows Rossiter's (2002) Construct definition, Object classification, Attribute classification, Rater identification, Scale formation, and Enumeration and reporting (C-OAR-SE) approach in developing scales for the opportunity creation construct. In this approach, constructs are defined in terms of Object, Attribute, and Rater Entity and is mostly used in developing new scales for management and marketing constructs. First, the study begins with the conceptual definition of what constitute opportunity creation. From the results of the exploratory interviews and the extant literature, *opportunity creation* is defined as an entrepreneurial behavior where the actions and activities (including ideation, evaluation and enactment) of entrepreneurs result in the realization of new ways of serving customers, new methods of production, new products and services, new markets and resources. This behavior or actions of entrepreneurs leading to creation, is characterized by subjectivity, uncertainty and a causally ambiguous path or processes (see Alvarez & Barney, 2010). Also, in other for opportunity creation not to be misconstrue as creativity, the conceptualization was anchored on opportunities and entrepreneurship (Eckhardt & Shane, 2003; Ardichvili, et al., 2003; McDougall & Oviatt, 2000). The next step is objectification where components of the

opportunity creation construct are generated – for its interpretation might differ across the sample of entrepreneurs and new ventures. Again, a decision was made on the classification of the main attributes of the of the opportunity creation construct. In this case, the attribute of opportunity creation is eliciting, since it causes the responses to its measurement items (see Rossiter, 2002). The next step is the decision on the rater entity. The rater entity in this study is a sample of entrepreneurs. Finally, a general scale formation was done through which 19 items were created based on the exploratory interviews, the construct definition and the existing literature. The items were subjected to experts[4] judging and pre-testing in other to have more parsimonious and valid scales. After pre-testing and series of discussions, six items were selected to capture the opportunity creation construct. Anchored on a seven-point Likert scale (1 = "strongly disagree" and 7 = "strongly agree"), respondents were asked to indicate the extent to which they agree to statements that describe their opportunity creation activities.

4.6.1.3 Entrepreneurial cognitive style

This construct explains entrepreneurs' cognition/cognitive style – whether analytic and/or intuitive (Allinson & Hayes, 1996) and how it influences their entrepreneurial decision-making process. The original scale, as developed by Allinson and Hayes, is made up of thirty-eight (38) items that seek to measure the cognitive style of individuals. Many entrepreneurship studies (see Brigham et al., 2007; Kickul et al., 2009) have adapted and used these items in measuring the cognitive style of entrepreneurs. This research adapted the 38 items by selecting the most reflective items of the intuition and analytic dimension. Thus, following the works of Hodgkinson and Sadler-Smith (2003) and Kickul et al., (2009), the study measures a two-factor model cognitive style of intuitive and analytic. On a seven - point Likert scale ranging from 1

[4] These include; entrepreneurs, academics in entrepreneurship studies and some selected colleague PhD students

= “not at all” to 7 = “to an extreme extent”, entrepreneurs were asked to state the extent to which each of the selected items applies to their thinking styles.

4.6.1.4 Absorptive capabilities

Absorptive capability is firms’ ability to identify, assimilate, transform and exploit external knowledge for the purposes of commercial ends (Cohen & Levinthal, 1990; Jansen et al., 2005; George & Zahra, 2002). From its definition and measurement (in past literature), absorptive capability is a multi-dimensional construct consisting of four dimensions. Previous studies have differentiated between potential and realized absorptive capabilities. Potential refers to knowledge acquisition and assimilation whiles realized relates to knowledge transformation and exploitation (Zahra & George, 2002). This research adapts the measures of Jansen et al., (2005) to measure all four dimensions of absorptive capability. Various number of items relating to each dimension of the construct were anchored on a seven-point Likert-type scale ranging from “strongly disagree” (1) to “strongly agree” (7) for the respondents to rate how those statements/items reflect their capabilities.

4.6.1.5 Adaptive capabilities

Adaptive capability is conceptualized as the firms’ ability to strategically sense and respond to environmental changes or shocks. The conceptualization covers many facets of the firm including marketing adaptive capability (e.g., Atuahene-Gima & Ko, 2001), technological adaptive capability (e.g., Hansen & Serin, 1997), and organizational design adaptive capability (e.g., Neill, McKee, & Rose, 2007). Measurement scales were adapted from Akgün et al., (2012) and Gibson and Birkinshaw (2004) for this current research. Respondents were asked to describe their firms’ capacity to adapt to environmental changes by responding to items anchored on a seven-point Likert-type scale ranging from “strongly disagree” (1) to “strongly agree” (7). The items covered all three areas of adaptive capabilities.

4.6.1.6 New venture performance

Meaningful and reliable measures of new venture performance are very important for the practice and theory of entrepreneurship. Several entrepreneurship studies have used new venture performance to measure the performance of entrepreneurial firms (e.g., Zhao, Song & Storm 2013; Hmieleski & Baron, 2009). Its measurement, however, has been mixed – either objective or subjective measures, with scholars advocating for the use both in a single study for the purposes of validation and/or because of the advantages and disadvantages each of them bring (see Stam & Elfring, 2008). Despite such recommendations, the researcher resorted to the use of only subjective measures because (1) it's difficult to have access to objective financial data especially, within the study setting (2) self-reported performance measures have been shown to have strong correlation with internally objective performance measures (see Dess & Robinson 1984) and (3) there is evidence of the reliability and validity of self-reported performance measures (e.g., Li & Atuahene-Gima, 2001). Accordingly, self-reported and relative subjective measures were used to measure new venture performance for the sampled entrepreneurial firms. Following Wiklund and Shepherd, (2003); Hult et al., (2008) and Hultman et al., (2009) the study selected five measures to capture three (i.e., financial, operational and overall effectiveness) different but theoretically relevant dimensions of new venture performance. Subsequently, based on five (5) indicative items, respondents were asked to indicate the extent to which the selected statements meet their financial, operational and overall performance goals relative to their competitors. The use of relative measures has a theoretical argument, of supporting the strategy and resource-based view focusing on competitive advantage (Gilbert, McDougall, & Audretsch, 2006). The scales were anchored on a seven-point Likert-type scale ranging from "much lower than target" (1) to "much higher than target" (7).

4.6.1.7 Control variables

Following, previous entrepreneurship research (e.g., Simsek & Heavey 2011; Hmieleski et al., 2015), relevant control variables were included in the study. The control variables comprise individual, firm and industry level factors. Specifically, the study controlled for firm size, entrepreneurial experience, industry type, competitive intensity and environmental dynamism. The selection of these variables has relevant implication to the model as they are assumed to have potential effect on the activities and the performance of entrepreneurial firms. Thus, the rational for choosing these control variables are explained in the preceding paragraphs.

Entrepreneurs' previous experience can be considered as a resource that enables them to continuously engage in opportunity identification and new venture creation process. From an experiential learning perspective, entrepreneurs who are experienced are more likely to have substantial amount of knowledge in venture creation process (Obeng et al., 2014). With respect to firm characteristics, size is often considered as one of the determinant of firm performance in management research. Evidence suggest larger businesses are likely to grow faster and perform better than small business in most African economies (e.g., Biesebroeck, 2005). Within, the study context, majority of these entrepreneurial firms are classified as small and medium size firms, hence the study finds it relevant to control for the likely effect firm size may have on the performance of these entrepreneurial firms. In addition, the type of industry a firm competes in has a significant effect on its performance outcomes. The study setting is characterised by two major industries – service and manufacturing, with majority of entrepreneurially oriented behaviors occurring within these two industries (see Boso et al., 2013). Lastly, environmental factors such as competitive intensity and environmental dynamism are controlled for in the model. The extant literature has demonstrated the effect these two factors have on the performance of entrepreneurial firms either as individual variables or as moderating variables (Sundqvist et al., (2012; Stam, Arzlanian & Elfring, 2014).

Thus, the dynamism of the markets and the competitiveness of entrepreneurial firms within the study setting gives a justification for such control effects.

Accordingly, in line with previous entrepreneurship studies, the phenomenon under study and the contextual effects of the study settings, these five variables are selected as alternative explanatory variables for both opportunity creation/discovery and new venture performance.

Depending on the variable being measured, both single and multi-item measures were used. The researcher adapted the scales developed by Jaworski and Kohli (1993) to measure both competitive intensity and environmental dynamism. The scales for both variables were anchored on a seven-point Likert-type scale from "strongly disagree" (1) to "strongly disagree" (7). Competitive intensity was measured by four (4) items while environmental dynamism was measured by three (3) items. Entrepreneurial experience was measured by the number of years the entrepreneur and/or the firm has been in business (e.g., DeTienne & Chandler, 2007). Firm size was also measured by the number of full time employees in each firm. The natural logarithm of both firm size and experience were used in the analysis. For industry type, an industry dummy with 1 for manufacturing, and 2 for services was created. Table 4.3 gives details of the measurement items for each construct and their respective literature sources as used in the questionnaire.

Table 4. 4: Selected measurement scales for questionnaire

Construct/Anchors	Items	Source
Opportunity creation	In looking for business opportunities, I	
1 = not all	focus on originality of business ideas	Newly developed
	rely more on untried opportunities	
7 = to an extreme extent	source for opportunities that have high degree of uncertainty	
	combine resources/capabilities in a novel way	
	create its own means of production	
	generate its own ways of serving the market	
Opportunity discovery	In looking for business opportunities, I	
1 = not all	scan the environment for new business opportunities	Ozgen and Baron (2008)
	search to discover existing ways of serving the market	Wu, Chen, & Jiao, (2016)
7 = to an extreme extent	search to discover demand and supply gaps on the market	
	discover opportunities in markets with lower degrees of uncertainty	
	make decisions based on business opportunities that are predictable	
	make decisions based on measurable business opportunities	
	In this firm, we are able to	
Absorptive capability	interact regularly with departmental heads to obtain new knowledge	Jansen et al., (2005)
1 = strongly disagree	acquire industry information on emerging opportunities	
	gather information about customer needs to identify a market gap	
7 = strongly agree	organize special meetings with customers/third parties to acquire new knowledge	
	listen and take actions on the complaints of our clients	
	understand information contained in external knowledge	
	recognize shifts in our markets in terms of regulations and competition	
	understand new ways of serving the market	
	quickly analyze and interpret changing market demands	
	combine existing knowledge with newly acquired and assimilated knowledge	
	record and store newly acquired knowledge for future use	
	easily grasp business opportunities from new external knowledge	

Table 4.3 continued

Construct/Anchors	Items	Source
	share new business practical experiences among employees	
	meet periodically to discuss the consequences of market trends and new product development	
	apply new knowledge commercially for new business opportunity	
	clearly listen to and understand clients' complaints about our services	
	constantly discuss and understand how to exploit new knowledge	
	implement knowledge about new products and services	
	understand, analyze and interpret information from external sources	
Adaptive capability	In this firm, we are able to	
1 = strongly disagree	challenge outmoded practices and traditions	Akgün et al. (2012)
	be flexible and respond quickly to changes in the markets	Gibson & Birkinshaw (2004)
7 = strongly agree	change our new business activities rapidly in response to shifts in business priorities	
	adapt quickly to sudden changes in industrial policies and technology	
	As a person...	
Intuitive cognitive style	I make decisions on the basis of intuition	Allinson and Hayes, (1996)
	My 'gut feeling' is just as good a basis for decision making as careful analysis	Kickul et al. (2009)
	Most people regard me as not being a logical thinker	
	I am always prepared to take a gamble	
	I find that 'too much analysis results in paralysis'	
	My understanding of a problem tends to come more from flashes of insights than thorough thinking	
Analytic cognitive style	In my experience, rational thought is the only realistic basis for making decisions	
	Most people regard me as a logical thinker	
	I find detailed, methodical work satisfying	
	My approach to solving a problem is to focus on one part at a time	
	My understanding of a problem tends to come more from thorough analysis than flashes of insight	
	I am most effective when my work involves a clear sequence of tasks to be performed	

Table 4.3 continued

Construct/Anchors	Items	Source
New venture performance	Performance relative to your main competitors on the following indicators for the past 3 years	
1 = much lower than target	Return on investment	Wiklund & Shepherd, (2003); Hultman et al. (2009); Hult et al., (2008)
	Profit growth	
7 = much higher than target	Sales growth	
	Market share	
	Overall performance of our new products and services	
Environmental dynamism	In this business…	
1 = strongly disagree	our company rarely changes its ways of identifying new business opportunities	Jaworski and Kohli (1993)
	the rate at which products become obsolete to consumers is very slow	
7 = strongly agree	it is easy to predict the actions of one's competitors	
	it is easy to forecast customers' future demands	
	the method of production is well established and rarely changes	
Competitive intensity	competition is cut-throat	Jaworski and Kohli (1993)
1 = strongly disagree	competition is intensive	
	anything that my company can offer, another company can match readily	
7 = strongly agree	competition is a major hallmark	
	we hear of a new competitive move almost everyday	
	our competitors are relatively strong	
		DeTienne and Chandler 2007
Firm size	Number of full time employers	Hmieleski et al. 2015
		Boso et al. 2013
Entrepreneurial experience	Number of years as entrepreneur/business owner	
Industry type	Which industry does your firm operate in	

4.6.3 Question wording

Because language used in questionnaires has significant impact on how respondents understand the questions (Christian & Dillman, 2004) and by implication the outcome of the survey, it is important for researchers to pay attention to the wording of the questions. Thus, if respondents do not understand the questions because of poor wording, they end up answering the questions wrongly or not answering at all, which might lead to higher non-response rate. As former colony of Britain, Ghana's official language is English language; hence, majority of companies and businesses speak English in their daily activities. Accordingly, English language was used in designing the questionnaire. Besides, during the pre-testing stage, more than 90% of the respondents could clearly read and speak English. First, to ensure clear understanding of the questions, simple and easy to understand words, sentences and phrases were used. Second words that had ambiguity in their meanings were noted especially during the pilot testing stage of the study. Finally, care was taken to avoid double-barrel type of questions such that each response given will relate to a single item question.

4.6.4 Question sequencing

The sequence of questions is equally important as the wording. The general recommendation is that questions should be a logical order and structured in thematic blocs (Malhotra, 2006). There are two ways in which questions can be properly ordered; namely, the funnel approach and the inverted funnel approach. This study adopted the former approach in laying out the various questions in the questionnaire. In the funnel approach, the general purpose of the study is introduced to the respondents with various statements assuring the respondents of their confidentiality and privacy while soliciting for their trust and cooperation. After the introductory part, the questionnaire then moves to soliciting response to specific questions relating to the research problem and finally non-personalized and non-sensitive background questions of the respondents are presented. Accordingly, the current study followed same. To

ensure that a high response rate is achieved, constructs-specific and relevant questions were placed on the first few pages of the questionnaire. The assumption is that, since some respondents end up not finishing the questionnaire, they would have completed the most relevant section of the questionnaire by the time they (respondents) get tired or decides to stop. For each thematic area, a rubric was given on how respondents should answer the questions. For example, in the section on *entrepreneurial cognitive style*, the instruction read 'this section seeks information about your decision-making style'. Also, in instances where a question may not be applicable to a respondent, they were clearly instructed to move onto another section of the questionnaire.

4.6.5 Response format

Depending on the kind of responses a researcher is expecting, there are many response formats to use during surveys. The most common ones include open-ended answers, closed-ended answers, multi-dichotomous answers, and dichotomous answers (Churchill, 1995). The study adopted the closed-ended type of response format for its many advantages. First, since the study wanted a more objective response for the purposes of testing the hypothesis, it was much suitable and convenient to use the closed-ended format. Also, closed-ended answers were found appropriate so that responses can be compared across the multiple respondents (Churchill, 1995). Finally, in other to limit respondents fatigue while ensuring high response rate, the closed-ended answers approach was adopted. However, it is important to note that, there were some few questions that had the open-ended answers such that varied responses could be accommodated. Another issue worth considering, is the type of measurement scale used in the management and entrepreneurship research. Accordingly, this study used both interval and ratio scale in the questionnaire design as most of the constructs were conceptualized as continuous (Churchill, 2005; Hair et al., 2006).

4.6.7 Physical characteristics and layout of the questionnaire

The appearance and physical characteristics of the questionnaire is very important, is it has a high probability of contributing to respondents' participation and high response rate (Churchill, 1995; DeVellis, 2003). The researcher took every step to ensure that the questionnaire is well presented in terms of appearance and lay out. First the front page had a cover letter that introduced the purpose of the study and some general instructions to completing the questionnaire. As part of the introductory page, respondents were assured of anonymity and confidentiality of whatever information they gave. It was printed on the letter head of the Leeds University Business School with the logo neatly embossed. The usage of the University's logo was to give the survey exercise more credibility. The structure of the questionnaire itself was in sections. For example, section A extensively covered the entrepreneurial opportunity constructs of creation and discovery, section B was on some frim level capability factors, among others. The last section had questions on company information and respondents' characteristics. Another critical issue as far as the physical appearance of the questionnaire is concerned, is the length of the questionnaire. Past studies have shown that the length of questionnaire could impact on both response rate and the reliability of the survey (DeVellis, 2003; Churchill, 2005). Whiles, longer questionnaire makes respondents not to complete all sections – leading to low response rate, shorter versions could also reduce reliability. In effect, the researcher kept the questionnaire to a considerable number of pages such that high response rate and reliability could be achieved at the same time. A copy of the questionnaire and its cover letter is attached, as appendix 4B.

4.7 Pre-testing and amendment

4.7.1 Pre-test with academics and experts

It is very important for questionnaires to go through pre-test before actual survey begins, especially, if one wants to achieve high validity in the measurement scales. The first part of the

pre-testing was with academics and experts in the field of entrepreneurship and strategy studies. This was to establish face validity even before the survey instruments are sent out to respondents. Hair et al., (2006) have emphasized the need for proper face validity to be established before survey administration and subsequent testing of a theoretical model. Face validity attempts to determine the extent to which the scales of a constructs measures what they seek to measure or the theory they seek to represent (Nunnally & Bernstein, 1994). Accordingly, Hair et al., (2006) explain that establishing face validity in survey studies is very important when (1) measurement items are already existing in previous studies: (2) when items are newly developed and (3) old items adapted within new context of a study. The current study has these conditions, hence warrants that the researcher carries out a face validity assessment. Thus, the scales in the in the questionnaire has newly developed scales such as the items measuring opportunity creation and adapted existing scales for the remaining constructs.

To carry out this face validity exercise, the questionnaire was first given to faculty members who have done extensive research and teaching in entrepreneurship, strategy and small business studies. Second, the questionnaire was also assessed by persons who are knowledgeable in scale development and questionnaire design. With respect to faculty members, the first point of call were my thesis supervisors, who spent a lot of time commenting, reviewing and giving feedback in other to clarify any ambiguity and misrepresentation that might seek to undermine or affect the validity of the items. Also, the researcher had the opportunity to attend two PhD seminars where the survey instruments was discussed with PhD colleagues and senior researchers for their opinion. Finally, the structure, wording and presentation of the questionnaire was discussed with an expert in scale questionnaire development, who also gave his thoughts and assessment on it.

4.7.2 Pre-test with Entrepreneurs

Besides, the academics and experts in entrepreneurship and strategy, the researcher also sought the views of entrepreneurs, business owners and CEOs of entrepreneurial firms in a face-to-face personal interview. The purpose of this was for them to give the researcher their understanding of the scale items, some wordings of the statements (questions) and how applicable these items are to their business operations. Additionally, some of these entrepreneurs were part of the respondents who took part in the exploratory interviews during the scale development process, so it was only proper for the researcher to once again seek their opinions as well as confirm their answers (thoughts) given during the exploratory interviews. After the review and comments from the entrepreneurs, some corrections such as re-wording of statements, replacing technical terms with simple words and removal of overlapping words were done to ensure that the questionnaire is a proper representation of what it seeks to solicit and measure.

4.7.3 Pilot study

After establishing face validity with both academics and entrepreneurs, an actual pilot study of the sample question was done. A complete paper version of the survey questionnaire was sent to 30 entrepreneurial firms. The questionnaire was administered to these entrepreneurs in a normal way that the actual survey administration would have taken place. This pilot study was very important to the researcher for many reasons. First, the pilot study will help identify possible problem that may arise from the face-to-face or mail survey method. This is the method that the main survey will use in reaching its respondents, therefore, having a foresight knowledge of the potential problem using the pilot study was very important. Second, since the researcher will use the same sample frame for the main survey, the pilot study will help identify if the respondents (in the case of the pilot study) will be appropriate for the main study; what questions are likely not to be answered; and what might account for a possible low response

rate. Once these problems are identified during the pilot study and addressed effectively, it will go a long way to improve the success of the main survey. After two weeks of the pilot study, 17 completed questionnaires were returned, representing 56% response rate. Out of the 13 remaining questionnaires, 8 of them were returned empty because the sample firms were not willing to respond to the questions while the remaining 5 were never returned because the addresses were either wrong or the firms have folded up. Table 4.4 shows analysis of response or non-response for the mailed pilot study.

Table 4. 5: Response rate for the pilot study

Response Pattern	Number/rate
Wrong address & fold ups	5
Non-response	8
Completed questionnaires	17
Total contacts	30

4.7.4 Response rate enhancement

After the many forms of pre-testing and feedback received thereafter, it became increasingly important for the researcher to consider ways of response rate enhancements before the main survey begins. First, the researcher had to re-visit the sample frame to ensure that all collapsed businesses will not be part of the final sample frame for the main survey. The second aspect was to ensure the effectiveness of the questionnaire and the trust of the respondents. The questionnaire had the logo of university of Leeds embossed on it as well as the names of the researcher and the three thesis advisors in other to ensure trust and credibility in the survey process. Following previous recommendations (Diamantopoulos & Schlegelmilch, 1996), respondents were addressed on the questionnaire by their tittles and names where appropriate. In the cover letter, respondents were made aware of the importance of completing the

questionnaire as this is a project for the award of a doctor of philosophy degree. They were also assured of their confidentiality and anonymity of the information, should they decide to take part in this study. Finally, all respondents were given the option of having a final copy of the study report should they be interested in receiving one. Thus, in other to gain the respondents' trust and maximum benefits from the survey, the researcher ensured that the following boxes in table 4.5 are ticked.

Table 4. 6: Table of information to gain respondents' trust and maximum benefits from the survey

Trust/Benefits	Indices	Details	Usage
Trust of respondents	Sponsorship from university	The study was approved and sponsored by the university of Leeds with the university's logo duly embossed on the questionnaire	Yes
	Cover letter	Cover letter provided with personalized information printed on a paper with the university logo and the Business School symbol	Yes
	Questionnaire	Clear and well-structured questionnaire with easy to understand statements/questions and a clear instruction on how to complete them	Yes
	Confidentiality/anonymity	Clearly explained	Yes
	Contact details	Contact details of the researcher and the three thesis advisors provided on the questionnaire	
Benefits	Monetary incentives	Promised monetary reward upon completion	No
	Non-monetary incentives	Promised a copy of the final study report upon request	Yes
	Relevance of questions to respondents' business operation	The research topic and the associated questionnaire was designed to also benefit business activities and growth of firms	Yes

4.8 The Main Survey Process

This section describes the processes involve in the main survey, the final sample selection and the details of all the field works. After the pilot study, a final questionnaire was arrived at for the main survey. Even before, the main survey begins, there was the need to settle on a final sample frame as well.

4.8.1 Sample frame for questionnaire administration

As already mentioned, the sample frame was developed from the Ghana Business Directory, Ghana Register Database, the Ministry of Trade and Industry and the Ghana Exports Promotion Council and comprised new ventures operating in a multi-industry context in Ghana. Results of the pilot study, did not lead to any significant changes in the sample frame, hence same sample was used for the main study. The respondents consisted of; (1) Managers, founders /CEOs, Entrepreneurs, Owner-Managers and individuals (teams) that make entrepreneurial decisions in the selected firms and (2) Finance Managers/Officers and/or performance evaluators for the performance aspect of the questionnaire.

Following the recommended guide line of having at least 200 observations for a better reliability and validity of the measures (Spector, 1992; Hair et al., 2010) and structural equation modelling, the researcher ensured that good steps are taken to receive maximum responses. Accordingly, 800 potential new ventures were identified in the sample frame and pre-notification emails and telephone calls were sent and made to them to solicit their cooperation and involvement in the study. With such pre-notification and awareness creation of an impending survey, the researcher anticipates the response rate to be high.

4.8.2 Field work procedures

In other to cover a wide geographical area and administer the questionnaire to as many respondents as possible within the shortest possible time, the researcher hired about 10

researched assistants to assist in the questionnaire administration process. Interviews were conducted to select these research assistants. The questionnaire administrators were given comprehensive training and introductory workshop on the nature of the project. In all, 600 pieces of questionnaire were either personally delivered or posted to the sampled firms selected. Reminders were sent either through emails or personally through the services of research assistants on weekly basis to remind the respondents on completing the questionnaire. After 14 weeks of reminder, a total of 118 completed questionnaires were received as the first round of responses. Again, the respondents were sent reminders again, on this occasion rather through more personal visits with the help of the research assistants. Twelve (12) weeks after the receipt of the first badge of completed questionnaire, a total of 112 completed questionnaire were received again through postage and personal pick-ups from the premises of the sampled firms. Out of the 600 pieces of questionnaire sent, some were not responded to at all, while others were returned empty even though, the sample firms had earlier agreed to take part in the survey.

4.8.3 Characteristics of respondents

To achieve validity of the responses given to the questionnaire and the findings of the study in general, it is important to ensure that the appropriate respondents are used in answering the questionnaires (DeVellis 2003; Dillman, 2000). Accordingly, the researcher made sure that those who are knowledgeable about the firm's entrepreneurial activities are contacted and subsequently answered the questionnaire. To achieve this, the mailed questionnaires were addressed personally to the right respondents in each firm, while those that were hand-delivered were personally sent to the offices of the selected respondents. Through-out the survey administration, the respondents included CEOs, business owners and managers. Additionally, finance mangers or officers of the selected firms were also included in answering the performance related aspect of the questionnaire. Detailed analysis of the respondents showed

that most of the respondents are in high managerial positions and are involved in entrepreneurial decision-making in their respective firms. For analysis purposes, these positions were coded into dummies (CEOs = 1, business owners = 2, managers = 3). Table 4.6 shows the characteristics of the respondents and how knowledgeable they are in responding to the questionnaire.

Table 4. 7 Characteristics of the respondents

Variable	Minimum	Maximum	Mean
Entrepreneurs' Experience (in years)	3	20	9.68
Knowledge of the issues (seven-point Likert scale)	2	7	5.5
Details of respondents	**No.**	**Percentage**	
Male respondents	195	84.78%	
Female respondents	35	15.22%	
CEOs	64	27.8%	
Managers	129	56.1%	
Business owners	37	16.1%	

4.8.3 Response Analysis

For many reasons, not all the 600 questionnaires sent were received completed or received at all. Thus, analysis of the response shows that, even though, respondents, had already agreed to take part in the survey process, most of the questionnaires sent were either not completed, partly completed or was never responded. Table 4.7 provides a detail analysis of the responses received on the 600 questionnaires distributed.

Table 4. 8: Response rate analysis of the main survey

Response category	Sub-total	Total
Total questionnaires sent		600
Non-response With reasons With no reasons	 88 114	 202
Responded questionnaires Completed Non-completion	 230 168	 398
Total		**600**

Thus, 88 firms never gave reasons for their non-response nor posted the empty questionnaire back. One hundred and fourteen (114) questionnaires were either posted back to the researcher or picked-up personally with reasons for non-response attached. Again, questionnaires that are less than 60% completed were categorized as non-completed. In all, out of the 600 pieces of questionnaire sent, 230 completed questionnaires were received (representing 38% response rate) after almost 6 months of questionnaire administrations. Though, the researcher would have preferred a much higher response rate, the 38% response rate is in line with other management and entrepreneurship studies (e.g., De Clercq, Honig, & Martin, 2013). Table 4.8 summarizes the most common reasons cited by the sampled firms for non-response in the survey.

Table 4. 9: Reasons for Non-response

Reasons given	Number of respondents
No time to fill in questionnaire/questionnaire too long	30
No questionnaire received	19
Travelled out of town/lost questionnaire	10
Company policy not to respond to questionnaires	8
Company does not believe in academic research	5
Others	16
Total	**88**

4.8.4 Survey bias assessment

4.8.4.1 Response bias assessment

Several steps were taken to ensure that there were no issues of survey bias. One such common bias is the response bias within samples. Especially, because the survey was completed after two rounds of data collection, it was important to check for any issue of non-response bias. Blair and Zinkhan (2002, p.4) defines non-response bias as "if failure to respond (or be observed) is disproportionate across groups". The first approach to reducing this phenomenon is to ensure that response rate is high. Following (Rindfleisch et al., 2008), the researcher also assessed the possible impact of the non-response bias after the data collection exercise. Accordingly, the data was grouped into early respondents and late respondents. Those who responded to the survey questionnaire first 14 weeks of the survey were classified as early respondents while, those who answered within the last 12 weeks were classified late respondents. Thus, there were 118 early responses and 112 late responses (referring to only the completed questionnaire). Accordingly, a non-response bias test was done for the mean values of the main constructs. Using a t-test, the mean values of new venture performance, opportunity creation, opportunity discovery, intuitive cognition, and analytic cognition, adaptive and absorptive capabilities of the early and late respondents were compared. The null hypothesis is

that those who responded within the first 14 weeks were not significantly different from those who responded after. The analysis on table 4.9 shows no significant differences across the two groups of early and late respondents.

Table 4. 10: Response bias assessment

Variables	Mean of early respondents (N = 118)	Mean of late respondents (N = 112)	Sig. of t-values
New venture performance	4.37	4.47	0.39
Opportunity creation	5.0	5.12	0.45
Opportunity discovery	4.70	4.80	0.32
Intuitive cognition	4.60	4.71	0.84
Analytic cognition	4.73	4.61	0.70
Adaptive capability	4.70	5.0	0.09
Absorptive capability	4.80	4.85	0.65

4.8.4.2 Common method bias assessment

Common Method Bias (CMB) is a major problem in studies that use survey data. It explains "variance that is attributable to the measurement method rather than the constructs the measures represent" (Podsakoff et al., 2003 p. 879). Thus, when survey questionnaires are used to collect data at the same time from same respondents or common ratter, CMB is likely to arise (Podsakoff & Organ, 1986). The causes of CMB can be put into four main categories, namely: common ratter effects, item characteristic effects, item context effects, and measurement context effects (Podsakoff et al., 2003). Some of these causes are more severe than others, hence present varying effects on the analysis of data and findings. In this current study, the source of CMB could arise from any of the following reasons or both: (i) same respondents rating the scales/answering the questions for both predictors and outcome variable, (ii) collecting the data at the same time point and (ii) the issue of social desirability[5]. The effects

[5] This arises when respondents try to impress by making attempts to answer the questions 'correctly' and 'appropriate'.

of CMB in survey studies usually include very high correlation figures (false internal consistency among variables) when there is none, hence a high potential of undermining the validity and conclusions of the research findings.

Many remedies have been proffered as ways of reducing the occurrence of CMB during the questionnaire design and data collection stages on the one hand, and during the analysis of data on the other hand. Following the suggestions by Chang, Van Witteloostuijn and Eden (2010), the first and basic steps (*ex-ante* remedies) the researcher adopted to minimize the occurrence of CMB was at the survey development stage and administration to the respondents. First a retrospective questionnaire was developed and administered to entrepreneurs, CEOs, managers and owner managers. Participants were asked to answer questions base on a retrospective account of an event or scenario in their minds. Second, the researcher mixed the appearance of the items and/or constructs such that they do not follow the same order as in the study's model. Third, as much as possible, the researcher and the research assistants ensured that the predictor(s) section of the survey was answered by the entrepreneur/CEO/Manager, while the outcome(s) section was answered by the finance manager. In addition to these, some scales were reverse coded in attempt to reduce the occurrence of CMB (Lindell & Whitney, 2001). The last *ex-ante* approach adopted is the complexity of the research model. Given the many interactions and paths in the conceptual model (Podsakoff et al., 2003), it is unlikely for respondents to guess a straight path of relationship or causation wiles answering the questions. In chapter 5 of this thesis, further analysis will be done in determining the presence of common method bias or otherwise in the data.

4.9 Analytical tools and approaches

The study applied various descriptive and analytical techniques to validate the data and test the hypothesis. Specifically, missing data analysis, normality test and other descriptive analysis were all done. Following previous entrepreneurship and management studies, all the constructs

were assessed for validity and reliability through both exploratory and confirmatory factor analysis procedures. Widely accepted fit indices criteria such as Comparative Fit Index, Normed Fit Index/Non- Normed Fit Index, Root Mean Square Error of Approximation, and the Chi-square statistic (Hu & Bentler, 1999) were employed to see how well the model fits the data. Per the many interrelationships among the study variables, the researcher employed Structural Equation Modelling (SEM) in testing the hypothesis. Further, various post-hoc and robustness analysis such as endogeneity test, quadratic effect analysis and multicollinearity test were done to confirm the reliability and unbiased nature of estimates. Depending on the specific analysis, different statistical software packages such as SPSS and LISREL were used

4.10 Chapter summary

The chapter has presented methodological issues and choices made in this study. Justification for each research method, design and approached has also be explained. Issues concerning sampling, interviews, development of data collection instruments, survey procedure and field work and data analysis have all been discussed.

CHAPTER 5
DATA ANALYSIS AND FINDINGS

5.1 Chapter overview

This chapter presents the results of the analysis of data. Specifically, it begins with a description of the sample characteristics followed by scale purification and selection through exploratory and confirmatory factor analysis. The chapter also presents detail processes in the testing g of the study's hypotheses.

5.2 The study sample

The sample for the study consisted of 230 entrepreneurs/new ventures across all ten political and administrative regions of Ghana. As already explained in chapter 4, the criteria for selection requires each sample firm to exhibit certain entrepreneurial characteristics and be classified as new ventures. Sample firms were basically domestic firms that operate either in the manufacturing or service sectors of the country. Table 5.1 give some profile of the sampled firms. These include firm age, the size of the firm (measured by full-time employees) and the industry classifications

Table 5. 1: Characteristics of sampled firms

Variable	Minimum	Maximum	Mean
Firm age	3	12	9.08
Firm size	18	296	61
Industry classifications	**No.**	**Percentage**	
Service industry	178	77.40%	
Manufacturing industry	52	22.60%	

5.3 Missing value analysis

As per the norm, it was important for the data to be explored to check for issues of likely missing values. Given the volume and length of the questionnaire, it is only proper to assume that, there may be cases of missing data as has been the case in most survey studies.

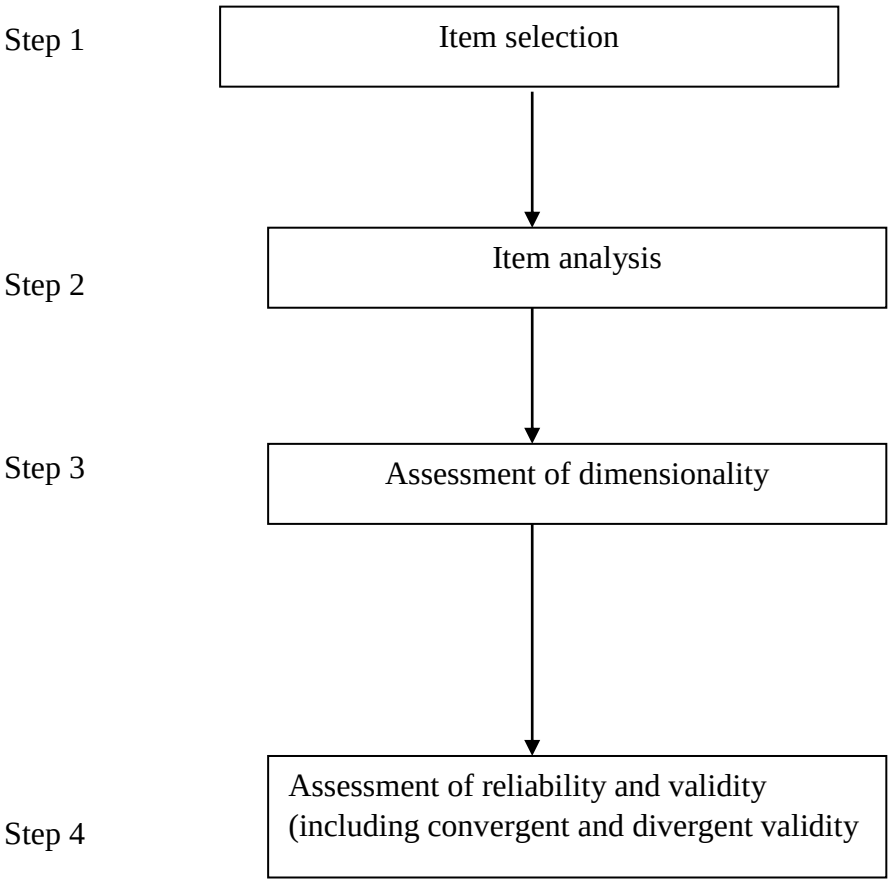
Accordingly, missing value analysis was done for each of the variables. Employing missing value analysis in SPSS, it was discovered that three items ANAS4, PERF2 and PERF5 representing Analytic cognitive style and new venture performance had missing data with a percentage of 0.3%, 0.1% and 0.5% respectively. These percentages are significantly below the 15% threshold argued by Hair et al., (2013), when doing missing value analysis. In effect, missing data did not pose much of a challenge to the subsequent multivariate analysis. Nonetheless, these missing data values were corrected for, by replacing them with their respective mean values.

5.5 Scale development and measurement assessment

5.5.1 Overview

Considering the number of constructs and their multi-item nature, it was imperative that proper and rigorous statistical procedures are used in selecting reliable and valid scales. Accordingly, the researcher follows the recommended psychometric procedure for scale purification and confirmation (e.g., Bagozzi et al., 1991; Netemeyer, Bearden & Sharma, 2003). Figure 5.1 shows the steps the researcher followed in the scale selection and purification process. The key processes and analysis include; item selection using Exploratory Factor Analysis (EFA), item analysis (e.g., inter-item/construct correlations and Cronbach's alpha), and using Confirmatory Factor Analysis (CFA) for dimensionality assessments (where applicable) as well as various validity and reliability measures. Details for each step of analysis are given in the preceding sections of this chapter.

Figure 5. 1: Scale development procedure followed by the researcher



5.5.1 Selection of items using exploratory factor analysis (EFA)

The selection of initial items that form the constructs was done using exploratory factor analysis (EFA)[6]. All times in the survey questionnaire was put in the SPSS software to be freely estimated without restricting it to the number of factors it should bring out (Anderson & Gerbing, 1988). Thus, in this case, the study assumes no knowledge of which items load on a specific latent construct nor the dimensionality of constructs (Netemeyer et al., 2003). In all, the model is made up of 64 items representing twelve (12) latent constructs. Out of this 12, one construct – absorptive capability is a multi-dimensional construct, comprising four dimensions; namely, Acquisition (AQCST), Assimilation (ASSM), Transformation (TRANS) and

[6] This analysis is done for only the multi-item constructs.

Exploitation (EXPT). The rest of the factors are; Intuitive Cognitive Style (INTT), Analytic Cognitive Style (ANAS), Opportunity Creation (CREAT), Opportunity Discovery (DISC), New Venture Performance (PERF), Adaptive Capability (ADAP), Environmental Dynamism (DYNM), and Competitive Intensity (COMPT).

To extract the initial factor solutions, the researcher relied on the principal axis factoring method of factor extraction and direct oblimin rotation. Per the sample size (230 respondents) of the study, factor loadings that are below 0.40 were not considered during this initial factor solutions (Hair et al., 2010). Accordingly, the items with factor loadings ≤ 0.40 were not selected for further EFA analysis. The initial EFA returned a 14-factor model contrary to the expected 12 factors assumed by the model (see appendix 5A) with 68% of the cumulative variance in the model.

Table 5. 2: Final EFA of all constructs

Items/constructs	DISC	CREAT	PERF	ANLYT	INTU	ADAPT	TRANS	ASSM	EXPT	ACQ	DYNM	COMP
AC_A2										.749		
AC_A3										.771		
AC_A4										.883		
AC_A5										.869		
AC_AS1								.846				
AC_AS2								.824				
AC_AS3								.862				
AC_T2							-.855					
AC_T3							-.845					
AC_T4							-.844					
AC_T5							-.747					
AC_E1									.766			
AC_E2									.839			
AC_E3									.805			
AC_E4									.781			
ADAP1						.744						
ADAP2						.764						

Items/constructs	DISC	CREAT	PERF	ANAS	INTT	ADAPT	TRANS	ASSM	EXPT	ACQ	DYNM	COMP
ADAP3						.874						
ADAP4						.711						
ANLYT 3				.729								
ANLYT 4				.743								
ANLYT 5				.840								
ANLYT 6				.820								
PERF1			.789									
PERF2			.803									
PERF3			.760									
PERF4			.854									
PERF5			.749									
OPPC1		.792										
OPPC2		.806										
OPPC4		.835										
OPPC5		.786										
OPPD1	.791											
OPPD3	.814											
OPPD4	.777											

Items/constructs	DISC	CREAT	PERF	ANAS	INTT	ADAPT	TRANS	ASSM	EXPT	ACQ	DYNM	COMP
OPPD5	.843											
OPPD6	.832											
DYN1											.766	
DYN2											.818	
DYN3											.854	
DYN4											.778	
DYN5											.743	
COM1												-.717
COM2												-.780
COM3												-.870
COM4												-.839
COM6												-.742
INTU1					.839							
INTU2					.869							
INTU3					.914							
INTU4					.843							

KMO: .797; Bartlett's Test: 7353.577 (sig. 0.000); Percentage of variance explained: 73%

Table 5. 3 Key to abbreviated constructs/items during EFA

No.	Abbreviations (description)	Number of items
1	PERF (measures of performance)	5
2	OPPC (measures of opportunity creation)	4
3	OPPD (measures of opportunity discovery)	5
4	ANLYT (measures of analytic cognition)	4
5	ADAP (measures of adaptive capability)	4
6	INTU (measures of intuitive cognition)	4
7	DYN (measures of environmental dynamism)	5
8	COM (measures of competitive intensity)	5
9	AC_A (measures of knowledge acquisition)	4
10	AC_AS (measures of knowledge assimilation)	3
11	AC_T (measures of knowledge transformation)	4
12	AC_E (measures knowledge exploitation)	4

Table 5.3 shows the full names of the abbreviations used during the EFA. After the initial EFA, some items were found to be cross-loaded, while others had a factor loading below the 0.40 threshold. Specifically, CREAT3 cross-loaded on a non-existing 14th factor, while INTU5 and INTU6 significantly cross-loaded on a 13th non-existing factor. These items were subsequently excluded from the second EFA analysis. In addition to the problem of cross-loadings, ANLYT1 and ANALYT2 had loadings of 0.34 and 0.22 respectively (which are below the 0.40 threshold), hence were also eliminated during the further EFA.

Accordingly, a second EFA solution with 58 items were estimated to extract the appropriate factors from the items. In addition to eliminating the cross-loading and below 0.40 factor

loadings, items that have low loadings such as AC6 (0.57), OPD2 (0.56) and AE5 (0.43) were also eliminated from the second EFA estimation. Using the same method of EFA estimation, 12 factors were extracted from the remaining items with 73% of the cumulative variance in the model. The factor loadings ranged from 0.70 - 0.91. Table 5.2 shows the final EFA for all the constructs in the model. In addition to the EFA, inter-item correlation analysis was done for all constructs, with satisfactory results. (See appendix 5B)

After the EFA, the next step is to proceed to do a Confirmatory Factor Analysis (CFA). Because, CFA normally assumes to test and/or confirm an existing hypothesis, it was necessary for the researcher to establish some initial reliability of the selected items in other to have some prima facie to performing the confirmatory factor analysis. Accordingly, the researcher did an inter-item correlation analysis and Cronbach alpha for each construct. With a threshold of 0.30 and 0.50 for the item-total correlation and 0.70 Cronbach alpha (Hair et al., 2013), the analysis was performed with the following results showing on table 5.4. As shown by the table, the item-total correlation ranged between 0.55 – 0.82 and a Cronbach alpha ranging from 0.83 to 0.90 for all the constructs. With this initial reliability indices and the results of the EFA, the researcher can safely proceed to do a confirmatory factor analysis.

Table 5. 4: Descriptive statistics of items and item-total correlation

Latent construct (number of items)	Items	Mean	SD	Item-total correlations	Alpha
New venture performance (5)	PERF1	4.39	1.09	.76	
	PERF2	4.42	0.99	.77	
	PERF3	4.46	1.03	.70	
	PERF4	4.43	1.05	.71	
	PERF5	4.41	1.08	.66	**.89**
Opportunity discovery (5)					
	OPPD1	4.76	1.18	.71	
	OPPD3	4.81	1.10	.75	
	OPPD4	4.70	1.14	.68	
	OPPD5	4.71	1.13	.74	
	OPPD6	4.75	1.13	.72	**.89**
Opportunity creation (4)					
	OPPC1	5.13	1.14	.64	
	OPPC2	5.04	1.21	.73	
	OPPC4	5.15	1.24	.79	
	OPPC6	5.00	1.19	.68	**.86**
Intuitive cognitive style (4)					
	INTU1	4.76	1.24	.78	
	INTU2	4.93	1.21	.78	
	INTU3	4.78	1.16	.82	
	INTU4	4.53	1.48	.70	**.90**

Latent construct (number of items)	Items	Mean	SD	Item-total correlations	Alpha
Analytic cognitive style (4)	ANLYT3	4.59	1.24	.55	
	ANLYT4	4.75	1.11	.60	
	ANLYT5	4.74	1.21	.73	
	ANLYT6	4.64	1.19	.71	**.83**
Knowledge acquisition (4)					
	AC_A2	4.67	1.43	.77	
	AC_A3	4.81	1.50	.78	
	AC_A4	4.37	1.54	.73	
	AC_A5	4.49	1.43	.78	**.89**
Knowledge assimilation (3)					
	AC_AS1	4.93	1.42	.80	
	AC_AS2	4.84	1.35	.82	
	AC_AS3	5.05	1.40	.81	**.88**
Knowledge transformation (4)					
	AC_T2	4.89	1.29	.74	
	AC_T3	4.83	1.26	.78	
	AC_T4	4.92	1.33	.74	
	AC_T5	4.72	1.31	.72	**.89**

Latent construct (number of items)	Items	Mean	SD	Item-total correlations	Alpha
Knowledge exploitation (4)	AC_E1	4.98	1.28	.64	
	AC_E2	5.21	1.27	.77	
	AC_E3	5.05	1.32	.77	
	AC_E4	5.02	1.24	.73	**.89**
Adaptive capability (4)					
	ADAP1	4.70	1.36	.64	
	ADAP2	5.08	1.32	.66	
	ADAP3	4.73	1.31	.70	
	ADAP4	5.01	1.32	.62	**.83**
Environmental dynamism (5)					
	DYN1	4.47	1.21	.62	
	DYN2	4.57	1.19	.68	
	DYN3	4.50	1.17	.73	
	DYN4	4.75	1.16	.66	
	DYN5	4.65	1.25	.64	**.85**
Competitive intensity (5)					
	COM1	4.63	1.42	.63	
	COM2	4.94	1.38	.70	
	COM3	4.83	1.47	.74	
	COM4	4.99	1.36	.73	
	COM5	4.89	1.35	.63	**.86**

5.5.2 Selection of items through confirmatory factor analysis (CFA)

As already mentioned, the next step after EFA is to do a CFA. The main purpose of this analysis is to determine if the hypothesized model will fit the study's data (Netemeyer et al., 2003). Thus, unlike EFA, CFA is theory driven, such that it allows the researcher to specify a model based on the established theory and subsequently test the model to see of such a relationship exist and/or such model fits the current data. Again, where issues of multi-dimensionality exist for constructs, the CFA can confirm or otherwise the dimensionality of the construct (e.g., Gerbing & Anderson 1988). In effect, among other things, the researcher used the CFA to confirm the appropriate number of factors, and the relationships among the factors. In addition, because the researcher will be using structural equation modelling (SEM) in testing the study's hypothesis, it was important to employ CFA in further purifying the scales and subsequently establishing validity and reliability.

There is an important requirement to be followed regarding having all indicators of the construct entered once in the estimation of the CFA model. Specifically, it is recommended that the minimum sample size to parameter ratio should be five-to-one (e.g., Tacbanik & Fidell, 2007). Also, entering all items once into a CFA model could lead to poor model fit and/or non-converged solution. To avoid such issues of violating the minimum sample size to parameter ratios, while ensuring good model fit, the researcher followed acceptable practices to estimate the CFA in sub-sets (Cadogan et al., 2006). What goes into a specific sub-set is defined and determined by constructs that are theoretically related. After the sub-sets estimation, a full model CFA, where all the constructs are put together is estimated to see if there will be acceptable fit indices. Details are given in the preceding sections.

5.5.3 CFA model specification and model fit assessment

The researcher used LISREL 8.50 software and maximum likelihood estimation method to assess the measurement models (Jöreskog & Sörbom, 2004). Following Anderson and Gerbing,

1988, the relationship among the items and their respective latent constructs were defined such that items were forced to load on their already assumed respective factors. The researcher adopted two path ways in doing the CFA. First, the subset or themes pathway – where relationships or hypotheses are estimated based on theoretically related constructs. For instance, with respect to the entrepreneurial opportunity construct, opportunity creation and discovery were estimated together. Specifically, four CFA models were estimated to represent four themes or subsets of the model; model 1 for antecedent variables (intuitive and analytic cognitive style), model 2 for main constructs (opportunity creation and opportunity discovery), model 3 for outcomes including moderator variables (adaptive capability, absorptive capability and new venture performance) and model 4 for control variables (environmental dynamism and competitive intensity).

A second pathway, is where all these models are estimated together to determine the overall model fit for the data. Consequently, a fifth CFA model is estimated. Table 5.5 give details of which variable went into which CFA model.

Table 5. 5: Theoretically related sub-constructs CFA

Model No.	Sub-themes	Constructs
1	Antecedents	Intuitive cognitive style Analytic cognitive style
2	Main constructs	Opportunity creation Opportunity discovery
3	Outcome and moderating variables	Absorptive capability Acquisition Assimilation Transformation Exploitation Adaptive capability New venture performance
4	Control variables	Competitive intensity Environmental dynamism
5	Full model	All constructs from model 1 to model 4

To establish how good each CFA model fits the data, the researcher used several criteria and fit indices. The first and most fundamental is the standardized loading of each item's loading on a latent construct. Thus, it is expected that each item will have a minimum of 0.50 standardized factor loading (Hair et al., 2013). Model fit was also evaluated using the conventional chi-square ($\chi 2$) goodness of fit statistic. Because the Chi-square statistic is quite sensitive to sample size, it is usually significant for large sample size, hence, it is recommended that other fit indices are used together with the Chi-square test (Jöreskog & Sörbom, 1996). In effect, model fit was determined using other assessment criteria. Specifically, following the suggestions of Hu and Bentler (1999) and Bagozzi and Yi (2012), the researcher relied on approximate fit heuristics to provide a broad evaluation and assessment of all the CFA models. Non-centrality based measures such as Root Mean Square Error of Approximation (RMSEA); relative fit indices including Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI); and absolute fit index such as Standardized Root Mean Squared Residual (SRMR) were all

used as a measure of model fit. The literature recommends the following threshold, normed chi-square (i.e. χ^2/degrees of freedom.) of less than 3.00; RMSEA ≤ 0.08; NNFI ≥0.90; NFI ≥0.90; CFI ≥0.90 and SRMR ≤ 0.05(Bagozzi & Yi 2012) in determining the fit of a model. Table 5.6 provides some fit indices and their corresponding thresholds.

Table 5. 6: CFA model fit indices and their threshold

No.	Measurement index	Recommended threshold
1	Chi-square (X^2)	> 0.05
2	Normed chi-square (X^2/DF)	<3
3	Root Mean Square Error of Approximation (RMSEA)	≤0.08
4	Normed Fit Index (NFI)	≥0.9
5	Non-Normed Fit index (NNFI)	≥0.9
6	Comparative Fit Index (CFI)	≥0.9
7	Standardized Root Mean Squared Residual (SRMR)	≤0.05

Adapted from Hultman (2008)

5.5.3.1. CFA model 1: Entrepreneurial cognitive style (intuitive and analytic

The first CFA model was for entrepreneurial cognitive style – analytic and intuitive style of cognition. Items were set to load on their respective latent constructs where the first item of each construct was fixed to 1.0. Using the scale purification procedure and depending on the number of items for each construct, items that had factor loadings of 0.50 and above were selected for the final measurement of the latent construct. From the standardized factor loadings and their significance levels (p values < 0.05), all the scales for intuitive and analytic cognitive style were retained (even though the standardized loadings have reduced, compared to the EFA values). For analytic cognitive style, the factor loadings ranged between 0.60 (ANLYT3) to 0.86 (ANLYT5) while intuitive cognitive style ranged from 0.74 (INTU4) to 0.88 (INTU3). Since all items for the two constructs had standardized coefficients above 0.50 and a significant t-values (in parenthesis), there was no need deleting any of them. Table 5.7 shows the

standardized loadings and their respective t-values. The second step was to use the model fit indices reported in table 5.7 to assess how the mode fits the data. Thus, the CFA model provided the following model fit for the data: $\chi^2 = 32.74$, d.f. = 19 (significant at 5%; p=0.025); χ^2/d.f. = 1.72; NNFI = 0.98; NFI = 0.98 CFI = 0.98; RMSEA = 0.056; and SRMR =0.036. Though the sample chi-square is significant (perhaps due to large sample size), all the other fit indices meet the criteria specify in table 5.6 above. Considering the significance levels of the factor loadings and the reported fit indices, the researcher can safely conclude that CFA model 1 for intuitive and analytic cognitive style sufficiently describes the data.

Table 5. 7: CFA for intuitive and analytic cognitive style

Items/constructs	Standardized loadings (t-values)
Analytic cognitive style	
ANLYT 3	0.60[b]
ANLYT 4	0.62 (7.49)
ANLYT 5	0.86 (9.00)
ANLYT 6	0.83 (8.96)
Intuitive cognitive style	
INTU1	0.86[b]
INTU2	0.85 (16.20)
INTU3	0.88 (16.75)
INTU4	0.74 (13.12)

Fit Indices: **χ2=** 32.74; *df* =19; χ2/*df***=** 1.72 p=0.025; NFI=0.98; NNFI=0.98; CFI=0.99; RMSEA=0.056; SRMR=0.036 *t*-values in parenthesis b Fixed parameter

5.5.3.2 CFA model 2: opportunity creation and discovery

The second CFA model was for the main construct of opportunity creation and discovery. As already explained in the conceptualization of the nature of opportunities, entrepreneurial opportunity creation and discovery is conceptualized and measured as two distinct constructs[7]. In effect, the CFA model did not hypothesize it as one construct or a higher order construct. Like model 1, items were set to load on their respective latent constructs with the first item of each construct being fixed to 1.0. From the scale purification procedure, items that had factor loadings of 0.50 and above were selected for the final measurement of the latent construct. Accordingly, all the scales for opportunity creation and discovery from the EFA were retained after the CFA. Thus, even though some of the effect size had reduced after the CFA (compared to the EFA factor loadings), all items had standardized coefficients above 0.50 with the least loading being 0.68 (OPPC1) for opportunity creation and 0.75 (OPPD4) for opportunity discovery. Also, the t-values (in parenthesis) as reported by table 5.8 shows high significance of each item. Second, the fit indices indicate the estimated model fits the data. Thus, the CFA model provided the following model fit for the data: χ^2 = 50.34, d.f. = 26 (significant at 5%; p=0.003); χ^2/d.f. = 1.93; NNFI = 0.97; NFI = 0.96 CFI = 0.98; RMSEA = .064; and SRMR =0.034. Except for the significance of the chi-square, all the other fit indices meet the conventional threshold. In effect it can be concluded that CFA model 2 sufficiently fits the data.

[7] In addition to the CFA, further test is performed in the preceding sections to illustrate that opportunity creation and discovery are two distinct constructs

Table 5. 8: CFA for opportunity creation and discovery

Items/constructs	Standardized loadings(t-values)
Opportunity creation	
OPPC1	0.68[b]
OPPC2	0.78 (10.33)
OPPC4	0.88 (11.05)
OPPC5	0.76 (10.11)
Opportunity discovery	
OPPD1	0.77[b]
OPPD3	0.81 (12.45)
OPPD4	0.74 (11.32)
OPPD5	0.80 (12.41)
OPPD6	0.79 (12.15)

***Fit Indices**: **χ2**= 50.34; df =26; χ2/df= 1.93 p=0.0028; NFI=0.96; NNFI=0.97; CFI=0.98; RMSEA=0.063 t-values in parenthesis b Fixed parameter*

Following previous literature on the theoretical perspective of opportunity creation and discovery, this study conceptualizes creation and discovery as distinct constructs (see Ramoglou & Tsang, 2016). Thus, given that entrepreneurial opportunity is the focal construct of this study, it was important to do further CFA assessment to ensure that the data indeed fits opportunity creation and discovery distinctively. Hence a competing CFA was estimated where the items of both creation and discovery was forced to load on one latent constructs, with the following fit indices.

Table 5. 9: Competing CFA for the entrepreneurial opportunity construct

Items/constructs	Standardized loadings (t-values)
Opportunity creation	
OPPC1	0.68[b]
OPPC2	0.28 (4.23)
OPPC4	0.26 (3.68)
OPPC5	0. 0.35 (4.87)
OPPD1	0.30 (4.15)
OPPD3	0.76(9.97)
OPPD4	0.30 (4.14)
OPPD5	0.26 (3.63)
OPPD6	0.84 (10.73)

Fit Indices: **χ2=** 877.31; *df* =27; χ2/*df***=** 32.49 p=0.0000; NFI=0.45; NNFI=0.27; CFI=0.45; RMSEA=0.37 *t*-values in parenthesis b Fixed parameter

The model provided very poor fit for the data. Not only did it have quite insignificant loadings, the fit indices as defined were also poor, hence not meeting the accepted threshold. In effect, the study will accept the distinctiveness of both constructs and proceed to apply it so during the SEM process.

5.5.3.3 CFA model for moderators and outcome variables

The next CFA model was for adaptive capability, absorptive capability and the outcome variable – new venture performance. After observing the standardized loadings and the fit indices, some items did not load significantly and some poor fit indices were also recorded. Accordingly, there was the need to follow some acceptable model re-specification and modification practices of deleting the non-significant items to help achieve some level of parsimony (Kelloway, 1998). Table 5.10 shows a re-specified CFA for all the items used in the final estimation of CFA model 3 and its fit indices. The CFA model provided the following model fit for the data: χ^2 = 446.22, d.f. = 215 (p=0.000); χ^2/d.f. = 2.07; NNFI = 0.91; NFI =

0.86 CFI = 0.92; RMSEA = 0.069; and SRMR =0.054. Except the NFI which is below the 0.90 threshold, all the other fit indices are acceptable.

Table 5. 10: CFA for moderators and outcome variables

Items/constructs	Standardized loadings (t-values)
New venture performance	
PERF1	0.82[b]
PERF2	0.90 (15.08)
PERF3	0.75 (12.42)
PERF4	0.73 (11.95)
Adaptive capability	
ADAP1	0.72[b]
ADAP2	0.76 (9.99)
ADAP3	0.77 (10.10)
ADAP4	0.69 (9.25)
Acquisition	
AC_A2	0.86[b]
AC_A3	0.87 (17.21)
AC_A4	0.76 (13.20)
AC_A5	0.81(14.11)
Assimilation	
AC_AS1	0.85[b]
AC_AS2	0.82 (14.30)
AC_AS3	0.85 (14.71)
Transformation	
AC_T2	0.81[b]
AC_T3	0.86 (14.49)
AC_T4	0.80 (13.31)
AC_T5	0.78 (12.81)

Items/constructs	Standardized loadings (t-values)
Exploitation	
AC_E1	0.70[b]
AC_E2	0.83(11.39)
AC_E3	0.85 (11.56)
AC_E4	0.80 (11.07)

Fit Indices: **χ2=** 446.22; df =215; χ2/df= 2.07 p=0.000; NFI=0.86; NNFI=0.91; CFI=0.92; RMSEA=0.069; SRMR= 0.054; t-values in parenthesis; b Fixed parameter

5.5.3.4 CFA model 4: competitive intensity and environmental dynamism

The final sub-construct CFA model was done for the control variables. In all, eleven (11) items; 5 for environmental dynamism and 6 for competitive intensity were transferred from the EFA. After further purification to assess the standardized loadings and fit indices, DYN1 and DYN5 for environmental dynamism and COMP1 and COMP2 for competitive intensity were all deleted due to their non-significant factor loadings. Thus, the remaining 7 items gave a better fit of the data than the initial 11 items. Table 5.11 shows all the items used in the final estimation of CFA model 4 and its fit indices. The CFA model provided the following model fit for the data: χ^2 = 13.75, d.f. = 13 (p=0.02); χ^2/d.f. = 1.05; NNFI = 0.99; NFI = 0.97; CFI = 0.99; RMSEA = 0.039; and SRMR =0.028.

Table 5. 11: CFA model for control variables

Items/constructs	Standardized loadings (t-values)
Environmental dynamism	
DYN2	0.65[b]
DYN3	0.92 (9.30)
DYN4	0.76 (9.63)
Competitive intensity	
COM3	0.77[b]
COM4	0.86 (12.46)
COM5	0.67 (9.91)
COM6	0.80 (11.80)

***Fit Indices**: χ2= 13.75; df =13; χ2/df= 1.05 p=0.391; NFI=0.97; NNFI=0.99; CFI=0.99; RMSEA=0.016; SRMR= 0.028; t-values in parenthesis; b Fixed parameter*

5.5.3.5 CFA model 5: overall CFA model

Finally, the researcher did an overall CFA for the grand model where all the pre-selected items for the sub-construct models were used. The purpose was to find out if the bigger model can still provide a good fit for the data. Though, the overall model does not provide an excellent fit (see table 5.12 for fit indices of all 5 CFA models), it fits the data at the minimum of the fit indices. The CFA model provided the following model fit for the data: χ^2 = 1416.73, d.f. = 968 (p=0.000); χ^2/d.f. = 1.46; NNFI = 0.91; NFI = 0.79; CFI = 0.92; RMSEA = 0.045; and SRMR =0.051.

Table 5. 12 Over all CFA for all constructs

Constructs	Items	Standardized loadings (t-values)
Firm performance (4)	PERF1	0.82[b]
	PERF2	0.89 (15.27)
	PERF3	0.76 (12.70)
	PERF4	0.73 (12.07)
Opportunity creation (4)	OPPC1	0.68[b]
	OPPC2	0.78 (10.39)
	OPPC4	0.87 (11.22)
	OPPC5	0.77 (10.28)
Opportunity discovery (5)	OPPD1	0.77[b]
	OPPD3	0.81 (12.55)
	OPPD4	0.75 (11.50)
	OPPD5	0.80 (12.48)
	OPPD6	0.78 (12.14)
Firm knowledge (4)	ANLYT 3	0.60[b]
	ANLYT 4	0.62 (7.48)
	ANLYT 5	0.85 (9.04)
	ANLYT 6	0.83 (8.98)
Entrepreneurial cognition (4)	INTU1	0.87[b]
	INTU2	0.86 (16.50)
	INTU3	0.87 (16.90)
	INTU4	0.74 (13.15)
Acquisition (4)	AC_A2	0.86[b]
	AC_A3	0.87 (16.15)
	AC_A4	0.76 (13.21)
	AC_A5	0.81(14.67)

Constructs	Items	Standardized loadings (t-values)
Assimilation (3)	AC_AS1	0.86[b]
	AC_AS2	0.84 (15.04)
	AC_AS3	0.85 (15.08)
Transformation (3)	AC_T2	0.81[b]
	AC_T3	0.86 (14.23)
	AC_T4	0.80 (13.27)
	AC_T5	0.78 (12.87)
Exploitation (3)	AC_E1	0.69[b]
	AC_E2	0.83 (11.23)
	AC_E3	0.86 (11.52)
	AC_E4	0.81 (10.97)
Adaptive capability (4)	ADAP1	0.73[b]
	ADAP2	0.75 (9.99)
	ADAP3	0.77 (10.19)
	ADAP4	0.69 (9.30)
Environmental dynamism (3)	DYN2	0.66[b]
	DYN3	0.90 (9.48)
	DYN4	0.77 (9.69)
Competitive intensity (3)	COM3	0.76[b]
	COM4	0.85 (12.43)
	COMP5	0.68 (9.94)
	COM6	0.80 (11.80)

Fit Indices: $\chi 2$= 1416.73; df =968; $\chi 2$/df= 1.46 p=0.0000; NFI=0.79; NNFI=0.91; CFI=0.92; RMSEA=0.045; SRMR= 0.051; t-values in parenthesis; b Fixed parameter

Table 5.13 provides a summary of the fit indices for the various CFA models estimated.

Table 5. 13: Summary of fit indices for the various CFA models

CFA models	X^2	df	X^2/df	p-value	RMSEA	SRMR	CFI	NNFI	NFI
Set 1	32.74	19	1.72	0.0025	0.056	0.036	0.99	0.98	0.98
Set 2	50.34	26	1.93	0.003	0.064	0.034	0.98	0.97	0.96
Set 3	446.22	215	2.07	0.000	0.069	0.054	0.92	0.91	0.86
Set 4	13.75	13	1.05	0.391	0.016	0.028	0.99	0.99	0.97
Set 5	1416.73	968	1.46	0.000	0.045	0.051	0.92	0.91	0.79

Note;

Set 1: firm knowledge and entrepreneurial cognition (drivers)

Set 2: opportunity creation and opportunity discovery (main construct)

Set 3: adaptive capability, absorptive capability and new venture performance (moderators and outcome variable)

Set 4: environmental dynamism and competitive intensity (control variables)

Set 5: all items for set 1-4 are modelled together

5.6 Assessment of Constructs Validity and Reliability

Construct validity and reliability is the next test to be done before testing the study's hypothesis. Both discriminant (how the constructs differ from each other) and convergent (how the items converge or highly correlated to measure their respective constructs) validity are employed in this assessment. Thus, while discriminant validity is used to establish the distinctiveness of each construct, convergent validity is to ensure the consistency in the measurement items (Hair et al., 2013). In effect, a measure or a construct is valid to (i) 'the degree that it assesses the magnitude and direction of a representative sample of the characteristics of the construct and (ii) the degree that the measure is not contaminated with elements from the domain of other constructs or error' (Netemeyer et al., 2003, p 71).

The first and basic step of ensuring reliability and validity was done at the various stages of the scale (questionnaire) development. Through expert judging and pre-testing, the researcher

made sure that the scales passed the face and content validity test such that the items measuring the constructs sufficiently reflect the operationalization of same (Trochim, 2002).

Statistically and following appropriate recommendations (e.g. Netemeyer et al., 2003, Fornell & Larcker 1981), the researcher assessed the validity and reliability of the constructs using Average Variance Extracted (AVE), Composite Reliability (CR), Highest Shared variance (HSV) or squared correlation between constructs and Cronbach alpha. Specifically, CR and Cronbach alpha values are used to determine the convergent validity and reliability of the constructs whiles the AVEs and HSV are used to assess the discriminant validity. To assess whether the study's construct is reliable and valid (convergent), the researcher used the CR cut off point of 0.70 and above (Bagozzi & Yi, 2012). The reported CR values of all the constructs ranged from 0.80 for analytic cognitive style and 0.91 for the Exploitation component of absorptive capability (see table 5.14). For the second test of construct reliability or internal consistency, the Cronbach alpha for all the constructs exceeded the recommended threshold of 0.70 (Bagozzi & Yi, 2012). Thus, the Cronbach alpha for the constructs is between 0.83 (analytic cognitive style) and 0.90 (intuitive cognitive style). Table 5.14 reports all values of CR and Cronbach alpha. With these figures, it is safe to assume that the measures are reliable and valid (convergent).

Next, the study assesses discriminant validity to ensure that each construct captures a distinct phenomenon. To do this, the researcher first looked at the inter-construct correlation coefficients. From table 5.14, the correlation coefficients ranged between 0.001 (exploitation and entrepreneurial experience) and 0.45 (acquisition and assimilation). Since none of these correlation coefficients is significantly equal to 1.0, the study makes a first and basic conclusion that the constructs are distinct due to the low correlation among them (Anderson & Gerbing, 1988). Again, the researcher adopted a more stringent test of comparing the AVEs of each construct to the HSV (squared correlations of the constructs). The recommendation is that,

none of the HSVs should be greater than the AVEs to establish discriminant validity (Fornell & Larcker, 1981). From table 5.14, the constructs' AVEs ranged between 0.51 and 0.73 – which meets the recommended threshold while the HSV 0.20 (0.45^2). Comparing these values of AVE and HSV, it is safe to conclude that the constructs passed the discriminant validity test and that their underlying assumptions and subsequent operationalization are different.

Additionally, an assessment of the distinctiveness of opportunity creation and discovery (as has been established through the conceptualization and measurement), has further been confirmed by the discriminant validity test. The AVEs and HSVs of opportunity creation and discovery points shows that the two constructs passed the discriminant validity test. Thus, both conceptualization and empirical evidence of this study suggest the non-contradictory nature of opportunity creation and discovery.

5.7 Descriptive Statistics and test of normality

The researcher was interested in descriptive statistics in other to assess the normality and spread of the data. Specifically, skewness and kurtosis are employed for normality while means and standard deviations are used to check for spread of the data. Such test statistics will help in the choice of appropriate method of estimation during hypothesis testing. Considering the mean values and standard deviation of the constructs (see table 5.14) it is fair to assume that the data is not far away from the mean and fairly spread. For test of normality, the researcher used the skewness threshold of ≤ 3 and kurtosis of ≤ 21 (see, Finch, West & MacKinnon, 1997). The skewness of the data (see appendix 5C) ranged between 0.37 (environmental dynamism) and -1.27 (firm size), whiles kurtosis ranged between 2.15 (firm size) and -.56 (entrepreneurial experience). With these test statistics, the data is not significantly different from a normal distribution. Further to the skewness and kurtosis test, histogram and normal distribution curves are used. From appendix 5D, the normal distribution curves for all the variables are within acceptable range of normality. Nonetheless, because the values of firm size (measured by

number of full time employees) and entrepreneurial experience (measured by number of years) were a bit higher than the rest of the variables, their natural log transformation were taken before testing the study's hypothesis.

Table 5. 14: Descriptive statistics and correlations

	Constructs	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Opportunity creation	5.10	1.01															
2	Opportunity discovery	4.73	0.95	.162*														
3	New venture performance	4.42	0.89	.352**	.205*													
4	Analytic cognition	4.67	0.93	.251**	.144*	.088												
5	Intuitive cognition	4.74	1.11	.092	.342*	.131*	.289**											
6	Adaptive capability	4.88	1.08	.162*	.189**	.109	.108	-.079										
7	Acquisition	4.57	1.28	.131*	.187**	.172**	.174**	.057	.275**									
8	Assimilation	4.91	1.24	.203*	.097	.199**	.180**	-.010	.243**	.446**								
9	Transformation	4.79	1.13	.175**	.059	.297**	.167*	.097	.180**	.314**	.358**							
10	Exploitation	5.00	1.11	.392**	.177**	.230**	.169*	.081	.371**	.293**	.262**	.358**						
11	Competitive intensity	4.84	1.17	.100*	.057	.095	.079	.066	-.022	.153*	.229**	-.021	.194**					
12	Environmental dynamism	4.60	1.00	-.040	-.027	.068	.088	.072	-.047	.101	.081	.012	-.027	.120*				
13	Entrepreneurial experience	2.19	0.53	.127	.068	.085	.120	.025	-.044	.091	.187**	-.032	.001	.017	-.024			
14	Firm size	3.40	0.82	.129	.091	.021	.058	.046	.026	.146*	.009	-.052	.040	-.018	.021	.167*		
15	Industry type	--	--	.178**	.076	.281**	.089	.152*	.094	-.014	.190**	.153*	.063	.046	.021	-.071	-.038	
	Cronbach alpha			0.86	0.89	0.89	0.83	0.90	0.83	0.89	0.88	0.89	0.87	0.86	0.85	--	--	--
	Construct composite reliability (CR)			0.86	0.89	0.88	0.80	0.90	0.82	0.89	0.89	0.89	0.91	0.86	0.82	--	--	--
	Average variance extracted (AVE)			0.60	0.61	0.65	0.51	0.69	0.54	0.68	0.72	0.66	0.73	0.60	0.61	--	--	--

5.8 Analysis of Common Method Bias/Variance (CMB/CMV)

As already explained in section 4.8.4.2 of chapter 4, the researcher followed many suggested ex-ante procedures in the questionnaire design and administration to ensure that the occurrence of common method bias in the data is minimized. However, as shown by past studies, such procedural remedies might not be enough in checking out for common method bias (see, Podsakoff et al., 2003). Accordingly, the researcher employed a more stringent statistical analysis during the data analysis stage in other to investigate the presence of CMV in the data. Specifically, the researcher employed the (1) Harman's single-factor test; (2) the CFA model assessments and (3) the CMV adjusted correlation analysis in assessing CMV in the data set.

5.8.1 Harman's single-factor test

Despite its criticisms for not being sensitive enough to detect CMB (Podsakoff et al., 2003), the Harman's single-factor test was done as a basic test during the exploratory factor analysis (EFA). Thus, all the measurement items in a study are subject to EFA, where the number of factors is fixed to a single factor and/or allowed to be freely rotated on many factors as possible. CMV is suspected if (a) a single factor emerges from unrotated factor solutions, or (b) a first factor has the highest percentage of the variance explained in the variables (Podsakoff & Organ, 1986). Appendix 5E shows the result of the Harman's single-factor test. From the results, no single factor has emerged nor has a high percentage of the variance explained (see Stam & Elfring, 2008). Because, this test has many flaws due to its simplicity, the study employed further test of CMV.

5.8.2 CFA approach to Bias Assessment

The next test after the Harman's single-factor test, is a CFA estimation of the factors and their respective scales. The occurrence of common method variance in research is due to the construct or trait being measured on one hand and the measurement error on the other hand. To effectively and explicitly capture these sources of variance in construct measurement, previous studies have recommended the use of the competing CFA approach (e.g., Malhotra, Kim, & Patil, 2006; Cote & Buckley, 1987). The competing CFA approach in evaluating common method bias, helps in modelling the observed constructs variance into trait, method and random error (Doty & Glick, 1998; Malhotra, Kim, & Patil, 2006). In effect, unlike other methods of examining common method bias, this CFA approach gives a competing estimate of trait, method and random error. Thus, this method will lead to modelling relationships between latent factors that are free from both method biases and random error.

Accordingly, the researcher estimated competing CFA models following Cote and Buckley (1987). Specifically, the researcher estimated three competing CFA models to test for common method bias. In Model 1 'method-only' model is estimated in which all items were loaded on an assumed single latent factor, with the following fit indices: $\chi 2/d.f. = 6.97$; RMSEA = 0.16; NNFI = 0.20; NFI = 0.21; CFI = 0.24; SRMR = 0.14. In Model 2 the researcher estimated a 'trait-only' CFA model in which each measurement item was loaded on their respective latent factor, with the following fit indices: $\chi^2/d.f. = 1.46$; NNFI = 0.91; NFI = 0.79; CFI = 0.92; RMSEA = 0.045; and SRMR =0.050. Finally, in model 3 we examined a 'method-and trait-model' in which model 1 and model 2 were estimated together with its fit indices as: $\chi 2/d.f. = 1.37$; RMSEA = 0.035; NNFI = 0.92; NFI = 0.82; CFI = 0.93; SRMR = 0.046. Subsequently, the researcher compared the three models to determine which of the models best fit the data. From table 5.15 the CFA fit indices indicate that model 2 (trait-only) and model 3 (method-and trait-model) are superior to model 1 (method-only). Also, model 3 is a little improvement

from model 2, suggesting that common method variance does not sufficiently describe the data and that CMB is not a major concern as far as this method of assessment is concerned.

Table 5. 15: CFA for common method variance

Approach	X^2	df	X^2/df	RMSEA	SRMR	CFI	NNFI	NFI
Method only	7208.60	1034	6.97	0.161	0.14	0.24	0.20	0.21
Trait only	1416.73	968	1.46	0.045	0.051	0.92	0.91	0.79
Method & trait	1246.27	909	1.37	0.035	0.046	0.93	0.92	0.82

5.8.3 CMV Adjusted Correlation Analysis

Sometimes a marker-variable (a variable that is assumed to have no relationship with the study's constructs) is used in assessing the presence of CMV in the data (see Musarra, Robson, & Katsikeas, 2016). However, in situations where there is no marker variable (ex-ante) in the survey instrument/data, the CMV adjusted correlation can be used, as suggested by Lindell and Whitney (2001). Thus, where there is no marker variable, researchers may use the second-lowest positive correlation among variables as a proxy. Accordingly, this study computed CMV adjusted correlation based on the second-lowest positive correlation (from the inter-constructs correlation table) to see if there is a statistical significance (using the t-values for a two-tailed test) between the original correlation coefficients and the CMV adjusted correlation coefficients. Any significant difference, shows the presence of CMV. From appendix 5F, the CMV-adjusted correlation coefficients indicate that, the difference between the original and the CMV-adjusted correlations did not make any difference to the significance of the correlations. Thus, most of the original correlations remained significant and same direction of relationships after the CMV adjustment.

Results from all these different CMV estimations, indicate that CMV does not sufficiently describe the data, hence the estimates from the subsequent hypothesis testing are unlikely to be biased by CMV.

5.9 Issues of multicollinearity

Multicollinearity describes the situation where there is high correlation among the independent variables. Multicollinearity is a major statistical issue in multivariate analysis, as it may lead to non-significant and wrong effects of estimates. Thus, when there is high correlation among two or more independent variables, it makes it difficult to know the individual effect of each variable on the dependent variable (Tabachnick & Fidell, 2007). One way of ensuring that multicollinearity does not pose a significant problem is to examine the inter constructs correlation for a possible high correlation coefficient. To rule out any possible multicollinearity, the rule of thumb is that; (a) correlation coefficients should not be more than 0.80 and (b) just like the discriminant validity test, the squared correlation of any pair constructs should not be more than the AVE values (e.g., Cote & Baumgartner, 2004). As can be seen from the descriptive statistics (table 5.13), the issue of multicollinearity does not arise as far as this current analysis is concerned. Thus, the highest correlation coefficient is 0.45 and none of the squared correlations is higher than the AVE values.

Secondly, the use of multiplicative terms in the structural model during the moderation effect analysis could lead to multicollinearity. To avoid this, the researcher followed the procedure of Ping (1995) by mean centering the variables before their cross-product terms are taken for the SEM analysis (details of this are given in the subsequent sections).

5.10 Testing of Hypothesis

As it is in most management literature (e.g., Nadkarni & Narayanan, 2007) and per the many interrelationships in this study's conceptual framework, the researcher adopted the use of structural equation modelling (SEM) in testing the hypothesis. SEM is an approach that allows

researchers in social sciences to perform path analysis using observed measures that measure unobserved or latent variables. Thus, 'SEM consists of a set of linear equations that simultaneously test two or more relationships among directly observable and/or unmeasured latent variables' (Shook et al., 2004 p 397). Despite some criticism over the use of SEM, for example PLS-SEM (see, Hair et al., 2012), it has many benefits over other traditional analytic techniques such as multiple regression analysis because researchers are able to **(**a) model relationships among multiple predictor and criterion variables, (b) model errors in measurements for observed variables, (c) statistically test priori models and/or confirm existing models against empirical data (Chin, 1998) and (d) test complete theories and concepts (Rigdon, 2016). Thus, using the maximum likelihood estimation technique in LISREL 8.50 software and the SEM analytic technique, the researcher tests the study's hypothesis.

Accordingly, seven regression models were estimated. Model 1 contains the effects of five control variables – namely, competitive intensity, environmental dynamism, firm size, entrepreneurial experience and industry type on opportunity discovery while in Model 2, two paths are added to model 1. Specifically, the effects of intuitive and analytic cognitive style. In Models 3, the researcher estimates the effect of the same control variables on opportunity creation, while for Model 4 the effects of intuitive and analytic cognitive style are added to Model 3. In model 5, the researcher estimates the effect of all five control variables on new venture performance. In Model 6, the direct effect of opportunity discovery and opportunity creation and two moderating variables (absorptive and adaptive capabilities) are added to Model 5. There is the need to emphasize that in Model 5, the effects of intuitive and analytic cognitive style on new venture performance are included as control variables. The final model is Model 7, where the effects of two interaction terms (opportunity creation x absorptive capability and opportunity discovery x adaptive capability) are added to model 6. All seven equations are written as follows;

Model 1: ***Opportunity discovery*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \mu_t$

Model 2: ***Opportunity discovery*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \beta_6 ANLYT + \beta_7 INTU + \mu_t$

Model 3: ***Opportunity creation*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \mu_t$

Model 4: ***Opportunity creation*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \beta_6 ANLYT + \beta_7 INTU + \mu_t$

Model 5: ***New venture performance*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \beta_6 ANLYT + \beta_7 INTU + \mu_t$

Model 6: ***New venture performance*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \beta_6 ANLYT + \beta_7 INTU + \beta_8 ABSP + \beta_9 ADAP + \beta_{10} DISC + \beta_{11} CREAT + \mu_t$

Model 7: ***New venture performance*** = $\beta_0 + \beta_1 DYM + \beta_2 COM + \beta_3 SZE + \beta_4 EXP + \beta_5 INDS + \beta_6 ANLYT + \beta_7 INTU + \beta_8 ABSP + \beta_9 ADAP + \beta_{10} DISC + \beta_{11} CREAT + \beta_{12} (CREAT \times ABSP) + \beta_{13} (DISC \times ADAP) + \mu_t$

where: environmental dynamism (DYM); competitive intensity (COM); firm size (SZE); entrepreneurial experience (EXP); industry type (INDS); analytic cognitive style (ANLYT); intuitive cognitive style (INTU); opportunity discovery (DISC); opportunity creation (CREAT); adaptive capability (ADAP) and absorptive capability (ABSP). μ_t is the error term (the value of the dependent variable if all independent variables = 0) and each β_0 represents a constant term in the equation, which gives the study seven constant terms.

5.11 Creating measurement index

Before testing the study's hypothesis, it is important to create measurement index from the CFA selected items for all the relevant multi-item constructs. Accordingly, the researcher computed measurement index by creating composite (mean) variables for each of the multi-item construct as suggested in previous literature (e.g., Jaccard & Wan, 1996).

5.11.1 Composites for single factor constructs

In line with common practice (Ping, 1995), single indicants for each construct was created by averaging the respective items. These items are those that passed the final CFA test. For

absorptive capability, the average for the four dimensions of knowledge acquisition, assimilation, transformation and exploitation were taken and a single indicant variable created (grand mean) out of them. Depending on the path to be tested in the structural model, full information approach was also adopted for the dependent variable. In full information approach, the items that measure the latent construct are used in the structural modelling instead of the composite index or the single indicant. For example, where new venture performance or opportunity discovery is modelled as a dependent variable, their full measurement items were used.

5.11.2 Composites for interaction terms

The study hypothesized a moderating role of absorptive and adaptive capabilities on the relationship between opportunity creation and new venture performance and opportunity discovery and new venture performance respectively. Accordingly, it was necessary to create interaction terms between the moderating and the independent variables. Additionally, to reduce the likelihood of multicollinearity (Aiken, West & Reno, 1991), the researcher used the mean-centering approach to create two interaction terms; (1) opportunity creation x absorptive capability and (2) opportunity discovery x adaptive capability.

5.12 Control variables

The choice of control variables for this study was not arbitrary. Consistent with previous studies on entrepreneurial opportunities (e.g., e.g., Kuivalainen, Sundqvist & Servais, 2007; Simsek & Heavey 2011; DeTienne & Chandler 2007; Hmieleski et al., 2015) the study controlled for firm size, industry type, entrepreneurial experience, competitive intensity and environmental dynamism. Thus, the researcher controlled for firm level factors like size and experience, while industry level factors include competitive intensity and environmental dynamism. From the review of the entrepreneurship literature and within the context of the study, the researcher

used same control variables for the main constructs (opportunity creation and discovery)[8] and the outcome variable (new venture performance).

5.13 Results

Over all, there was systematic model improvement as successive models are estimated. As shown by the R^2 change and the chi-square difference test, each model gets better as new variables or paths are added to previous ones. The preceding sections, present details of each model including significance of variables and overall model fit.

5.13.1 Antecedents of opportunity creation and discovery

The first hypotheses (divided into two) sought to examine the effect of intuitive cognitive style on the types of opportunity (opportunity discovery and creation). Specifically, the study hypothesized for a relationship between intuitive cognitive style and opportunity discovery on the one hand, while no relationship exists between intuitive cognitive style and opportunity creation on the other hand. Accordingly, the study finds support for the hypothesized relationships (H1a and H1b). Thus, the study finds that intuitive cognitive style positively impacts on opportunity discovery ($\beta = 0.15$, $t = 2.30$ $p<0.05$) but not opportunity creation ($\beta = 0.06$, $t = 0.70$, n.s.[9]). These analysis is presented by model 2 with model fit indices of RMSEA = 0.05, NNFI = 0.94, CFI = 0.97, GFI = 0.93 and SRMR = 0.026. Comparing the model 1 (model with only controls) to model 2, there is a change in R^2 and a significant chi-square difference test of 12% and $p<0.01$ respectively.

For analytic cognitive style, the study hypothesized that it will have positive effect on both creation and discovery (H2a and H2b). The study finds support for both hypothesis – that analytic cognitive style positively impacts both creation ($\beta = 0.14$, $t = 2.19$ $p<0.05$) and discovery ($\beta = 0.35$, $t = 5.15$ $p<0.01$). From model 4, the model fit indices are RMSEA = 0.032,

[8] Here, the predictor variables for discovery and creation are analytic and intuitive cognition.
[9] Non-significant relationship

NNFI = 0.98, CFI = 0.99, GFI = 0.98 and SRMR = 0.025. The change in R^2 with respect to model 3 is 2% while there is a significant chi-square difference test of $p<0.01$. Looking at the fit indices, it safe to conclude that the data fits the hypothesized structural model as far as the antecedents of opportunity creation and discovery are concerned. Also, there is significant improvement of successive models as additional paths are added.

5.13.2 The effects of opportunity creation and discovery on new venture performance

The next batch of hypothesis investigated the effect of opportunity discovery on new venture performance (H3) and opportunity creation on new venture performance (H4). Thus, the study is interested in investigating the differential impact of opportunity creation and discovery on firm performance. Findings of the study rejects the hypotheses that opportunity discovery drives performance of firms ($\beta = 0.06$, $t = 1.02$, n.s.). However, the study finds support for H4 that opportunity creation positively influences new venture performance ($\beta = 0.39$, $t = 5.98$ $p<0.01$). These result is presented by model 6 with the following fit indices; RMSEA = 0.041, NNFI = 0.91, CFI = 0.97, GFI = 0.97 and SRMR = 0.036. Also, comparing model 6 to the controls model (model 5) there is a significant change in R^2 and a significant chi-square difference test of $p<.01$. In sum, even though, hypothesis H3 is not supported, the fit indices indicate that the conceptualized structural model sufficiently describes the current data.

5.13.3 Interaction effect of absorptive and adaptive capability

For the final set of hypotheses, the study was interested in knowing under what conditions can the effect of opportunity creation and discovery on new venture performance be strengthened or otherwise. Accordingly, two moderators – firms' adaptive and absorptive capabilities were used as boundary condition variables. First, the researcher hypothesized that the relationship between opportunity discovery and new venture performance is moderated by firms' adaptive capabilities such that the direct effect of opportunity discovery on new venture performance is strengthened at high levels of adaptive capabilities (H5). Accordingly, the study finds support

for this hypothesis (β = 0.24, t = 4.00 p<0.01). The second boundary condition hypothesis investigated by the researcher is that, the positive effect of opportunity creation on new venture performance will be strengthened at high levels of firms' absorptive capabilities (H6). Contrary, findings show that the positive effect of opportunity creation on new venture performance is weakened when moderated by firms' absorptive capabilities (β = 0.04, t = 0.67, n.s.). Again, the fit indices show that the model with the interaction effects (model 7) has improved significantly than the model with the direct effects only (model 6).

Figures 5.2 and 5.3 show the graphs for two-way interaction for opportunity discovery – adaptive capability interaction and opportunity creation – absorptive capability interaction respectively. The interaction effect of discovery and adaptive capability shows that higher levels of both opportunity discovery and adaptive capability combine to amplify new venture performance.

Figure 5. 2: Two-way interaction between opportunity discovery and adaptive capability

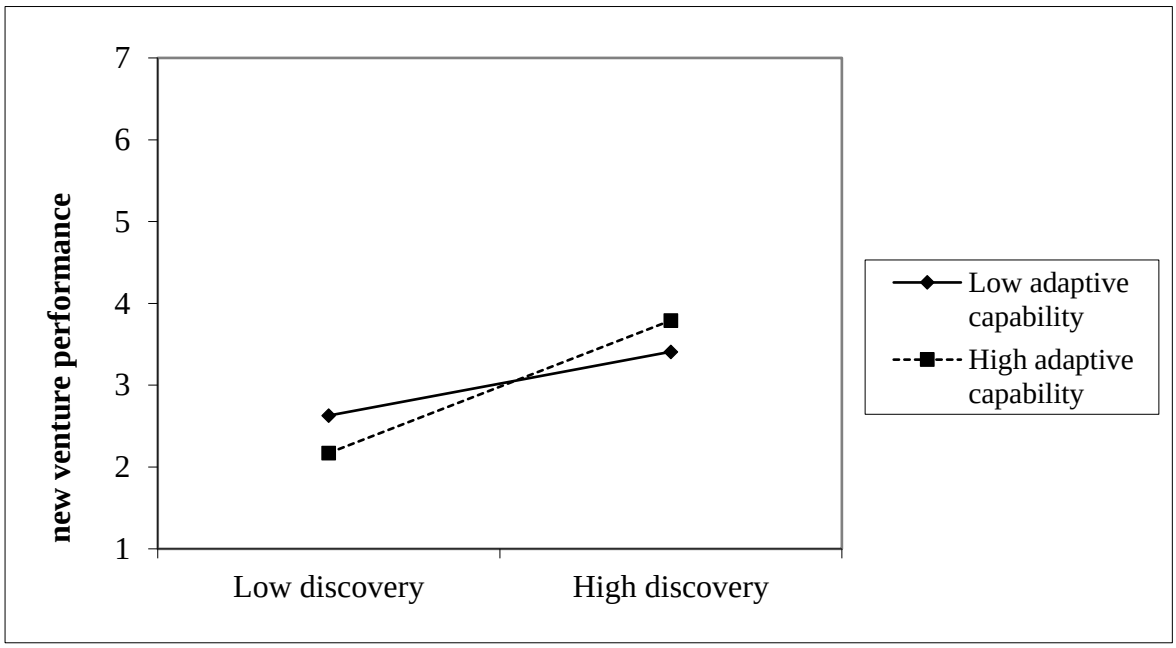
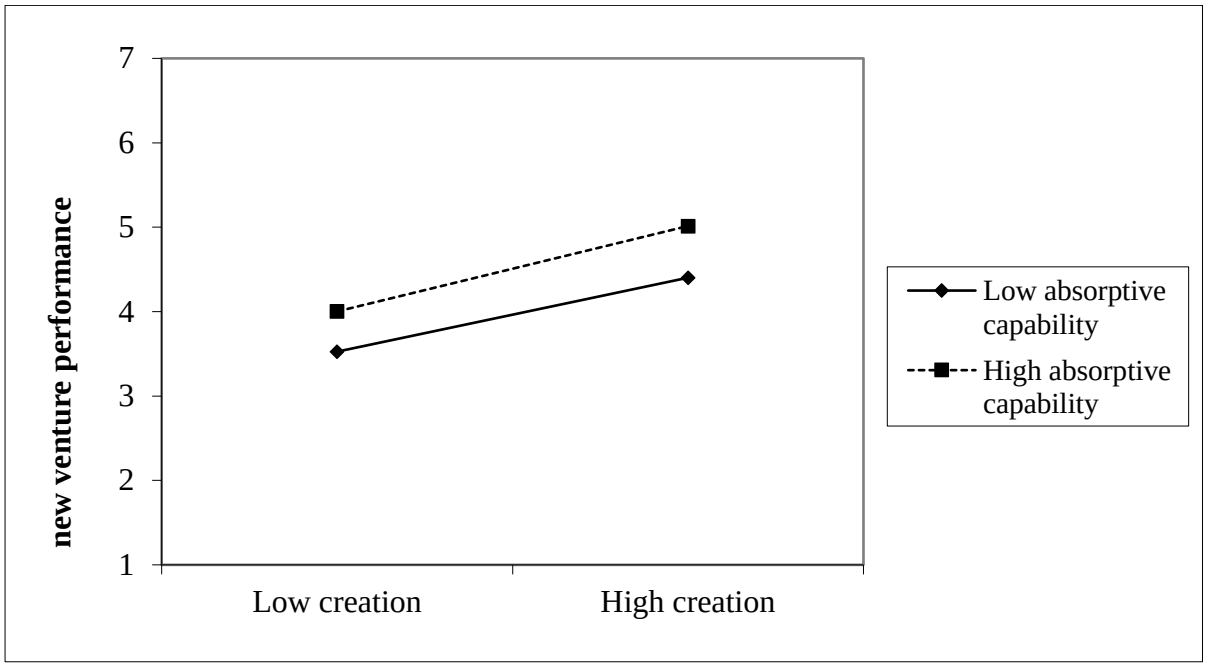


Figure 5. 3: Two-way interaction between opportunity creation and absorptive capability



5.13.4 Control Variables

Apart from industry type, none of the control variables had a significant impact on their respective dependent variable being it opportunity creation, discovery or new venture performance. Specifically, industry type was significant to opportunity creation ($\beta = 0.18$, $t = 2.61$ $p<.05$) and new venture performance ($\beta = .26$, $t = 3.86$ $p<0.01$). Table 5.16 presents detail findings of the SEM analysis and all the relevant model fit indices.

Table 5. 16: Empirical analysis of the conceptual model

		Opportunity discovery				Opportunity creation				New venture performance					
Variables	**Hypothesis**	**Model 1**		**Model 2**		**Model 3**		**Model 4**		**Model 5**		**Model 6**		**Model 7**	
		β	t-value	β	t-value	β	t-value	β	t-value	β	t-value	β	t-value	β	t-value
Competitive intensity		0.09	1.30	-0.06	-0.99	0.09	1.36	0.08	1.15	0.07	1.02	0.05	0.91	0.05	0.83
Environmental dynamism		0.01	0.21	-0.02	-0.29	-0.05	-0.77	-0.07	-1.09	0.04	0.62	0.07	1.17	0.02	0.43
Firm size		0.03	0.43	0.01	0.10	0.10	1.45	0.10	1.42	0.02	0.24	-0.03	-0.57	-0.00	-0.00
Entrepreneurial experience		0.09	1.31	0.09	1.41	0.14	1.94†	0.13	1.94†	0.09	1.29	0.01	0.25	0.01	0.23
Industry type		0.06	0.87	-0.01	-0.16	0.21	3.05**	0.18	2.61**	0.26	3.86**	0.18	2.95**	0.19	3.33**
Direct effects															
intuitive cognitive style	$H_{1a} - H_{1b}$			0.15	2.30*			0.06	0.70	0.15	2.17*	0.05	0.76	0.06	1.03
analytic cognitive style	$H_{2a} - H_{2b}$			0.35	5.15**			0.14	2.19*	0.12	1.87†	0.08	1.32	0.07	1.24
Absorptive capability												0.18	2.68**	0.12	1.86†
Adaptive capability												-0.01	-0.10	0.01	0.19
Opportunity discovery	H_3											0.06	1.02	0.07	1.14
Opportunity creation	H_4											0.39	5.98**	0.36	5.71**
Interaction effect															
Creation x absorptive capability	H_5													0.04	0.67
Discovery x adaptive capability	H_6													0.24	4.00**
Goodness of fit indicators															
R^2		2%		14%		9%		11%		13%		30%		37%	
ΔR^2		--		12%		---		2%		--		17%		7%	
Chi-square (χ^2)		91.33		53.45		33.91		28.25		104.17		59.85		43.18	
DF		35		33		25		23		47		43		41	
$\Delta\chi^2/\Delta$D.F.		---		0.00001		---		0.00047		----		0.00001		0.00025	
RMSEA		0.084		0.052		0.039		0.032		0.073		0.041		0.030	
NNFI		0.83		0.94		0.95		0.98		0.71		0.91		0.97	
CFI		0.90		0.97		0.97		0.99		0.90		0.97		0.99	
GFI		0.93		0.96		0.97		0.98		0.93		0.97		0.98	
SRMR		0.093		0.026		0.038		0.025		0.081		0.036		0.021	

Critical values of the t distribution for α = .10, α = .05, and α = .01 (two-tailed test) are † = 1.65, * = 1.96, and ** = 2.58, respectively

5.14 Post hoc analysis

Several post-hoc analysis are undertaken for three main reasons: (1) because hypotheses H3 and H5 were not supported by the data (2) to check of possible endogeneity of opportunity creation and discovery and (3) for overall robustness check. With these reasons, the researcher was interested in further exploration of the data. The analyses include suppression effect analysis, quadratic effect of opportunity discovery variable/an alternative interaction effect and endogeneity test.

5.14.1 Multicollinearity and suppression effects

To find statistical possible explanation of the non-significant effect of opportunity discovery, the researcher first looks at a possible suppression effect. Thus, it is possible that the relationship between opportunity discovery and new venture performance is suppressed by a suppressor (perhaps opportunity creation). Such effect, is likely to make the coefficient of opportunity discovery smaller or even have an opposite relationship with new venture performance. Where there are issues of suppression, the standard error estimate of the beta coefficients tends to be very high (Tzelgov & Henik, 1991). However, a look at table 5.17 shows that, the standard errors of the beta coefficients are relatively small, implying that there are no major issues of suppression effects.

Further, the multicollinearity diagnostic test indicates that all the Variance Inflation Factors (VIF) are below the 10.0 benchmark (see Poppo, Zhou, & Li, 2016) which also proofs that there are no major issues of multicollinearity with the independent variables including the interaction terms. In this case, it can be concluded that the estimates are not biased or have spurious estimates due to multicollinearity.

Table 5. 17: Results of further analysis for multicollinearity and suppression effects

Predictors	Coefficients	Std. Error	t-value	Sig	VIF
Constant term	1.37	.519	2.63	.009	
Industry type	.203	.111	3.62	.000	1.06
Firm size	-.009	.062	-.155	.877	1.09
Entrepreneurial experience	.024	.084	.426	.671	1.06
Environmental dynamism	.022	.050	.022	.698	1.07
Competitive intensity	.046	.041	.824	.411	1.04
Opportunity creation	.33	.053	5.44	.000	1.23
Opportunity discovery	.11	.055	1.88	.064	1.09
Adaptive capability	-.024	.050	-.390	.697	1.24
Absorptive capability	.121	.067	1.86	.060	1.37
Creation X absorptive capability	.048	.051	.860	.391	1.06
Discovery X adaptive capability	.24	.051	4.13	.000	1.16

5.14.2 Quadratic and alternate moderating effect

Further the research explored the quadratic effect of opportunity discovery on new venture performance to see if higher levels of discovery could have a significant impact. As shown by table 5.18, the study finds a negative and non-significant relationship between the square values of opportunity discovery and new venture performance. Also, an alternative interaction effect of opportunity creation and adaptive capability on the one hand and opportunity discovery and absorptive capability on the other hand, did not give any significant results. In sum, further exploration of the data for significance and alternative theory explanation as far as hypothesis H3 and H5 are concerned, did not yield any significant results.

Table 5. 18: Results of further analysis for quadratic and alternate moderating effects

Predictors	Coefficients	Std. Error	t-value	Sig
Constant term	.903	.534	1.69	.092
Industry type	.203	.117	3.45	.000
Firm size	-.045	.064	-.778	.437
Entrepreneurial experience	.044	.087	.765	.445
Environmental dynamism	.073	.052	1.26	.209
Competitive intensity	.056	.042	.973	.331
Opportunity creation	.340	.055	5.38	.000
Opportunity discovery	.109	.057	1.84	.067
Opportunity discovery^2	-.112	.053	-1.85	.065
Adaptive capability	-.034	.052	-.548	.584
Absorptive capability	.177	.069	2.68	.008
Creation * adaptive capability	-.022	.036	-.375	.708
Discovery * absorptive capability	.025	.068	.429	.669

5.14.3 Endogeneity

Most marketing and management research findings are liable to issues of endogeneity bias (Zaefarian et al., 2017), especially for those whose data are collected through a survey or questionnaire (Toubia et al., 2003). In regression analysis, endogeneity refers to situations where the explanatory variables are correlated to the error terms (see, Wooldridge, 2003), such that it could potentially bias the regression estimates or make them inconsistent. Endogeneity bias is a major concerned in survey research as it could lead to 'wrong' regression estimates and infer causality between dependent and independent variables, even when none exist (Antonakis et al., 2014; Jean et al., 2016). Major sources of endogeneity include: (1) errors in variables, (2) omitted variables and (3) simultaneous causality (Wooldridge, 2003). This study argues that opportunity creation and discovery could be potentially endogenous due to one or more of the reasons raised above. If these regressors are endogenous (correlated with the error term), then their already established relationship with new venture performance could be misleading. Accordingly, further analysis is done to rule out possible endogeneity bias.

Following acceptable practices in marketing and strategy research, (see Poppo et al., 2016; Hamilton & Nickerson, 2003), the researcher used a three-stage least squares (3-SLS) analysis

to correct for potential endogeneity. In stage 1, the researcher regressed opportunity discovery against its predictors (intuitive and analytic cognitive style) and the two moderators (absorptive and adaptive capabilities). This is done to partial out any potential effect the predictors and moderators will have on opportunity discovery. Same procedure is done for opportunity creation. After the regression, the residuals of both opportunity creation and discovery are saved. In stage 2, the residuals of opportunity creation and discovery generated from stage 1 are now used as independent variables to examine their effect on new venture performance. In stage 3, two interaction terms between (Discovery $_{\text{RESIDUAL}}$ x adaptive capability) and (Creation $_{\text{RESIDUAL}}$ x absorptive capability) are modelled for their effect on new venture performance. Thus, this new analysis uses the residuals of opportunity creation and discovery (based on their antecedents and moderating variables) instead of the original values of creation and discovery as it was in the main analysis. From table 5.19, only Creation $_{\text{RESIDUAL}}$ and the interaction term of Discovery $_{\text{RESIDUAL}}$ x adaptive capability impacted significantly on new venture performance. Thus, since this result is not significantly different from the initial analysis, the researcher can rule out possible endogeneity in this case.

Table 5. 19: Test of endogeneity

Estimates	*Model 1* β	t-value	*Model 2* β	t-value	*Model 3* β	t-value
Controls						
Industry	0.56	4.46**	0.40	3.46**	0.41	3.61**
Firm size	0.02	.23	-0.04	-0.54	-0.01	-0.22
Experience	0.14	1.46	0.07	0.81	0.046	0.53
Environmental dynamism	0.05	0.94	0.06	1.01	0.031	0.60
Competitive intensity	0.09	1.78	0.02	0.45	0.02	0.51
Main effect						
Absorptive capability			0.29	4.34**	0.24	3.50**
Adaptive capability			-0.09	-0.17	0.01	0.23
Discovery $_{RESIDUAL}$			0.05	0.89	0.04	0.78
Creation $_{RESIDUAL}$			0.29	5.25**	0.28	5.20**
Interaction effect						
Discovery $_{RESIDUAL}$ x adaptive capability					0.15	2.61*
Creation $_{RESIDUAL}$ x absorptive capability					0.08	1.27
R^2	0.10		0.26		0.30	
ΔR	-----		0.16		0.04	
ΔF	5.35		12.23**		4.79*	

5.15 Chapter summary

This chapter dealt with the analysis of the hypothesized relationships of all relevant constructs. The first part of the model investigated the relationship between entrepreneurial cognitive style and opportunity creation and discovery. Second, the study also examined the effect of opportunity creation and discovery on new venture performance as well as their associated boundary conditions of absorptive and adaptive capabilities. Further, through post hoc analysis, the study explored the data for possible explanation of the initial unsupported hypotheses as well as any issue of endogeneity. Table 15.20 gives a summary of the tested hypotheses.

Table 5. 20: Summary of hypotheses

Hypothesis	Hypothesized relationship	Comments
H1a	Intuition *to* opportunity discovery	Supported
H1b	Intuition *to* opportunity creation	Supported
H2a	Analytic *to* opportunity creation	Supported
H2b	Analytic *to* opportunity discovery	Supported
H3	Opportunity discovery *to* performance	Not supported
H4	Opportunity creation *to* performance	Supported
H5	Creation X absorptive capability *to* performance	Not supported
H6	Discovery X adaptive capability *to* performance	Supported

CHAPTER 6
DISCUSSION, LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

6.1 Chapter overview

This chapter of the thesis presents discussions of the study's findings and implications for entrepreneurship theory advancement and practice. Specifically, key findings are presented viz-a-viz the study's research gap and questions raised in the first chapter. Also, implication of the findings for both theory development and entrepreneurship practice are discussed. Finally, the study's limitations are presented and suggestions for future research avenues are made.

6.2 Discussion of findings

Past entrepreneurship studies have debated, mostly conceptually, whether entrepreneurial opportunities are subjective or objective and the implication thereof for the theory and practice of entrepreneurship (e.g., Garud & Giuliani, 2013; Alvarez & Barney, 2010). Such debates, however, are likely to benefit entrepreneurship research if the notion of entrepreneurial opportunity is properly conceptualized, measured and context situated in terms of its antecedents, outcomes and boundary conditions. From a review of comprehensive literature in cognitive psychology, entrepreneurship and strategic management and analysis of data, the findings of this current study, put the ongoing debate into such a perspective.

6.2.1 Opportunity creation and discovery

First, findings from this study brings some clarity to the conceptual domain of entrepreneurial opportunity. Results of confirmatory factor analysis of survey data obtained from new ventures in a sub-Saharan African economy shows that opportunities can occur as subjective and objective phenomenon and that entrepreneurs can engage in both activities distinctively. Thus, as recently suggested by Ramoglou and Tsang (2016) of the non-contradictory nature of creation and discovery, this study finds evidence for such a conceptualization of opportunity as creation and discovery processes. This research, therefore, provides a first step toward an empirical classification of the form that entrepreneurial opportunity takes.

6.2.1 Antecedents to opportunity creation and opportunity discovery

While entrepreneurial cognitive style has been linked to different constructs and concepts in entrepreneurship research (e.g., Chen et al., 2015; Levine et al., 2017), little is known about how cognitive style influences the creation and discovery of opportunities. Accordingly, the first objective of this study is to investigate the differential impacts that intuitive and analytic cognitive styles have on the processes of opportunity creation and discovery.

Results indicate that entrepreneurs' analytic cognitive style positively drives both processes of discovery and creation, while intuitive cognitive style positively impacts discovery but not opportunity creation. As already argued at the hypothesis development section, intuitive cognitive style usually involves effortless problem-solving approaches such as recall of information and signal detection. Opportunity discovery being an objective attribute that already exist in the environment, entrepreneurs with such cognitive style of intuition, are more likely to exploit such opportunities than subjective opportunities. For example, Kickul et al., 2009, found that entrepreneurs with intuitive cognitive style are more confident in identifying opportunities but less confidence in other entrepreneurial activities like planning, evaluation and marshalling of resources. Obviously, the latter activities of planning and evaluation require a much more effortful thinking process and skills which fall under the umbrella of analytic cognitive style. These findings are also consistent with previous studies that argued that basic knowledge on how to start a new venture enables CEOs to act more efficiently in a discovery context (Hmieleski et al., 2015)

Second, the findings that analytic cognitive style impacts both opportunity creation and discovery do give credence to existing knowledge and research in creativity and cognition. Comparing the process of analytical cognitive style such as conceptual combination, creative thinking, counterfactual thinking and cognitive structural alignment on the one hand, and

opportunity creation such as reconstruction of the environments and markets to produce market niche and novel products on the other hand, clearly means that opportunity creation requires analytical cognitive style other than intuitive cognitive style. For example, borrowing from the literature of problem solving and creativity, it is evident that individuals with analytic skills are more likely to synthesis their thoughts, connects the dots and make meanings out of their environments to produce outputs that are new, novel and useful (see Shin et al, 2012). Further, the results show that such analytical efforts also drive opportunity discovery. Thus, the objective nature of discovery opportunity implies that entrepreneurs with analytic cognitive style could also exploit them.

In general terms, the results are consistent with past studies, both conceptually (Sadler-Smith, 2016) and empirically (Chaston & Sadler-Smith, 2012; Kickul et al., 2009) about the effect of cognitive style on certain entrepreneurial processes such as entrepreneurial self-efficacy, entrepreneurial orientation and the process of opportunity exploitation. In effect, the findings suggest the significance of both analytic and intuitive cognitive style to the current debate of subjective and objective opportunities.

6.2.2 Consequences and boundary conditions of opportunity creation and opportunity discovery

The relationship between entrepreneurial activities and firm performance has been a dominant research interest in both entrepreneurship and management literature for many years (e.g. Zahra, Nielsen, & Bogner, 1999). Past research in entrepreneurship has shown the inclusion of key organizational outcomes such as firms' performance and new venture success in analysis of the entrepreneurial opportunity process (e.g., Davidsson, 2015; Short et al., 2010; Smith, Matthews, & Schenkel, 2009). Accordingly, this section discusses the study's findings on the effect of opportunity creation and discovery on new venture performance.

From hypothesis H3-H6, the study examines how the two opportunity types influence the performance of new ventures and the boundary conditions of such relationships. The process of opportunity creation and discovery ought to move beyond the debates on conceptual domains and possible antecedents to their performance outcomes if any. The literature (e.g., Eckhardt & Shane, 2003) explains that entrepreneurial opportunities describe the introduction new products and new ways and means of serving customers and the markets – hence, such entrepreneurial activities have the possibility of increasing the performance of firms.

The study argues that both opportunity discovery and creation impact positively on new venture performance. Results show that there is no significant relationship between opportunity discovery and new venture performance. In other words, opportunity discovery has no influence on new venture performance. For discovery, because objective opportunity is a pre-existing market imperfection, information about its exploitation are easily diffused (as it is in the case of codified knowledge), making other competitors with similar cognitive properties aware of its existence. Hence without speed and secrecy in its exploitation, discovery opportunity will not have a significant impact on firm performance. The non-significant relationship could be explained by the fact that entrepreneurs operating in a discovery context are unable to have first mover advantage hence their exploitation of discovery opportunities can at best lead to temporary or un-sustained competitive advantage (Alvarez et al., 2013; Barney, 1991).

However, the study finds a positive relationship between opportunity creation and new venture performance. The enactment and construction process of opportunity creation creates tacit products (see Alvarez & Barney, 2010) that gives new ventures some sustained competitive advantage, leading to significant performance outcomes. This confirms the assertion that, when entrepreneurs adopt new ways of doing things, such as forming and exploiting opportunities, it improves the performance of their ventures (e.g., Short et al., 2010). The attributes of

opportunity creation such as subjectiveness, tacit and causally ambiguous make it difficult for other firms to copy (at least for a period) and for its benefits to be diluted.

Also, borrowing from the literature of innovation, empirical evidence has shown the impact of innovation on firm performance, and since subjective opportunities are more innovative and novel, it explains why opportunity creation impact significantly on new venture performance. For example, a study by Hechavarría and Welter (2015) found that whiles, formed opportunities (creation) are more strongly related to innovative capacities, found opportunities (discovery) are less likely to be related to innovative capacities.

The study further examined the boundary conditions of the entrepreneurial opportunity – new venture performance relationship. Thus, evidence from the existing literature suggests that there may be some contingency variables that have the potential of conditioning the relationship between new venturing (pursuing opportunities) and firm performance (see Zahra & Hayton, 2008). From the tenets of dynamic capabilities, the study hypothesized that adaptive capability may amplify the relationship between opportunity discovery and new venture performance on the one hand, whilst absorptive capability enhances the opportunity creation – performance relationship on the other hand. Results indicate that the relationship between opportunity discovery and new venture performance is moderated by adaptive capability, such that firms that possess greater degrees of adaptive capabilities experience stronger effect of opportunity discovery on new venture performance. Hence, there is a complementary effect of opportunity discovery and adaptive capabilities on new venture performance. These findings resonate with past studies that posit that the effect of both Kirznerian and Schumpeterian entrepreneurial orientation behaviors on international business performance is dependent on some environmental factors (Sundqvist et al., 2012).

Contrary to the study's hypothesis in H6, findings show that absorptive capability weakens the effect of opportunity creation on new venture performance. Absorptive capability which describes how firms acquire and exploit external knowledge for internal use is usually considered to be unique capability that contributes to firm performance (see Wales et al., 2013). Results of this study, show that absorptive capability weakens the relationship between opportunity creation and new venture performance. However, there is a significant effect of absorptive capability on new venture performance when controlled for in the model. Considering the impact of opportunity creation on new venture performance, it is not out of place to conclude that, within the context of this current study, absorptive capability and opportunity creation play substitutable rather than complementary role regarding their effects on new venture performance (see Zahra, Filatotchev & Wright, 2009). Even though, the study did not find support for absorptive capability and firm performance – relationship, the research in part, answers recent calls in the extant literature about possible contingency factors that could shape the entrepreneurial opportunity process – firm performance relationship (see Short et al., 2010).

6.3 Revisiting the purpose of the study

The purpose of this study was to contribute to the current knowledge on the entrepreneurial opportunity process. Specifically, the study was set out to achieve the following: (1) establish the conceptual domain of entrepreneurial opportunity seeking behavior; (2) the extent to which element of entrepreneurial cognitive style (intuitive and analytic cognitive style) function to drive opportunity creation and/or discovery; (3) how opportunity creation and/or discovery impact on new venture performance; and (4) how the relationship between opportunity creation and/or discovery and new venture performance is dependent upon degrees of absorptive and adaptive capabilities. Summary of the findings indicate that

- *Entrepreneurial opportunities exist distinctively as objective and subjective, hence theoretically (as suggested by past studies) and empirically (as confirmed by this current study, including the qualitative interviews) opportunity creation differs from opportunity discovery, yet they are not mutually exclusive*
- *Regards entrepreneurial cognition, intuitive cognitive style drives opportunity discovery but not opportunity creation. While analytic cognitive style drives both opportunity creation and discovery.*
- *There is differential impact of created opportunities and discovery opportunities on new venture performance. While opportunity creation has positive impact on new venture performance, opportunity discovery does not on its own contribute to new venture performance.*
- *Dynamic capability plays a key role in the success or otherwise of opportunity creation and discovery on performance outcomes.*
- *Specifically, it was discovered that opportunity discovery and adaptive capability play a complementary role on their effect on firm performance, such that adaptive capability strengthens the positive relationship between opportunity discovery and new venture performance. On the other hand, absorptive capability weakens the positive relationship between opportunity creation and new venture performance, such that the two behaviors play a substitutable role at best.*

6.4 Study implication

This section discusses the implications of the key findings from the standpoint of how the findings help advance entrepreneurship theory and practice.

6.4.1 Theoretical advancement

The different facets and dynamics of opportunity creation and discovery such as antecedents and outcomes have significant theoretical implication for the study of entrepreneurship. By

establishing the distinctiveness of opportunity creation and discovery, this study has, to some extent clarified the ambiguities surrounding the objectiveness and/or subjectiveness of entrepreneurial opportunities. In this case, the study has shown that, creation and discovery are not mutually exclusive and that researchers can accept the views of critical realist (discovery view) without necessary giving up that of evolutionary realist (creation view) (see Alvarez & Barney, 2007). Thus, with such a nuanced empirical evidence, the study adds to recent realist perspective that argues that the subjectiveness of opportunity actualization does not contradict with the objectiveness of opportunities (Ramoglou & Tsang, 2016). Further, the study contributes to the existing literature by developing and validating new scales for the entrepreneurial opportunity creation construct. Specifically, through the establishment of measurement scales for opportunity creation, the current study provides further understanding into the differences between opportunity creation and discovery, which in the past, has been a difficult area of research in terms of empirical findings (see Dimov, 2011).

The findings regarding the effect of entrepreneurial cognition on opportunity creation and discovery, contribute theoretically to entrepreneurial cognition literature. Even though, previous studies have examined the relationship between cognition and certain entrepreneurial behaviors and attributes, this study is the first of its kind to provide an explanation of the nexus linking intuitive and analytic cognitive style to the process of opportunity creation and discovery. By highlighting the role entrepreneurial cognition play in the development of opportunity creation and discovery, the study answers recent research calls on investigation how cognitive psychology (specifically, cognitive process) affect opportunity discovery and creation (see Mainela, Puhakka & Servais, 2014).

Further, the findings on the effect of creation and discovery on new venture performance give credence to the argument that creation firms have greater competitive advantage than firms that engage in opportunity discovery. Thus, from the RBT perspective, creation leads to sustained

competitive advantage, while opportunity discovery on its own is a source of temporal competitive advantage (Alvarez, Barney & Anderson, 2013). With such an antecedent – outcome framework of opportunity creation and discovery, this study adds to past frameworks and literature that argue for ways of integrating discovery and creation views in entrepreneurship research (see Hmieleski & Baron, 2015; Venkataraman *et al*., 2012) being it common driving factors and/or consequences.

Again, past studies have underscored the need for integrating entrepreneurship and strategic management theories to propose and test models that involves both opportunity and advantage seeking behaviors for improved firm performance (e.g., Kuratko & Audretsch, 2009; Ireland, Hitt & Sirmon, 2003). By developing a model that finds evidence on how firms can deploy dynamic capabilities in the form of absorptive and adaptive capabilities, to effectively exploit opportunities for greater gains, this study contributes to that aspect of strategic entrepreneurship literature and cross-discipline theory development. For example, Miller (2011) had argued for future research that will use theories of related disciplines such as strategy and entrepreneurship for the advancement of research in entrepreneurial orientation.

The use of individual level factors such as cognitive style and firm level factors like dynamic capabilities and performance, brings a significant contribution to the study of entrepreneurship. By having these two units of analysis, the researcher has contributed to understanding the nexus between individual and organizational factors in entrepreneurship research (Hitt et al., 2007).

Lastly, this research makes a significant contextual contribution to entrepreneurship and strategy. By examining the process of opportunity creation and discovery and its effect on the performance of new ventures within a sub-Sahara African economy, the study has introduced a unique empirical setting in understanding the process and effect of opportunity creation and discovery. For example, arguments have been made on whether entrepreneurial or new

ventures have dynamic capabilities (see Arend, 2014). Findings within the current context, shows that new ventures do possess dynamic capabilities and that such capabilities contribute to new venture performance through a complementary effect. Thus, by these findings, theoretical and empirical debates on strategic entrepreneurship can be extended to entrepreneurial ventures operating within an under-explored context such as the African context.

In summary, the present study contributes to theory within the domains of strategic entrepreneurship and cognitive psychology by showing how entrepreneurial cognitive style drives entrepreneurial opportunity processes, and how the effect of entrepreneurial opportunities on new venture performance is conditional upon levels of adaptive and absorptive capabilities.

6.4.2 Managerial implication

This study has important managerial implications for understanding how entrepreneurial cognition drives opportunity creation and discovery on the one hand, and how the process of creation and discovery shape performance outcomes on the other hand. Past studies have shown how individuals' cognitive properties can help distinguish entrepreneurs from non-entrepreneurs (Armstrong & Hird, 2009; Allinson et al., 2000) and aid the understanding of the entrepreneurial opportunity process (e.g. Sadler-Smith, 2016; Corbett, 2005). This study distinguished between two styles of cognition and showed that entrepreneurs who possesses intuitive cognitive style are more likely to engage in discovery, while those who are analytic can engage in both opportunity creation and discovery. Thus, results of the study demonstrate that entrepreneurs' cognitive style is very significant to the nature of opportunities and that whether or not opportunity creation and discovery is uniformly distributed among firms, is contingent on the cognitive style of managers or entrepreneurs. Moving forward, a question to address, is how entrepreneurs can be helped to understand their cognitive capabilities and to

know that differences in cognitive styles matters at certain stages of the venture creation process (Kickul et al., 2009) such as opportunity discovery and creation.

Findings of the performance outcomes imply that, firms who aspire to achieve sustained competitive advantage and by extension, superior performance, should commit more resources and energy into opportunity creation activities. Rather than thinking that, all opportunity types are identical especially, with respect to their performance outcomes, this study has demonstrated otherwise to entrepreneurs and business owners that, there are different and unique implications as far as the nature of opportunities are concerned.

Again, engaging in opportunity seeking behaviors such as discovery is not sufficient to achieve higher performance outcomes. The complementary effect of opportunity discovery and adaptive capabilities on new venture performance implies that, for firms to be able to create wealth from opportunity discovery, they ought to develop other capabilities to help them effectively exploit such opportunities to their advantage. Such capabilities include the ability to be able to anticipate and respond quickly to changes in markets, customer demands and technology.

Even though, the interaction between opportunity creation and absorptive capability have no effect on new venture performance, such findings inform entrepreneurs that, to a large extent, opportunity creation does not require additional capabilities (at least in the case of absorptive capabilities) in other for it to be beneficial to the firm. By exploring these types of dynamic capabilities, business owners and entrepreneurs are made aware of which capabilities foster or attenuate the effects of creation and discovery on the performance of their firms**.**

6.5 Study limitations and future research

Like it is with most studies, the current study has some limitations with the potential of opening avenues for future entrepreneurship research.

First, the study only modelled for opportunity creation and discovery as the outcome variable for intuitive and analytic cognitive style. Literature on entrepreneurial alertness provides three dimensions of the alertness scale, namely alert scanning and search; alert association and connection; and evaluation and judgement (Tang et al., 2012). The researcher is of the view that, entrepreneurial intuitive and analytic cognitive styles hold a promise in differentially impacting on each of these alertness dimensions. For example, according to Tang et al, scanning and search helps in developing cognitive frameworks such as prototypes and schemas while, association and connection is on creativity, information application and extensions in logic. From this account, one could argue that scanning and search components of alertness could be more applicable to individuals with intuitive cognitive style while association and connection could hold true for those with analytic cognitive style. Therefore, future studies will contribute significantly to the literature of cognition and entrepreneurial alertness by investigating such dynamics. Further, the researcher is of the view that, to get a more understanding of the role of cognition on entrepreneurial opportunity process, future research should investigate possible antecedents of entrepreneurial cognition.

Second, the study is limited by further exploration of the effect of the interaction between absorptive capability and opportunity creation on new venture performance. Absorptive capability has been conceptualized as realized and potential absorptive capabilities (Camisón, & Forés, 2010; Zahra & George, 2002). Potential absorptive capability (PACAP) is knowledge acquisition and assimilation ability, while realized capability (RACAP) focuses on knowledge transformation and exploitation. This distinction suggests that RACAP will most likely aid firms to exploit creation opportunities for sustained competitive advantage than would PACAP. For example, Patel et al., (2015) found that potential absorptive capability amplifies the effect of entrepreneurial orientation on innovation while realized absorptive capability helps to exploit variability in innovation outcomes. In effect the literature will benefit from studies that

will decompose absorptive capability into RACAP and PACAP and model their respective interaction effect with opportunity creation on new venture performance.

Third, in the mist of the debate surrounding the objectiveness or otherwise of the opportunity construct, this study found a distinct measurement of creation and discovery thereby, citing with the realist perspective of the nature of opportunities (Ramoglou & Tsang, 2016). With such a stand, it is recommended that, future studies replicate the model across different samples and industries before further generalizations can be made about the nature of entrepreneurial opportunities.

Fourth, the study's research design is cross-sectional – where data is collected at one point in time and mostly from a single informant. With such research design, worries about assuming causality of the observed relationships (Keinänen & Kuivalainen, 2015) can arise. Thus, there is a limitation of the effect of one variable on the other over time. Specifically, such causal inferences may apply to this study. Moving forward, the literature will benefit from a more nuanced finding if future studies collect data on both opportunity and performance variables longitudinally, such that analysis are done over time.

Finally, it may be argued that, there are statistical problems that come with relying on single informant for data especially on both the independent and outcome variables. Thus, the problem of Common Method Variance (CMV) is quite pronounced in survey data because of the unfavorable and biased effect it has on study results (Podsakoff et al., 2003). Even though, the researcher took steps (both ex-ante and post-ante) to remedy such a situation, its effect on the current results cannot be completely ruled out. This study suggests that, future research collect objective performance data, that is, from secondary sources such as company financial reports to validate the subjective measures of performance.

6.6 Conclusion

To conclude, this study has explored the recent and ongoing scholarly work on entrepreneurial opportunity, dealing with the question of whether entrepreneurial opportunity can be created and/or discovered. First, the study has established the distinctive and non-contradictory nature of both opportunity creation and discovery. Second, from cognitive psychology, the study finds that, entrepreneurial cognition plays an important role in entrepreneurs' attempt to either create or discover opportunities. Third, findings from the study show that, there are differential effect of opportunity creation and discovery on new venture performance; while opportunity creation directly impacts on new venture performance, the effect of opportunity discovery on new venture performance is conditioned upon levels of firms' adaptive capability. It is hoped that, these findings may spark scholarly and practitioner interest in the form, antecedent, consequences and boundary conditions of the entrepreneurial opportunity creation and discovery concepts.

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8.0 APPENDICES

Appendix 4A: Interview Guide

A MODEL OF ENTREPRENEURIAL OPPORTUNITY-SEEKING BEHAVIOR; AN INVESTIGATION INTO ITS ANTECEDENTS, CONSEQUENCES AND BOUNDARY CONDITIONS.

Kindly clarify with the interviewee that the interview needs to be recorded so that it can be accurately transcribed. Assure the interviewee that he/she or his/her company will not be identified in the results of the interviews as all analyses will be anonymous. Also assure the interviewee that, the recording will be destroyed as soon as the transcription is completed.

Date and Time of interview:

Location of interview:

Company name:

Contact details:

Industry:

Interviewee's Position:

Entrepreneurial opportunity formation process; drivers and outcomes.

i. What does new business opportunity mean to you as a business man/woman?

ii. What types of new business opportunities are there in your industry?

iii. How do you go about looking for these new opportunities in your industry?

iv. Do you use existing ways of serving the needs of your customers? How do you go about doing this?

v. How does your company do this particular form of serving your customers?

vi. Do you experiment with new ideas for introducing new products/services or you adopt existing ideas? Any particular reason(s) why?

vii. Does your company pursue opportunities that are characterised by high risk or great uncertainties?

viii. Does your company show any novelty in introducing products/services to the markets? If yes, how does this show in your new product offerings?

ix. How many new opportunities have you identified in your industry over the last three (3) years?

x. How many new opportunities did you create yourself over the last three (3) years?

xi. To what extent is the industry where you source your opportunities dynamic?

xii. Do you have any other thing to say about your business environment? How do they influence your decisions to exploit or not to exploit a new business opportunity?

xiii. What are the key issues that compel you to try to discover new business opportunities in and beyond your industry? Could you kindly be more detailed on the issues?

xiv. Could you think about situations when you tried to craft a new business opportunity yourself? What was it that caused you to do that?

xv. So, in the end, what do you get (or benefit) from all of these efforts you put in trying to discover or create a new business opportunity?

xvi. Can you think of issues that make the opportunities you have exploited eventually more or less successful?

xvii. Do you have any particular interesting story to share with us about your business?

Appendix 4B: survey questionnaire

UNIVERSITY OF LEEDS

A Survey on Entrepreneurial Opportunities in Ghana

Dear Respondent,

Thank you for agreeing to participate in this study that aims to investigate and understand how entrepreneurs in Ghana exploit and benefit from entrepreneurial opportunities. You are responding to this survey in your capacity as **business owner/CEO/manager/entrepreneur/finance officer**. This project is sponsored by Leeds University Business School in the United Kingdom. Please be assured that your responses will be treated in the strictest confidence, with the results collected being anonymised and used for statistical and academic purposes only. Please **answer every question**, reflecting on your attitudes and opinions about your company's new business opportunity seeking behaviour. Although some questions appear very similar, please answer them anyway as this is deliberately done for statistical analysis purposes.

Once again, we are extremely grateful that you take the time to participate in this study.

If you are interested in having a summary of the study's findings, please provide your email address at the end of the survey.

Yours sincerely,

Francis Donbesuur – Doctoral Researcher and Project Coordinator
Phone: *+44(0)7480210878 or +233(0)504747777;* ***Email:*** *bnfd@leeds.ac.uk.*

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Please indicate your consent for participation ***I Agree [ ]*** ***I disagree [ ]***

SECTION A –Your Search for Business Opportunities

Please indicate, by <u>circling one number</u>, the extent to which the following activities/processes characterise your company's ways of looking for new business opportunities. ***(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).***

In looking for new business opportunities, our company….	*Not at all*			*To a moderate extent*			*To an extreme extent*
focuses on originality of business ideas	1	2	3	4	5	6	7
relies more on untried opportunities	1	2	3	4	5	6	7
sources for opportunities that have high degree of uncertainty	1	2	3	4	5	6	7
comes up with new products/service ideas	1	2	3	4	5	6	7
combines resources/capabilities in a novel way	1	2	3	4	5	6	7
creates its own means of production	1	2	3	4	5	6	7
generates its own ways of serving the market	1	2	3	4	5	6	7
scans the environment for new business opportunities	1	2	3	4	5	6	7
searches to discover existing ways of serving the market	1	2	3	4	5	6	7
searches to discover demand and supply gaps on the market	1	2	3	4	5	6	7
discovers opportunities in markets with lower degrees of uncertainty	1	2	3	4	5	6	7
makes decisions based on business opportunities that are predictable	1	2	3	4	5	6	7
makes decisions based on measurable business opportunities	1	2	3	4	5	6	7

Please indicate, by <u>circling one number</u>, the extent to which the following statements describe the situation in your company. ***(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).***

In looking for new business opportunities…	*Not at all*			*To a moderate extent*			*To an extreme extent*
we frequently try out new ideas	1	2	3	4	5	6	7
we have increased the number of new products introduced to the market	1	2	3	4	5	6	7
we often look for new ways to do things	1	2	3	4	5	6	7
we are often the first to market with new products and services	1	2	3	4	5	6	7
we perceived innovation as not risky	1	2	3	4	5	6	7
we have original ideas	1	2	3	4	5	6	7
we have a unique perspective	1	2	3	4	5	6	7
our solution is often different from traditional ways of doing a task	1	2	3	4	5	6	7
our solution is out-of-the box	1	2	3	4	5	6	7
we develop solutions focused on the needs of the user	1	2	3	4	5	6	7

In looking for new business opportunities…	*Not at all*			*To a moderate extent*			*To an extreme extent*
we develop adequate plans for the implementation of new ideas	1	2	3	4	5	6	7
we integrate multiple perspectives in a constructive manner	1	2	3	4	5	6	7
we produce simple solutions to problems	1	2	3	4	5	6	7
we combine ideas in a constructive manner	1	2	3	4	5	6	7

SECTION B–Possible triggers of your new business opportunities

Please indicate, by <u>circling one number</u>, the extent to which you agree with the following statements about the business environment in which your company operates. ***(1=strongly disagree, 2= disagree, 3= slightly disagree, 4= neither agree nor disagree, 5= slightly agree, 6= agree, 7= strongly agree).***

In this industry, …	*Strongly Disagree*			*Neither agree nor disagree*			*Strongly Agree*
competition is cut-throat	1	2	3	4	5	6	7
competition is intensive	1	2	3	4	5	6	7
anything that my company can offer, another company can match readily	1	2	3	4	5	6	7
competition is a major hallmark	1	2	3	4	5	6	7
we hear of a new competitive move almost everyday	1	2	3	4	5	6	7
our competitors are relatively strong	1	2	3	4	5	6	7
our company rarely changes its ways of identifying new business opportunities	1	2	3	4	5	6	7
the rate at which products become obsolete to consumers is very slow	1	2	3	4	5	6	7
it is easy to predict the actions of one's competitors	1	2	3	4	5	6	7

it is easy to forecast customers' future demands	1	2	3	4	5	6	7
the method of production is well established and rarely changes	1	2	3	4	5	6	7

SECTION C – Your knowledge of the market

Please indicate, by <u>circling one number</u>, the extent to which you agree or disagree with the following statements on how you source and apply external knowledge in your company ***(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).***

In our company, we have the capability to…	***Strongly Disagree***			***Neither agree nor disagree***			***Strongly Agree***
interact regularly with departmental heads to obtain new knowledge	1	2	3	4	5	6	7
acquire industry information on emerging opportunities	1	2	3	4	5	6	7
gather information about customer needs to identify a market gap	1	2	3	4	5	6	7
make our employees approach other companies (e.g., business partners and consultants) for new knowledge	1	2	3	4	5	6	7
organise special meetings with customers/third parties to acquire new knowledge	1	2	3	4	5	6	7
listen and take actions on the complaints of our clients	1	2	3	4	5	6	7
understand information contained in external knowledge	1	2	3	4	5	6	7
recognise shifts in our markets in terms of regulations and competition	1	2	3	4	5	6	7
understand new ways of serving the market	1	2	3	4	5	6	7
quickly analyse and interpret changing market demands	1	2	3	4	5	6	7
combine existing knowledge with newly acquired and assimilated knowledge	1	2	3	4	5	6	7
record and store newly acquired knowledge for future use	1	2	3	4	5	6	7
easily grasp business opportunities from new external knowledge	1	2	3	4	5	6	7
share new business practical experiences among employees	1	2	3	4	5	6	7
meet periodically to discuss the consequences of market trends and new product development	1	2	3	4	5	6	7
apply new knowledge commercially for new business opportunity	1	2	3	4	5	6	7
clearly listen to and understand clients' complaints about our services	1	2	3	4	5	6	7
constantly discuss and understand how to exploit new knowledge	1	2	3	4	5	6	7
implement knowledge about new products and services	1	2	3	4	5	6	7
understand, analyse and interpret information from external sources	1	2	3	4	5	6	7
challenge outmoded practices and traditions	1	2	3	4	5	6	7
be flexible and respond quickly to changes in the markets	1	2	3	4	5	6	7
change our new business activities rapidly in response to shifts in business priorities	1	2	3	4	5	6	7
remove unexpected obstacles that emerge in the competitive environment	1	2	3	4	5	6	7
adapt quickly to sudden changes in industrial policies	1	2	3	4	5	6	7
effectively segment and target markets	1	2	3	4	5	6	7
learn about customer needs and requirements	1	2	3	4	5	6	7
discover competitors' strategies and tactics	1	2	3	4	5	6	7
gain insights about the industry	1	2	3	4	5	6	7
identify and understand market trends	1	2	3	4	5	6	7
learn about the broad market environment	1	2	3	4	5	6	7
develop new products/services to exploit R&D investment	1	2	3	4	5	6	7
test market new products/services	1	2	3	4	5	6	7
successfully launch new products/services	1	2	3	4	5	6	7
ensure that product/service development efforts are responsive to customer needs	1	2	3	4	5	6	7

Please indicate, by <u>circling one number</u>, the extent to which the following statements describe your company's marketing activities ***(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).***	***Not at all***			***To a moderate extent***			***To an extreme extent***
we continuously try to discover additional needs of our customers of which they are unaware	1	2	3	4	5	6	7
we incorporate solutions to unarticulated customer needs in our new products and services	1	2	3	4	5	6	7
we brainstorm on how customers use our products/services to discover new customer needs	1	2	3	4	5	6	7
we search for opportunities in areas where customers have a difficulty expressing their needs	1	2	3	4	5	6	7

we work closely with lead users who try to recognize customer needs months or even years before the majority of the market recognizes them	1	2	3	4	5	6	7

Please indicate, by <u>circling one number</u>, the extent to which the following statements describe your company's entrepreneurial activities *(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).*	***Not at all***		***To a moderate extent***				***To an extreme extent***
We promote new, innovative product/services in our company	1	2	3	4	5	6	7
Our company is constantly experimenting with new products/services	1	2	3	4	5	6	7
We have built a reputation for being the best in our industry to develop new methods and technologies	1	2	3	4	5	6	7
Top managers of our company, in general, tend to invest in high-risk projects	1	2	3	4	5	6	7
This company shows a great deal of tolerance for high risk projects	1	2	3	4	5	6	7
Our business strategy is characterized by a strong tendency to take risks	1	2	3	4	5	6	7
We seek to exploit anticipated changes in our target market ahead of our rivals	1	2	3	4	5	6	7
We seize initiatives whenever possible in our target market operations	1	2	3	4	5	6	7
We act opportunistically to shape the business environment in which we operate	1	2	3	4	5	6	7
We typically adopt an "undo-the-competitor" posture in our target markets	1	2	3	4	5	6	7
We take hostile steps to achieve competitive goals in our target markets	1	2	3	4	5	6	7
Our actions toward competitors can be termed as aggressive	1	2	3	4	5	6	7
Personnel behave autonomously in our business operations	1	2	3	4	5	6	7
Personnel act independently to carry out their business ideas through to completion	1	2	3	4	5	6	7
Personnel are self-directed in pursuit of target market opportunities	1	2	3	4	5	6	7

SECTION D – Your company operations

Please circle the appropriate number to indicate the extent to which you agree or disagree with the following statements about your company's operations *(1= strongly disagree, 2= disagree, 3= slightly disagree, 4= Neither disagree nor agree 5=slightly agree, 6= agree, 7= strongly agree).*

Our company is able to compete against major competitors because…	***Strongly Disagree***			***Neither agree nor disagree***			***Strongly Agree***
we offer products/services that are highly reliable	1	2	3	4	5	6	7
we offer high quality products/services to our customers	1	2	3	4	5	6	7
we provide customised products/services	1	2	3	4	5	6	7
we alter our product/service offerings to meet customer needs	1	2	3	4	5	6	7
we are able to compete based on quality products/services	1	2	3	4	5	6	7
we deliver product to market quickly	1	2	3	4	5	6	7
we are the first in the market in introducing new products/services	1	2	3	4	5	6	7
we have fast new product/service development process	1	2	3	4	5	6	7

Please indicate the extent to which your company has met or exceeded the following performance expectations relative to your competitors in the <u>past 3 years</u>	***Below expectation***			***Met expectation***			***Exceeded expectation***
sales growth	1	2	3	4	5	6	7
Market share	1	2	3	4	5	6	7
Profit growth	1	2	3	4	5	6	7
return on investment	1	2	3	4	5	6	7
overall performance of our new products and services	1	2	3	4	5	6	7

For the following questions, please tick a box (√) to indicate your response to the questions asked

Do you have a unit or function in your company that is primarily dedicated to identifying new business opportunities? Yes [ ] No [ ]

My experience in this industry led to a business idea Yes [ ] No [ ]

For each of the following indicators, use the left side to evaluate your company's new product performance in the past financial year and the right side to project your projected performance for the next financial year.

Past year's new product performance. (a)								**New product performance projection for the next year. (b)**						
Much lower than target						***Much higher than target***		***Much lower than target***						***Much higher than target***
1	2	3	4	5	6	7	Revenues from new products compared with business unit objectives.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Growth in revenues from new products compared with business unit objectives	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Profitability of new products compared with your business unit objectives.	1	2	3	4	5	6	7

1	2	3	4	5	6	7	Growth in profitability of new products compared with business unit objectives	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Growth in sales of new products compared with business unit objectives	1	2	3	4	5	6	7

For each of the following indicators, use the left side to evaluate your company's customer performance in the past year and the right side to project your projected customer performance for the next year.

Past year's performance. (a)								**Performance projection for the next year. (b)**						
Much lower than target						***Much higher than target***		***Much lower than target***						***Much higher than target***
1	2	3	4	5	6	7	Customer satisfaction	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Customer retention	1	2	3	4	5	6	7
1	2	3	4	5	6	7	New customer generation	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Customer service	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Customer referral	1	2	3	4	5	6	7

For each of the following indicators, use the left side to evaluate your company's performance in the past financial year and the right side to project your projected performance for the next financial year.

Past year's performance. (a)								**Performance projection for the next year. (b)**						
Much lower than target						***Much higher than target***		***Much lower than target***						***Much higher than target***
1	2	3	4	5	6	7	Profit margin	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Return on investment (ROI)	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Profit growth	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Cash flows	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Reaching company financial goals	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Return on assets (ROA)	1	2	3	4	5	6	7

SECTION E – General Information about you/your Company

Please indicate your responses to the following questions about your company

In what industry does your company operate? …….....

How many years has your company been operating? ….....

How many years of experience do you have as an entrepreneur/business owner? ……...

People differ in the way they think about problems. Below are statements that are designed to identify your managerial approach. Please indicate, by circling one number, the extent to which the following problem solving styles apply to you in your role as a manager *(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).*

To the best of my knowledge…	***Not at all***			***To a moderate extent***			***To an extreme extent***
	1	2	3	4	5	6	7
In my experience, rational thought is the only realistic basis for making decisions	1	2	3	4	5	6	7
Most people regard me as a logical thinker	1	2	3	4	5	6	7
I find detailed, methodical work satisfying	1	2	3	4	5	6	7
My approach to solving a problem is to focus on one part at a time	1	2	3	4	5	6	7
My understanding of a problem tends to come more from thorough analysis than flashes of insight	1	2	3	4	5	6	7
I am most effective when my work involves a clear sequence of tasks to be performed	1	2	3	4	5	6	7
I make decisions on the basis of intuition	1	2	3	4	5	6	7
My 'gut feeling' is just as good a basis for decision making as careful analysis	1	2	3	4	5	6	7
Most people regard me as not being a logical thinker	1	2	3	4	5	6	7
I am always prepared to take a gamble	1	2	3	4	5	6	7
I find that 'too much analysis results in paralysis'	1	2	3	4	5	6	7
My understanding of a problem tends to come more from flashes of insights than thorough thinking	1	2	3	4	5	6	7
Formal plans are more of a hindrance than a help in my work	1	2	3	4	5	6	7
We would be pleased if you could provide us with some information on your knowledge of the questions we have asked you so far.	***Strongly Disagree***			***Neither agree nor disagree***			***Strongly Agree***

The questionnaire deals with issues I am very knowledgeable about	1	2	3	4	5	6	7
I am completely confident about my answers to the questions	1	2	3	4	5	6	7
I am confident that my answers reflect the company's situation	1	2	3	4	5	6	7
Please circle the appropriate number to indicate the extent to which you agree or disagree with the following statements about yourself as a manager *(1= strongly disagree, 2= disagree, 3= slightly disagree, 4= Neither disagree nor agree 5=slightly agree, 6= agree, 7= strongly agree).*	***Strongly Disagree***			***Neither agree nor disagree***			***Strongly Agree***
My success depends on whether I am lucky enough to be in the right place at the right time	1	2	3	4	5	6	7
To a great extent my life is controlled by accidental happenings	1	2	3	4	5	6	7
Success in business is mostly a matter of luck	1	2	3	4	5	6	7
I feel in control of my life	1	2	3	4	5	6	7
I feel that what happens in my life is mostly determined by people in powerful positions	1	2	3	4	5	6	7
Whether or not I am successful in life depends mostly on my ability	1	2	3	4	5	6	7
My life is determined by my own actions	1	2	3	4	5	6	7
Below you will find a list of statements. Please read each statement carefully and decide if that statement describes you or not. If it describes you, check the word "true"; if not, check the word "false."		***true***				***false***	
I always admit my mistakes openly		[ ]				[ ]	
I always accept others' opinions, even when they don't agree with my own		[ ]				[ ]	
When I have made a promise, I keep it – no ifs, and or buts		[ ]				[ ]	
Please for each of the following questions below, indicate 'Yes', or 'No'		**yes**				***no***	
Do you buy insurance every time you travel?		[ ]				[ ]	
Do you need to know the answer before you'll ask the question?		[ ]				[ ]	
Do you need to know that it's been done already before you're willing to try it		[ ]				[ ]	

Finally, please provide us with some general information about yourself:

Your current position held…….

Your number of years working in the company……. years

Your number of years working in this industry……...years

Would you like to receive a summary of the study's finding? Yes [ ] No [ ]

Email ……. phone number…….

Additional comments (optional)……

……

Appendix 4C: letter of ethical approval

Performance, Governance and Operations
Research & Innovation Service
Charles Thackrah Building
101 Clarendon Road
Leeds LS2 9LJ Tel: 0113 343 4873
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UNIVERSITY OF LEEDS

Francis Donbesuur
Marketing Division
Leeds University Business School
University of Leeds
Leeds, LS2 9JT

ESSL, Environment and LUBS (AREA) Faculty Research Ethics Committee
University of Leeds

19 November 2018

Dear Francis

Title of study: **A Model of Entrepreneurial Opportunity-Seeking Behaviour and Firms' Economic Performance; Evidence from Emerging Economies**
Ethics reference: **LTLUBS-118**

I am pleased to inform you that the above application for light touch ethical review has been reviewed by the ESSL, Environment and LUBS (AREA) Faculty Research Ethics Committee. I can confirm a favourable ethical opinion on the basis of the application form as of the date of this letter.

The following documentation was considered:

Document	*Version*	*Date*
LTLUBS-118 LightTouchEthicsFormFrancisDonbesuur.doc	2	01/02/16

Please notify the committee if you intend to make any amendments to the original research as submitted at date of this approval, including changes to recruitment methodology. All changes must receive ethical approval prior to implementation. The amendment form is available at http://ris.leeds.ac.uk/EthicsAmendment.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited. There is a checklist listing examples of documents to be kept which is available at http://ris.leeds.ac.uk/EthicsAudits.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to ResearchEthics@leeds.ac.uk.

Yours sincerely
Jennifer Blaikie
Senior Research Ethics Administrator, Research & Innovation Service
On behalf of Dr Andrew Evans, Chair, AREA Faculty Research Ethics Committee
CC: Student's supervisor

Appendix 5A: initial EFA analysis

Items	Factor loadings													
	PERF	INTT	COMPT	AQCST	DYNM	TRANS	ANAS	EXPT	DISC	ASSM	ADAP	CREAT	INTT^{**K}	CREAT/ ANAS **
PERF1	**.760**	.067	.017	-.003	.032	.038	-.047	.114	.001	-.107	.076	.132	.015	-.001
PERF2	**.780**	-.059	-.072	-.036	.062	-.123	-.030	.020	.014	-.101	.035	.089	.128	-.070
PERF3	**.751**	.020	.023	.007	.068	.012	.006	-.034	.100	.017	-.019	.102	.039	.118
PERF4	**.848**	.011	.022	.014	-.040	-.017	-.025	-.004	.047	.030	.026	-.058	.001	-.040
PERF5	**.746**	.029	.098	.043	-.053	.083	.077	.051	-.031	-.016	-.073	.053	-.041	-.031
OPPC1	.084	.049	-.139	.090	.057	-.047	-.041	-.088	-.061	.037	.006	**.728**	.113	-.018
OPPC2	.014	-.052	.003	.081	-.096	-.135	-.037	.044	.019	.119	-.033	**.731**	.160	-.055
OPPC3	-.013	-.035	.007	-.014	.090	-.077	.050	.021	-.014	-.006	.035	.206	.331	**-.519**
OPPC4	.060	.022	.046	-.073	-.030	.048	-.017	.139	.038	-.054	-.075	**.750**	.027	-.027
OPPC5	.081	-.034	.063	-.003	-.018	.051	.084	.087	-.002	-.054	.063	**.803**	-.090	.009
OPPC6	.072	.007	.045	-.068	.037	.052	-.013	.018	.033	-.056	.076	**.775**	-.026	-.075
OPPD1	-.051	.132	.005	.039	-.028	.009	.036	-.014	**.786**	-.066	.014	.035	-.029	.119
OPPD2	.151	.020	.006	.039	-.041	-.155	.080	-.072	**.571**	.010	-.089	.275	-.111	.189
OPPD3	.063	-.001	.070	.058	-.041	.070	.074	.016	**.810**	-.019	.072	.031	-.068	.003
OPPD4	-.007	.077	-.037	.032	.019	-.064	-.045	.008	**.756**	.075	.064	.008	.073	-.026
OPPD5	-.003	.055	-.014	-.037	.032	-.001	-.035	.023	**.818**	.049	.047	-.053	.029	-.099
OPPD6	.059	-.051	.007	-.004	.064	-.024	-.022	.063	**.815**	-.004	-.061	-.120	.140	-.107
INTU1	.002	**.871**	.006	.033	.050	.031	.003	-.024	.121	-.019	.019	.050	-.131	-.030
INTU2	.006	**.866**	.014	-.047	-.018	-.019	.025	.057	.034	.024	.022	-.002	.006	-.027
INTU3	.023	**.908**	-.027	-.071	.011	.018	-.036	.016	-.021	-.066	-.002	.022	.044	-.006
INTU4	-.017	**.801**	-.013	.039	-.014	-.007	-.062	-.004	.004	.042	-.087	-.108	.163	.011
INTU5	.147	.089	-.019	.034	-.025	.029	.006	.039	-.014	.027	.032	-.016	**.849**	.031

Appendix 5A: initial EFA analysis (continued)

Items	Factor loadings													
	PERF	INTT	COMPT	AQCST	DYNM	TRANS	ANAS	EXPT	DISC	ASSM	ADAP	CREAT	INTT[a]	CREAT/ ANAS[a]
INTU6	-.041	.053	.033	-.046	-.009	.057	.056	-.044	.129	-.094	.022	.122	**.821**	-.005
ANLYT 1	.098	.164	.135	.029	-.031	.002	.342	-.033	.034	.033	.041	.101	-.083	**-.536**
ANLYT 2	.052	.159	.030	.094	.008	-.035	.220	.010	.117	-.071	.000	.087	-.111	**-.654**
ANLYT 3	.079	.010	-.110	-.031	-.051	.003	**.640**	-.008	-.010	-.055	-.010	.054	.005	-.238
ANLYT 4	-.119	-.101	-.065	-.016	.007	.103	**.766**	.154	.207	-.109	-.100	.041	-.006	.045
ANLYT 5	.000	.013	.083	.007	.069	-.078	**.839**	-.052	-.056	.056	.081	-.009	.042	-.008
ANLYT 6	.066	.041	.058	.034	.096	-.069	**.818**	-.028	-.080	.031	.047	-.109	.031	-.032
CMPIT1	.022	.057	**.685**	.054	-.098	-.070	.253	-.079	.003	.032	.069	-.009	.074	.090
CMPIT2	.126	-.012	**.738**	-.021	-.059	-.136	.143	-.087	.021	-.052	.011	-.111	.045	.130
CMPIT3	-.019	-.021	**.857**	-.107	-.009	.026	-.069	.013	-.013	-.088	.010	.012	-.071	.006
CMPIT4	.082	.010	**.834**	-.016	.037	-.051	-.043	.013	-.072	-.003	-.015	-.003	-.055	-.044
CMPIT5	-.065	.090	**.715**	.172	.058	.140	-.088	.118	.084	.101	-.071	.018	.048	-.129
CMPIT6	-.021	-.092	**.764**	.007	.069	-.029	-.116	.062	.026	-.076	-.056	.083	.007	-.089
EDYN1	-.002	.013	.059	.004	**.764**	.089	.101	.066	-.047	-.031	-.022	.054	.015	.297
EDYN2	-.025	-.004	.017	-.027	**.807**	.035	-.055	-.028	.018	-.061	.019	-.008	.035	.101
EDYN3	-.068	.012	-.039	.011	**.856**	-.028	-.006	-.092	.004	-.011	.051	.077	-.083	-.074
EDYN4	.040	-.022	.026	.009	**.785**	-.020	.063	-.003	.043	.003	.003	-.052	-.071	-.198
EDYN5	.095	.041	-.042	.049	**.741**	-.036	.014	.018	.012	.041	-.092	-.097	.086	-.101
AD1	.025	-.040	-.033	.298	-.019	-.048	-.032	-.055	.046	.046	**.723**	.014	-.023	-.010
AD2	-.093	.018	.075	-.080	-.009	.079	.066	.124	-.003	-.148	**.769**	.077	.064	.002
AD3	.144	.025	-.085	-.024	-.025	-.143	-.003	-.088	-.024	.054	**.875**	-.004	-.020	.024
AD4	-.086	-.093	-.001	-.026	.020	.081	-.019	.271	.090	.006	**.719**	-.066	.049	-.037
AC1	.060	-.064	.095	**.647**	-.072	.098	-.033	-.060	.071	-.130	.103	.060	-.011	-.008
AC2	.074	.012	-.032	**.811**	.055	-.045	.023	.005	.009	-.128	.070	-.092	-.080	.012

AC3	.025	-.042	-.037	**.820**	.020	-.048	.008	.073	.052	-.086	-.001	-.038	-.111	-.062
AC4	.039	.055	.024	**.835**	.050	-.068	-.019	-.031	-.008	.086	-.074	.026	.089	.042
AC5	-.017	-.040	-.029	**.835**	.026	-.044	-.003	.119	-.001	.020	-.043	-.001	.057	.005
AC6	-.178	.047	.033	**.586**	-.044	.057	.040	.015	.011	-.182	.146	.072	.027	-.048
AS1	-.027	-.029	.046	.182	-.023	.033	.053	.030	-.049	**-.786**	.017	.026	.082	-.002
AS2	.038	-.038	.055	.172	-.004	-.030	-.016	.019	.053	**-.795**	-.052	-.044	.056	-.060
AS3	.002	.022	.023	.001	.074	-.096	-.005	-.002	-.029	**-.865**	.043	.042	.010	.042
AS4	.119	.055	-.019	-.048	.032	-.172	.001	-.012	-.038	**-.766**	.008	-.041	-.070	-.005
AT1	-.117	.063	-.008	.027	-.083	**-.663**	-.020	-.014	.086	-.196	-.012	.086	.049	.065
AT2	-.013	.031	.024	-.084	.013	**-.814**	-.022	.049	-.004	-.114	.030	.011	-.120	-.040
AT3	.001	-.043	.082	.003	-.037	**-.840**	.016	.107	.000	-.029	-.037	-.026	.014	-.071
AT4	.028	-.053	.024	.032	.093	**-.831**	-.023	.010	.076	.024	.096	.013	-.030	.040
AT5	.113	.033	-.009	.125	-.051	**-.729**	.098	.079	-.058	-.010	-.023	-.075	.026	-.072
AE1	.168	.003	-.111	.015	-.037	.032	.033	**.739**	.046	-.084	.085	-.059	.056	-.061
AE2	.039	-.018	.050	-.025	-.058	-.038	-.020	**.842**	.070	-.008	.061	.016	-.127	-.093
AE3	-.063	.035	.100	.080	.006	-.104	-.081	**.803**	-.015	.060	.044	.077	.063	-.002
AE4	-.020	.036	.013	.024	-.001	-.107	.084	**.767**	.012	-.044	-.005	.119	.030	.153
AE5	.032	.105	.047	.174	.107	-.254	.153	**.432**	-.154	.074	.051	.156	.007	.201

KMO: 0.80; Bartlett's Test of Sphericity: 9535.98 (sig. 0.000); percentage of variance explained: 68%; **cross-loading items

Appendix 5B: Inter-item correlation of selected scales

Opportunity discovery					
	OPPD1	*OPPD3*	*OPPD4*	*OPPD5*	*OPPD6*
OPPD1	1.00				
OPPD3	0.68	1.00			
OPPD4	0.58	0.63	1.00		
OPPD5	0.60	0.60	0.58	1.00	
OPPD6	0.57	0.60	0.55	0.72	1.00

Intuitive cognitive style				
	INTU1	*INTU2*	*INTU3*	*INTU4*
INTU1	1.00			
INTU2	0.77	1.00		
INTU3	0.74	0.73	1.00	
INTU4	0.61	0.61	0.71	1.00

Competitive intensity					
	CMPIT1	*CMPIT2*	*CMPIT3*	*CMPIT4*	*CMPIT6*
CMPIT1	1				
CMPIT2	0.67	1.00			
CMPIT3	0.55	0.59	1.00		
CMPIT4	0.46	0.58	0.67	1.00	
CMPIT6	0.38	0.44	0.58	0.68	1.00

Analytic cognitive style				
	ANT3	*ANT4*	*ANT5*	*ANT6*
ANT3	1.00			
ANT4	0.55	1.00		
ANT5	0.52	0.77	1.00	
ANT6	0.42	0.57	0.66	1.00

Environmental dynamism					
	EDYN1	*EDYN2*	*EDYN3*	*EDYN4*	*EDYN5*
EDYN1	1				
EDYN2	0.60	1.00			
EDYN3	0.56	0.60	1.00		
EDYN4	0.41	0.50	0.69	1.00	
EDYN5	0.50	0.54	0.51	0.57	1.00

Adaptive capability				
	AD1	*AD2*	*AD3*	*AD4*
AD1	1.00			
AD2	0.52	1.00		
AD3	0.59	0.61	1.00	
AD4	0.51	0.53	0.54	1.00

Appendix 5B: Inter-item correlation of selected scales

Knowledge acquisition				
	AC2	*AC3*	*AC4*	*AC5*
AC2	1.00			
AC3	0.78	1.00		
AC4	0.60	0.64	1.00	
AC5	0.68	0.68	0.73	1.00

Knowledge assimilation			
	AS1	*AS2*	*AS3*
AS1	1.00		
AS2	0.72	1.00	
AS3	0.73	0.72	1.00

Knowledge transformation				
	AT2	*AT3*	*AT4*	*AT5*
AT2	1			
AT3	0.74	1.00		
AT4	0.62	0.68	1.00	
AT5	0.62	0.63	0.66	1.00

Knowledge exploitation				
	AE1	*AE2*	*AE3*	*AE4*
AE1	1.00			
AE2	0.63	1.00		
AE3	0.57	0.71	1.00	
AE4	0.56	0.67	0.71	1.00

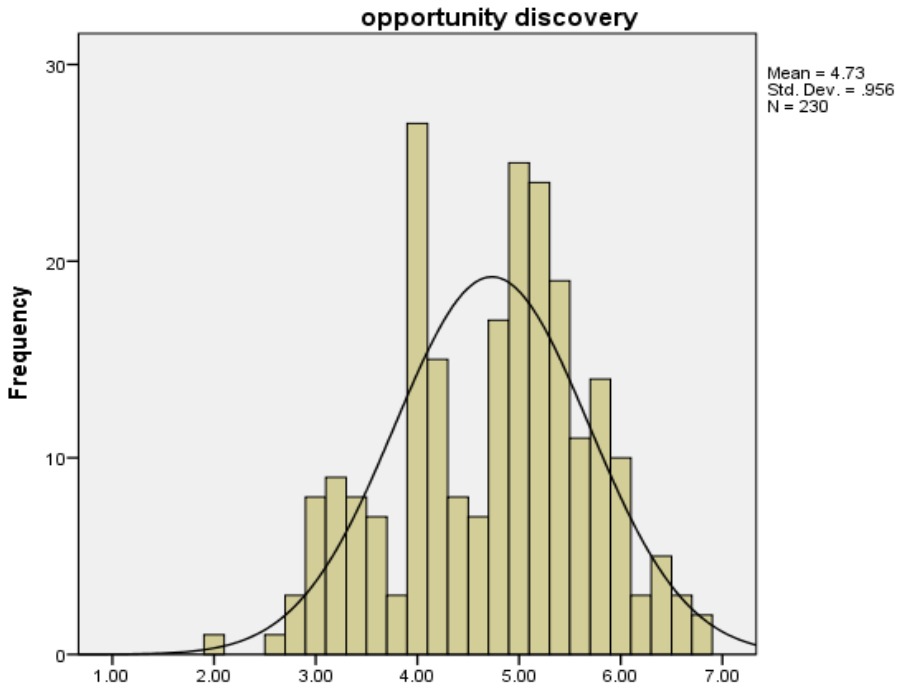
New venture performance					
	PERF1	*PERF2*	*PERF3*	*PERF4*	*PERF5*
PERF1	1.00				
PERF2	0.74	1.00			
PERF3	0.63	0.66	1.00		
PERF4	0.57	0.66	0.58	1.00	
PERF5	0.61	0.53	0.51	0.61	1.00

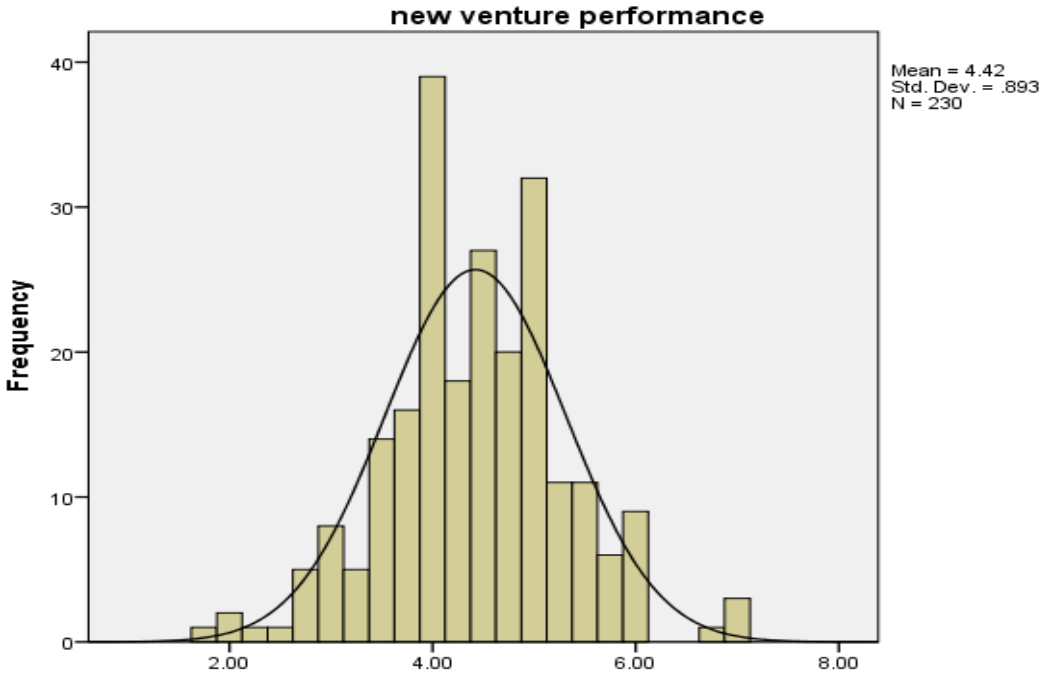
Opportunity creation				
	OPPC1	*OPPC2*	*OPPC4*	*OPPC6*
OPPC1	1.00			
OPPC2	0.29	1.00		
OPPC4	0.56	0.21	1.00	
OPPC6	0.62	0.21	0.60	1.00

Appendix 5C: Normality test

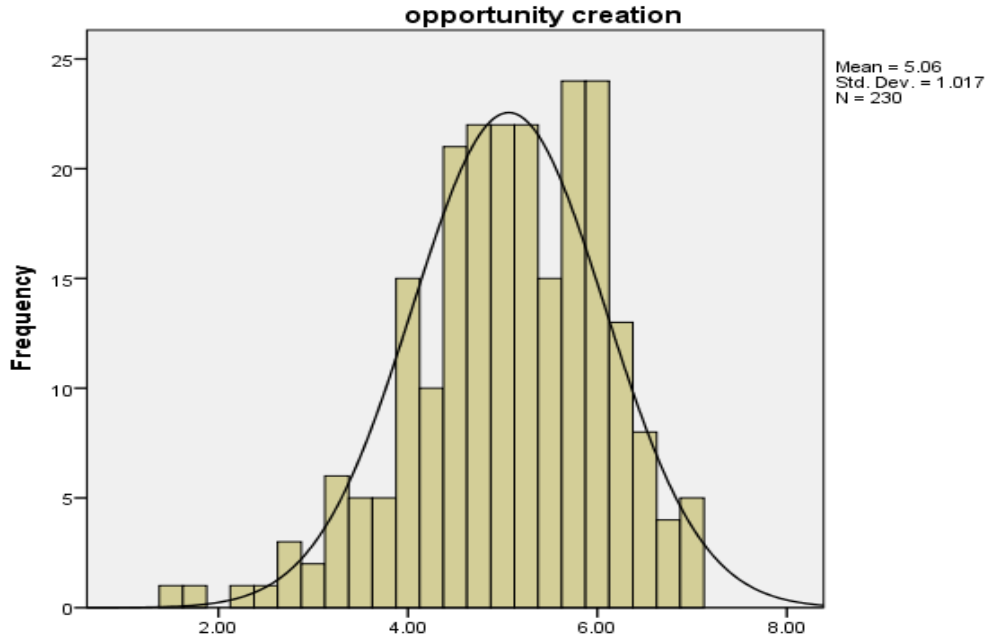
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Firm size	230	-1.270	.160	2.149	.320
Entrepreneurial experience	230	.040	.160	-.569	.320
Intuitive cognition	230	.052	.160	.096	.320
Analytic cognition	230	-.171	.160	-.315	.320
Environmental dynamism	230	.371	.160	-.281	.320
Opportunity discovery	230	-.244	.160	-.518	.320
Opportunity creation	230	-.588	.160	.453	.320
New venture performance	230	.015	.160	.569	.320
Adaptive capability	230	-1.014	.160	1.203	.320
Competitive intensity	230	-.892	.160	1.132	.320
Knowledge acquisition	230	-.599	.160	.131	.320
Knowledge assimilation	230	-1.085	.160	1.012	.320
Knowledge transformation	230	-.676	.160	.489	.320
Knowledge exploitation	230	-1.004	.160	1.054	.320
Valid N (listwise)	230				

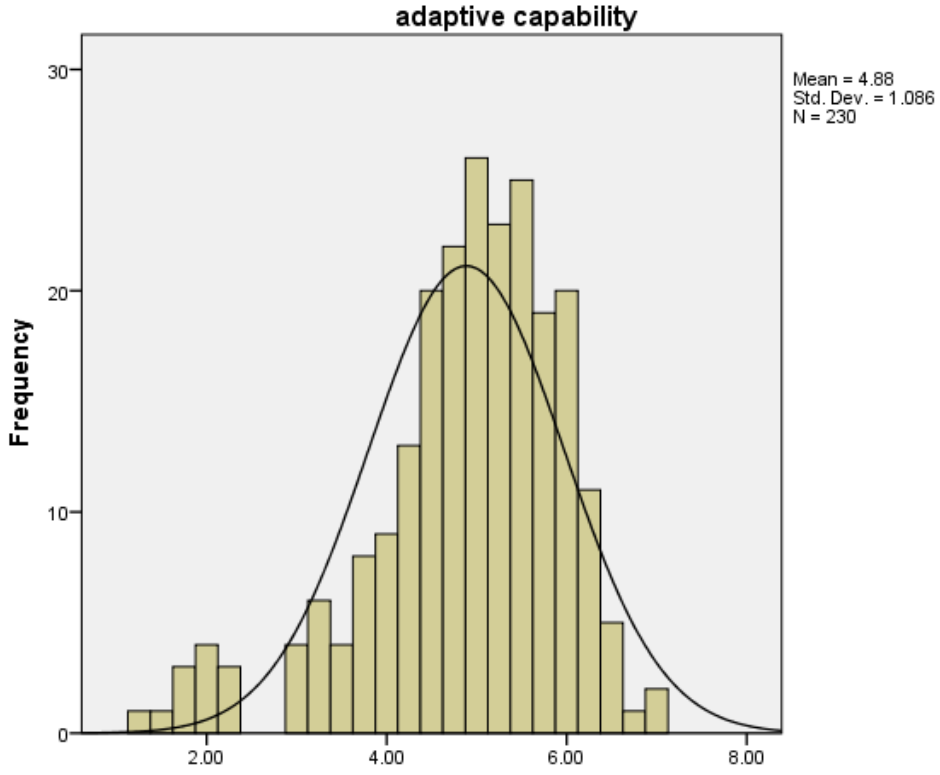
Appendix 5D: Additional normality test using histogram



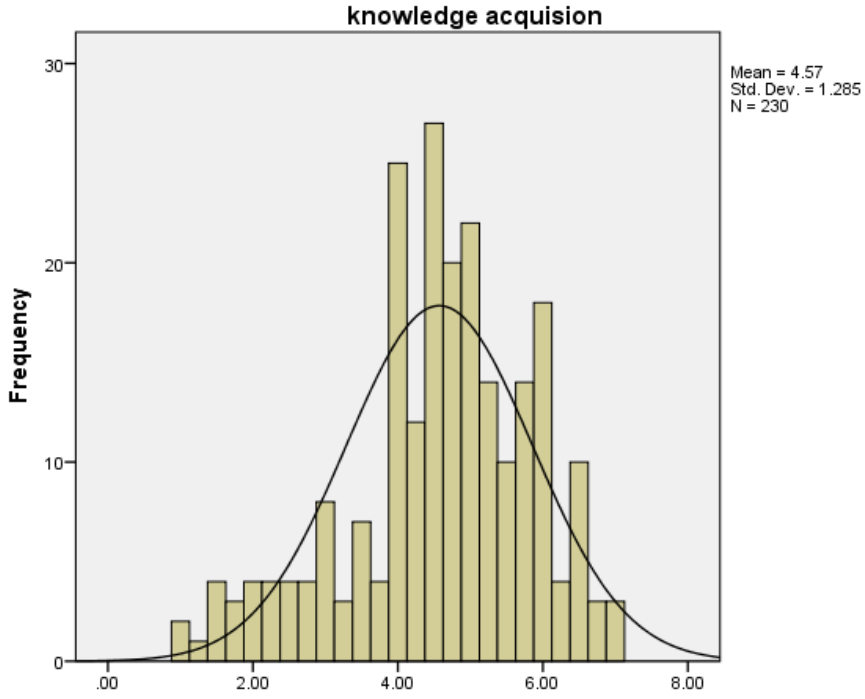


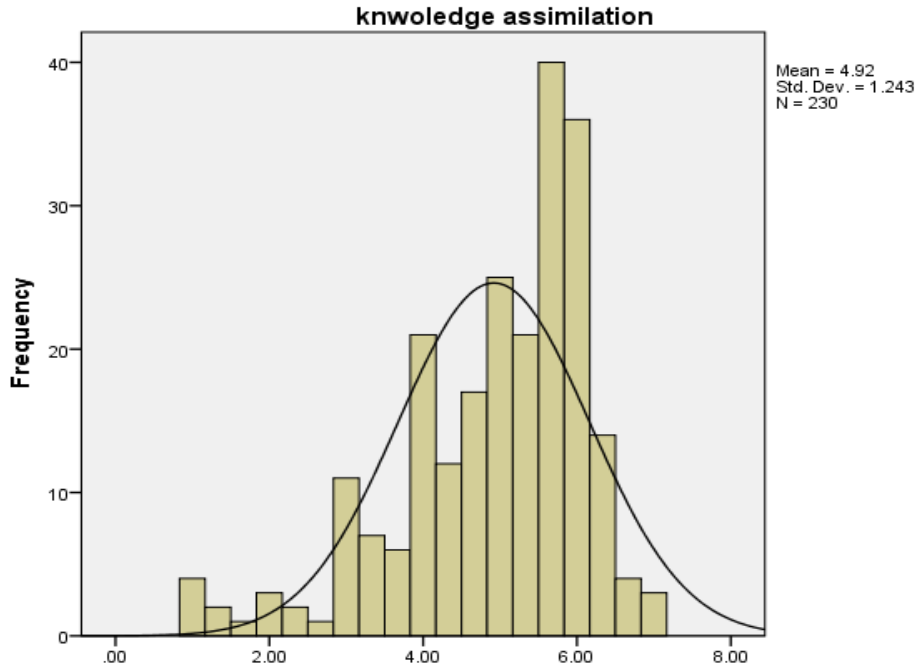
Appendix 5D: Additional normality test using histogram (continued)



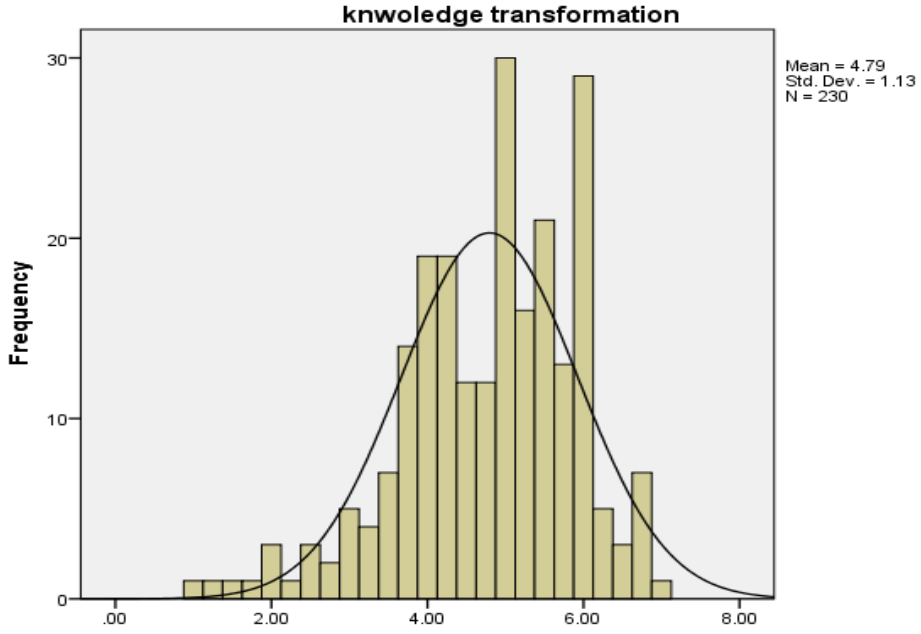


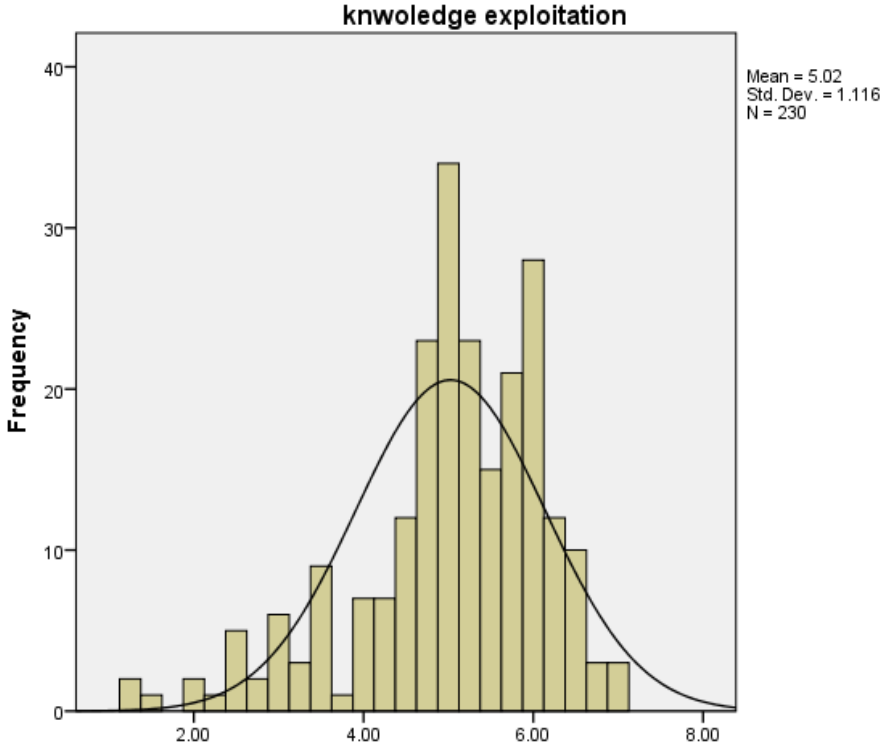
Appendix 5D: Additional normality test using histogram (continued)



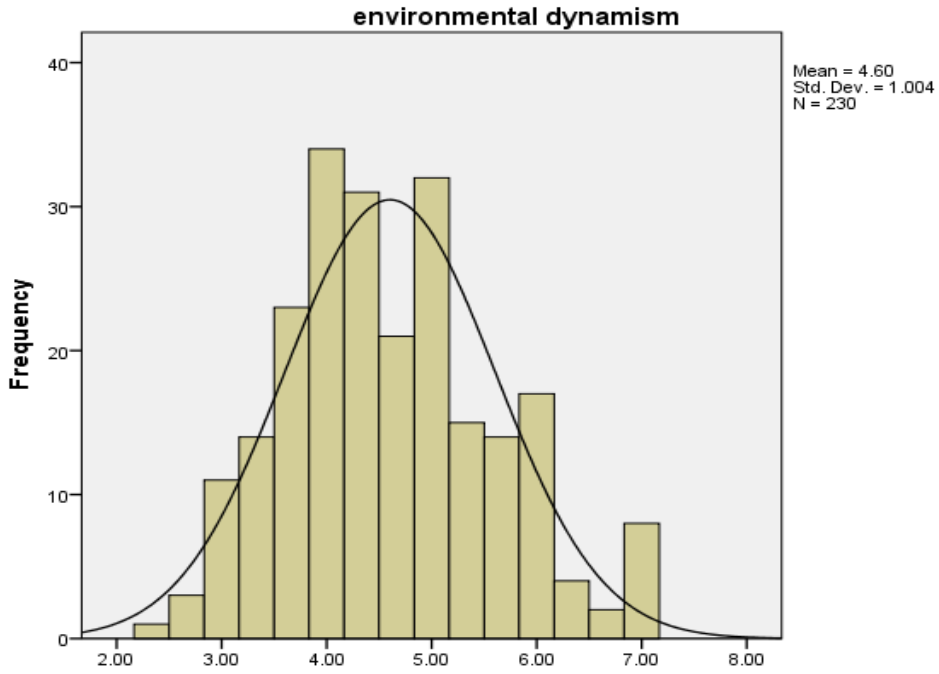


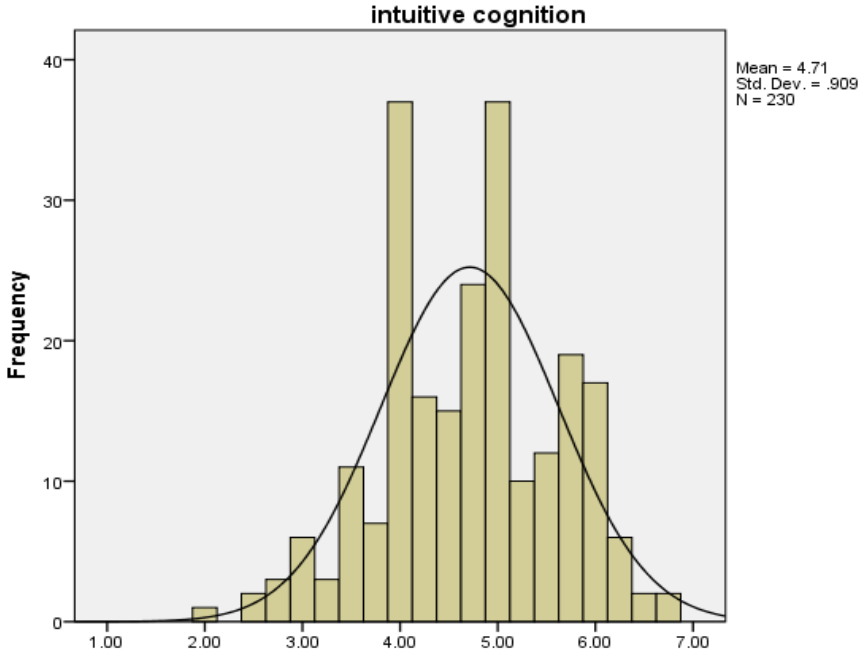
Appendix 5D: Additional normality test using histogram (continued)



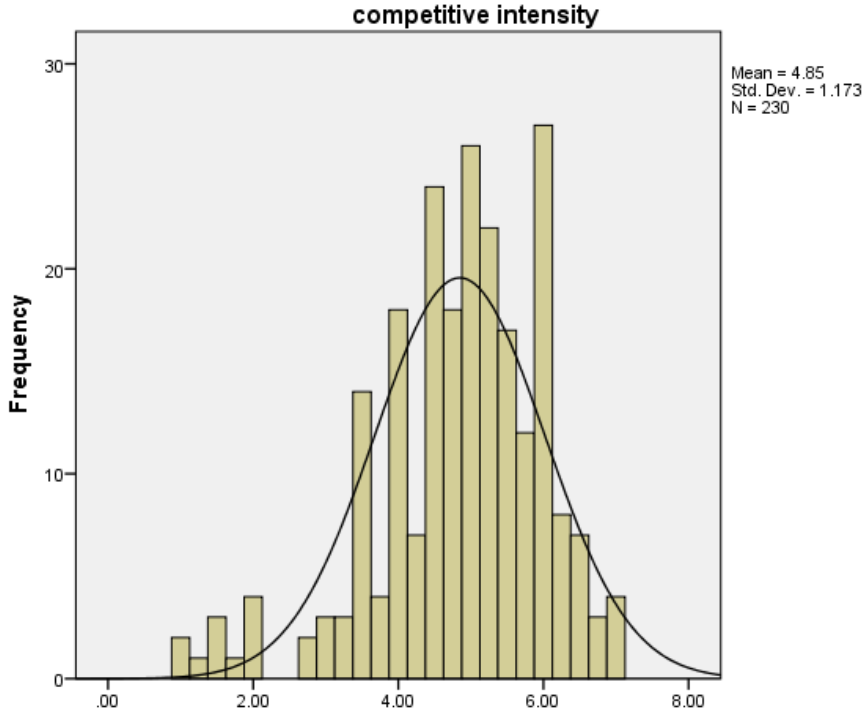


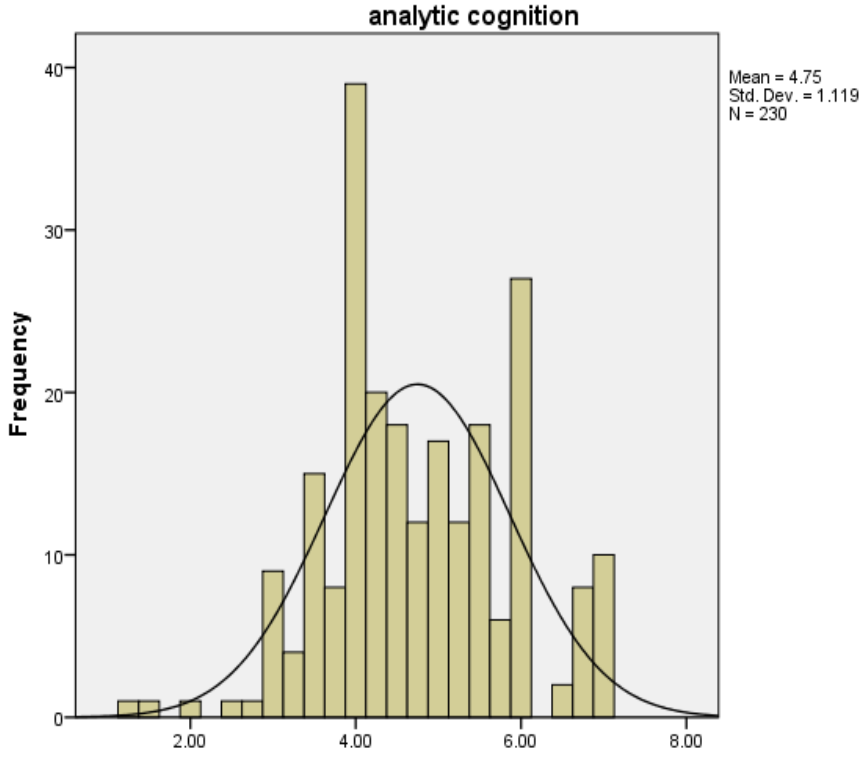
Appendix 5D: Additional normality test using histogram (continued)





Appendix 5D: Additional normality test using histogram (continued)





Appendix 5E: Results of Harman's single factor test using EFA

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	12.510	17.871	17.871	12.510	17.871	17.871	6.192
2	5.402	7.716	25.587	5.402	7.716	25.587	5.654
3	4.016	5.737	31.325	4.016	5.737	31.325	4.347
4	3.780	5.401	36.725	3.780	5.401	36.725	5.271
5	3.434	4.906	41.632	3.434	4.906	41.632	3.418
6	3.043	4.346	45.978	3.043	4.346	45.978	5.222
7	2.959	4.228	50.206	2.959	4.228	50.206	4.135
8	2.557	3.653	53.859	2.557	3.653	53.859	4.910
9	2.448	3.497	57.356	2.448	3.497	57.356	4.036
10	1.983	2.833	60.189	1.983	2.833	60.189	5.431
11	1.881	2.687	62.877	1.881	2.687	62.877	5.079
12	1.546	2.209	65.085	1.546	2.209	65.085	4.605
13	1.455	2.079	67.164	1.455	2.079	67.164	3.692
14	1.204	1.720	68.884	1.204	1.720	68.884	4.651
15	1.085	1.550	70.433	1.085	1.550	70.433	1.389
16	1.004	1.435	71.868	1.004	1.435	71.868	1.224
17	.925	1.321	73.189				
18	.895	1.279	74.469				
19	.825	1.179	75.648				
20	.778	1.112	76.760				
21	.763	1.089	77.849				
22	.742	1.060	78.909				
23	.732	1.046	79.955				
24	.676	.966	80.921				
25	.664	.948	81.869				
26	.627	.896	82.765				
27	.581	.830	83.595				
28	.563	.804	84.399				
29	.537	.767	85.166				
30	.509	.728	85.893				
31	.505	.721	86.614				
32	.474	.678	87.292				
33	.443	.634	87.925				

34	.439	.627	88.552				
35	.434	.620	89.172				
36	.400	.572	89.744				
37	.398	.568	90.312				
38	.378	.540	90.853				
39	.358	.512	91.365				
40	.339	.485	91.850				
41	.335	.478	92.328				
42	.329	.470	92.797				
43	.312	.445	93.242				
44	.298	.425	93.668				
45	.289	.413	94.081				
46	.277	.395	94.476				
47	.260	.372	94.847				
48	.253	.362	95.209				
49	.250	.357	95.567				
50	.231	.330	95.896				
51	.226	.322	96.219				
52	.210	.300	96.518				
53	.205	.293	96.812				
54	.188	.268	97.080				
55	.176	.252	97.332				
56	.166	.238	97.570				
57	.163	.233	97.803				
58	.151	.216	98.019				
59	.151	.215	98.235				
60	.145	.207	98.441				
61	.139	.198	98.640				
62	.135	.194	98.833				
63	.124	.178	99.011				
64	.119	.170	99.181				
65	.113	.161	99.342				
66	.107	.153	99.495				
67	.105	.151	99.646				
68	.093	.133	99.779				
69	.085	.121	99.900				
70	.070	.100	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Appendix 5F: CMB Adjusted correlation

	Constructs	1	2	3	4	5	6	7	8	9	10	11	12
1	Opportunity creation												
2	Opportunity discovery	0.145*											
3	New venture performance	0.339**	0.189**										
4	Analytic cognition	0.236**	0.127*	0.079									
5	Intuitive cognition	0.073	0.329**	0.122*	0.282**								
6	Adaptive capability	0.145*	0.172**	0.100*	0.099	-0.090							
7	Acquisition	0.113*	0.170**	0.164*	0.166*	0.047	0.268**						
8	Assimilation	0.187**	0.079	0.191**	0.172**	-0.020	0.235**	0.440**					
9	Transformation	0.158*	0.040	0.283**	0.150*	0.079	0.163*	0.300**	0.345**				
10	Exploitation	0.380**	0.160*	0.214**	0.152*	0.062	0.358**	0.279**	0.247**	0.345**			
11	Competitive intensity	0.082	0.038	0.077	0.060	0.047	-0.043	0.136*	0.213**	-0.042	0.178**		
12	Environmental dynamism	-0.061	-0.048	0.049	0.069	0.053	-0.068	0.083	0.062	-0.008	-0.048	0.102*	