Novel Business Models: An Empirical Study of Antecedents and Consequences

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Abstract

This research addresses three questions: (1) What are the key antecedent drivers of novel business model design? (2) What effect does a novel business model have on business performance? (3) Does the linkage between novel business model and business performance depend on the environmental context and in/dependence of the strategic business unit? Drawing on the broad strategic orientation literature, the study derives three antecedents of novel business model design: market, entrepreneurial, and technological orientations. Accordingly, and building on the resource-based view of the firm, the study develops hypotheses that link the three strategic orientations to novel business model design. The study also hypothesizes that a novel business model is crucial for business performance; however, this effect is moderated by technological turbulence and by the (in)dependence of the business unit.

To test the research model, a cross-sectional design was employed to collect data by means of a web-based survey from a random national sample of UK firms across various sectors and sizes. Following well established procedures for scale development and purification as recommended in the methodology literature, the measurement scales were critically evaluated and reviewed for their psychometric properties. The conceptual model was tested with a structural equation model. The empirical results indicate significant positive effects of market, entrepreneurial, and technological orientations with novel BM design. The variance in business performance was also found to be partly explained by a firm's ability to design a novel business model, more specifically in an environment characterized by high technological turbulence. Furthermore, the results indicate that starting a new business venture for the new BM can have better performance consequences compared to accommodating it within the borders of the existing structure of the firm.

A key implication of the research is that exploiting internal firm capabilities is important not only for product innovation but also for business model innovation. This study contributes to business model literature by examining the business model performance in the new business context, as well as by identifying key antecedent factors that can potentially help firms' managers in their business model innovation efforts. This gap has been strongly emphasized in previous BM research.

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Chapter 1. Introduction

1.1 Research Background

In recent years, the business model (BM) concept has received an increasing attention from both academics and practitioners and the concept has emerged as a key research area in the fields of strategy and entrepreneurship (Morris et al., 2005; Shafer et al., 2005; Zott and Amit, 2007; Teece, 2010; Brettel et al., 2011; Zott et al., 2011). There various examples of firms who achieved considerable success in the market due to their novel BMs. Examples include IKEA in the furniture industry, Canon in the copiers, Southwest, EasyJet, and Ryanair in the airline industry, Enterprise in the car rental market, Netflix in the DVD rental market, and Honda motorcycles. The success of these firms can be explained by their ability to develop novel BMs which enabled them to compete by changing the rules of the game in the industry (Markides, 2006; Markides, 2008). According to Teece (2010) BMs are also growing in popularity because they represent an important source of competitive advantage. However, despite this growing popularity, the BM literature can be characterized as largely conceptual. Furthermore, limited work has been carried out to examine the antecedent drivers of a novel BM across various industries and firm sizes.

This chapter aims to provide background information on the BM concept and its development as an academic construct. Consequently, the research gaps and objectives will be highlighted. The chapter also sheds light on limitation of the study, the chosen research method, and concludes with an overview of the structure of the thesis.

1.1.1 What is a Business Model

Recently, a wide range of scholars have reached an agreement that the term ‘business model’ refers the logic of the firm and how it intends to deliver and appropriate value (e.g., Osterwalder and Pigneur, 2010; Teece, 2010; Zott and Amit, 2013). More specifically, the model specifies the architecture of revenue and cost that will allow

firms to maximize their profit (Teece, 2010). This study employs the BM definition proposed by Amit and Zott (2001), who state that "a business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities." For them, the BM concept has the potential to bridge research from the fields of entrepreneurship and strategy due to its focus on value creation.

Numerous definitions of the BM concept have been proposed in the literature without one particular version attracting widespread consensus (George and Bock, 2011). The level of complexity and specific parts within each definition differ depending upon the aim of each research study. The notion of BMs as boundary-spanning systems of transactions and activities has been develop in a series of research papers by Amit and Zott (2001) and Zott and Amit (2007; 2008; 2010). This conceptualization is considered appropriate for a number of reasons. First, it allows researchers to measure performance outcomes based on the value creation potential or/and competitive advantage attained through novel BM design. Second, the definition includes clear and measurable design elements that enable researchers to test the hypothesized relationships. Third, the definition is not limited to a single industry, but allows the analysis of the value creation potential in a wide range of industries. Finally, the definition has strong theoretical basis, as it draws heavily from the resource-based theory; one of the most prominent theories and strategic management, which is important for developing and empirically testing the relational paths in the model based on high academic standards. It is argued in this study that the transaction perspective could potentially offer a useful agreed-upon perspective across the various proposed conceptualizations of the BM (Amit and Zott, 2015).

Innovation is about doing things differently from the norm (Afuah, 2015). Amit and Zott (2001) argue that innovation not only can be achieved through the introduction of new products or services, new methods of production, distribution, or marketing, but also through the way firms conduct business activities or in what they call the structure of the transaction (i.e. BM innovations). Merriam and Webster online dictionary defines the term "novelty" as "the quality or state of being new, different, and interesting or something that is new or unusual". Zott and Amit (2007) define novel

BM in terms of new ways of carrying out economic exchanges among various participants. This can be accomplished by connecting with new transaction partners or by reconnecting with existing transaction partners in new ways. In doing so, firms create novel types of transactions that may result in an innovation in the BM itself.

The extant BM research suggests that BMs have properties that can translate into sustainable competitive advantage and superior business performance (Amit and Zott, 2001). Performance is considered a recurrent theme in most fields of management, including strategic management, and it is a construct of interest for both academics and business managers (Venkatraman and Grant, 1986). Prior literature on organization performance reveals that there is a lack of agreement in regard to the definition of performance. However, three identifiable perspectives have gained widespread popularity in the organization performance literature (Ford and Schellenberg, 1982). One perspective, the goal approach (Etzioni, 1964), contends that organizations pursue ultimate and identifiable goals. This perspective, consequently, conceptualize performance in terms of goal attainment. A second perspective, the systems resource approach (Yuchtman and Seashore, 1967), emphasis the link between the organization and its environment. It defines performance in terms of the firm's ability to secure rare and valued resources. Finally, the process approach (Steers, 1977), defines performance in terms of the behaviour of organization participants., Richard *et al.* (2009) point out that organizational performance includes three specific areas of firm outcomes: (1) financial performance (profits, return on assets, return on investment, etc.); (2) product market performance (sales, market share, etc.); and (3) shareholder return (total shareholder return, economic value added, etc.). In line with previous strategy research, the current study defines business performance by employing various subjective indicators that measures a firm's profitability and its' market growth (e.g., Powell, 1992; Slater and Olson, 2000; Newbert, 2008).

1.1.2 Emergence of the BM Concepts in Academic Research

Environment in which firms compete is dynamic and rapidly changing, which require them to adapt and innovate in order to respond promptly to changing customer needs

and expectations. The advancement in information and communication technologies and the development of the internet allowed firms to interact and collaborate with each other and the customer in novel ways. Not only the internet transformed how firms carry out their business activities, but also led to the disruption of various industries. Accordingly, the BM concept has appeared as a popular term among business managers, entrepreneurs, and consultants who used the concept to articulate how their firms conduct business as well as to clarify the value creation and capture mechanisms (Teece, 2010).

To track the origins of the concept in the academic literature, an EBSCO Business Source Premier search was conducted for the term "business model" in academic peer reviewed journals. The database search was conducted on 19/05/2014 and produced 1,077 "title" hits, 11,449 "abstract" hits, and 148,721 "all-text" hits. The results show that academic interest in the BM construct is quite recent; 999 out of 1,077 "title" hits were in fact published after the year 2000. A similar search for the term "Business Model" was also conducted using the ISI Web of Science Database, and this generated 2,674 hits via the "topic" feature and 745 hits via the "title" feature of the search engine. The second search confirmed the initial search results in regard to recent academic interest in the BM concept and, hence, out of 745 "title" hits, only 20 articles were published before the year 2000.

According to Ghaziani and Ventresca (2005), the public started to use and talk about BMs in the early 1970s. At that time, the concept was mainly used in relation to business modelling (Wirtz, 2011). In consequence, most BM literature during that period was published in journals of informational technologies such as the Journal of System Management. From the 1970s to the early 1990s, the concept was used in parallel with other terms from the fields of computer science and system modelling, e.g. Computerized Model, Computer Assisted Modelling, and Information Systems (Ghaziani and Ventresca, 2005). Therefore, it can be noted that the conceptualization of the BM concept has been influenced to a large degree by the development of business modelling and information systems during this period.

The advances in information and communication technologies during the 1990-1995 led to an increased interest in the concept by both researchers and practitioners. During this period, other themes increasingly began to shape peoples' understanding of the concept, although most published work was connected to the same fields of computer science and business modelling. For example, scholars in the strategy context used the term BM in connection with other terms, such as revenue models or relationship management (Ghaziani and Ventresca, 2005; Wirtz, 2011). The advent of the "new economy" and the proliferation of the internet increased the popularity of the term BM within business enterprises (Morris *et al.*, 2005; Osterwalder *et al.*, 2005; Teece, 2010). Megretta (2002) suggested that the BM concept became widely used after the introduction of the personal computer and spreadsheets. Along with the growth of e-commerce/e-business activities, there was also a substantial increase in the number of publications.

One key issue that also attracted scholars' attention was identifying the strategic components of the concept, rather than using the term as a modelling tool. This literature linked BMs to both competitive advantage and business performance. While some authors considered the BM as distinct but related to the concept of strategy (Seddon *et al*., 2004), others point out that the concept can be used to integrate various strategy perspectives (Hedman and Kalling, 2003). Chesbrough and Rosenbloom (2002) argue that the development of the BM as a management concept has been influenced to a large degree by the field of business strategy rather than business modelling. Recently, scholars have started to emphasize value creation and value capture, which are now considered one of the main elements of the BM concept (Osterwalder and Pigneur, 2010; Teece, 2010; Zott and Amit, 2010; Afuah, 2014).

1.1.3 Limitations of BM Research

Early BM research can be described as largely conceptual. Specifically, early BM researchers have mainly focused on defining the BM concept and identifying its main elements and components (e.g., Timmers, 1998; Hamel, 2000; Tapscott *et al.*, 2000; Afuah and Tucci, 2001; Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002; Hedman and Kalling, 2003). With the increase in the number of BMs, scholars have

shifted their interest towards identifying BM archetypes and taxonomies (Applegate, 2000; Rappa, 2001; Weill and Vitale, 2001).

Subsequent research studies have emphasized BMs in young entrepreneurial firms that had the potential to disrupt an existing industry (e.g. Amit and Zott, 2001; Zott and Amit, 2007). Specifically, these studies examined the role of the BM in value creation in the context of e-business firms and virtual markets. These firms have competed with large established firms with new BMs that are mainly supported by the emergence of the internet and advances in information and communication technologies.

Another stream of researchers have focused on the link between BM innovation and the commercialisation of new technologies (Chesbrough and Rosenbloom, 2002; Chesbrough, 2007; 2010; Gambardella and McGahan, 2010). It was argued that technological innovations can be commercialized more successfully through a novel BM other than the current model employed by the firm. Thus, to maximize the chances of the success of new technologies, firms must evaluate the extent to which the existing model is appropriate, and if a new BM is required to benefit from the planned change.

Together the above studies provide evidence of the growing scholarly interest in the BM concept and BM innovation (Zott *et al*., 2011). However, these studies tend to suffer from a number of shortcomings. First, while there are a growing number of studies that have investigated the importance of change arising from BM innovation, these studies did not address the antecedents to such change and, consequently, more work is needed on the antecedents of novel BMs. Second, most of BM research has emphasized the BMs of entrepreneurial e-business-related firms and, thus, more work is required on the role of novel BMs across various industries and firm sizes. Third, BM research can be described as generally conceptual and large empirical quantitative studies are limited (Malone *et al*., 2006; Bock *et al*., 2011). The current research employed a cross-sectional design to collect data from a large national random sample of UK firms from various industries. Accordingly, the finding of this research can be generalized to a wider business context. Fourth, and finally, while the BM- performance link has started to gain prominence in extant research, limited studies have explored the performance

implication (in)dependence decision of the new BM, a gap that this study has attempted to fill. These gaps are elaborated in Chapter Two.

1.2 Overview of Research Objectives

The study of business BM is considered an important topic for strategic management research because BMs can help firms create and capture value. (Amit and Zott, 2001; Zott and Amit, 2008). Accordingly, the study draws from the wide strategic orientation literature to develop and empirically test a theoretical model of the main antecedents of a novel BM design. The study also refers to key management theories to explain and predict the relationships among a novel BM, its drivers, and business performance. These explanations and predications are expected to help business manager better create and execute profitable BMs. The main objectives of this research can be broken down into the following: -

1. To develop and empirically test a theoretical model that links the strategic orientation of the firms to novel BMs.
2. To test the hypothesized effect of a novel BM on business performance.
3. To test The role of technological turbulence and the (in)dependence of the new BM in moderating the relationship between novel BM design and business performance.

1.3 Overview of the Methodology

The paradigm adopted by researchers can be linked to their viewpoints on the development of knowledge. According to Collis and Hussey (2003), there are two philosophical positions or paradigms: positivistic or phenomenological. (Collis and Hussey (2003), p.52) point out that positivism seeks "the facts or causes of social phenomena, with little regard to the subjective state of the individual".

Saunders *et al.* (2011) argue that deductive research, to a large extent, focuses upon the search for a potential relationship between a set of related variables. This research adopts a positivistic philosophical position with the intention of analysing the relationship that exists between the antecedents and consequences of novel BMs.

As the objective of this study is to analyse the relationship between various strategic orientations, novel BM, and business performance, a deductive approach was adopted. Probability sampling was used to meet the research objectives and then the primary data were collected through a web-based survey. The quantitative data collected were analysed via Statistical Packages for Social Sciences (SPSS) operations.

In order to empirically test the relationships between the antecedents and consequences of novel BMs, this research has employed several methods. Firstly, this research develops the relationships between the identified strategic orientations, the novel BM, and business performance, by reviewing the related literature which helped in deriving the research hypotheses. To empirically justify these hypotheses, a structural equation model was developed, and the data used in this research were collected by developing a questionnaire that was devised from previous research. Reliability, validity, and correlation analysis were conducted utilizing IBM SPSS 21. Moreover, to analyse the structural equation model and path relationships, a covariance structural analysis was performed using AMOS 21.

1.4 Findings

This study addresses the impact of novel BM on performance and key antecedents to novel BM design in a comprehensive, empirically verified model. Thus, the study fills a significant gap in understanding novel BMs, the nature of relationships between a novel BM and key variables that drive it, and the effect of novel BM on business performance. The findings of the current thesis are particularly relevant to the fields of strategy and innovation. It adds to an emerging body of research on BMs and BMs innovation (e.g., Zott and Amit, 2008; Teece, 2010; Casadesus-Masanell and Zhu, 2013; Morris et al., 2013). To the best of the researcher knowledge, this is the first relatively large-scale quantitative study of novel BMs. While there are interesting empirical studies in this field (e.g., Rajgopal et al., 2003; Zott and Amit, 2007), there has been no empirical analysis of the antecedents and performance implications of novel BMs by employing the resource-based view.

This study strongest and most robust finding relates to the strategic orientation antecedents of novel BM design. Overall, the findings of this study indicate that market, entrepreneurial, and technological orientations are key antecedents drivers of novel BM and that variance in business performance can be explained by the novelty of a firm's BM. Furthermore, the results show that the impact of novel BM on performance is stronger in an environment characterized by high technological turbulence. As such, the higher the technological change, the higher the impact of novel BM on performance.

These findings add to the ongoing discussion about firms' resources and how they can be translated into superior business outcomes. One key implication of this study that business managers should place special emphasis on the three strategic orientation capabilities as they can contribute the development of novel BM and, consequently, the attainment of competitive advantage and superior business outcomes. This goes in line with resource-based view which suggests that the ownership and exploitation of rare, valuable, inimitable, and non-substitutable resource and capabilities will help firms improve their short-term and long-term performance (Barney, 1991; Amit and Schoemaker, 1993; Henderson and Cockburn, 1994; Teece *et al.*, 1997; Eisenhardt and Martin, 2000; Powell, 2001).

1.5 Structure of the Thesis

This thesis is structured as follows. Chapter two reviews the literature relevant to BMs, BM innovation, and a resource-based view, the key theoretical base employed in this study. In this review, gaps in the BM literature are identified and the research questions and objectives of the study are formulated. Chapter three covers the hypotheses tested in the thesis and their development. Chapter four covers the methodology and development of the instruments used. Chapter five covers the data analysis of the study and presents the key findings obtained in the research. Chapter six discusses the overall results of the research in the light of extant studies. Finally, chapter seven provides concluding comments as well as a summary of the theoretical contributions, managerial implications, limitations of the study and suggestions for future research.

Chapter 2. Literature Review

2.1 Introduction to Chapter Two

The central aim of this chapter is to establish the context and the framework for this research. Specifically, it will provide an in-depth multidisciplinary discussion of the BM construct and its theoretical grounds. The chapter will start by discussing prior research on the BM concept in regard to existing definitions and frameworks. The second part reviews literature on novel BM designs and their performance implications. The theoretical lenses that inform the present study, i.e. the resource-based view and contingency theory, are consequently discussed. Finally, the chapter is concluded by identifying gaps in previous research which are then used to define the research focus, objectives, and questions.

2.2 Business model definitions

2.2.1 About "business" and "models"

To understand the meaning of the term "Business model" and how it is defined in literature, it is of importance to initially define what the terms "business" and "model" mean separately (Osterwalder *et al.*, 2005; Shafer *et al.*, 2005), as both terms might be used in the conceptualization of the BM concept. Based on WordNet 2.0 Osterwalder et al. (2005) define both 'business' and 'model' as follows:

- Business: 'the activity of providing goods and services involving financial, commercial and industrial aspects'.
- Model: 'a simplified description and representation of a complex entity or process'.

In regard to the definition of the term "model", representation implicitly refer to conceptualization which can be defined as "'the objects, concepts and other entities that

are assumed to exist in some area of interest and their interrelationship"(Genesereth and Nilsson, 1987; cited in Osterwalder et al., 2005).

2.2.2 Definition of the term "Business Model"

The BM has been conceptualized as a firm's framework for making money (Afuah, 2004), and it captures the key relationships in a venture on a number of levels including production, strategy and economic aspects (Amit and Zott, 2001; Morris *et al.*, 2006). Although various definitions have been proposed for the concept, there is a growing consensus that a BM describes the logic of the firm and how it intends to create and capture value (See Zott and Amit, 2009; Osterwalder and Pigneur, 2010; Teece, 2010). This section will first explore these definitions and highlight some of the similarities and differences to increase our understanding of the BM concept. This section will end by discussing the recent definitions of the concept which highlight value creation and value capture. Table 2.1 provides a sample of the widely used BM definitions.

Table 2.1 Sample Business Model Definitions.

Authors	BM Definition	Articles citing this definition
Timmers, (1998)	"An architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues."	Hedman & Kalling, 2003
Rappa, (2001)	"A method of doing business by which a company can sustain itself that is, generate revenue. The business model spells out how a company makes money by specifying where it is positioned in the value chain."	Doganova and Eyquem-Renault (2009)
Afua and Tucci, (2001)	"The method by which a firm builds and uses its resources to offer its customer better value that its competitors and to make money doing so. It details how a firm makes money now and how it plans to do so in the long term."	Doganova and Eyquem-Renault (2009)
Amit and Zott, (2001)	"A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of new business opportunities."	Zott & Amit, 2007, 2008; Bock & George 2000; Morris et. al. 2005; Hedman & Kalling, 2003.

Authors	BM Definition	Articles citing this definition
Chesbrough and Rosenbloom. (2002)	" The business model provides a coherent framework that takes technological characteristics and potential as inputs and converts them thorough customers and markets into economic outputs"	Chesbrough et al., 2006; Tecece, 2010.
Magretta, (2002)	"A good business model answers Peter Drucker's age-old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?"	Seddon et al. 2004; Demil & Lecocq 2010.
Hedman & Kalling (2003)	"Business model is a term often used to describe the key components of a given business. That is customers, competitors, offering, activities and organization, resources, supply of factors and production inputs as well as longitudinal process components to cover the dynamics of the business model over time."	Shafer et. Al. 2005
Osterwalder et al. (2005)	"A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences. "	(Osterwalder and Pigneur, 2010)
Morris et al. (2005)	''A business model is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets.'	Calia et al. 2007.
Teece, (2010)	"A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers to customers"	Gambardella & McGaham, 2010

Academic research on BMs started appearing late 1990s with early work from, for example, Timmers (1998), Weill and Vitale (2001) and Afuah and Tucci (2001). For

instance, Timmers defines the BM as "An architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues" (Timmers, 1998, p. 4). Mahadevan (2000) and Weill and Vitale (2001) proposed similar definitions. A salient feature of the previous conceptualizations is conceiving the BM as architecture; they also adopt a network approach by focusing on actors, their roles and their interactions.

Rappa (2001, Online) proposed another early definition where he emphasized the revenue generation and financial arrangement from conducting online business transactions. These elements were also prominent in the definitions proposed by Afuah and Tucci (2001) and Teece (2010). These definitions are centred on organizations and the way they attain competitive advantages. However, most of the authors who adopt a strategic lens to study BMs emphasize that the BM concept does not cover all aspects of strategy (Chesbrough and Rosenbloom, 2002). Other authors emphasize the difference between BMs and strategy. For instance, Magretta (2002) argues that while BMs are highly focused on cooperation, the focus of business strategy, in the other hand, is on competitiveness (Magretta, 2002).

Another stream of researchers offered more general definitions by integrating the logic of revenue generation for the focal firm and the architectural visualization of the business network (Dubosson-Torbay *et al.*, 2002; Osterwalder and Pigneur, 2002; Morris *et al.*, 2005; Osterwalder *et al.*, 2005). For example, Osterwalder (2005, p. 5) defined BM as "a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore, we should consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences". Other scholars, however, were more precise and proposed less inclusive definitions which focus on specific components. Hence, Timmers (1998) differentiates clearly between a BM and a marketing model while Amit and Zott (2001) view revenue model as a separate, yet, complementary component of the BM concept.

There is fairly some misunderstanding about the organizational entity as BM definitions in some papers refer to the firm level (e.g., Rappa, 2001; Afuah and Tucci, 2003; Osterwalder *et al.*, 2005) while in others to the network level (e.g., Mahadevan, 2000; Tapscott *et al.*, 2000; Weill and Vitale, 2001). In contrast, Amit and Zott (2001) view it as a new level of analysis that is distinct from the product, firm, industry, or network. Some definitions do not provide a clear reference to the organizational entity (e.g., Chesbrough and Rosenbloom, 2002; Morris *et al.*, 2005). Most scholars do include both levels in their conceptualizations based on their further discussion, operationalization and application of the BM concept. Most firm level definitions do not distinguish between the corporate entity and the business unit although the majority appear to imply the business unit. One exception is Chesbrough and Rosenbloom (2002), who explicitly relate the BM to the business unit strategy.

Some definitions are influenced by the specific context in which the BM concept is used. For instance, Amit and Zott (2001) focus on value creation in e-business and view the BM as depicting the design of transaction content, structure, and governance transactions. Chesbrough and Rosenbloom (2002, p. 529) link the BM to the successful commercialization of new technologies and define it as the "heuristic logic that connects technical potential with the realization of economic value". This use of BMs for different purposes and in various contexts, such as start-ups and established firms, different types of innovation, for-profit and not-for-profit, etc. may also clarify why there is no common consensus on a single definition.

Some researchers have attempted to address the problem of different BM definitions by identifying categories or themes reflecting the different origins or meanings of the concept (Osterwalder *et al.*, 2005; Morris *et al.*, 2006; Wirtz, 2011). Osterwalder et al. (2005) differentiate between an activity/role-related approach, which is more inward looking and a value/ customer-oriented approach, which is more outward looking. Wirtz (2011) points out that definitions progressed from a technology orientation to an organization orientation to a strategic orientation. Morris et al. (2005) argue that three dominant perspectives helped shape our understanding of the BM concept where the perspective increases in comprehensiveness as one progressively moves from the economic to the operational to the strategic levels. Given this wide variety of origins

and meanings of the BM concept, it is not surprising that a general accepted definition has not yet emerged. Consequently, it will be important for the definition to offer a generic and abstract conceptualization that can be applied for different purposes and in different contexts (e.g. technology, innovation, strategy).

A shift in focus can also be observed when a comparison is made between earlier and later definitions of BMs. Earlier definition shared several similarities with frameworks; a summary of the major elements or component of the model, example include Osterwalder (2005) and Timmers (1998). While in recent definitions, a focus on the logic of value creation, delivery and capture is a key feature (Osterwalder and Pigneur, 2010; Teece, 2010). In a recent study, Zott et al. (2011) argue that BMs "seek to explain how value is created, not only how it is captured". To a large degree, the logic of value creation is prevalent in almost all definitions (Ghaziani and Ventresca, 2005), however, it is not further explained; no clear definition of how value is provided.

2.2.3 The Business Model Definition Adopted in this Thesis

As discussed in section 1.1.2 , the current study employs the definition proposed by Amit and Zoot (2001) as it is sufficiently broad to embrace the various reflections on BMs that sprung up in different fields such as e-business, computer science, strategy or management (Pateli and Giaglis, 2003; Brettel et al., 2011). According to Mahadevan (2000) and George and Bock (2011), Amit's and Zott's definition is considered the most rigorous and engaging definition of the BM construct as it focuses on the transactive structures. It is also considered unique as traditional approaches to strategic configurations depends on mutually exclusive categories and are applicable to a wide range of industries (Hitt et al., 2001). Furthermore, the definition not only satisfies the criterion of a rigours theoretical basis, but also it enables researchers to measure and test empirically the drivers of novel BM design and their performance consequences. It is also consistent with a range of conceptualizations that have been proposed in the literature, specifically those focused on value creation and value capture. (Zott et al., 2011). Accordingly, this definition is adopted in this study.

The current research follows a static view to examine novel BMs and their links to business performance (Demil and Lecocq, 2010). This view, admittedly, might limit the

researcher ability to answer the question of how firms change and adapt their BMs, which is more in line with the transformational view in BMs (Demil and Lecocq, 2010).

2.2.4 Business Model Frameworks

Research on BMs has progressed from work that is mostly focused on defining the BM concept and listing its main elements/components towards identifying conceptual models or frameworks that describe the elements of BM and the relationship between these elements. One popular theme in the BM literature relates to the processes by which firms create and capture value (Hamel, 2000; Amit and Zott, 2001; Gordijn and Akkermans, 2001; Hedman and Kalling, 2003; Morris *et al.*, 2005; Johnson, 2010; Osterwalder and Pigneur, 2010). These efforts are considered pivotal as they represent an initial step for business managers to use the concept to articulate and describe the logic of value creation and value capture. Table 2.2 summarizes the most frequently cited frameworks in the BM literature. It can be noted that while some of the proposed frameworks were e-business focused, other scholars have provided generic frameworks that can be used by any firms in any industry.

Table 2.2: BM frameworks related to value creation

Author (year)	Components/elements	
Timmers (1998)	Product/service Information flow architecture Business actors and roles	Actor benefits Revenue sources
Mahadevan (2000)	Value stream, Revenue stream assuring revenue	Logistical stream
Hamel (2000)	Core strategy strategic resources	Value network, and customer interface
Alt and Zimmerma (2001)	Mission Structure Processes	Revenues Legal issues Technology
Amit and Zott (2001)	Transaction content Transaction structure	Transaction governance
Weill and Vitale (2001)	Strategic objectives Value proposition Revenue sources Success factors	Channels Core competencies, Customer segments IT infrastructure
Chesbrouh and	Value proposition	Cost structure and profit model

Rosenbloom (2002)	Target markets Internal value chain structure	Value network, and Competitive strategy
Hedman and Kalling (2003)	Customers Competitors Offering Activities and organization	Resources Supply of factor and production inputs Longitudinal process component
Afuah (2004)	Structure System	People Environment
Morris *et al*. (2005)	Offering Market factors Internal capabilities	Competitive strategy Economic factors Personal/investor factors
Osterwalder and Pigneur (2010)	Value propositions Key resources Key activities Key partnerships Channels	Customer relationships Customer segments Cost structure Revenue stream
Johnson (2010)	Customer value preposition Profit formula	Key resources Key processes

As scholars have given special emphasis to the development of BM frameworks, a decision was made to focus on one of the available frameworks rather than developing a new one. Hence, the present study chose to adopt the framework developed by Amit and Zott (2001). The authors introduced this framework in their seminal article 'Value creation in E-business' (Amit and Zott, 2001). As shown in Table 2.2, Amit and Zott's framework includes three main components: (1) transaction content; (2) transaction structure; and (3) transaction governance.

Transaction content

Transaction content refers to the selection of activities to be performed as well as to the resources and capabilities that are required to enable the execution of such activities (Amit and Zott, 2001; Amit and Zott, 2012). A classic example of firms that experimented with transaction content is IBM. In the early 1990s, the firm transformed its business from being a hardware manufacturer to becoming a service provider. Building on accumulated knowledge and know-how, IBM launched a range of new activities in consulting, IT maintenance and other services.

Transaction structure

Transaction structure specifies how activities are linked and the sequence of these activities, and also describes the adopted exchange mechanism for enabling transactions (Amit and Zott, 2001). Choosing an appropriate transaction structure can have large impact on the flexibility, adaptability, and scalability of a firm's transactions. For instance, Priceline, Expedia, and Travelocity have all innovated in their transaction structure by creating links with airline companies, credit card companies, and hotels and car reservation systems, among others.

Transaction governance

Transaction governance specifies who performs each activity. It also describes the legal form of an organization, and incentives for members or parties who are involved in the transaction. Allowing customers to create content is one form of innovating transaction governance (Amit and Zott, 2001).

The current study employed this framework because it is well-established and frequently used in academic work (e.g., Teece, 2010; Brettel *et al.*, 2011; Amit and Zott, 2012) as well as because it can be applied to all business activities and is not limited to e-business context (Hedman and Kalling, 2003; George and Bock, 2011). The framework provides, as discussed in section 2.2.3, clear design elements that can guide business managers who are planning to transform or update their firms' BMs. Zott and Amit (2010) have shown that the design of a BM can be characterized by 'design themes,' which are specific configurations of the content, structure, and governance of activities. There are at least four such design themes: novelty, lock-in, complementarities, and efficiency. Firms can design a novel BM by adopting of new activities (content), new ways of linking activities (structure), or new ways of governing activities (governance). A key example is Apple, which started as a manufacture of hardware equipment such as personal computers. Through the introduction of the iPod and the related music download business iTunes, Apple was the first firm that included music circulation as an activity linking it to the development of the iPod hardware and software and digitizing it and thus pushing many subactivities of legal music downloads to its customers (Zott and Amit, 2010).

2.2.5 Criticism of the BM Concept

There is a large volume of published studies describing how the BM concept enables firms to create and appropriate value by satisfying the existing and latent needs of current and potential customers. Some scholars have criticised the concept for being vague and superficial and having no theoretical grounding (Porter, 2001). One key criticism that is dominant in the literature relates to the lack of theoretical development of the BM concept in economic and business studies, which may raise concerns about the value of employing the concept for empirical research and theory building (Zott *et al*., 2011, Porter, 2001). Moreover, few papers have highlighted the difficulty of differentiating the concept from other "related concepts such as new organizational forms, ecosystems, activity systems, and value chains or value networks" (Zott *et al*., 2011 p.1038). For instance, Mason and Spring (2011) and Osterwalder *et al.* (2005) criticised the concept because it offers only a snapshot of a firm's business logic at a specific point in time. In Manson and Spring words (2001),

> 'an important limitation of the business model literature is that it only creates a description of the firm at a single point in time and, in so doing, fails to take account of the influence of the business network on the business model and vice versa' (p.1033).

More recently, Arend (2013) published a research paper to discuss the usefulness of the BM idea. The author contends that "the use of the term business model as a description of how a traditional venture operates is strong on redundancy and weak on theoretical grounding" (p.390). However, the practical value of the BM in providing a common language for stakeholders and as a cognitive tool for visualization is acknowledged. Arend points out that while Amit and Zott (2001) identified the BM as a new unit of analysis, they define it at the level of the transaction, and also measure it at this level. George and Bock (2011) admit that Amit's and Zotts's conceptualization and framework of the BM construct have been very productive in the BM literature, but yet lacks theory building and empirical research outside of the e-business field, a gap this this research is attempting to fill.

Regardless of the above criticisms, Hedman and Kalling (2003) believe that the concept is promising as it can integrate various strategic perspectives such as a resources-based view and industrial organization. Teece (2010) points out that " new organizational forms can be a component of a business model; but organizational forms are not business models" (p.179). While the Teece admits that more work is needed to establish the concept theoretically in economic and business studies, he emphasizes the importance of the concept for firms to differentiate themselves and develop a sustainable competitive advantage. In response to Arend (2013) criticism, Zott and Amit (2013) stress that their earlier work helped develop the concept theoretically, arguing that the concept has emerged as a "robust, useful construct for strategic analysis" (p.409). Moreover, the authors concludes that "empirical research on the measurement of business models and business model innovations, structured to capture all lines of a firm's business that have revenue potential, holds great promise to enhance our understanding of wealth creation" (409). As discussed above, Amit's and Zott's (2001) definition of the BM construct is gaining prominence: it rests on observed firm behaviour, interlinks elements of strategy and entrepreneurship, and provides a range of opportunities for empirical evaluation and theory building.

2.3 Business Model Design

A wide range of research studies has emphasized internal design issues such as span of control, centralization, and line of authority (e.g., Nystrom and Starbuck, 1981). More recently, however, some scholar have noted that many firms are "experimenting with their governance of transactions, that is, adopting new ways of structuring their boundaries" (Foss, 2002, p. 1). A considerable amount of literature on organization forms has gradually shifted focus from internal design toward ways of organizing and managing transaction with the business environment (e.g., Romanelli, 1991; Ilinitch et al., 1996; Lewin and Volberda, 1999). Building on this line of research, Zott and Amit (2007) proposed a measure for BM design and explored the direct BM design-performance link. Specifically, Zott's and Amit's work emphasized two BM design themes; novelty and efficiency. For the authors, a BM represents a structural template that captures the focal firm's transaction with external environment to create and capture value (Amit and Zott, 2001).

Recent developments in information and communication technologies, such as the creation and rapid expansion of the internet coupled with decrease in communication and computing costs, have facilitated the introduction of new ways to create and deliver value (Zott et al., 2011), which have offered new possibilities for the development of untraditional exchange mechanisms and transaction architectures (Amit and Zott, 2001) and gave raise to new alternatives for the design of new boundary-spanning organizational forms (Daft and Lewin, 1993; Dunbar and Starbuck, 2006). Undoubtedly, these developments have paved the ground for the design of BMs by allowing firms to transform the way they organize and participate in economic exchange, both within and across firm and industry boundaries (Mendelson, 2000). Brynjolfsson and Hitt (2005) point out that this includes the methods in which organizations collaborate with suppliers as well as with customers.

Design logic considers the BM a result of creating new organizational structures or changing existing structures to pursue a new opportunity. George and Bock (2011) carried out a systematic literature review and surveyed managers to study how they perceived the elements of a BM. The authors illustrate that there is a design logic behind how entrepreneurs and managers perceive and explain their BMs. Managers and entrepreneurs evaluate rationally existing and potential BMs to start new ventures and ensure their survival (Perlow et al., 2002). Slywotzky (1999) practitioner-oriented framework integrates BM and strategy and suggests that BM innovation is highly important for a firm's long-term performance. Other studies indicate that organizational performance is contingent on the degree of fit between strategy and BM (Zott and Amit, 2008) or BM consistency across international divisions or partners (Roberts and Senturia, 1996).

2.3.1 Novel Business Model

According to Schumpeter's (1934) value is derived from distinctive arrangement of recourses that lead to innovation. In his theory, the theory of economic development, Schumpeter identified several sources of value creation including introduction of new products or services, new methods of production, distribution, or marketing, or the tapping of new markets. Merriam and Webster online dictionary defines novelty as

"something that is new or unusual". In his seminal work Schumpeter's (1934) differentiates between "newness" and "novelty" where first leads to growth (a process of incremental change) and the later resulting in entrepreneurial development. Novelty was central to the author definition of entrepreneurship; it has also been used to describe how entrepreneurs develop new markets while at the same time destroy current market structures. Here, the emphasis was not on what is new to the firm rather than how novelty affect market or industry.

In this literature novelty is achieved through the discovery of new BMs; not products or technologies in an existing industry (Amit and Zott, 2012). Three advantages of pursuing BM innovation are identified in the literature including the ability to create value for customers at low cost, creation of sustainable competitive advantage, and finally innovative BMs can be provide firms with a powerful competitive tool (Amit and Zott, 2012). The existing literature indicates that factors such as high product development cost, shorter product life cycles, globalization, and the development of new communications and computing technologies are increasingly forcing firms to innovate their BMs to replace or complement product or process innovations (Chesbrough, 2007; Teece, 2010). Novelty in the BM provide potential for firms to achieve a huge success and become market drivers (Kumar and Scheer, 2000), such as in the cases of Dell, Amazon, Apple, Wal-Mart, and Southwest Airlines. Additionally, novel BMs provide potential for disrupting current industries or the creation of new markets (Markides, 2008).

2.4 Review of Literature on Business Models and Firm Performance

As discussed above there is growing interest among scholars to explore the performance implication of the BM concept. This study specifically focuses on three streams of literature: value creation and BMs, BMs and business performance, and the integration or separation decision of the new BM.

2.4.1 Business Models and Value Creation

In the last decade, the BM concept has become widely used by both strategy scholars and practitioners to clarify the logic of firms, in terms of how they conduct business, and how they create value for their stakeholders (Aspara *et al*., 2011). The internet economy has enabled firms to develop and test innovative forms of value creation schemes. Value in this context is network-centred as it results from interaction between the firm, its partners and customers. In consequence, this new notion of value seemed compelling to management researchers, who have used the concept of the BM to describe value creation mechanisms in networked markets (Zott and Amit, 2009).

In their seminal article "Value Creation in E-business," Amit and Zott (2001) have argued that value creation, specifically with the rise of e-business, cannot be explained by a single theory, and a cross-theoretical approach is required. The authors identified four interdependent value drivers in e-business: novelty, lock-in, complementarity, and efficiency. More recently, Zott and Amit (2013) clarified that while the BM "is anchored on the focal firm, it is market centric and designed so as to enable the focal firm not only to enhance total value for all business model participants but also to appropriate a share of the value created" (p.404). This view of the BM concept as a source of value creation and appropriation is widely echoed in the emergent BM literature (Casadesus-Masanell and Ricart, 2010; Osterwalder and Pigneur, 2010; Teece, 2010; Afuah, 2014).

Novel BMs can be a source of value. Hamel (2000) stressed that firms are required to continuously innovate themselves, and design new BMs for them to flourish in what he calls the "age of revolution". Zott and Amit (2009) suggested that BM innovation represents a new form of innovation, in addition to product and process innovation, and can be an alternative source of value creation, especially in times of economic change. However, for a firm to succeed, it is not only required to create value, it needs to capture some of the value resulting from the delivery of goods and services. Zott *et al*. (2011) point out that one key feature of new BMs is that both value creation and value capture take place in a value network, which can consist of suppliers, partners, distribution channels, and alliances that extend the firm's resources.

2.4.2 Business Models and Firm Performance

The existing research suggests that firms with novel BMs will be able attain sustainable competitive advantage and superior financial performance (Afuah and Tucci, 2001; Teece, 2010). However, efforts to capture BMs and assess their effect on firm outcomes tend to rely on qualitative methodologies, frequently involving one or few case studies, with little ability to generalize the results (Malone *et al.*, 2006; Zott and Amit, 2007).

Business models can play a central role in explaining firm performance. Afuah and Tucci (2001) argue that the BM-based advantage can positively affect business performance. The authors define BMs as "the method by which a firm builds and uses its resources to offer its customers better value and to make money in doing so" (2001, p. 3). The authors also point out that BM is about the value that a firm provides its customers, the segment of customers it targets to offer the value to, the scope of products or services it offers to which segment of customers, its sources of revenue, the prices it puts on the value offered its customers, the activities it must perform in offering that value, the resources and capabilities these activities rest on, what a company must do to sustain any advantages it has, and how well it can execute these elements of the BM. In a subsequent study, Afuah (2004) focuses on firms' profitability and conceptualizes the BM as "a firm's framework for making money". Based on this framework, a number of components were proposed to affect the firm's profitability, which includes resources, industry factors, activities, and position. By looking at the BM through the factors that determine the profitability of the firm, the author has implicitly established a causal relationship between the BM and the firm's performance.

The relationship between BMs and firm performance was the subject of numerous case studies (e.g., Kuivalainen et al., 2007; Mair and Schoen, 2007; Sosna et al., 2010; Desyllas and Sako, 2013). Case studies offer rich data on the BM a firm's uses to operate its business (Kshetri, 2007; Kuivalainen et al., 2007; Mair and Schoen, 2007; Dunford et al., 2010; Wu et al., 2010) and holds them as examples to be imitated

(Baden-Fuller and Morgan, 2010). These studies do not agree on what represents a firm's success and have proposed various criteria to measure financial performance, which includes revenue growth, profitability, market capitalization, and equity growth (Fisken and Rutherford, 2002; Glick, 2008; Rédis, 2009), as well as a range of non-financial measures including resilience in turbulent markets and the ability to provide social value stakeholders (Kshetri, 2007; Mair and Schoen, 2007).

Sosna et al. (2010) employs a dynamic perspective to examine BM innovation at large established firms using the case of Spanish dietary industry. The authors found that BM innovation has two distinct phases—exploration phase and exploitation phase. Trial-and-error learning is also found to be critical for BM innovation. Desyllas and Sako (2013) focused on the Pay As-You-Drive auto insurance to examine how an incumbent firm profits from BM innovation. Drawing on the profiting-from-innovation framework (Teece, 1986), they find that formal and strategic IP protection methods play complementary roles. Competitiveness in the long-run, however, relies on whether the innovator establishes a strong position in specialised complementary assets and is capable of reconfiguring them over time in response to changes in the business environment.

Aversa et al. (2015) investigate the BM configurations linked with high and low firm performance by carrying out a qualitative comparative analysis of firms competing in Formula One racing. The scholars adopts the conceptualization of Baden-Fuller and Mangematin (2013) which includes four constitutive elements of a business model: customer sensing, customer engagement, monetization, and value chain linkages. Customer sensing allow firms to identify customer groups and their needs. Customer engagement defines customer value proposition. Monetization reflects how firms capture portions of the value that they create, encompassing pricing and the mechanisms by which customers can be convinced to pay for the products or services that they consume. Finally, value chain linkages focus on the governance architecture of value creation and capture, defining the degrees of integration in a firm's relationships with its suppliers and other stakeholders. They found that configurations of two BMs—one focused on selling technology to competitors, the other one on developing and trading human resources with competitors—are associated with high performance. This is

facilitated by capability-enhancing complementarities, accelerating firms' learning and supporting the development of focused firms' capabilities.

While the above literature can be largely characterized as conceptual, Zott and Amit (2008, 2007) empirically examined the performance implications of BM design. In their 2007 paper "Business model design and the performance of entrepreneurial firms", the authors investigated the relationship between two BM design themes, efficiency and novelty, and the performance of the entrepreneurial firms, based on a sample of e-business firms that went public between 1996 and 2000. The value creation potential of the BM design and the firm's ability to capture that value can distinctly explain the nature of relationship between BM design and firm performance. The authors conclude, based on their empirical work, that the BM can be viewed as the independent variable, and that the BM and performance constructs are correlated, illustrating that this correlation robust across various business environments.

In their 2008 study, Zott and Amit emphasize the BM concept as a contingency variable that mediates the relationship between product market strategy and firm performance. They also suggest that firms can outperform competition through the creation of a sustainable competitive advantage which can be an outcome of superior product-market positioning, as well as the firm's BM. Both BM and product market strategies are found to be complements, rather than substitutes, and they argue that the firm's performance can be significantly improved when the BM interacts with product market strategy. Two main findings of their study are of importance in this context: 1) BMs that focus on novelty and are associated with either differentiation or cost leadership can positively influence the firm's performance, and 2) combining novelty-centred BMs with an early market entry strategy can positively influence performance.

For Zott and Amit (2010), the design of a BM can be characterized by design themes, which can be viewed as a specific configurations of the content, structure, and governance of activities. Viewed as an activity system, the BM includes what Afuah (2004) notes as 'the set of which activities a firm performs, how it performs them, and when it performs them.' An activity in a focal firm's BM can be viewed as the engagement of human, physical, and capital resources of any party to the BM to serve a specific purpose toward the fulfilment of the overall objectives (Zott and Amit,

2010).The activity system enables the firm, in collaborations with its partners, to create value and also capture a share of that value for itself (Zott and Amit, 2013). Understanding the context of interactions may be crucial in order to understand the sustainability of competitive advantage (Porter and Siggelkow, 2008).

In a similar vein, Patzelt et al. (2008) conducted another empirical study in which they employed the BM as a contingent variable that moderates the relationship between the top management team composition and firm performance (Patzelt et al., 2008, p. 1). Based on their analysis of a group of German biotechnology firms and limiting the discussion to two BM types that are highly related to the biotechnology industry, platform and therapeutics, they found: 1) founder-based firm specific management team members had a negative effect for therapeutics, and yet a positive effect for platform firms, and 2) the positive effect of experience in the pharmaceutical industry was higher for firms adopting therapeutics than for those adopting platform BMs.

Recently, Morris et al. (2013) carried out a study to examine the effect of BM design in firms' performance at the firm level of analysis. Their empirical research was conducted on the basis of a cross-sectional survey of firms in the Russian food service industry. Cluster analysis was performed on the data to develop groupings of common types of BMs. The result of their study indicates that firms operating in the same industry and employing different BMs had significant differences in performance. Unfortunately, neither the results from the cluster evaluations, measurement information nor the regression results are provided by the authors. In contrast, Camisón and Villar-LÓpez (2010) conducted an empirical study to test the difference in firm performance between BM clusters of Spanish industrial firms, and they reported no significant difference.

Focusing on BM innovation in low-income markets, Sanchez and Ricart (2010) explored the value-creation potential and strategies of isolated and interactive BM types, contending that interactive BMs provide a more sustainable competitive advantage than isolated business models due to the socio-economic value accruing to the community. Besides these studies linking BMs to financial success, a wide range of non-financial measures have been proposed as dependent variables, including the agility of open

source software (Feller et al., 2008), consumer expectations in the digital audio distribution industry (Arampatzis, 2004) and social value (Sanchez and Ricart, 2010).

The link between BMs and organizational performance has also been examined by a wide range of practitioners and consultants reports. For example, IBM's 2006 global CEO study interviewed 756 leaders from both private and public sectors world-wide. It was found that the competitive environment is pushing firms toward reinventing their BMs in order to remain competitive (IBM Global Business Services, 2006). Firms with superior performance are found to exert twice as much effort in BM innovation as compared with underperformers. The Economist Intelligence Unit conducted a study that involved surveying 4000 senior managers worldwide. The majority of respondents indicated that they prefer changing or re-inventing the firm's BM as a source of competitive advantage in comparison to new products or processes (Economist Intelligence Unit, 2005). Similarly, Linder and Cantrell (2001) interviewed 70 corporate executives to examine the role of the BM in a firm's successfulness. The results are consistent with those of other studies and suggest that successful firms always seek to identify and carefully implement an appropriate BM, and they also emphasize frequent change and updating of their current BM in response to competitive threats.

Furthermore, Innosight, a global strategy and innovation consultancy firm, carried out a study to analyse BM innovators. Innosight found that half of the twenty-six companies in the sample that were established in 1984, and entered the Fortune 500 between 1997 and 2007, did so through novel BMs (Johnson, 2010). This list included leading firms such as eBay, Starbucks, Google, and Qualcomm. Innosight's study also revealed that novel BMs can lead to the creation of new industries, the disruption of existing ones, and the redistribution of value among members in the value chain. In the airline industry, for instance, a significant portion of the market value is currently accounted for by airline firms who have employed the no-frills passenger model (i.e. Southwest Airlines in the U.S, EasyJet in Europe, and LAN Airlines in Latin America). Similarly, in the retail industry, new arrivals such as Target, Walmart, and Amazon are now dominating much more market share than traditional department stores.

In the strategy literature, the BM model is also used in the context of innovation, in particular, technological innovation. In this context, the BM is defined as "a coherent framework that takes technological characteristics and potentials as inputs and converts them through customers and markets into economic outputs. The business model is conceived as a focusing device that mediates between technology development and economic value creation" (Chesbrough and Rosenbloom, 2002, p. 352). Therefore, the concept can be essential for implementing and deploying technological innovations as it can help firms to capture and to create value for all stakeholders involved in the value chain (Chesbrough and Rosenbloom, 2002; Chesbrough, 2003). In addition, business models can also be used to map all supporting processes and defining relationships between members in the value chain (Chesbrough and Rosenbloom, 2002; Chesbrough, 2007).

Hence, in itself a BM represents an independent form of innovation, separate from product and process innovation (Zott and Amit, 2009). With the decrease in the importance of the digital economy and, consequently, a renewed focus on traditional firms, special attention is given to innovation and the restructuring of the incumbent firm –in the strategic sense, through the renewal of its current BM.

2.4.3 Separation or Integration Decision of the BM

The success of disruptive innovators such as EasyJet, Netflix and ING Direct in gaining market share has motivated established firms to respond by adopting new BMs alongside their traditional models (Markides and Oyon, 2010). However, a key challenge for established firms is running more than one BM at a time because the new model may compete with the exiting one. The new model may also require a new organizational culture, or it might focus on a new target segment formerly neglected by the firm (Osterwalder and Pigneur, 2002; Casadesus-Masanell and Tarziján, 2012). As a results, the integration or separation decision of the new BM has received a growing scholarly attention (Markides and Charitou, 2004; Andries and Debackere, 2007; Markides, 2008; Osterwalder and Pigneur, 2010; Casadesus-Masanell and Tarziján, 2012; Markides, 2013).

Regardless of this growing interest, scholars are still divided on the issue venture (e.g., Porter, 1980; Christensen, 1997; Christensen and Raynor, 2003). Various studies suggest that the new BM should be implemented as a separate. For instance, Porter (1980) argued that competing simultaneously with two distinct BMs is risky and may lead to a strategic failure. Similar argument is offered by Markides and Charitou (2004) who contend that incumbent firms that attempt to copy innovators' new BMs are in fact risking failure due to the huge conflict with their traditional BM. Christensen and Bower (1996) also argue that the success of established firms is highly linked to the creation of distinct business unit for the new BM that is physically separate from the traditional business. By separating existing and new models, managers can prevent the firm's existing processes and culture from stifling the new BM (Markides and Oyon, 2010). The new venture can develop its own strategy, culture, and processes without direct interference from the parent firm.

Yet, deciding to spin-off the new BM is not without limitation as the new independent venture may fail to exploit the knowledge and resources of the established firm (Andries and Debackere, 2007). To exploit synergies, some scholars proposed the establishment of separate units that are connected by various integrating mechanisms (Nickerson and Zenger, 2002; Siggelkow and Levinthal, 2003; Puranam *et al.*, 2006). Markides and Charitou (2004) stress that synergies must be exploited even when the new model is implemented as a separate venture. Separation or integration decision of the new BM also relies on the level of risk. The higher the level of risk that the new model will harm the operation of the established model in terms of brand image, earnings and legal liability, the higher the chances that the new model will be implemented as an independent venture (Markides, 2008; Osterwalder and Pigneur, 2010).

Generally, the above studies suggest that creating a new BM requires an incumbent firm to: (1) balance separation with integration (Markides and Charitou, 2004); (2) focus on separation or integration of specific activities rather an overall structural separation or integration (Markides and Oyon, 2010); (3) trigger virtuous cycles that enhance both value creation and value capture (Casadesus-Masanell and Ricart, 2011); (4) decide on complementarity or substitutability between old and new BMs (Casadesus-Masanell and Tarziján, 2012); and (5) use formal intellectual property rights

in the short term and develop specialized complementary assets in the long term to prevent competitive imitation (Desyllas and Sako, 2013).

2.4.4 Summary of Literature on BMs and Firm Performance

As illustrated above, research into BM and business strategy is centred on two key issues, namely: (1) the logic of value creation; and (2) the link between BM and firm performance. As firms' activities are central to strategy scholars, the various scholars that form this line of research, not surprisingly, also include the notions of activities or activity system in their conceptualization of the BM concept (See Zott and Amit, 2010). The findings of this stream of research indicate "increasing consensus that business model innovation is key to firm performance" (Zott *et al*., 2011, p.1033).

Overall, the above studies suggest that novel BMs are important for achieving sustainable competitive advantage and superior financial performance (Amit and Zott 2001). However, efforts to capture BMs and assess their effect on firms outcomes tend to rely on qualitative methodologies, mostly involving one or a few case studies, with little ability to generalize findings (Malone *et al.*, 2006; Zott and Amit, 2007; Morris *et al.*, 2013). Prior research has also focused on young firms operating in a single industry which might limit generalizations of results. Consequently, this calls for more empirical research that explores the antecedents of novel BMs in a wider range of industries and firm sizes.

2.5 Antecedents to Novel BM

Based on a review of relevant literature and theoretical conceptualizations, it is argued that among the key antecedents to novel BM are the constructs of market orientation (MO), entrepreneurial orientation (EO), and technological orientation (TO). This section briefly reviews the extant literature on these three orientations, but more attention has been given to their conceptualizations and their components.

2.5.1 Market orientation

MO has been conceptualized differently by various scholars (Kohli and Jaworski, 1990; Narver and Slater, 1990; Deshpandé et al., 1993; Day, 1994). However, two dominant perspectives of MO have received considerable attention in the literature, i.e. cultural and behavioural (Homburg and Pflesser, 2000). The cultural perspective considers MO as key aspect of organization culture that gives higher emphasises on the creation and maintenance of superior customer value (Narver and Slater, 1990). The behavioural perspective, an equally influential approach, regards MO as a specific set of behaviours which include: intelligence generation, intelligence dissemination, and responsiveness to market intelligence (Jaworski and Kohli, 1993). Regardless of the various interpretations of MO, it can be argued that they all have an operational emphasis on market information processing activities which relates to customers and competitors. More specifically, market oriented-firms emphasize processes of information generation, information dissemination, and wide-firm responsiveness to acquired intelligence.

As an aspect of organization culture, MO can be defined as a specific set of organizational values. Thus, market-oriented firms are most likely to exert considerable efforts to provide and maintain superior value to their customers (Narver and Slater, 1990; Slater and Narver, 1995). Accordingly, Narver and Slater (1990, p. 25) define MO as "the organization culture that most effectively and efficiently creates the necessary behaviours for the creation of superior value for buyers and, thus, continuous superior performance for the business". In their study, Narver and Slater point out that, MO is composed of three behavioural elements: customer orientation, competitor orientation, and interfunctional coordination. Customer orientation and competitor orientation incorporate activities that are focused on collecting information about firms' customers and competitors and distributing it to the relevant organizational units (Narver and Slater, 1990). Interfunctional coordination refers to the coordinated efforts between the marketing department and other business functions to create and maintain superior value for the customers (Narver and Slater, 1990).Therefore, a firm that aspires to offer superior value to its customers must have the ability and commitment to: (1) develop capabilities that support the acquisition of customer information and

coordination of their needs; (2) gather competitors intelligence; and (3) integrate employees within and across department which, consequently, leads to better firm performance (Kohli and Jaworski, 1990; Slater and Narver, 1994; Slater and Narver, 1995).

Kholi and Jaworski (1990), on the other hand, propose a behavioural perspective to MO. They conceptualize MO as the implementation of marketing concept. For them MO refers to "the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization wide responsiveness to it" (Kohli and Jaworski, 1990, p. 25). Market intelligence is a broader concept than customers' expressed needs, and preferences in that involves an analysis of external factors which influence those needs and preferences. Intelligence dissemination refers to communicating the market intelligence to relevant departments and individuals in the organization. Responsiveness refers to the action taken in response to intelligence that is generated and disseminated(Jaworski and Kohli, 1993).

The two approaches (i.e. cultural and behavioural) to MO are considered somewhat similar and complementary at the same time. Both approaches suggest that MO can be the source of competitive advantage as well as the driver of business performance. Both perspective also stress that marketing intelligence involves collecting information about customers and competitors which is a key aspect to the development of MO. Furthermore, cultural and behavioural perspectives emphasize the need for managers and employees to be engaged in creating and maintaining the market. MO construct is also conceptualized in both studies to comprise three equally components. Behavioural and cultural approaches, however, have significant differences. One salient difference is the emphasis on customers which tend to be more dominant on the paper of Kohli and Jaworski (1990). Narver and Slater (1990), on the other hand, focus on human role and view MO as an aspect of organization culture. They argue that specific set of value or beliefs will lead to specific customer or competitor-oriented behaviour throughout the organization which may enhance performance.

2.5.2 Entrepreneurial orientation

In recent years, numerous studies have attempted to systemically conceptualize EO (e.g., Lumpkin and Dess, 1996; Lyon et al., 2000; Covin et al., 2006). These studies have suggested a number of labels to describe firms with an orientation towards entrepreneurial activity which include: entrepreneurial orientation, style, intensity, proclivity, posture, propensity, and in some instances, corporate entrepreneurship (e.g., Zahra et al., 1999). This literature mostly characterize EO as a firm-level construct which refers to the propensity of firms' management to engage in innovative, proactive, and risk-taking behaviour (Miller, 1983; Covin and Slevin, 1989). EO also depicts a strategic predisposition that embraces entrepreneurial processes and behaviours (Covin and Slevin, 1989; Lumpkin and Dess, 1996).

The origins of EO research can be traced back to the work of Mintzberg (1973). In his study, Mintzberg identified three modes of strategy making which clearly reflects the underlying pattern of strategic decision-making processes: the entrepreneurial mode, aggressive proactive stance, and the adaptive or incremental mode. Of particular interest is the entrepreneurial mode which reflects managerial disposition characterized by an active search for new opportunities, risk taking, and adopting a rapid growth strategy. Similarly, Khandwalla (1976/1977) explored new managerial dispositions and introduced the concept of management style which is defined as "operating set of beliefs and norms about management held by the organization's key decision makers. . . that when translated into action, constitute the organization's strategy for survival and growth" (p. 22). For Khandwalla, an entrepreneurial management style can be conceived as a bold, risky, and aggressive style to decision making, compared to a more cautious, stability-oriented style.

The pioneering work of Mintzberg and Khandwalla has developed EO as a managerial disposition entrenched in decision making (Covin and Wales, 2012), this view has subsequently been adopted by a large number of research studies (e.g., Miller and Friesen, 1982; Covin and Slevin, 1989; Lumpkin and Dess, 1996). For instance, Covin and Slevin (1989, p. 77) suggest that "entrepreneurial firms are those in which top managers have entrepreneurial management styles, as evidenced by the firms' strategic decisions and operating management philosophy." Similarly, Lumpkin and Dess (2001,

p. 3) suggest that EO can be viewed as an "organizational-level phenomena involving key decisions made on behalf of the entire organization."

Miller and Friesen (1982) and Miller (1983) papers examined entrepreneurship at the firm-level, which consequently gave rise to a school of thought that manifest EO as a set of organization behaviours. Miller and Friesen (1982, p.5) postulate that entrepreneurial firms "innovate boldly and regularly while taking considerable risks in their product-market strategies." Similarly, Miller (1983, p. 771) propose a new dimension (i.e. 'proactivity') and suggest that an organization is entrepreneurial when it "engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch." Although the term EO was not used in the scholar's initial work, Miller (1983) considered EO as the simultaneous exhibition of risk taking, innovativeness, and proactiveness. Miller emphasizes that these factors must be all present and positively co-vary for EO to be manifested (i.e. based on this conceptualization, only organizations that show high levels in all three dimensions should be viewed as entrepreneurial).

Lumpkin and Dess (1996, p. 136) also define EO from firm-level perspective as "the processes, practices, and decision-making activities that lead to new entry." They also suggest that the key aim of entrepreneurship is the new-venture creation. In addition to three dimensions emphasized in prior research Lumpkin and Dess add two more dimensions to EO; autonomy and competitive aggressiveness. They suggest that innovativeness, risk taking, proactiveness, competitive aggressiveness, and autonomy a key dimensions of EO, and in contrast to Miller (1983) and Covin and Slevin (1989) they argue that these dimension can vary independently depending on the environmental and organizational conditions. Although Lumpkin and Dess argue that all five dimensions are pivotal in conceiving the entrepreneurial process, they do not require entrepreneurial firms to emphasize a single dimension or a set of dimensions.

As EO research has continued to grow, so have the alternatives for measuring the construct. While the original studies of Miller (1983) and Covin & Slevin (1989) provided the foundations for the scales, different variations of the scales are being used (Rauch et al., 2009). In particular, some studies considers EO as consisting of alternative or additional dimensions such as futurity and/or competitive aggressiveness,

both taken from Venkatraman (1989). For example, Tan and Litsschert (1994) build on the work of Venkatraman (1989) and defines EO as consisting of five key dimensions, namely: futurity, proactiveness, analysis, defensiveness and risk taking. Futurity reflects the 'desired future', and the process through which a firm plans to reach the desired state (Andrews, 1971), proactiveness reflects proactive behaviour in relation to engaging with emerging industries, continuous search for market opportunities and experimentation with potential responses to changing environmental trends (Miles and Snow, 1978; Venkatraman, 1989); analysis which refers to the trait of overall problem solving posture (Miller and Friesen, 1984), defensiveness reflects defensive behaviour (Miles and Snow, 1978), and signifies more emphasis on cost reduction and efficiency seeking methods, finally riskiness captures the extent of riskiness reflected in various resource allocation decisions as well as choice of products and markets (Venkatraman, 1989).

In short, it can be argued that extant literature has conceptualized EO as either domain-focused, i.e. it defines where to look for EO (Lumpkin and Dess, 1996), or phenomenon-focused that specifies what EO looks like Miller (1983). While, there are less agreement on the definitions and components of EO, most scholars agree that EO relates to how a new venture enterprise is undertaken and entrepreneurship is perceived as entrepreneurial decision about what business a firm shall enters. Scholars have also been able successfully differentiate between uni-dimensional perspective of EO, linked mostly to the work of Miller (1983) and Covin and Slevin (1989) and the multidimensional perspective of EO linked mostly to the work Lumpkin and Dess (Lumpkin and Dess, 1996).

2.5.3 Technology orientation

Technology-oriented represents a firm’s desire to introduce new ideas, products or processes (Damanpour, 1991; Gatignon and Xuereb, 1997; Hult and Ketchen, 2001). Gatignon and Xuereb (1997) have formally conceptualized TO as a firm’s "...ability and will to acquire substantial technological background and use it in the development of new products”. Technology orientation also means that the company can use its technical knowledge to build a new technical solution to answer and meet new needs of the users” (p. 78). Thus, technology-oriented firms tend to show high commitment to

R&D, and they are considered proactive in terms of acquiring and merging complex technologies in the new product development process (Zhou et al., 2005; Slater et al., 2007). Firms with high level of technology-orientation also encourage openness and exploitation of novel technologies.

Prior literature has linked firms' long term success and the creation of superior customer value to high investment in new innovations, advanced technologies, products and services, and production processes (Hamel and Prahalad, 1991; Gatignon and Xuereb, 1997; Grinstein, 2008).TO has been also linked with the development of positional advantage which may play a key role on the sustainability of an organization. For example, Jeong et al. (2006) argue technology-oriented firms' tend to develop capabilities that facilitate the creation of positional advantage through the advancement and use of novel technologies that are difficult to imitate by rival firms. Hamel and Prahalad (1991) highlight the limitation of customer orientation and suggest that customers might not be able to articulate their latent needs; as a result, the development or adoption of new technologies can help firms achieve differentiation or cost advantage strategies (Gatignon and Xuereb, 1997). Christensen and Bower (1996) argue that in times of disruptive change, value will likely result from the development and use of novel technologies since they ensure the sustainability of the organization.

Organization learning scholars emphasize two types of TO: exploitation and exploration. Technology orientation within organizations (i.e., exploitation strategy) captures things such as refinement, choice, production, efficiency, selection, implementation, and execution (March, 1991), which are considered key to information system resource development. It emphasizes the use or modification of existing knowledge and technologies so that current operations are performed with high level of excellence (Levinthal and March, 1993). Exploitation is most likely to encourage incremental technological innovation which builds upon existing organizational knowledge and provide solution to current rather than latent needs of customers (March, 1991; Auh and Menguc, 2005; Gupta et al., 2006).

Technology exploration, on the other hand, reflects the explorative capability of the organisation. Prior research suggests that information technologies can be viewed as resources which are developed through interaction with external innovation partners

(Turnbull et al., 1996). Turnbull et al. (1996) differentiate product and process technologies where product technologies supports firms capabilities to design new products and services, while the later reflects a firm's ability to manufacture these product and services. Technological explorations allow firms to capture resources through activities characterized by search, variation, risk taking, experimentation, play, flexibility, discovery, and innovation (March, 1991). Katila and Ahuja (2002) argue that exploration is crucial for the creation of new knowledge, which leads to radical product innovation. This view is shared by Zhou et al. (2005, p.46) who states that "technology-oriented firm tolerates and often encourages employees with "crazy ideas" or an instinctive interest in inventing something drastically new".

2.6 Theoretical Roots of the Business Model Concept

The BM concept has been influenced by various research disciplines, e.g. e-business, strategy, and entrepreneurship. Although the concept has been particularly popular within research within e-business research (Hedman and Kalling, 2003), it has recently become widely used within strategy and entrepreneurship research. According to Loukis and Tavlaki (2005), the definitions of the BM concept converge towards the approach that the BM is linked to few managerial perceptions. For the authors, although the BM captures some of the main elements of a business-plan, it does not include a number of start-up and operational issues that transcend the model. Moreover, it is not viewed as a strategy although it incorporates various strategic elements.

For Amit and Zott (2001), BM as a source of value creation builds upon several theories including those from business strategy and entrepreneurship. Specifically, it builds upon theoretical views derived from the value chain model (Porter and Millar, 1985), the theory of economic development (Schumpeter, 1934), the strategic network theory (Dyer and Singh, 1998) and transactions costs economics (Williamson, 1975). Additionally, according to Amit and Zott (2001), since the BM perspective takes into consideration the ways in which resources can be valuable, difficult to imitate, less transferable, less substitutable, and more productive with use, it therefore builds on the resource-based view of the firm (e.g. Wernerfelt 1984; Barney, 1991). In consequence, the BM concept is defined as a "unifying unit of analysis that captures value arising

from multiple sources" (Amit and Zott, 2001, p.494). Based on the above argument, it appears that BM research incorporates the entire business process characteristics associated with both internal operational processes and external strategic partnership relations.

2.6.1 Theoretical Lens Adopted in this Study

To support these theoretical arguments, this study builds on the resource-based view (RBV) of the firm. The origins of RVB can be traced back to the work of Penrose (1959) and it was established as a theory by both Wernerfelt (1984) and Barney (1991). RBV logic as discussed by Barney's (1991) publication provides a strong basis for other scholars to build on. Consequently, the theoretical underpinnings of RBV were reinforced by later key contributions, including those of Conner (1991), Mahoney and Pandian (1992), Conner and Prahalad (1996), and (Makadok, 2001). Previous studies have positioned RBV with regard to various other research disciplines. Amit and Schoemaker (1993) offered a more practical approach, specifically in regard to the definition of resources and capabilities.

The RVB works under the supposition that the resources required to formulate, select, and implement strategies are heterogeneous within the industry and it assumes that these firms' differences do not change over time (Barney, 1991). Based on these assumptions, RBV scholars postulate that (1) competitive advantage can be attained by owning and exploiting resources and capabilities that are both valuable and rare, and (2) to sustain this advantage, the resources and capabilities owned and controlled by a firm must be both inimitable and non-substitutable and, consequently, gain such advantages that will enable firms to achieve better performance outcomes in both the short- and long-run (Amit and Schoemaker, 1993; Barney, 1991, 1997; Eisenhardt and Martin, 2000; Henderson and Cockburn, 1994; Powell, 2001; Teece, Pisano, and Shuen,1997). If an established firm has valuable resources, it can benefit its customers by satisfying their needs, and yet if competitors in the industry have the same resource, customers can move to them to maximize their value, limiting the focal firm's ability to generate money. Rare resources indicate fewer competitors in the market and, consequently, customers are more likely to be loyal to the few owners of the resource, enhancing each

owner's odds of generating money. If the resource is easy to imitate and substitute, competing firms can copy any customer benefits arising from the focal firm, diminishing any competitive advantages that the owner of the resource may have had. Accordingly, firms that own and control more valuable, rare, inimitable, and non-substitutable resources are more likely to create and make sustainable profits (Barney, 1991; Barney and Clark, 2007; Barney, 2011).

Resources are more likely to sustain competitive imitation when protected by an isolating mechanism (Rumelt, 1984), time-compressions diseconomies, unique historical conditions, embeddedness, and causal ambiguity (Dierickx and Cool, 1989; Barney, 1991; Peteraf, 1993). The resources and capabilities that a firm owns and controls 'are valuable if, and only if, they reduce a firm's costs or increase its revenues compared to what would have been the case if the firm did not possess those resources' (Barney, 1997, p. 147).

The RBV literature classifies resources into either assets or capabilities (Day, 1994; Hunt and Morgan, 1995). Assets are tangible or intangible resources (e.g. copyrights, patents, trademarks, knowledge) that firms own and control. Capabilities, on the other hand, are frequently defined as a "complex bundles of skills and accumulated knowledge, exercised through organizational processes, that enable firms to coordinate activities and make use of their asset*"* (Day, 1994). These skills are considered fundamental to the novelty of products and services as well as to a firm's BM. Unlike assets, capabilities are difficult to quantify financially, and they include skills that are rooted in organizational routines and practices (Barney, 1991; Day, 1994). Amit and Schoemaker (1993) differentiate between resources and capabilities. For them, resources refers *"*to the stocks of available factors that are owned or controlled by the firm" (Amit and Schoemaker, 1993, p. 35) and are considered tradable and non-specific to the firm, while capabilities are considered non-tradable and firm-specific, and defined in terms of a firm's ability to deploy its resources.

Since the early developments of the RBV, various scholars (e.g., Nelson and Winter, 1982; Teece *et al.*, 1997) have introduced several labels to describe resources owned

and controlled by the firm. For instance, Teece *et al.* (1997) labeled one type of firm resources 'dynamic capabilities', to show how companies exploit new capabilities to attain sustainable competitive advantage. Other scholars have also employed the term 'routine' to refer to resources. This work has been essential for clarifying the connection between RBV and the evolutionary theory of the firm (Nelson and Winter, 1982).

In defence of RBV, Barney and Clark (2007, p. 249) argue that "changing the label of the independent variable of a theory does not change the central assumptions and assertions of that theory." The authors also claim that what makes resources create a long-lasting competitive advantage is extremely similar to what makes capabilities, dynamic capabilities, and routines create a sustained competitive advantage. Hence, resource-based view is not really about ownership or control of resources, in itself, but about how these resources will be organized and exploited, and the attributes that these resources must relish if they are to be a source of sustained competitive advantage (Barney and Clark, 2007; Barney *et al.*, 2011). Thus, unless the new labels change the nature of the logic that relates a firm's resources and capabilities with sustained competitive advantage, they are unlikely to be considered theories, but rather, a specific case of a more general theory (Barney and Clark, 2007; Barney, 2011).

Based on the above discussion, RBV is considered a rational choice for the current study for various reasons. First, RBV is one of the most highly acknowledged and cited theories in the extant strategic orientation and BM research (Amit and Zott, 2001; Hult and Ketchen, 2001; Özsomer and Gençtürk, 2003; Hult *et al.*, 2005; Ketchen *et al.*, 2007; Zhou *et al.*, 2008; Afuah, 2013). In fact, Barney *et al.* (2011) argue that in the last two decades RBV "has evolved from a nascent, upstart perspective to one of the most prominent and powerful theories for understanding organizations" (p.1299). Second, various scholars are currently using the term resource-based theory rather than resource-based view (Barney *et al.*, 2011) suggesting that resource-based research has progressed and reached higher levels of precisions and sophistication. Third, while previous BM research has utilized various theories for framework development, in the current study it is argued that using a well-established theory provides a better understanding of the

phenomenon under investigation, as it also allows for a comparison across research projects and an integration of research findings.

The BM concept has been linked in the literature to the competitive strategy by which firms pursuing innovating activities gain and maintain an advantage over their competitors. From a resource-based perspective (Wernerfelt, 1984; Barney, 1986; Barney, 1991; Peteraf, 1993), the development of strategic assets (Amit and Zott, 2001) plays a prominent role in acquiring and maintaining such advantages. Hence, RBV theory assumes that value can be created through the provision of services enabled by the firm's unique bundle of resources and capabilities (Amit and Zott, 2001).

The incorporation of knowledge and dynamic capabilities into RBV has indeed laid the ground for a higher linkage between BM and RVB. Previous research suggests that virtual organization as a new BM has been enabled by the leveraging of both traditional and knowledge assets (Venkatraman and Henderson, 1998). Boulton and Libert (2000) argue that the "new economy" firms are credited for their success to create above-normal value by taking advantage of intangible assets. Hamel (2000) argues the urgent need for firms to acquire resources in parallel with the implementation of their BM. Mangematin *et al*. (2003) propose a BM typology in the context of the French biotech industry focusing on financial, human, and social capital resources. Other scholars have also defined the BM from a dynamic capability perspective; for instance, (Eden and Ackermann, 2000) define the BM as the dynamic capability that links the firm's core competences to the organization's aspirations and outcomes.

2.6.2 Contingency Theory

A wide range of research studies have emphasized the role of fit or match between strategy and environment in determining organizational performance (e.g., Miles and Snow, 1978; Porter, 1980; Snow and Hrebiniak, 1980; Miller, 1988; Jangwoo and Miller, 1996). According to Porter (1996, p. 73) "strategic fit among many activities is fundamental not only to competitive advantage but also to the sustainability of that advantage. It is harder for a rival to match an array of interlocked activities than it is merely to imitate a particular sales-force approach, match a process technology, or

replicate a set of product features." Venkatraman and Camukkus (1984) argue that the concept fit has been central for developing middle range theories in various academic disciplines, and more specifically in organizational theory and strategic management fields. Prior literature has linked the theoretical roots of the fit concept to population ecology and contingency theory (Van de Ven, 1979).

Contingency theory claims that there is no best strategy that fits all organizations and suggests that the optimal choice of strategy variables changes in accordance with certain factors, called contingency factors. Consequently, strategic management scholars have investigated a large number of contingency factors, such as technology (Dowling and McGee, 1994), organization structure (Miller, 1988), marketing choices (Claycomb *et al.*, 2000), and some environmental characteristics, and they have examined the mechanism by which these and other contingency factors connect with strategy variables to define business performance.

2.7 Gaps in Business Model Research

Although a growing number of research studies have been devoted to exploring BMs over the last decade, these studies tend to suffer from a number of shortcomings. First, the concept of BM lacks a coherent theoretical base and as noted by George and Bock (2011, p. 84) "The lack of a convergent, well-defined theoretical construct has led to inconsistent empirical findings in its effect on firm performance and organizational change". In attempting to explain various parts of a proposed framework, scholars (e.g., Amit and Zott, 2001) have combined multiple theories to explain each portion of their framework. Second, while few studies have emphasized the importance of BM design, so far the key antecedent drivers of novel BM design have received limited attention in the literature. Third, the majority of work on BMs has failed to examine the impact of integration or separation of the BM on firm performance. Fourth, the majority of BM research can be described largely conceptual and, consequently, empirical quantitative research is required. Finally, most of MB studies have focused on a single industry and young entrepreneurial firms which may limit generalization. The sections that follow elaborate on each of these shortcomings.

Gap 1: Theoretical bases of existing business model frameworks

The theories and concepts employed to develop the BM concept include as an example, Resource Based View (RBV), creative destruction, agency theory, value chain, network theory, transaction cost economics, and dynamic capabilities (Amit and Zott, 2001; Afuah, 2004; Bonaccorsi et al., 2006; Andries and Debackere, 2007; Afuah, 2013; Morris et al., 2013). The rationale for exploiting multiple theories for framework development is that one theory cannot describe the BM (Amit and Zott, 2001). Consequently, scholars rely on multiple theories and concepts to explain how specific aspects of the model or types of BM perform. For instance, Morris *et al.* (2006) used creative destruction to explain why an organization benefits from a novel BM and strategic network theory is used as a basis for a type of BM that integrates complementary goods that provide additional value when considered together (Amit and Zott, 2001).

In this study, it is argued that using a single and consistent theoretical foundation offer better chances to learn more about the BM concept. This study acknowledges that researchers often use multiple theories to reach better understanding of complex phenomena. However, problems may arise from using multiple theories. As highlighted in the literature, a theory has a specific purpose and is developed with bounded criteria leading to specific implications (Donaldson and Preston, 1995). It can be viewed as a matter of context and "a mismatch between theory and context results in false leads and inconclusive results" (Zahra, 2007, p. 445). The use of a single theory, with appropriate consideration of assumptions and context, allows comparison across research projects and an integration of findings (Brannon, 2011).

The resource-based view of the firm is considered one of the most widely acknowledged theoretical perspectives in the strategic management literature (Newbert, 2007). Accordingly, the RBV has become a principal theory upon which arguments in

academic journals have been grounded (Barney *et al.*, 2001; Newbert, 2007). Therefore, the proposed research grounds the concept in established theory. The current study explores the relationships between a firm's internal resources and capabilities with novel BMs and how such novelty affectbusiness performance. The use of the RBV in this research helped the researcher explain the link between strategic orientation and novel BM-based advantage as well the value creation potential of the BM.

Gap 2: Antecedents of Novel BMs

Previous BM research has emphasized the relationship between BMs and successful technology exploitation (e.g., Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Gambardella and McGahan, 2010). New technologies can operate more successfully if they are commercialized using different BMs (Chesbrough and Rosenbloom, 2002). Other studies have focused on the link between different BM types and business performance of entrepreneurial firms (e.g., Amit and Zott, 2001; Zott and Amit, 2007). Recent work on business model innovation draws from ambidexterity literature to create a theoretical foundation for those firms who choose to compete simultaneously with two BMs (Markides, 2013).

The studies mentioned above show that research on BM has become increasingly important in recent years, and yet there is still a growing need for continued research on this subject. Particularly, previous research has mainly been focused on entrepreneurial firms and their types of BMs. The antecedents of novel BM have received limited scholarly attention. This could be explained by the complexity of the concept and the vast amount of information needed for testing and evaluating a full BM. One exception is Sosna *et al.* (2010), a work which relies on a case study example. A step in this direction is the paper of Casadesus-Masanell and Zhu (2013), which focused on a specific type of BM innovation, especially sponsor-based BM; however, this paper remains theoretical in nature and does not take into consideration the antecedents of novel BM design from the start. Zott and Amit (2007; 2008) have examined the link between various BM designs and business performance, but they do not offer any discussion in regard to the antecedents of the four proposed BM design themes.

While reaching consensus on the definition and components of the BM concept is important to advance the study of BMs, it is argued in this thesis that the questions of what are the antecedents of novel BM design is just as important for both scholars and practitioners. Considering the antecedents of novel BM design allows researcher to better understand the relationships between BM design and business performance. Additionally, it will enable business managers and entrepreneurs to fully understand the logic of the firm and thereby strengthen overall value proposition to each stakeholder.

Gap 3: The in/independence of the new BM

Prior research investigated numerous aspects of BM innovation including when (Markides and Oyon, 2010), what (Johnson *et al.*, 2008; Sosna *et al.*, 2010; Amit and Zott, 2012), and how (Markides and Charitou, 2004; Markides and Oyon, 2010; Casadesus-Masanell and Ricart, 2011; Desyllas and Sako, 2013) an incumbent firm would add and operate a new BM together with an existing one to attain better performance outcomes. However, these studies have emphasised the creation of new BMs for young entrepreneurial firms (Amit and Zott, 2001; Zott and Amit, 2007), and limited empirical research have attempted to explore the performance implications of the in/dependence decision (Markides, 2008). Prior research also lacks consensus in regard to this issue. While many scholars suggest that the new BM should be implemented as a separate venture (e.g., Porter, 1980; Christensen, 1997; Christensen and Raynor, 2003), other stress that spinning-off the new BM is risky as the new independent venture may fail to exploit the knowledge and resources of the established firm (Andries and Debackere, 2007). Accordingly, this study attempts to add to this ongoing discussion about the strategic benefits of separation or integration of the new BM and their performance implications.

Gap 4: The link between novel BM and firm performance

Much of the current literature on the performance implications of BMs suggests that BMs have properties that can translate into sustainable competitive advantage and better business performance (Amit and Zott, 2001; Teece, 2010). Many studies on BMS have emphasized the investigation of specific cases, explaining a firm's competitive

advantages by the nature of its unique BM such as eBay, Dell, and Southwest Airlines (Magretta, 2002; Morris *et al.*, 2005). However, these studies tend to examine models at the level of a specific firm, which makes it difficult to generalize the results obtained. A few studies have proposed generic taxonomies for BMs and established the presence of a link between the separate types and the indicators of firm performance (Malone *et al.*, 2006; Zott and Amit, 2007). Yet, cross-sectional studies linking novel BMs to performance are notably lacking. Yet, attempts to capture BMs and assess their effect on firm outcomes tend to rely on qualitative methodologies, typically involving one or a few case studies, with little ability to generalize results (Malone et al. 2006; Zott and Amit 2007). Conceptual and qualitative research is considered to be important for building basic knowledge about the BM concept. However, as the research advances, more quantitative studies are required where proposed theories can be formally tested (George and Bock, 2011). Demonstrating how this shortcoming in the research can be addressed is our primary purpose in the current study.

Gap 5: Context of Existing Business Model Research

The last gap deals with the context of BM research which has been focused on young entrepreneurial firms operating on a single industry or a group of related industries. While such research is valuable and interesting, researches findings can only be generalized to limited context. More research is, thus, required on the antecedents and consequences of a novel BM across a wide of industries a firm sizes. There are exceptions, including the empirical study by Morris *et al.* (2013), which was focused on the food sector. However, this study is based on case study examples.

2.8 Research Objectives and Questions

The purpose of this research is to identify the key antecedents of novel BMs design and to examine the impact of the novelty in the model on business performance. Taking into consideration the above mentioned research gaps and to advance discussion concerning the BM, as well as establishing the theoretical grounds for the BM concept, the study will attempt to answer the following questions:

1) What are the key antecedents of novel BM design?
2) What effect does novel BM have on business performance?
3) Does the linkage between novel BM and business performance depend on the environmental context and in/dependence of the new B

2.9 Chapter Summary

In the introduction part of this chapter, it has been identified that the academic interest in the BM has been growing, especially after the year 2000. In addition, the historical context of the BM has been discussed. Early scholars have centred their work toward defining the concept, clarifying its meaning, and listing its main components. With the increasing number of BMs, specifically since the proliferation of the internet, authors have shifted their attention toward identifying BM archetypes and taxonomies. In the second part of this chapter, the antecedents and consequences of a novel BM concept were summarized. Finally, research gaps, objectives and questions were identified.

Chapter 3. Conceptual Framework and Hypothesis Development

3.1 Introduction to Chapter Three

This chapter develops the conceptual model to support the key objective of the research, which is to identify the main internal antecedents to novelty-centred BM, and the nature and impact of BM novelty on business performance. The chapter starts by providing a brief overview of the conceptual model. The main theory underlying the model is RBV and contingency theory (Venkatraman and Camillus, 1984; Wernerfelt, 1984; Van de Ven and Drazin, 1985; Barney, 1991). The last section develops the study's hypotheses, which are subsequently tested based on data collected from the UK's manufacturing and service firms.

3.2 Overview of the Conceptual Model

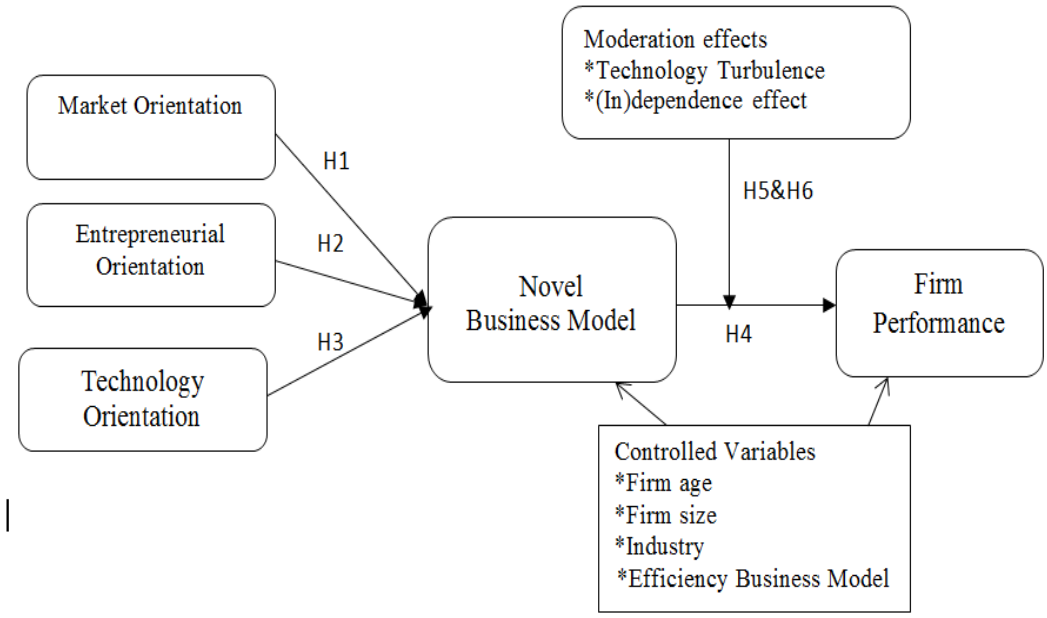
Prior empirical research has emphasized on a potential direct positive relationship between various strategic orientations and performance (e.g., Miller and Friesen, 1982; Covin and Slevin, 1986; Deshpandé and Farley, 1998; Matsuno and Mentzer, 2000). Various studies propose that such relationship should be examined on a broader framework (Day, 1994; Slater and Narver, 1998; Slater and Narver, 1999; Connor, 2007). These studies suggest that a firm's capabilities can lead to competitive advantage based upon innovative offerings. This study suggests that superior performance is achieved not only by a firm's focus on various orientations, but also by the BM-based advantage in novelty. The conceptual and empirical literature shows not only that firms can sustain their advantage through the introduction of new products or technology, but can also do so through innovations in their BMs (e.g., Markides, 2008; Amit and Zott, 2012; Casadesus-Masanell and Zhu, 2013).

This study perceives antecedents as influencing factors for changing or transformation a BM. Some scholars in the general BM field have started to conceptually think about antecedents for BM design (Zott and Amit, 2013). Other studies have proposed specific antecedents such as the use of templates (Chesbrough, 2010), environmental constraints on stakeholder activities (Sanchez and Ricart, 2010), and the importance of value creation and appropriation goals (Teece, 2010). Yet, these antecedents are frequently

discussed in isolated fashion. Most importantly, the link between these factors and the mechanisms by which the impact novel BM design is either missing or underdeveloped. For instance, Sanchez and Ricart (2010) argue that constraints could either hinder or facilitate novel BM design.

Figure 3.1 illustrates the study's theoretical model. Building in the RBV of the firm, the first part of the model establishes the relationship between three strategic orientations (i.e. market orientation, entrepreneurial orientation, technological orientation) and novel BM. The second part of the model then examines the link between novel BM and business performance. Environment is considered a key moderator of the posited relationship between novel BMs and business performance (Zott and Amit, 2007). Consequently, to account for external contingences, this study takes into consideration the effect of technological turbulence. More specifically, this study examines the role of "fit" in explaining the novel BM performance relationship, that is, the extent to which the relationship of BM to performance is contingent on business environment. While many studies have shed light on the importance of integration or separation of the new BM from the physical boundaries of the incumbent firms, limited work has examined the moderation effect of integration or separation decision on the novel BM-performance relationship.

Figure 3.1: Research Model with Hypotheses



3.2.1 Definition of Variables

The Strategic Orientation of the Firm

One of the most significant current discussions in strategy, marketing, and entrepreneurship literature relates to a firm's strategic orientation (Hakala, 2011). Various scholars argue that a firm's strategic orientation reflects the principles that guide and influence firms activities, and that this then generates behaviours that facilitate the creation of a viable and high performing business (Day, 1994; Gatignon and Xuereb, 1997; Han *et al.*, 1998). These behaviours are closely linked to the generation and dissemination of information (Diamantopoulos and Hart, 1993; Gatignon and Xuereb, 1997; Han *et al.*, 1998). Since this information is most likely to be transformed into knowledge, a number of studies have linked strategic orientations to learning behaviours and, thus, to innovation capabilities (Slater and Narver, 1995; Noble *et al.*, 2002; Atuahene-Gima *et al.*, 2005; Baker and Sinkula, 2007).

Various strategic orientations that are linked to the creation of competitive advantage and the long term success of the firm beyond market orientation were discussed in the

strategic management and marketing literatures (e.g., Covin and Slevin, 1989; Gatignon and Xuereb, 1997; Sinkula *et al.*, 1997; Wiklund, 1999; Hult *et al.*, 2004; Wiklund and Shepherd, 2005; Zhou *et al.*, 2005). The following is a brief discussion of the orientations used in our model.

Market orientation: the current study adopts the cultural perspective of Market Orientation (MO), which views the concept as a key aspect of organizational culture that gives greater emphasis to the creation and maintenance of superior customer value (Han *et al.*, 1998). Narver and Slater (1990, p. 25) officially define MO as "the organization culture that most effectively and efficiently creates the necessary behaviours for the creation of superior value for buyers and, thus, continuous superior performance for the business".

Entrepreneurial orientation: This study accordingly employed Lumpkin and Dess's (1996) definition of EO. For them, EO is defined from a strategy process perspective as "the methods, practices, and decision-making styles that managers use" (p.136). Consequently, EO may be considered as the entrepreneurial strategy-making processes that key business leaders employ to enact their firms' organizational purpose, sustain its vision, and develop competitive advantage (Rauch *et al.*, 2009).

Technological orientation: TO represents a firm's desire to introduce new ideas, products or processes (Damanpour, 1991; Gatignon and Xuereb, 1997; Hult and Ketchen, 2001). This study adopts the definition of Gatignon and Xuereb (1997) who formally conceptualized TO as a firm's "...ability and will to acquire substantial technological background and use it in the development of new products".

Dependent Variables

There are two dependent variables in this study: novelty-centred BM and SBU performance.

Novel business model: novel BM in this thesis refers to new methods of conducting business exchanges among various participants. While firms can frequently innovate through the introduction of new products and services, Amit and Zoot (2001) found that

firms can also innovate in the way they conduct business or in what they call "the structure of the transaction". Firms with novel BMs will be able to create, deliver, and capture value in unique ways compared to other rivals. This can be done, for instance, through linking value chain members in a novel way, introducing innovative transaction methods which may eliminate inefficiencies in the buying and selling processes, identifying unexpressed customer needs, and even through the development of completely new markets (Amit and Zott, 2001).

Performance: In line with previous strategy research, the study defined business performance by employing various subjective and objective indicators that assess a firm's profitability and its' market growth (e.g., Powell, 1992; Slater and Olson, 2000; Newbert, 2008). The subjective measures were designed to measure a firm's sales growth, market share, profitability, and overall financial performance. The respondents were asked to provide objective measures of performance (i.e. business unit's operating profits, total assets, and total equity). However, as many of the firms in my sample are privately held, the respondents were reluctant to reveal their firms' objective financial data.

Moderating Variable

Previous BM research has emphasized environment as a key contingency variable in the BM performance link (Zott and Amit, 2007). This study focuses on one environmental factor, i.e. technological turbulence, which refers to the level of technological change (Jaworski and Kohli, 1993).

Control Variables

Control variables were collected for items that may influence the performance of the firms in the study sample. Since the firms in the study sample are different in terms of their size and industry they operate in, it became critical to control for firm size and industry. Accordingly, and in line with prior BM and strategy research this study controlled for firm size, firm age, industry (i.e. manufacturing and service), and the efficiency of the BM, which refers to the measures that firms may implement to realise transaction efficiency (Zott and Amit, 2007).

3.3 Theoretical Framework and Hypotheses Development

In examining the model, this study adopts the RBV of the firm as its theoretical foundation. RBV is considered a dominant theoretical framework in strategic management for explaining how competitive advantage can be created and sustained over time (Penrose, 1959; Wernerfelt, 1984; Prahalad and Hamel, 1990; Barney, 1991; Teece *et al.*, 1997; Eisenhardt and Martin, 2000). Specifically, RBV considers firms as a bundle of resources that are heterogeneously distributed among firms, and that these differences are stable over time (Wernerfelt, 1984; Amit and Schoemaker, 1993; Pelham and Wilson, 1995). Firm resources include both assets and capabilities (Zhou *et al.*, 2008). Assets can be observed and valued and include, as an example, spatial preemption, brand equity, and patents (Hult and Ketchen, 2001). However, capabilities are hard to observe and quantify and represent "the glue that brings the assets together and deploys them advantageously, such as Wal-Mart's docking system or Dell's logistics system" (Zhou *et al.*, 2008, p. 987). Accordingly, various studies posited that when firms own and control the so called VIRN resources (i.e., valuable, rare, inimitable, and nonsubstitutable), they will be able to create sustainable competitive advantage by implementing novel strategies for value creation that are hard to duplicate by rival firms (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Eisenhardt and Martin, 2000).

In line with Zhou *et al.* (2005) and Hult and Ketchen (2001) a firm's strategic orientation is viewed in this study as an important resource or capability, and it represents the principles that guide and influence firms activities and generate behaviours that facilitate the creation of viable and high performing business (Narver and Slater, 1990; Day, 1994; Gatignon and Xuereb, 1997). These behaviours are highly linked to the generation and dissemination of information (Narver and Slater, 1990; Jaworski and Kohli, 1993; Gatignon and Xuereb, 1997). Since this information are most likely to be transformed into knowledge, various scholars have linked strategic orientations to learning behaviours and, thus, to innovation capabilities (Slater and

Narver, 1995; Noble *et al.*, 2002; Atuahene-Gima *et al.*, 2005; Baker and Sinkula, 2007).

3.3.1 Market Orientation and Novel BMs

A wide range of literature suggests that MO's key objective is to provide superior customer value based on the knowledge acquired from customers and competitors and the process by which this knowledge is accumulated and widely shared across the entire organization (e.g., Felton, 1959; Slater and Narver, 1995; Han *et al.*, 1998; Slater and Narver, 1998). Jaworski and Kholi (1993) highlight the marketing information processing view of MO and argue that all organizational efforts must be directed toward the acquisitions, dissemination, and quick response to market intelligence, more specifically to information acquired from a firm's current and potential customers and competitors. Narver and Slater (1999) contend that market-oriented firms not only focus on current customer needs (i.e. customer-led) but show high commitment to understanding current and latent needs for both existing and potential customers. Slater and Narver (1998), p. 1005) argues that market-oriented firms tend to show high "commitment to continuous market learning, to discovering latent needs and unserved markets, and to organization-wide mobilization of resources, enables them to achieve market focused innovation and to sustain competitive advantage in all types of markets".

Drawing on traditional RBV, a wide range of studies have stressed that MO can be considered as a key resource or capability (Hult and Ketchen, 2001; Hult *et al.*, 2005; Zhou *et al.*, 2005; Zhou *et al.*, 2008) which contributes to the development of novel BMs since MO is valuable, rare, imperfectly imitable, and non-substitutable (Barney 1991; Barney *et al.* 2001; Barney *et al.* 2011; Luo *et al.*2005; Morgan *et al.* 2004; Morgan and Hunt 1999; Zhou *et al.* 2008). MO is valuable given that market-oriented firms focus on customers and competitors, paving the way for more cooperation between the firms' employees across the various functions to facilitate the production and delivery of customized products and services that meet the current and latent needs of customers. The collected information may also help firms innovate their BMs and, thus, they will be able to create, deliver and capture value in a unique way. Such efforts

can be linked to enhanced customer satisfaction and loyalty, which may lead to competitive advantage and superior business performance (Kohli and Jaworski 1990; Narver and Slater 1990). Rarity comes from the fact that limited knowledge is available on how to create and implement MO (Zhou *et al*. 2008). MO is also hard to imitate; scholars have argued that MO, in essence, is an organizational culture which establishes the proper behaviours that are linked to the effective and efficient creation and delivery of superior value to customers, thus making it hard to copy (Deshpande and Farley 2004; Narver and Slater 1990). Because MO is unique, intangible, and deeply rooted in the fabric of organization, it is unlikely that the competitor will recognize the MO culture, making it hard to copy (Morgan and Hunt 1999; Zhou *et al*. 2008).

Day (1994, p. 38) has identified two key capabilities that are widely linked to MO culture: "market-sensing and customer-linking capabilities". As time passes, these capabilities become highly rooted within organizational routines, which improves firms' ability to sense and respond to varying market demands ahead rivals (Day, 1994). This study argues that MO capabilities are highly important since they facilitate the creation and design of novel BMs (Markides and Charitou, 2004; Morris *et al.*, 2005; Teece, 2010). MO capabilities can help firms gain knowledge and insights about customer needs and wants, as well as about competitors' actions (Kohli and Jaworski, 1990; Han *et al.*, 1998). Such information and cooperation between the various business functions is considered fundamental for incremental or radical BM transformation, which contributes to the development of a novel-centred BM.

From the perspective of BM research, a wide range of researchers emphasize learning from customer and competitor information for the creation of a novel BM. For example, Teece (2010, p. 191) views a BM as a "management's hypothesis about what customers want, how they want it, and how an enterprise can best meet those needs, and get paid for doing so". Scholars also argue that novel BM advantage can result from meeting a particular customer need (Hamel, 2000; Teece, 2010). Consequently, firms who frequently acquire intelligence about customers and competitors will be able to create a unique value proposition for their customers by satisfying their needs in different ways, compared to their rivals. Similarly, Hamel (2000) considers firms' ability to capture

customer information and gain insight from that information as a major recipe for the design of novel BM. Hence, it can be argued that the key challenge for business managers is to recognize the threats to the viability of their existing BMs, and then to utilize firms' resources to minimize the competitive threats.

This study suggests that the more capabilities a firm's develops from the acquired customers and competitors' information, the more it will be able to gain deep insights about customers and competitors, which can support firms' efforts to design either low-cost or differentiated BMs. For example, Apple was able to transform its BM by focusing on a long-lasting relationship with its customers rather than through the introduction of new hardware innovations to the market (Amit and Zott, 2012).

In sum, the RBV suggests that MO resources and capabilities are important because they contribute to the creation of a novel BM. This is argued to be a consequence of the greater understanding of customers' expressed and latent needs, competitor capabilities and strategies, and the wide business environment than their competitors. Because BMs are deeply rooted in the fabric of the firm, competitors will not be able identify the source of BM-based advantage. This enhanced knowledge can then be then used to handle problems or chase opportunities. Consequently, it is hypothesized:

H1: Market orientation is positively linked to novel BM design.

3.3.2 Entrepreneurial Orientation and Novel BM Design

Entrepreneurial orientation is widely considered as an important concept within the field of entrepreneurship (Wales *et al.*, 2013). Entrepreneurial orientation may refer to the specific manner in which ventures act upon opportunities (Miller, 1983), or to the various activities of firms' key players that leads to a new entry (Lumpkin and Dess, 1996). Entrepreneurially-oriented firms tend to promote several values including proactive behaviour toward market opportunities, risk-taking, defensiveness, analysis, and futurity (Venkatraman, 1989; Lumpkin and Dess, 1996; Matsuno *et al.*, 2002). Consequently, entrepreneurial values have been linked to organization transformation and renewal, development of new competences, and the establishment of a new business

within an existing business (Grinstein, 2008). Slater and Narver (1995) argue that the proactive behaviour of entrepreneurially-oriented firms is of high importance as it focuses their efforts towards acting upon new business opportunities.

While scholars have not yet reached an agreed definition for entrepreneurial orientation, it is widely viewed as firm-level entrepreneurship centred on opportunity recognition and exploitation. Covin and Lumpkin (2011, p.857) regard it as "strategic business unit (SBU) level phenomenon where the "unit" can range from a non-diversified small to medium-sized enterprise (SME) to a single business unit of a multi-business firm".

The growing interest in entrepreneurship has been linked to the rapid changes in business environment where product and BM life cycles are shortened (Hamel, 2000; Rauch *et al.*, 2009). In such an environment, firms are likely to face uncertain profit potential and, thus, are forced to constantly develop and take advantage of new business opportunities (Wang, 2008; Rauch *et al.*, 2009). This may include introducing new products, services, and novel technologies, as well as transforming the organization itself in terms of how it operates and creates and delivers value which can contribute positively to business performance (e.g., Zott and Amit, 2007; Casadesus-Masanell and Zhu, 2013). Indeed, entrepreneurs take new ventures to market shaped by specific BM regardless of whether it is explicitly or implicitly articulated (Chesbrough and Rosenbloom, 2002; Teece, 2010).

While previous conceptual and empirical research has emphasized a direct entrepreneurial orientation performance link (Covin and Slevin, 1986; Miller, 1993; Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003; Wiklund and Shepherd, 2005), recent studies have suggested that scholars should consider internal and external factors as possible mediators of the entrepreneurial orientation performance link (Rauch *et al.*, 2009; Rosenbusch *et al.*, 2011). In this study, it is argued that EO contributes to performance by enabling entrepreneurs to design novel BM. This seems logical due to the various benefits that a BM offers to entrepreneurs in their pursuit of new business opportunities. According to Morris (2005), BMs allow entrepreneurs to come up with rather a logical and internally consistent method for the design and operation of the new business and at the same time facilitates the communication of this new approach to

employees. For Teece (2010), the BM represents the architecture that defines the key elements that can be integrated in a novel way and, hence, a BM can be a platform of innovation in itself. Furthermore, BMs can be used as a tool for showing the financial attractiveness of new business to venture capitalists and to other fund providers (Magretta, 2002). BMs also define the logic of the firm and how it conducts business operations, in that it sets boundaries that determine the suitability of various strategic and tactical choices that a firm's management might be considering (Casadesus-Masanell and Ricart, 2010; Casadesus-Masanell *et al.*, 2010).

Accordingly, and building on the RBV of the firm, EO is considered a key strategic resource or capability that contributes positively to the development of novel BM (Hult and Ketchen, 2001; Zhou *et al.*, 2005). Previous research has widely acknowledged the role of entrepreneurship in creating and sustaining competitive advantage (Covin and Miles, 1999). Various studies have suggested that entrepreneurial orientation can contribute positively to the competitive positioning of firms as well as transforming them, their markets, and industries as result of developing and exploiting innovation opportunities (Miller, 1983; Naman and Slevin, 1993; Zahra and Covin, 1995; Lumpkin and Dess, 1996). Thus, entrepreneurial firms are more likely to create superior performance as result of pursuing new business opportunities shaped by a novel BM which enables them to emphasize either a low-cost or differentiation strategy. Hence, it can be hypothesized:

H2: Entrepreneurial orientation is positively related to novel BM design.

3.3.3 Technological Orientation and Novel BM Design

Previous research has identified new technologies as an important trigger of BM innovation (Timmers, 1998; Chesbrough and Rosenbloom, 2002; Calia *et al.*, 2007; Bjorkdahl, 2009). According to Zhou *et al.* (2005), technological orientation encourages firms to pursue a "technology push strategy" rather than a customer-pull strategy. They argue that such a strategy is reflected by a market-oriented philosophy. Consequently, firms who are technology-oriented acknowledge that customers favour technology-superior products and services compared to those of competitors (Gatignon and Xuereb,

1997). It has been suggested that technology-oriented firms are open to the implementation of novel ideas, yet they are most likely to encourage ideas that are focused on offering superior technological solutions to customers instead of meeting customers preferences; this is a fundamental objective of a market-oriented culture (Zhou *et al.*, 2005).

Two unique forms of technology orientation have been suggested by organizational learning scholars: technology exploration, i.e. development of new products and services, and exploitation, i.e. efficiency of operation (March, 1991). Incremental technological innovation targeting the needs of existing market segments tends to be exploitative and it depends on available organizational knowledge. Technology exploration, on the other hand, is defined in terms of a firm's ability to acquire resources through search, variation, risk taking, experimentation, play, flexibility, discovery, and innovation (March, 1991). This means that an exploration strategy would result in the creation of new knowledge, which may lead to a new product, organizational forms, and even new BMs.

In this study, it is argued that firms' exploration or exploitation technology capabilities are central to the creation of a novel BM. A wide range of studies have emphasized that the BM concept represents an important tool for the commercialization of new technological innovations (e.g., Chesbrough and Rosenbloom, 2002; Chesbrough, 2007; Bjorkdahl, 2009; Gambardella and McGahan, 2010; Teece, 2010). For example, Björkdahl (2009) argues that merging novel technologies into the technology base of a product, i.e. cross-fertilization, can introduce new subspaces in the current technical performance and functionality space, which in turn calls for the design of novel BMs that can help to unlock the economic value potential latent in the new technology. BMs not only lead to consequences for technological innovation, they can also be shaped by them. Calia *et al.* (2007) illustrate how technological innovation can encourage changes in a firm's operational and commercial activities, leading to a change in the existing BM.

As a result, and drawing from the RBV of the firm, this study considers firms' information technology exploration and exploitation as a key capability. These firms

tend to integrate novel technologies with their products and services and allocate considerable resources to research and development. This frequently enhances their technical proficiency and flexibility, which is considered important to successful innovations. These arguments suggest that firms tend to match these efforts with changes to their traditional BMs. Chesbrough and Rosenbloom (2002), p. 529) argue that "established firms as well as startups take technology to market through a venture shaped by a specific business model, whether explicitly considered or implicitly embodied in the act of innovation". Teece (2010) also emphasizes that the commercial success of technological innovation requires novel design and implementation as well as careful strategic analysis. Hence, it is rational to suggest that:

H3: Technological orientation is positively related to novel BM design.

3.3.4 The Impact of Novel BM Design on Business Performance

The RBV of the firm proposes that competitive advantage and superior firm performance rest on the acquisition and control of imperfectly imitable resources by applying organizational and managerial capabilities (Wernerfelt, 1984; Barney, 1991; Grant, 1991; Peteraf, 1993). Thus, the capability of bringing a novel BM to market ahead of competitors is considered crucial to a firm's success (Amit and Zott, 2001; Teece, 2010; Brettel *et al.*, 2011). In theory, firms are expected to develop new and unique capabilities that enable them to generate value which is different from other rival firms.

According to Schumpeter (1934), BM innovation can complement other innovation types (e.g. products, services, methods of production, distribution or marketing, and markets). A novel BM can either create new markets or innovate transaction in existing markets, such as that of Wal-Mart (Amit and Zott, 2001). BMs can help firms create value not only through opportunity exploitation, but through the design of the model itself, which can be considered as a part of the opportunity development process. Scholars have also argued that innovative BMs could potentially lead to an increase in entrepreneurial rents (Rumelt, 2005). Such rents can offer substantial benefits to BM parties in the period between the development of innovation and its diffusion.

Novelty in a firm's BM can be achieved in various ways which may include connecting transaction parties in new ways, the development of new transaction mechanisms, and creation of first-mover advantages (Amit and Zott, 2001; Zott and Amit, 2007). For instance, Lieberman and Montgomery (1988) argue that organizational innovations are hard to duplicate and their diffusion is slow, which may create a durable advantage. First-mover advantages can be a result of three key sources: (1) technological leadership; (2) pre-emption of scarce assets; and (3) buyer switching costs (Lieberman and Montgomery, 1988). Novel BMs can help firms gain first-mover advantage through the pre-emption of assets and through developing buyer switching costs. If a firm is able to design and implement a novel BM ahead of its competitors, it will be able to gain new customers and enhance its reputation in the market (Amit and Zott, 2001). Successful firms will attempt to exploit these advantages to increase switching cost for buyers which will force firms to invest in the development of new resources to fend away customers from the first mover (Lieberman and Montgomery, 1988). Accordingly, firms with a novel BM will be able differentiate themselves from their competitors or achieve a cost advantage (Teece, 2010).

As discussed in the literature review chapter, the BM performance has been discussed as a limited concept. For instance, in the context of e-commerce, various studies have reported a positive relationship between innovative BMs and business performance (e.g., Rajgopal *et al.*, 2003; Zott and Amit, 2007; 2008). Additionally, this relationship has been supported by qualitative research which is based on case studies of successful BM innovators. Examples include large corporations such as Dell and Apple in the computer industry, Wal-Mart in discount retailing, and Southwest Airlines in the airline industry, all of whom have achieved great success through the design of novel BMs (Teece, 2010; Amit and Zott, 2012). The firm's ability to design a novel BM can be fundamental since it enables firms to radically change a market (Christensen, 2001), to grow a market (Daley, 2011), and even to change the basis of competition within an industry (Hamel, 2000). In a recent conceptual paper, Amit and Zott (2012) argue that novel BMs allow firms to create value to customers at low cost, which leads to a

sustainable advantage, which in turn might have a strong impact on the firm's performance.

While the benefits of BM innovations have been emphasized in the literature, some studies have highlighted the difficulties that firms might face in their BM innovation efforts. The BM concept in its conceptualization phase might increase the levels of uncertainty, mainly for companies interested in making a radical BM innovation. This might restrict many firms from pursuing BM innovation even though various examples of empirical research and case studies have linked higher levels of innovation activities with higher performance. Although some scholars have empirically found a positive relationship between novel BM design and firm performance (Zott and Amit, 2007), there are cases where firms have failed to innovate their BMs. Some firms keep focusing on the existing model while developing or testing new ones or they fail to devote sufficient time or the resources needed to design, prototype, and test the new models (Kaplan, 2012).

As a result, firms are expected to be selective in pursuing business opportunities and they only implement innovative models which provide the highest value to customers. BM innovators face huge uncertainty due to the unknown elements of the new initiatives. Novel BMs can have substantial impact on firm performance. However, to be a BM innovator and attain BM-based advantage, firms are required to carry out various changes i.e. changing the structure of routines as well as resource allocation and management philosophies. The process also includes a great deal of adaption and reconfiguration of resources and capabilities (Feldman and Pentland, 2003). According to Hemel (2000), the level of innovation is determined by how the need for change is perceived and by the firm's ability to implement the change.

Based on the previous discussion, it can be concluded that firms who are successfully able to achieve a competitive advantage through innovation of their existing BM are linked to better performance outcomes. Therefore, it can be hypothesized:

H4: Novel BM design has a direct positive relationship with business performance.

3.4 Contingent Relationships

In the context of BM research, scholars have emphasized the importance of considering the BM performance relationship in a contingency framework (e.g., Zott and Amit, 2007; Bornemann, 2009). Therefore, this study proposes hypotheses for examining the performance implications of an appropriate fit between the independent (predictor) variable-novel BM models, and one potential moderator: the environment. From a methodological and empirical perspective, scholars have identified and tested various forms of fit (Venkatraman, 1989). This study focuses on the "*fit as moderation*" perspective (Venkatraman and Camillus, 1984; Van de Ven and Drazin, 1985; Olson *et al.*, 2005). The moderation perspective suggests that the effect an independent variable has on a dependent variable is contingent on a third variable, termed as moderators (Venkatraman, 1989). Thus, it can be argued that the fit between the predictor variable in this study (i.e. novel BM) and the moderators (i.e. environment) is the main determinant of business performance.

A wide range of environmental conceptualizations have been emphasized in previous studies. For instance, Kohli and Jaworski (1993) have examined the moderation effect of three environmental characteristics which are believed to moderate the market-orientated business performance relationship: market turbulence, technological turbulence, and competitive intensity. In exploring the impact of market orientation on new product performance, Atuahene-Gima (1995) focuses on three environmental variables: competitive hostility, competitive intensity, and industry maturity. Gatignon and Xuereb (1997) investigated the effect of strategic orientation on innovation performance, and reported a support for the moderating effect of demand uncertainty. Other strategic orientation studies have adopted similar environmental characteristics (e.g, Dess *et al.*, 1997; Voss and Voss, 2000; Lumpkin and Dess, 2001; Wiklund and Shepherd, 2005; Simsek *et al.*, 2010). In short, it can be argued that most of the previous conceptualizations of environment are, to a large extent, consistent with Dess and Beard (1984) three environmental dimensions: munificence, dynamism, and complexity.

To date, a limited number of BM studies exist that support the selection of the most appropriate environmental characteristics. However, it can be argued that a firm's BM is designed to fit a specific environment, and the ability of a firm's managers to develop a good understanding of this environment is critical for designing a better, more informed, and highly competitive BM. It is also expected that the importance of BM novelty will vary across various environmental contexts.

This study focuses one key environmental dimension: technology turbulence. Technology turbulence in this study refers to "the rate of technological change" (Jaworski and Kohli, 1993) and is considered a major source of instability and unpredictability in the external environment (Ruekert *et al.*, 1985). Previous BM research has examined the moderating effect of resource munificence on the BM performance link (Amit and Zott, 2007). However, given the stronger link between technological innovation and novel BM, this study emphasises the contingent role of technological turbulence.

In the next section, the moderating effect of the technological turbulence is examined for the novel BM-business performance relationship. Superior business performance can also be effected by the (in)dependence of the new BM, i.e. whether a firm's decision to integrate or separate the new venture in the form of an independent business unit with its unique BM. Accordingly, this study also explores the moderation effect of the business unit's (in)dependence.

3.4.1 Moderating Effect of Technological Turbulence

This research focuses on the moderation effect of technological turbulence –the degree of change and advancement on technology. Previous research suggests that a product's life cycle tends to be shortened significantly as a consequence of technological advances. Consequently, this may threaten the sustainability of the competitive advantage of well-established firms as they might be disrupted by new players with new technologies (Porter 1985; Tushman and Anderson, 1986; Christensen, 1997). However, it is argued in this research study that technology change will have no effect on the novel BM-business performance relationship. Firms are less likely to outperform

competitors by simply focusing on technology advancement. Rather, to develop sustainable competitive advantage and superior business performance, firms are most likely to integrate both novel technologies and innovative BMs. For example, the success of firms such as eBay or Facebook is not credited to their ability to develop new technology, but to their ability to create a novel model form of existing technology. Although radical technology may emerge, it is most likely that change will result from existing technology that is applied in different ways, i.e. improving business processes or creating innovative means to interact with customers, or even a major transformation in how firms conduct their business activities. According to Teece (2010), technological innovation often requires a new BM so that its chance of success is increased in the market place. In other words, technological innovation and innovation in the BM should be considered complementary for a successful introduction of a new product or service (Chesbrough, 2010).

H5: Technology turbulence is expected to positively affect the BM-business performance relationship.

3.4.2 The Moderating Role of (In)Dependence of New BMs

The arguments of various studies indicate that established firms sometimes have difficulty operating more than one BM at the same time within the same industry, and such efforts have been linked to strategic failure (e.g., Markides and Charitou, 2004; Markides, 2008; Casadesus-Masanell and Tarziján, 2012). For instance, Markides and Charitou (2004) argue that established firms who try to imitate disruptive innovators' new BMs (Christensen and Bower, 1996) frequently fail because of conflicts with their existing BM. This is consistent with Porter (1980), who contends that operating two distinct BMs that have substantial conflicts and market differences is challenging, risky, and likely to fail. Consequently, the choice to integrate the new BM within the current organizational infrastructure or separate it into a physically distinct venture is expected to have a significant impact on firms' performance (Andries and Debackere, 2007). The presence of these trade-offs and conflicts indicates that firms attempting to compete in two models in tandem risk incurring a large straddling cost as well as reducing the value of their current activities (Markides and Charitou, 2004).

Christensen and Bower (1996) illustrate that established firms are more likely to succeed if they create distinct a business unit for the new BM that is physically separate from the traditional business. This can be a successful strategy if the two models have huge differences and when there are limited chances to share synergies between them. Similar arguments have been offered by Burgelman (1988), and by Gilbert and Bower (2002). Such a strategy has also been encouraged by (Porter, 1996); although he argued that most firms trying to achieve a competitive advantage with two strategies will likely fail, he states that "companies seeking growth through broadening within their industry can best contain the risks to strategy by creating stand-alone units, each with its own brand name and tailored activities" (Porter, 1996, p. 77). This success can be explained by the ability of a new BM to develop a new culture, processes, and strategy without direct interaction from the parent firm. Additionally, the new business unit can run its business activities without the fear of being suffocated by the incumbent firm's management, who view cannibalization and channel conflicts as key threats (Markides and Charitou, 2004; Markides, 2008).

However, separation as a strategy is argued to have its own problems and risks. For instance, failure to exploit the synergies of the two BMs can be one key limitation (Markides and Charitou, 2004). Although separate units tend to have important upfront knowledge about the market, technologies, and organization, they frequently lack the money, resources, and capabilities of their parent organization considered central to the long term success of the new business unit (Andries and Debackere, 2007). Lansiti *et al.* (2003) have reported that "spinoffs often enable faster action early on, but they later have difficulty achieving true staying power in the market". Other scholars argue that separate business units are linked to under-developed intelligence gathering and analysis capabilities (Andries and Debackere, 2007).

While scholars have not reached consensus in regard to the optimal strategy, this study argues that integrating the new BM within the borders of the current firm's structure can have better performance consequences than establishing an independent venture, specifically when the new market is highly similar to the existing business and presents

few conflicts that requires managing. For instance, the internet and online selling of computer is was surely a challenge for Dell, but this novel way of distributing commuter was not predominantly disruptive to Dell's existing BM. Previous research also indicates that business units of established firms have better-organized and more developed intelligence gathering and analysis capabilities (Morris *et al.*, 1999; Stoica and Schindehutte, 1999) . Furthermore, they can use their parents' resources and capabilities to simultaneously to change various elements of the BM in order to reach fit between these elements (Andries and Debackere, 2007). Furthermore, the new business unit can learn and take advantage of the established firm's management skills and expertise (Markides and Charitou, 2004). This suggests that integrating the new BM within the established firm can have a higher impact on business performance. Thus, it can be hypothesized:

H6: The effect of novel BM on performance is more positive for business units of established companies than for independent ventures.

3.5 Chapter Summary

The key objective of this study is to explore the antecedence and consequences of novel BMs at the business unit level of analysis. To achieve this objective and drawing from a RBV and contingency theory, a theoretical framework and a set of hypotheses were developed. In the next chapter, a discussion of the research method and design will be presented.

Chapter 4. Research Strategy and Research Methods

4.1 Introduction

This chapter starts by discussing the research philosophy and the approach adopted in this study. Later, it presents the research design and methodology used for carrying out the empirical phase of this research, together with the sampling procedure, data collection methods, survey instrument development, and questionnaire administration. The chapter also briefly discusses the statistical analysis approach followed by a review of the steps taken by the researcher to reduce common method variance and non-response bias.

4.2 Methodological Considerations

4.2.1 Research Philosophy

"Philosophy can be defined as the questioning of basic fundamental concepts and the need to embrace a meaningful understanding of a particular field" (Burke, 2007, p. 476). The research approach employed by the researcher (qualitative or quantitative) entails different philosophical assumptions about the nature of reality, epistemology, values, the rhetoric of research, and methodology (Creswell, 2003). From a philosophical perspective, researchers make assumptions "about what is knowledge (ontology), how we know it (epistemology), what values go into it (axiology), how we write about it (rhetoric), and the processes for studying it (methodology)" (Creswell, 2003, p. 6). Guba and Lincoln (1994) contend that the question of research methods is not as important as the question of which paradigm is applicable to a specific research. The authors note:

> Both qualitative and quantitative methods may be used appropriately with any research paradigm. Questions of method are secondary to questions of paradigm, which we define as the basic belief system or world view that guides the investigation, not only in choices of method but in ontologically and epistemologically fundamental ways (p.105).

In this section, two of the most important epistemological positions that researchers can choose to direct a research project will be discussed: interpretivism and positivism.

Positivism: Traditionally, the positivist assumptions have dictated claims about what derives knowledge. It is based on the view that the production of knowledge in social sciences is similar to that in natural sciences. This philosophical stand is sometimes called the "scientific method" or doing "science" research (Crotty, 1998; Creswell, 2003; Neuman and Neuman, 2006). In this approach, the researcher is an explainer of a social reality where they are required to be objective and not be affected by the research subjects (Remenyi *et al*., 1998). Positivism main argument being that the social world exists externally to the researcher, and that its properties can be measured directly through observation (Crotty, 1998; Neuman and Neuman, 2006). For logical positivists, the method of verification for the meaning of a statement is based on only sensory observations (Brown *et al.*, 2002; Ayer, 2012). The validity of a theory is based on the criteria of verifiability by the means of empirical observation. Logical positivists believe that meaningful expressions are empirically testable from observations and experiments. The premise of scientific knowledge is based on the systematic relationships of observables to observables. Similar to natural sciences, the aim of social sciences is to produce generalisations or laws in stating the causal relationships of events that can be observed. Early logical positivists adhered to an inductive type of reasoning on conducting research in reflecting from particular instances to general statements. Knowledge is generated through the accumulation of 'well attested facts' from which general laws can be inferred (Harré, 1972). The inductive method assumes that there is a reality 'out there' with regularities and laws that can be observed and explained (Blaikie, 2007)

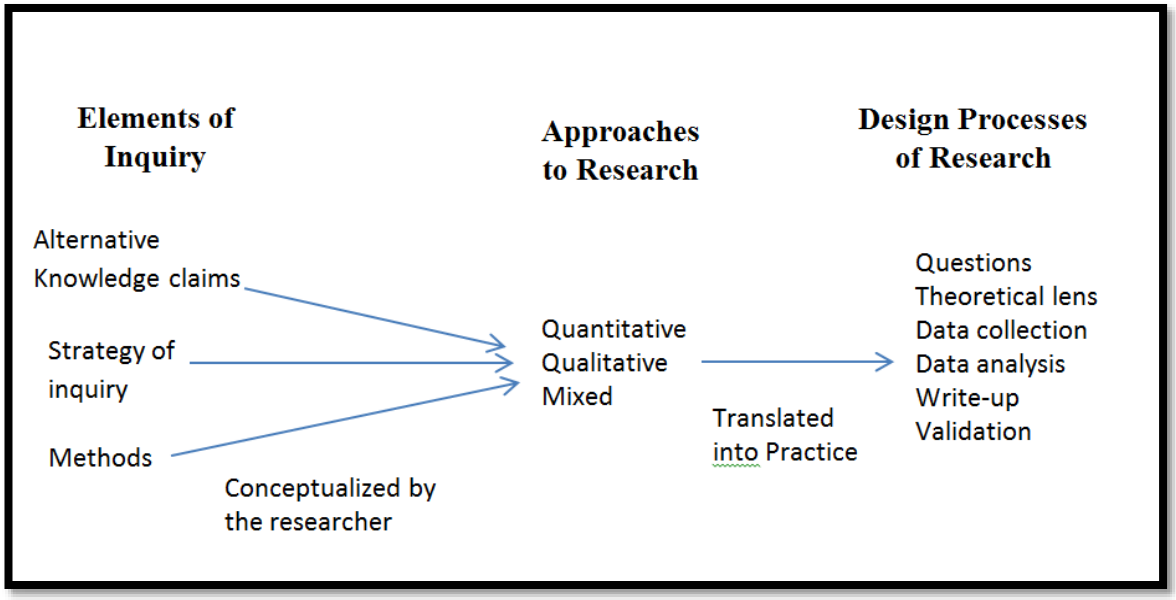
Interpretivism: interpretivism paradigm is frequently linked to the thought of Max Weber, who argued that in the human sciences we are interested with understanding (Crotty, 1998). Interpretative epistemology suggests that it is important for the researcher to recognize differences between humans in our role as social actors (Guba and Lincoln, 1994; Crotty, 1998). It involves, as the name implies, researchers interpreting elements of the study, and therefore interpretivism incorporates human

interest into a study. Thus, “interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions such as language, consciousness, shared meanings, and instruments” (Myers, 2013, p.38). Collins (2010) points out that interpretivism is linked with the philosophical position of idealism, and is used to group together different approaches such as social constructionism, phenomenology and hermeneutics. Such approaches reject the objectivist view “that social entities exist in reality external to social actors concerned with their existence” (Saunders *et al.,* 2011, p. 110). Furthermore, interpretivism studies frequently focus on meaning and may use various methods in order to reflect different aspects of the issue.

The aim of this research is to examine the relationship between various strategic orientations, novel BM, and business performance. In order to explain the relationship between these variables, it will be important to test a hypothesis generated by previous studies, rather than to explore the concept and then devise a theory. The quantitative method is conventionally based on the positivist approach to explore the scientific enquiry of the phenomena. This also underlies the deductive model which shows hypothesized relationships. Consequently, quantitative analysis is considered most appropriate to establish the relationship. Structural equation modelling is employed to data analysis.

Creswell (2003) argues that philosophical positions should be integrated with research strategy and research methods, or as he termed it, ‘elements of inquiry’ (i.e. knowledge claims, strategies, and methods). Based on this, the various approaches to research and the design processes are sequentially guided, as shown in Figure 4.1.

Figure 4.1: Knowledge claims, strategies of inquiry, and methods leading to approaches and the design process



Source: (Creswell, 2003)

4.2.2 Deductive Approach

The bulk of research carried out in the fields of business and management adopts either a deductive approach or an inductive approach. The former is usually associated with positivism and the latter is linked to interpretivism. Hence, an inductive approach is related to scientific research aimed at theory building. In deductive research, however, the key objective is to test current theories. The origins of contemporary deductive logic (hypothetico-deductivism) can be traced to Popper (1959). He pointed out that induction can create theories but it cannot test them. To test a hypothesis, it is important to use a deductive approach. Deduction thus involves developing a theoretical model where a relationship between set of variables is proposed, and the researcher then attempts to quantify observable outcomes by conducting a statistical analysis. Consequently, results are obtained that allow for the acceptance or rejection of the hypothesised relationships (Stadler and Institut Wiener, 2004; Harry *et al.*, 2008). In contrast, an inductive approach is usually associated with qualitative research focusing on understanding the meanings of humans and events in the social world. It tends to use qualitative methods for collecting data and is less concerned with generalisations (Harré, 1972)

The objective of this research is to examine the existence of the empirically established relationship between various strategic orientations (i.e. market orientation, entrepreneurial orientation, and technological orientation), novel BMs, and business performance in random national sample of UK firms. Thus, to meet the objective of this research, an exploratory approach to research needs to be adopted. The nature of exploratory research will offer insights into the causal relationships between variables, and consequently it is appropriate as a means of underpinning a deductive approach that utilises quantitative data. It has been stated that "deductive means reasoning from the particular to the general. If a causal relationship or link seems to be implied by a particular theory or case example, it might be true in many cases. A deductive design might test to see if this relationship or link did obtain on more general circumstances" (Gulati, 2009, p.42). Consequently, to answer the research questions the deductive approach was employed.

4.2.3 Research Strategy

(Johnson and Clark, 2006) point out that it is important for business and management researchers to be aware of the philosophical commitments they make through their choice of research strategy. Before reaching a decision with regard to the research strategy, practical issues such as the nature of the topic and the type research question need to be considered (Bryman and Bell, 2011). As discussed above, the aim of this research is to test the relationship between a set of variables. For this reason, and based on the aims and objective of the current research, a quantitative strategy has been employed with a survey utilising a web-based questionnaire in the research method.

Denscombe (2010) identified the following advantages of surveys:

- Empirical data: the social research is expected to generate data based on real-world observations. Surveys allow the researcher to directly collect information from respondents. The researcher who adopts a survey strategy tends to follow a tradition of research which highlights the quest for details of tangible things that can be measured and recorded.

- Wide and inclusive coverage: surveys enable the researcher to carry out not only large-scale research covering many people or specific events but also small-scale qualitative research. Wide and inclusive coverage is a significant factor as well-designed research survey can add credibility to generalisation.
- Surveys lend themselves to quantitative data: the methods that use a survey strategy such as questionnaires can produce large volumes of quantitative data, and compared to other research strategies such as experiments, surveys can yield large volumes of data in a short time at a fairly low cost. Hence, it allows the researcher to plan the research schedule and to complete the research on time.

These advantages make survey questionnaires the preferred research strategy for the current research. Thus, using a survey will ensure that subsequent data will properly answer the questions and achieve the aims and objectives outlined in this study.

4.2.4 Research Design: Quantitative Research Strategy through Questionnaire Survey

The use of a questionnaire survey was based upon the research strategy of choice. Furthermore, this research method acts as an effective means to investigate the relationships between several variables in relation to particular phenomena. Because of this, a questionnaire survey used in a quantitative research strategy will be an appropriate and effective method in order to achieve the aims and objectives of this research.

4.2.5 Choice of a Cross-Sectional Design

Generally, there are two key forms of quantitative research design: longitudinal and cross-sectional designs. According to De Vaus and de Vaus (2001) longitudinal designs represent a good choice for identifying the causal directions between variables; however, they are limited in making representative samples. Other limitations of this type of design include large administrative costs and the longer time frame required for data collection. Such a large commitment of both time and cost makes the choice of

longitudinal design largely impractical. In fact, most of the strategic orientation and business model studies have opted for the cross-sectional design, with the exception of Kumar *et al.* (2011), Pelham and Wilson (1995), and Noble *et al.* (2002).

De Vaus and de Vaus (2001) argue that cross-sectional designs provide an acceptable alternative when they are carefully designed and implemented. They are powerful tools for data collection under a number of situations. For instance, as the key objective of this study, "examining the relationships between a set of antecedents factors, novel BMs, and business performance" represents a novel endeavour; cross-sectional data could be an invaluable source of incremental knowledge. Additionally, cross-sectional data are considered beneficial for the evaluation and modification of theoretically derived *a priori* models (De Vaus and de Vaus, 2001). Practically , the pattern of the relationship between constructs of concern can be compared with regard to the logic of theoretical argument (Cadogan *et al.*, 2003). Hence, the current research followed cross-sectional approach of design.

Bowen and Wiersema (1999) point out that cross-sectional designs are employed to estimate models whose parameters do in fact vary or over time and, thus, the resulting estimation may fail to yield statistically valid inferences. The use of cross-sectional vs. longitudinal data is considered an important issue in the application of structural equation modelling (Shook *et al.*, 2004). Kelloway (1995) stress that the strongest inference of causality may be made only when the temporal ordering of variables is established. Accordingly, studies that use cross-sectional design are encouraged to develop strong theoretical underpinnings which are critical to causality inferences. Researchers should also ensure that their data meet the assumed distribution of their estimation approach (Shook *et al.*, 2004). The common methods to estimating structural equation models assume that indicator variables have multivariate normal distributions (MacCallum *et al.*, 1992). Non-normal data may lead to inflated goodness of-fit statistics and underestimated standard errors.

This study used RBV-one of the most prominent theories in strategic management research (Barney *et al.*, 2011)- to establish the links between endogenous and

exogenous variables. Before running the data analysis, the researcher has also ensured that all the assumptions of SEM were met as will be discussed in chapter 5.

4.3 Method of Data Collection

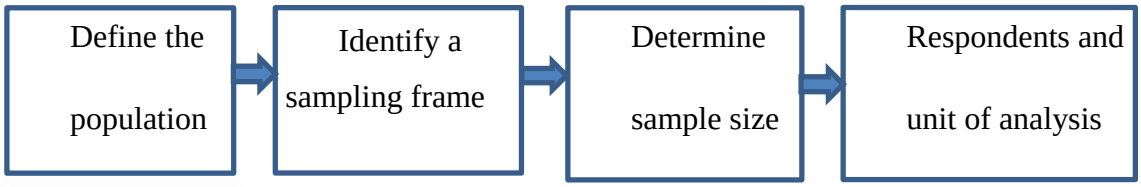
A web-based survey research design was employed to collect data to test the hypotheses. Such design is considered to be suitable for this study because: (1) it is appropriate to collect perceptual data from a large population; (2) data gathered via web-based survey are easily quantifiable and amenable to statistical analysis and hypothesis testing; and (3) information obtained web-based survey is relatively accurate (Fleming and Bowden, 2009). Witt (1998) argues that online surveys facilitate the collection of large amounts of data without interviewers, stationery or postage, and they also allow researchers to automatically place the collected data in a database which can significantly reduce cost and increase the attractiveness of this method. One key advantage of web surveys over mail surveys is the ease of follow-up. Nowadays, it is cost effective to use e-mail to send follow-up reminders in order to increase the survey response rate.

4.4 Sampling Procedure

A sample can be defined as a subset of a statistical population whose properties are used to make inferences about the population as a whole (Webster, 1985). Selecting a sample with properties that generally resemble the population is highly important, as in survey research researchers are frequently interested in making inferences about a population based on data collected from a sample. Researchers should give special concern to the way they choose a sample from a given population as it greatly affects the representativeness of that sample. Accordingly, sampling procedure has become a key component of research design, and determines the robustness of survey results and generalizability. Sekaran and Bougie (2010, p.266) define sampling as "... the process of selecting a sufficient number of the right elements from the population, so that a study of the sample and an understanding of its properties or characteristics make it possible for us to generalise such properties or characteristics to the population elements".

There are two common sampling techniques: random or representative sampling and non-random or judgemental sampling (Cochran, 2007). The sampling method adopted in this research is random sampling, because most statistical analysis requires a normally distributed data, and a good representation of the population researched. Random sampling is the appropriate way to meet this requirement. As illustrated in Figure 4.2, the sampling procedure follows the process of defining the population, identifying the sampling frame, determining the sample size, and selecting respondents and the unit of analysis.

Figure 4.2: Procedure for drawing a sample



4.4.1 Population

The main focus of this research is on the antecedents and consequences of novel BM-based advantage. The novel BM design is expected to be valuable for both manufacturing and service firms, and consequently the population of interest includes firms from the UK's manufacturing and service sectors.

4.4.2 Sampling Frame

The researcher purchased a commercial mailing list of 3,443 manufacturing and service firms from Dun and Bradstreet (D&B) Inc., UK. These firms were randomly selected based on the following criteria:

- Non-duplicated UK trading companies.
- Number of employees equal to or over 50.
- Business Sector of Manufacturing and Services.

D&B is considered the world's leading commercial database with more than 170 years of experience and more than 235 million business records. The use of this database in

this research is justified since it is widely used in strategy and marketing research (e.g., Hult and Ketchen, 2001; Ray *et al.*, 2004). In the UK, D&B's Trading File offers access to more than 2.8 million actively trading businesses. Business records are frequently updated and include complete information about firms and their executive teams. These include registered company address and contact details, top managers' email addresses and phone numbers, industry based on the SIC code, size (e.g. employees, turnover) and financial information.

4.4.3 Sample Size Determination

The determination of an appropriate sample size relies on a number of key issues such as degree of variability, perception, required confidence interval and time and cost considerations (Diamantopoulos and Schlegelmilch, 1997; Slater and Atuahene-Gima, 2004). For instance, as the researcher attempts to increase the sample size, the cost of carrying out the survey will also increase. Peterson (1982) argues that too large a sample is most likely to be associated with inefficiency and waste of resources. However, a small sample will produce information that might not be valid for making statistical inferences. Accordingly, researchers are encouraged to balance cost and sample size in a way which is reasonable for accurate and precise generalizations.

Another factor that affects sample size is the degree of accuracy that is required in the sample, and the degree to which there is heterogeneity in the population with regard to the main characteristics of the study. Various statistical techniques such as factor analysis, regression analysis, and structural equation modelling demand a large enough sample size for the model to be precisely measured. As this study utlizes the SEM approach for data analyis, the researchers follows the recommendation of (Kline, 2011), who provides an absolute guideline for the determination of sample size based on the ratio to estimated parameters. Accordingly, Kline argues that a sample of 100 cases is considered "small," 100 to 200 is "medium," and over 200 is "large." In this study, the sample size is 281 cases and, thus, it is considered large enough for employing SEM for statistical analysis.

4.4.4 Respondents and Unit of Analysis

In this study, the main unit of analysis is the business unit. Since the main objective of this study is examine the causal relationship between the various strategic orientations, novel BM, and business performance, a firm's business unit is considered the most appropriate unit of analysis. Firms, more specifically large ones, can have more than one business unit which makes it difficult to examine the effect of novel business model at the firm level of analysis.

One senior executive per each SBU was targeted as a key informant considering the nature and focus of this study. Managerial rank included vice-presidents, directors, and general managers. This choice was made as senior executives are believed to have the knowledge needed to accurately answer the survey questionnaire. The key informant strategy has been widely used in previous strategic orientation and business model research (e.g., Baker and Sinkula, 1999; Slater *et al.*, 2006; Zott and Amit, 2007; Wang, 2008). The previous studies assumes that senior executive are true representatives of the organization and that their views can be used as valid representations of the organizational phenomenon being investigated (Venkatraman and Grant, 1986).

4.5 Variables and Measures

Construct measurement represents one of the most essential elements in research. It is considered a common problem shared by researchers in all disciplines as they try to quantify observations (Rose and Sullivan, 1993). In social research, a measurement refers to "the process of assigning number to observation according to a set of rules" (Walsh, 1990, p.7). Walsh (1990) points out that the observations being measured are variables, or anything that can vary in value from one case to another. After outlining the data collection procedure, this section deals with issues concerning the detailed design of the survey questionnaire.

This research utilized Likert scales for data collection, and treated them as an interval scale. The rationale behind this are: (1) previous research indicates that these scales tend

to communicate interval properties to the respondents, and hence produce data that can be intervally scaled (Schertzer and Kernan, 1985; Madsen, 1989); (2) this is a common practice in management and strategic orientation research (Kohli and Jaworski, 1990; Han *et al.*, 1998) (for example, Koli and Jaworski, 1990; Narver and Slater, 1990). This allows the researchers to describe the nature of research subjects, as well as using inferential statistics to explain the relationships between constructs; (3) in structural equation modelling, observed variables are frequently defined as being measured on a linear continuous scale, although handling ordinal or nominal measured variables is also possible (Schumacker and Lomax, 2012).

All of the key measures in this study have been used in previous strategic orientation and BM research. Some of these measures were slightly adapted to meet the purpose of the current study. A full description of the items used and their source is presented Table 4.1.

Table 4.1: Measurement Item Descriptions

Item	Label	Source
Market Orientation		
We constantly monitor our level of commitment an orientation to serving customers needs.	MO1	Adapted from Slater and Narver (1990)
Our business strategies are driven by our beliefs about how we can create greater value for our customers.	MO2	Adapted from Slater and Narver (1990)
Our strategy for competitive advantage is based on our understanding of customers needs.	MO3	Adapted from Slater and Narver (1990)
Our business objectives are driven primarily by customer satisfaction.	MO4	Adapted from Slater and Narver (1990)
We measure customer satisfaction systematically and frequently.	MO5	Adapted from Slater and Narver (1990)
We give close attention to after-sales service.	MO6	Adapted from Slater and Narver (1990)
Our salespeople regularly share information within our business concerning competitors' strategies.	MO7	Adapted from Slater and Narver (1990)
We are slow in responding to competitive actions that threaten us.	MO8	Adapted from Slater and Narver (1990)
Top management regularly discusses competitors' strengths and strategies.	MO9	Adapted from Slater and Narver (1990)
We target customers where we have an opportunity for competitive advantage.	MO10	Adapted from Slater and Narver (1990)
Our top managers from every function regularly visit our current and prospective customers.	MO11	Adapted from Slater and Narver (1990)
We freely communicate information about our successful and unsuccessful	MO12	Adapted from Slater and

Item	Label	Source
customer experiences across all business functions.		Narver (1990)
All of our business functions (e.g., marketing/sales, manufacturing, R&D, finance/accounting, etc.) are integrated in serving the needs of our target markets.	MO13	Adapted from Slater and Narver (1990)
All of our managers understand how everyone in our business can contribute to creating customer value.	MO14	Adapted from Slater and Narver (1990)
We share resources with other business units.	MO15	Adapted from Slater and Narver (1990)
Entrepreneurial Orientation		
In making strategic decisions, we look into the future to anticipate conditions.	EO1	Adapted from Tan and Litschert (1994)
We are willing to sacrifice short-term profitability for long-term goals.	EO2	Adapted from Tan and Litschert (1994)
We emphasize investments that will provide us with a future competitive edge.	EO3	Adapted from Tan and Litschert (1994)
In making strategic decision, we constantly seek to introduce new brands or new products in the market.	EO4	Adapted from Tan and Litschert (1994)
Whenever there is ambiguity in government regulations, we will more proactively to try to take lead.	EO5	Adapted from Tan and Litschert (1994)
In making strategic decisions, we respond to signals of opportunities quickly.	EO6	Adapted from Tan and Litschert (1994)
In making strategic decisions, we emphasize planning techniques and information systems.	EO7	Adapted from Tan and Litschert (1994)
In analysing situations, we evaluate possible consequences thoroughly and obtain alternatives.	EO8	Adapted from Tan and Litschert (1994)
We seek opportunities that have been shown to be promising.	EO9	Adapted from Tan and Litschert (1994)
We emphasize the use of cost control systems for monitoring performance.	EO10	Adapted from Tan and Litschert (1994)
We constantly modify manufacturing technology to achieve efficiency	EO11	Adapted from Tan and Litschert (1994)
We put emphasis on following government regulations and make important changes that are specifically allowed.	EO12	Adapted from Tan and Litschert (1994)
In making strategic decisions, we tend to focus on investments that have low risk and moderate returns, or high risk and high returns.	EO13	Adapted from Tan and Litschert (1994)
We search for big opportunities, and favour large, bold decisions despite the uncertainty of their outcomes.	EO14	Adapted from Tan and Litschert (1994)
We approve new projects on a “stage-by-stage” basis rather than “blanket” approval.	EO15	Adapted from Tan and Litschert (1994)
Technology Orientation		
We use sophisticated technologies in our new product development.	TO1	Zhou *et al* (2005)
Our new products always use state-of-the-art technology.	TO2	Zhou *et al* (2005)

Item	Label	Source
Technological innovation based on research results is readily accepted in our organization.	TO3	Zhou *et al* (2005)
Technological innovation is readily accepted in our program/project management	TO4	Zhou *et al* (2005)
Novel Business Model		
The business model offers new combinations of products, services, and information.	NBM1	Zott and Amit (2007
The business model brings together new participants.	NBM2	Zott and Amit (2007
Incentives offered to participants in transactions are novel.	NBM3	Zott and Amit (2007
The business model gives access to an unprecedented variety and number of participants and/or goods.	NBM4	Zott and Amit (2007
The business model links participants to transactions in novel ways.	NBM5	Zott and Amit (2007
The richness (i.e., quality and depth) of some of the links between participants is novel.	NBM6	Zott and Amit (2007
Number of patents that the focal firm has been awarded for aspects of its business model.	NBM7	Zott and Amit (2007
Extent to which the business model relies on trade secrets and/or copyrights.	NBM8	Zott and Amit (2007
Does the focal firm claim to be a pioneer with its business model?	NBM9	Zott and Amit (2007
The focal firm has continuously introduced innovations in its business model.	NBM10	Zott and Amit (2007
There are competing business models with the potential to leapfrog the firm's business model.	NBM11	Zott and Amit (2007
There are other important aspects of the business model that make it novel.	NBM12	Zott and Amit (2007
Overall, the company's business model is novel.	NBM13	Zott and Amit (2007
Efficiency Business Model		
Inventory costs for participants in the business model are reduced.	EBM1	Zott and Amit (2007
Transactions are simple from the user's point of view.	EBM2	Zott and Amit (2007
The business model enables a low number of errors in the execution of transactions.	EBM3	Zott and Amit (2007
Costs other than those already mentioned for participants in the business model are reduced (e.g., marketing and sales, transaction processing, communication costs).	EBM4	Zott and Amit (2007
The business model is scalable (i.e., can handle small as well as large number of transactions).	EBM5	Zott and Amit (2007
The business model enables participants to make informed decisions.	EBM6	Zott and Amit (2007
Transactions are transparent: flows and use of information, services, goods can be verified.	EBM7	Zott and Amit (2007

Item	Label	Source
As part of transactions, information is provided to participants to reduce the asymmetric degree of knowledge among them regarding the quality and nature of the goods being exchanged.	EBM8	Zott and Amit (2007
As part of transactions, information is provided to participants about each other.	EBM9	Zott and Amit (2007
Access to a large range of products, services and information, and other participants is provided.	EBM10	Zott and Amit (2007
The business model enables demand aggregation	EBM11	Zott and Amit (2007
The business model enables fast transactions.	EBM12	Zott and Amit (2007
The business model, overall, offers high transaction efficiency.	EBM13	Zott and Amit (2007
Technology Turbulence		
The technology in our industry is changing rapidly.	TT1	Kholi and Jaworski (1993)
Technological changes provide big opportunities in our industry.	TT2	Kholi and Jaworski (1993)
A large number of new product ideas have been made possible through technological breakthroughs in our industry.	TT3	Kholi and Jaworski (1993)
Technological developments in our industry are rather minor.	TT4	Kholi and Jaworski (1993)
		Kholi and Jaworski (1993)
Subjective Business Performance		
Sales growth	BP1	Powell (1992;1995), Delaney and Huselid (1996) and Delaney and Micallef (1997).
Profitability	BP2	Powell (1992;1995), Delaney and Huselid (1996) and Delaney and Micallef (1997).
Market share	BP3	Delaney and Huselid (1996), Slater and Olson (2000) and newbert (2007)
Overall financial performance	BP4	(Powell, 1992; Delaney and Huselid, 1996; Baker and Sinkula, 1999; Arend, 2006; Newbert, 2007)

4.5.1 Market Orientation

In line with previous research (e.g., Han *et al.*, 1998; Hult and Ketchen, 2001; Zhou *et al.*, 2005), this study adapts the cultural perspective of MO (Han *et al.*, 1998). As an organization culture, MO is often characterized as a specific set of organizational values. In this line of argument, a market-oriented firm exerts considerable efforts to provide and maintain superior value to its customer (Slater and Narver, 1995; Han *et al.*, 1998). More specifically, it follows Narver and Slater's (1990) conceptualisation of MO as "the business culture that most effectively and efficiently creates superior value for customers". MO "consists of three behavioural components –customer orientation, competitor orientation, and interfunctional coordination –and two decision criteria – long-term focus and profitability" (p.21). MO was operationalized with the MKTOR scale. MKTOR consists of 15 items designed for measuring the three components of market orientation: customer orientation, competitor orientation, and interfunctional co-ordination. A firm's MO score is a simple mean score of the three behavioural components (Han *et al.*, 1998).

4.5.2 Entrepreneurial Orientation

EO refers to a firm's strategic orientation, capturing specific entrepreneurial aspects of decision-making styles, methods, and practices (Lumpkin and Dess, 1996). To measure the EO construct, this research adopted the measurement scale proposed by Tan and Litsschert (1994), who build on the work of Venkatraman (1989). The measurement scale consists of 15 items which are grouped into five factors, namely futurity (3 items), proactiveness (3 items), and analysis (3 items), defensiveness (e items), and riskiness (3 items). Futurity was measured by asking managers about the firm's plans to reach the desired state, and their willingness to sacrifice short-term profitability for long-term goals. Proactiveness is measured by asking managers about the firm's tendency to lead, rather than follow, in terms of developing new procedures, technologies, and new products or services (Miles and Snow, 1978; Covin and Slevin, 1989; Venkatraman, 1989). Firm risk taking is measured by asking managers about the firm's tendency to engage in risky projects and managers' inclination for bold versus cautious acts to achieve firm objectives (Lumpkin and Dess, 1996). Analysis was measured by asking

managers about the firm's overall problem solving posture, and the emphasis it places on the use of planning techniques and information systems (Venkatraman, 1989). Defensiveness was measured by asking managers about the firm's emphasis on cost reduction and efficiency seeking methods (Venkatraman, 1989).

4.5.3 Technological Orientation

Technological orientation represents a firm's desire to introduce new ideas, products or processes (Damanpour, 1991; Gatignon and Xuereb, 1997; Hult and Ketchen, 2001). Gatingnon and Xuereb (1997, p. 78) have formally conceptualized technological orientation as a firm's "ability and will to acquire substantial technological background and use it in the development of new products. Technology orientation also means that the company can use its technical knowledge to build a new technical solution to answer and meet new needs of the users". Thus, technology-oriented firms tend to show high commitment to R&D, and they are considered proactive in terms of acquiring and merging complex technologies in the new product development process (Zhou *et al.*, 2005; Slater *et al.*, 2007). Firms with a high level of technology-orientation also encourage openness and exploitation of novel technologies. This study operationalizes technology orientation using the four-item Likert scales developed by Zhou *et al*. (2005); these build on a scale developed by (Gatignon and Xuereb, 1997), as shown in Appendix 1.

4.5.4 Novel Business Model

In essence, BM refers to the logic of the firms and how it intends to provide and capture value for its stakeholders (Osterwalder and Pigneur, 2010). In this sense, BM innovators often seek to identify new ways to capture and deliver value by focusing on novel methods to generate revenue and create value propositions for customers, suppliers, and other business partners (e.g., Amit and Zott, 2001; Magretta, 2002; Zott and Amit, 2007; 2008; Baden-Fuller and Morgan, 2010; Casadesus-Masanell *et al.*, 2010; Gambardella and McGahan, 2010; Teece, 2010). Consequently, BM innovation is argued to have an impact on the whole organization (Amit and Zott, 2001), and a novel BM has been linked to the creation of a sustainable competitive advantage.

This study adopts Aimt and Zott's (2001) understanding of the concept. The authors argue that BM refers to a firm's boundary-spanning transactions with external stakeholders such as customers and suppliers. They argue that a BM depicts "the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities" (p.511). To measure the novel BM design, the researcher used the 13-item Likert scale developed by Zott and Amit (2007). Given the difficulty of obtaining objective measures of BM design, this study deemed the use of perceptual measures to be appropriate (Dess and Robinson 1984). In line with Zott and Amitt (2007, 2008), the Likert scale items were coded into a standardized score. After coding, the items scores were combined into an overall score for the composite scale using equal weights, as shown in Appendix 1.

4.5.5 Business Performance

Business performance has been measured by BM researchers in various ways; these include stock market value (Zott & Amit, 2007), industry turbulence (Kim and Mauborgne, 2005), and a set of objective measures including return on total assets, return on sales, return on equity, inventory turnover ratio, sales growth ratio, and the compound annual growth rates of sales (e.g., Morris *et al.*, 2013). Accordingly, this study has attempted to collect both subjective and objective measures of performance. However, the sample in this study includes many privately held firms and, hence, the majority of the respondents were reluctant to supply the objective measures of performance.

Thus, and in consistent with previous strategy research, the researcher relied on the subjective indicators for measuring business performance. Specifically, SBU performance was measured by asking respondents to rate their satisfaction with four performance indicators (see Appendix 1) on a 7-point Likert-type scale. The selected scale items emphasize both profitability and market growth in line with previous strategy research (e.g., Powell, 1992; Slater and Olson, 2000; Newbert, 2008). Some studies indicate that subjective measures are a good measure of business performance and they tend to have a high correlation with objective measures (Dess and Robinson,

1984). Similarly, Morgan *et al.* (2004) reported a high correlation between objective performance data and subjective measurements of performance by key informants, which offers more support for the validity of key informant data. Furthermore, subjective performance assessments have been found to be less problematic than more 'objective' financial measures, as the latter may be biased by the aim for which they are created (Gatignon and Xuereb, 1997).

4.5.6 Moderator Variables

Technology turbulence is measured using a 4-item, 7-point Likert-type reflective scale (1=strongly disagree, 7=strongly agree) in line with (Jaworski and Kohli, 1993). Technological turbulence refers to the level of technological change in the industry (Jaworski and Kohli, 1993). More details about the items used to measure the construct are provided in Appendix 1.

4.5.7 Controls

Control variables were collected for items that may influence the performance of the sampled firms. Various studies have argued that industry and firm characteristics may have a significant effect on firms' performance (e.g., Schmalensee, 1985; Rumelt, 1991). Consequently, to test the research hypothesis, this study controls for specific industry and firm level variables. At the industry level of analysis, the study includes industry sector (manufacturing vs. services). At the firm level, the study follows prior research and control for firm age measured by asking respondents to specify the years when the organization was established (Gulati and Higgins, 2003) and firm size measured in terms of the number of employees (Zott and Amit, 2008; Brettel *et al.*, 2011). Finally, the study controlled for other types of business model design (i.e. efficiency-centred BM) in line with Zott and Amit (2007). Efficiency-centred BM was measured using the 13-item Likert scale developed by Zott and Amit (2007). The Likert scale items were coded into a standardized score (Zott and Amit, 2007; 2008). After coding, the item scores were combined into an overall score for the composite scale using equal weights, as shown in Appendix 1.

4.6 Validity and Reliability of Research Design

The impact of management and business studies relies heavily on the appropriateness and rigor of the research methods used. Issues in research design such as instrumentation, data analysis, and construct validity can have a huge impact on research findings and conclusions. This led to growing scholars' attention to the reliability and validity of research methods. Various authors have addressed the issues from different perspectives, resulting in several labels that are employed to describe reliability and validity of measures in the research methods literature. The following section reviews the literature on reliability and validity and discusses the methods used by the researcher to enhance the reliability and validity of this research. Statistical assessment of both aspects is discussed in Chapter 5.

4.6.1 Validity

Validity refers to the "evidence that the instrument, technique, or process used to measure a concept does indeed measure the intended concept" (Fan and Yan, 2010, p. 447). This process ensures that the questions that are designed to measure a specific concept do in fact measure the concept they set out to measure, and not something else. Besides, the instrument, as the operational definition, must be consistent and incorporate all aspects of the abstract concept to be explored. Preferably, it should be possible to confirm this through different, independent observations. De Vaus (1992) clarifies that scholars must not only pay special attention to the fact that the measure is valid or invalid, but to how they have defined the concept it is designed to measure. An instrument may be an appropriate measurement, but not necessarily valid for the concept it is designed to measure. In general, prior research highlights five types of validity: face validity, content validity, construct validity, predictive validity (Anderson and Gerbing, 1988; Iacobucci and Churchill, 2009), and external validity (Olson *et al.*, 1995; Bryman and Bell, 2011).

Face validity represents a subjective evaluation of the measure and it is concerned with how closely the operationalization appears 'on its face' to measure what it is supposed to measure, or whether it is covering the concept it purports to measure. As the validity

of a test is determined subjectively, face validity is largely viewed as the weakest way to try to demonstrate construct validity.

Content validity ensures that the measure incorporates an appropriate and representative set of items that tap the concept (Iacobucci and Churchill, 2009; Sekaran and Bougie, 2010), i.e. the more the scale questions represent the domain of the concept being measured, the higher the content validity. In other words, content validity can be established based on how well the dimensions and elements of a concept have been delineated.

Construct validity refers to the degree to which the measurement questions actually measure the presence of those constructs a researcher intended to measure (Hair *et al.*, 2010; Hair *et al.*, 2013), and it also testifies to how well the results obtained from the use of the measure fit the theories around which the test is designed. This is frequently assessed through convergent validity and discriminant validity. Convergent validity is achieved when the scores produced from two different instruments measuring the same concept are highly correlated. Discriminant validity, however, is achieved, based on theory, when two constructs are expected to be uncorrelated, and the scores produced by measuring them are empirically found to be so (Tabachnick and Fidell, 2007; Hair *et al.*, 2010).

Predictive validity indicates the ability of a measurement instrument to predict what it should be able to predict. The predictive ability of measurement is a key aspect of validity and can be established in several ways. One popular approach is nomological validity, which refers to the extent to which predictions from a conceptual model are confirmed (Cronbach and Meehl, 1955). A measure has nomological validity when it correlates positively with different but related constructs. Predictive validity can also be assessed through what Olson *et al.* (1995) calls "internal validity". Internal validity reflects the degree to which causal conclusions based on a study are warranted, and it indicates the level of confidence in causal effects among a set of variables (Saunders *et al.*, 2011).

External validity refers to the extent of the generalizability of the results across times, settings, and individuals (Tabachnick and Fidell, 2007; Hair *et al.*, 2010). Researchers are required to establish the domain to which the findings can be generalised. Consequently, this type of validity is considered the closest to the concept of generalizability (Sackett and Larson Jr, 1990). Scandura and Williams (2000) argue that external validity, or generalizability, can be better addressed by methods such as formal theory and sample surveys. Generating a theoretical model from a literature review and testing the model using a sample survey would enable the researcher to report more generalizable findings and enhance external validity.

It is widely acknowledged that no single research strategy can adequately cover all aspects of validity. Hence, researchers are required to adopt a variety of strategies to maximize different kinds of validity. For instance, triangulation has been suggested as an effective strategy to achieve more valid and reliable research results. However, due to the nature of research projects and the type of research questions, triangulation is not always possible. In the current thesis, the main task is to identify causal relationships between constructs. Quantitative methods are thus more effective, considering the research aims and objectives. Based on the above discussion, the following steps were taken to ensure the various issues of validity.

The face validity and content validity are maximized through a rigorous literature review. The operationalization of each measurement is assessed against the pertinent content domain for the construct. The researcher placed extra efforts to use the measures that have been previously tested and validated by previous studies, specifically from those published in high ranking management journals.

Construct validity is empirically tested by employing a two-step approach. Firstly, convergent validity is established through confirmatory factor analysis. Then, discriminant validity is tested by comparing the square root of the Average Variance Extracted (AVE) for a specific latent construct, with the correlations between that construct and all other latent constructs. Once convergent and discriminant validity are

established, the unidimensionality of measurement constructs is supported. These will be reported in Chapter 5, Analysis and Findings.

Predictive validity is empirically tested and also reported in Chapter 5. Structural equation modelling is used to establish causal links between constructs. Structural equation modelling, referring to a whole set of goodness-of-fit indices, is recognised as a most effective method for predictive validity (Kline, 2011).

The external validity of this research is established through adopting a quantitative research strategy, followed by a critical review of all relevant research fields in terms of identifying theoretical foundations and a cross-comparison with previous research findings. Survey research is adopted and aims to achieve generalizable findings by adopting the random sampling method. Details of the questionnaire administration are reported later in this chapter.

4.6.2 Reliability

Reliability analysis refers to the method that is used to examine whether the measurement tool has internal consistency (Hair *et al.*, 2010). A reliable instrument, thus, is one that is free from random error and able to produce consistent results. High reliability indicates that the instrument used to measure something will produce very much the same results at two different points in time, assuming that what or who is being measured has not changed. In this research, the reliability of the measurement tools is assessed using Cronbach's alpha, which is one of the most popular measures of scale reliability (Field, 2009). In this context, it is important to note that while it is possible to have a measure that is valid but not reliable, a measure that is not valid will never be reliable. In reality, the actual score is usually not obtained since we cannot make a perfect measuring instrument, and this is especially true of those designed to measure abstract concepts. Hence, all reliability coefficients are estimates, depending on what type of reliability one is employing. The most popular types of reliability test include stability, equivalence, inter-rater reliability, and intra-rater reliability (Mehrens and Lehmann, 1984).

The previous research methods literature suggests that the test-retest method is considered the only way to test the reliability of single questions (See De Vaus, 2002; Sekaran and Bougie, 2010). Test-retest reliability refers to the reliability co-efficient obtained with the repetition of the same measure on a second occasion. The higher it is, the better the test-retest reliability, and consequently the stability of the measure across time. In the current study, a test-retest is impractical, since it is difficult to convince the actual respondents to participate in a second survey using the same questionnaire, especially since respondents are assumed to have senior managerial positions with tight and busy schedules. This is also emphasized by de Vaus (2002, p. 52), who states that "Unfortunately the test-retest method is a poor one. It is often very difficult to give the same test to the same sample twice... Another problem is memory: people may remember their answer on the first occasion and answer the same time to be consistent. This can artificially inflate the apparent reliability of the question."

The reliability of this research is established through the following measures: minimising the source of unreliability, multi-item indicators, and the use of questions from studies published in high ranking journals.

- Minimising source of unreliability: de Vaus (2002) argues that the reliability of a question is likely to be reduced as a result of bad wording. Hence, respondents may understand a question differently on separate occasions. Another source of error occurs when respondents have no opinion or have incomplete information. In the current study, bad wording was minimised through rigorous review of the previous literature, thorough discussion with the supervisors, and academic and peer review of the questionnaire. Difficult questions were reworded and ambiguous questions were amended.
- Multi-item measures: Employing multi-item indicators is considered the best approach to create reliability, and it also offers an easier method of assessing their reliabilities (De Vaus, 2002). This method is often contrasted with single-item measures which tend to have a strong yes-saying bias, while multi-item measures are likely to eliminate such bias.

- The survey questions were adopted from reputable studies: the current study employed measures that are well established and which have undergone numerous validity and reliability tests. The reliability of the measurement instruments was checked and established using Cronbach's alpha coefficient.
- Cronbach's Alpha test of reliability: This is a model of internal consistency, based on the average inter-item correlation. Cronbach's Alpha was calculated for each variable, and this is reported in the data analysis chapter.

The above discussion highlights the importance of the validity and reliability of measurement in generalising research findings. Guba (1978) questions the significance of generalised research results, specifically in the context of evaluation studies that tend to be fraught with local variables. In some circumstances, the situation can change so radically that not only is generalizability difficult, replication is impossible. Despite the disagreement surrounding this issue, in academic society it is still frequently argued that research should produce generalizable results. Black (1993, p. 55) points out that "without generalizability of results, social science research in general will tend to limp along, not benefiting from the efforts of others, collecting results on a piecemeal basis". The more generalizable the research results, the more research will be able to deal with conflicting hypotheses. By following the above identified methods, this research aimed to establish optimal validity and reliability.

4.7 Questionnaire Design

Questionnaire design and administration is considered an important step in the research process. As previously discussed, the researcher ensured the selection of well-established scales that have demonstrated high reliability and validity in previous research. The questionnaire used a 7-point Likert-type scale, ranging from 1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=neither agree or disagree, 5=somewhat agree, 6=agree, 7=strongly agree, except for the novelty and efficiency business model scales, where a 4-point Likert scale was used (see Appendix 1).

As this research study adopted a self-administered questionnaire technique, the researcher ensured that the questionnaire was clear, direct and easy to handle. During the design process an attempt was made to address all the issues that might have affected the respondents' understanding of the survey instrument, which include the questionnaire format, and the introduction and closing of the questionnaire. A careful consideration of these issues can significantly improve the response rate (Dillman *et al.*, 2009).

4.7.1 Web-Based Survey Administration

Survey Monkey, a web-based tool, was used to distribute the survey questionnaire to the targeted respondents. This offers businesses and researchers a cheap method to design and distribute surveys on-line (see Appendix 3). Survey Monkey has valuable features that clearly facilitate the data collection process. For example, once the design of the survey questionnaire is completed, a survey link is provided which can be sent by email to the participants. Other features are provided to improve the management level of the survey and to keep track of the response rate. Survey Monkey also enables researchers to restrict responses to one response per IP address. To collect survey responses, the management tools include other features such as viewing responses and filtering based on the completion rate. The moment the data collection is completed, the results can be downloaded directly into SPSS, which saves the time needed for data entry and screening (Survey Monkey, 2014).

Accordingly, an e-mail message was sent to the respondents along with a cover letter and the website address (URL), as shown in Appendix 1. The respondents were informed that they could request a paper copy of the survey should they have a problem with accessing the survey online. The researcher ensured that the letter was short and illustrated the key objective of the study. Respondents were also informed of how they were selected and the time required to complete the survey questionnaire. The letter also stressed that all information provided would be strictly confidential and stored in a secure location (Diamantopoulos and Schlegelmilch, 1996). The internet protocol numbers (IP) were obtained along with the time and date the survey was completed by

the participant. Responses were checked for multiple entries by the same person, and if found, the extra ones were deleted.

4.7.2 Format of the Questionnaire

The format of questionnaire is considered one of the key criteria that determines response rate (Parasuraman *et al.*, 2006; Dillman *et al.*, 2009; Babbie, 2012). Dillman *et al.* (2009) point out that in a web-based survey, both the layout and appearance of the questionnaire are crucial, because they are crucial elements for encouraging respondents to cooperate. They recommend that a web-based survey must appear attractive, neat and uncluttered. While a professionally produced attractive questionnaire can increase the chances of respondent cooperation, an uncluttered questionnaire with clear instruction will minimise the respondent's errors. Specifically, the researcher followed the recommendation of Dillman *et al.* (2009) during the design process by taking the following steps:

- The researcher has attempted to introduce the web-based survey with a welcome screen that is motivational, highlights the ease of response, and instructs respondents about how to proceed with the survey.
- An attempt was made to begin with interesting but simple to answer questions. Each question was presented in a traditional format, similar to that normally used on paper, self-administered questionnaires.
- Respondents were not required to provide an answer to each question before being allowed to answer subsequent questions. The respondents were not forced to provide answers to each single question in survey.
- The researcher ensured each question, and corresponding potential responses to that question, were visible on the screen at one time. It has been ascertained that design techniques such as providing a 'don't know' response option, or reassuring respondents that they need not feel compelled to answer every questionnaire item have proved effective in reducing but not eliminating uninformed response. Therefore, a middle option representing a 'neither agree nor disagree' answer is always given in this questionnaire.

- Questions were deliberately grouped into sections and sub-sections using sub-numbering systems to enhance the format of the questionnaire.

It is frequently argued that a lengthy survey questionnaire will not encourage the respondent to cooperate (Dillman *et al.*, 2009). However, if the sample is made up of respondents with a special interest in the research project or with a high standard of literacy, they will not be discouraged by lengthy questionnaires (Dillman *et al.*, 2009). Dillman (2000) famously suggests "there is no other method of collecting survey data that offers so much potential for so little cost" (p.400). Using this tool effectively and in a way that generates adequate response rates could be a significant improvement in our ability to understand needs and evaluate programmes.

4.7.3 Inducing Responses Using a Web-Based Survey

An important issue with mail surveys is how to increase the rate of response by giving incentives and conducting follow-ups. A literature review of experimental evidence relating to industrial mail surveys has proposed six methods that can increase response rates (Jobber, 1995). These include a preliminary telephone call, prepaid monetary incentives, non-monetary gifts, the use of stamps on return envelopes, granting anonymity to respondents, and following-up the first mailing with a second cover letter and questionnaire.

In the context of web-based surveys, the researcher followed the recommendation of (Dillman *et al.*, 2009) to enhance the response rate by offering both monetary and non-monetary incentives. Hence, target respondents had a chance to enter a prize draw of five £50 Amazon vouchers. Furthermore, a summary of the study findings was promised to the respondents upon completion of the study. To enhance the response rate, a follow up letter was sent to non-respondents by email at two and four week intervals (Kanuk and Berenson, 1975; Cobanoglu and Cobanoglu, 2003) (see Appendix 2). The researchers also made phone calls to firm managers to encourage them to participate in the study. The respondents were also promised a summary of the survey results. These efforts have significantly improved both the speed and the total number of complete responses.

4.7.4 Response Rate

The response rate refers to the percentage of the sample that does actually agree to participate in the study (Bryman and Bell, 2011). It is the most commonly used statistic to show the quality of surveys (Fan and Yan, 2010). In this study, the invitation letter with the survey link was sent to all managers included in the sampling frame (i.e. 3,443) via their business e-mail. Out of these, 497 e-mail messages were undelivered. This can be explained by the fact that some managers had moved to other companies and, hence, their emails were not valid anymore. Second, to limit the number of non-business related emails, it has become a common practice for firms to install their own e-mail filtering techniques which can lead to this high level of undelivered emails. The researcher attempted to contact the managers of these firms by phone; however, most of them were out of reach due to their busy schedules. Furthermore, 546 firm managers clearly indicated that they were unable to participate in the study. In total, the researcher received 300 responses. Out of these, 19 responses were discarded because they had a high percentage of incompletion rate, leaving 281 useable responses. Based on the above information, the researcher obtained a response rate of 11.6 %. This rate was calculated according to the following equation (Bryman and Bell, 2011):

$$Response\ rate\ = \frac{n\text{umber of useable questionnaires}}{\text{total sample} - \text{unsuitable or uncontactable members of the sample}} * 100$$

Based on the above equation, an 11.6% response rate is achieved. Given that informants in this study were senior managers, and given the nature of data required, the rate of response is considered acceptable. Prior research indicates that the level of web-based survey response rates vary widely and are affected by a number of factors. These include length of the survey questionnaire, target respondents, design, lack of interest, and incentives, among others (Dillman *et al.*, 2009). Accordingly, some studies have reported a response rate as low as 2% (e.g., Petchenik and Watermolen, 2011).

4.8 General Sample Characteristics

Table 4.2 presents a summary of the sample general characteristics based on firm age, firm size, and industry types. It can be noted that the majority of firms who participated

in this study are medium-sized while 30 % are large firms. The Department for Business Innovation and Skills (UK) classifies firms with 50 to 249 as medium sized, and those with more than 250 as large firms.

Table 4.2: Sample characteristics

Characteristic (variable name)	Category	%
Number of employees (size)	From 50-200	66
	201 to 500	14
	501 to 1,000	9
	More than 1000	11
Sample size	281	
Firm age	Less than 20 years	26
	21 to 50 years	50.2
	51 to 75 years	7.1
	76 to 100 years	6.8
	101 to 125 years	3.9
	More than 125 years	6
Industry type	Manufacturing	46
	Service	54

4.9 Statistical Analysis

The cross-sectional data collected from the sampled population were analysed in Chapter 5 to test the construct measures and to test the study hypotheses proposed in the theoretical model. The data analysis process started, as illustrated in Chapter 5, by a preliminary analysis of the sample data to ensure that it met the requirements of multivariate analysis. Second, the properties of the measurement scales were assessed for unidimensionality, convergent validity, discriminant validity, and reliability. Third, confirmatory factor analysis was carried out using AMOS 21 to assess the model fit followed by model re-specification and estimation (Schumacker and Lomax, 2012; Byrne, 2013). Finally, after providing a summary of the key descriptive statistics, the

research hypotheses were tested by employing the Structural Equation Modelling (SEM) technique.

SEM is considered a powerful quantitative data analytical technique which estimates and tests theoretical relationships between latent and observed variables and combines regression and factor analysis (Tabachnick and Fidell, 2007). It can be viewed as a general model of many frequently used statistical models, such as analysis of variance, analysis of covariance, multiple regression, path analysis, factor analysis, and discernment analysis. However, as pointed out by various scholars, several factors make SEM different from other traditional multivariate techniques (Kline, 2011; Schumacker and Lomax, 2012e.g., ; Byrne, 2013). First, in SEM, data is analysed using a confirmatory rather than exploratory approach, even though certain aspects of the latter can be addressed. Second, SEM incorporates capabilities that enable assessing and correcting for measurement error as opposed to traditional multivariate techniques that do not include such capabilities. Third, traditional approaches to data analysis include only observed measurement, whereas the SEM procedure incorporates both observed and unobserved (i.e. latent) variables. Fourth, SEM has been used in similar strategic orientations research (e.g., Zhou *et al.*, 2005; Menguc and Auh, 2006; Zhou *et al.*, 2008). Finally, there is a lack of popular alternatives to SEM that can be easily applied for modelling multivariate relations, or for estimating point and/or indirect effects. Consequently, SEM can be thought of as an "umbrella" incorporating a group of multivariate statistical techniques to empirical data, in terms of both traditional and recently advanced approaches.

To assess the goodness-of-fit between the hypothesised model and the observed data, researchers are increasingly relying on a number of goodness-of-fit indices. As each single criterion has its own strengths and limitation, scholars are advised to use a combination of goodness-of-fit indices to evaluate the model fit, model comparison, and model parsimony (Hair *et al.*, 2010; Schumacker and Lomax, 2012; Byrne, 2013). This study follows the recommendation of Hair *et al.* (2010) and reports indices from various sets of fits statistics which include the following:

Chi-square (X^2) statistics: Researchers are frequently interested in getting non-significant X^2 results, suggesting that there is no difference between the observed matrix (S) and the estimated matrix ($\sum$) (Kline, 2011). This statistic tests the degree to which the residuals in the matrix ($\sum$- S) are zero (Bollen 1989). As the X^2 test is very sensitive to sample size, researchers often report X^2 relative to the degree of freedom (i.e. X^2/df). A value of the X^2/df ratio that is less than or equal to 2.00 represents a very good fit between the hypothesized model and the sample data (Byrne, 2013).

For the comparative fit index (CFI), the incremental fit index (IFI), and the Tucker-Lewis index (TLI), these goodness-of-fit statistics are considered part of baseline comparisons, and are classified as comparative or incremental goodness of fit. For a well-fitting model, the values of these fit indices should be close to the cut-off point of 0.95 (Hu and Bentler, 1999). Other scholars have proposed less stringent criteria where an index value that is equal or higher to 0.90 represents a good fit (Bentler, 1992; Byrne, 2013).

The root mean square error of approximation (RMSEA) represents the error of approximation in population. It is frequently termed "badness of fit" since a score of zero represents the best fit (Schumacker and Lomax, 2004). An RMSEA value of 0.060 or less indicates a good fit between the hypothesized model and the observed data (Hu and Bentler, 1999). Byrne (2013) offers a summary of the previous literature recommendations of the acceptable values of RMSEA as follows: (1) less than 0.08 represents a reasonable fit; (2) between 0.08 and 0.1 indicate a mediocre fit; and (3) more than 0.1 is a poor fit.

4.9.1 Common Methods Variance

The current study relies on self-reported data from one key informant and, additionally, data were collected for the dependent and independent variables using a single web-based survey. This is likely to introduce common method variance (Podsakoff *et al.*, 2003). A number of studies (Spector, 1987; Williams *et al.*, 1989; Bagozzi and Yi, 1990) have investigated the effect of common method variance and reported mixed

findings. To minimize bias, previous research has proposed the use of both procedural and statistical methods (Tepper and Tepper, 1993; Podsakoff *et al.*, 2003).

From the procedural perspective, the researcher has assured participants that their confidentiality and anonymity will be maintained in order to reduce evaluation apprehension, as suggested by Podsakoff *et al.* (2003). Additionally, the survey questionnaire and the cover letter were designed so that the respondents do not understand the logical link between the latent factors, as illustrated in Appendices 1 and 2. Furthermore, before the actual data collection, the survey questionnaire was pilot tested by group of academics and business managers for their insights in designing a questionnaire (five academics and five business managers). Six people responded and represented 60% response rate of the pilot test. All feedback was reflected and actions taken accordingly (see Appendix 4).

In regard to the statistical remedies (Podsakoff *et al.*, 2003), this study carried out Harman's one-factor test (Podsakoff and Organ, 1986), which is a technique that is frequently adopted by researchers to assess the existence of common method bias. All variables included in the conceptual model (i.e. MO, EO, technology orientation, novel BM, efficiency BM, technology turbulence, and firm performance) were entered into an exploratory factor analysis. The results indicated that a single factor does not appear to account for the majority of variance in these variables: the first factor accounted for only 17.6% of the total variance.

Additionally, the researcher employed the "unmeasured latent factor method" suggested by Podsakoff *et al.* (2003) to test for common variance, and used by Hammer *et al.* (2013). This approach entails the addition of an unmeasured latent factor to the measurement model during confirmatory factor analysis. This latent factor consists of all indicators from all other latent factors. This technique identifies the variance shared between all observed indicators (Hammer *et al.*, 2013). The procedure requires that all indicator loadings be equal to each other in order to attain equal unstandardized loadings. Squaring the unstandardized loading (i.e. the same value for all indicators) provides the per cent of common variance across all indicators in the hypothesized

model. This value represents the common method bias. The results of this test showed that approximately 2 per cent of the variance could be due to common method bias. From the results of both tests, it can be concluded that common methods bias was not a serious concern in the current study.

4.9.2 Non-Response Bias

Previous research has pointed out that sample representativeness might be questioned for at least two reasons (Wilcox *et al.*, 1994). First, the selected sample may not be representative of the frame or population of interest. The second reason is that non-response bias can occur in statistical surveys when the answers of those who participated may differ from the potential answers of those who did not. Wilcox (1994) further notes that although sampling and inferential statistics literature is well developed and readily available, the methods for handling non-response bias are less developed.

The extant literature indicates that non-response bias can be handled by three main approaches (Luck and Rubin, 1994). In the first approach, the researcher assumes that there are no differences in the responses between those who participated and those who did not. Substantial evidence must be provided by the researchers who choose to make such an assumption. The second approach is widely used in the literature and entails comparing a sample of respondents and non-respondents on some key characteristics. In the third approach, researchers are advised to re-contact non-respondents by telephone to fill in a new wave of questionnaires. Consequently, comparisons can be made between the answers given by respondents with those of non-respondents.

In this study, the second approach was adopted. A sample of non-respondents was randomly selected and phoned. To assess non-response bias, business unit managers were asked about the size of the business unit (i.e. the number of employees) and the year that the business/venture was established. The mean for business unit age and size for the sample of non-respondent was then calculated and compared with those who responded. The results indicated that the mean difference between respondents and non-respondents was statistically non-significant. Accordingly, it was concluded that non-response bias is not an issue for the current research.

4.10 Ethical Concerns

Ethical issues play a vital role in conducting a business research (Sekaran and Bougie, 2010; Bryman and Bell, 2011; Saunders *et al.*, 2011). Saunders *et al.* (2011) also indicate that good ethical standards are a pre-condition for running a good business. It is imperative, therefore, that ethical issues are taken into consideration before conducting research. The ethical implications of the current study which could negatively affect respondents were taken into consideration when planning the research design and methodology. The research methodology was consequently adapted in accordance with suitable ethical principles. Various actions were taken to minimize any ethical concerns, which include obtaining informed consent, giving the right to respondents to withdraw from the study at any time, and the protection of anonymity and confidentiality. Participants were also informed that they had the chance to ask questions, at any time, throughout the research process.

The most important ethical issue is likely to be confidentiality and anonymity for respondents and the data they provide. As Bryman and Bell (2011) point out, the issues of confidentiality and anonymity are of great importance when implementing quantitative research. Therefore, an ethical approval from was submitted to Newcastle University Business School, and once the researcher received notification of approval from the school, a cover letter was prepared. The cover letter explained the aims and the objectives of the research study, and highlighted the voluntary nature of the participation. Burton (1997, p.229) states that "ethical concerns are present in all research designs and go beyond data collection to include analysis and publication" (Burton, 2000, p.299). These issues were prioritized by the researcher throughout the research process.

4.11 Chapter Summary

This chapter introduced the research methodology that was used to answer the research questions outlined in Chapter 2. The chapter started by discussing the epistemological stance adopted for the current study. Consequently, it summarized the approaches taken to measure market orientation, entrepreneurial orientation, technological orientation, novel BMs, and business performance. To test the research hypotheses, a web-based

survey questionnaire was employed to collect quantitative data to be subsequently analysed using AMOS –a covariance based SEM technique. Specifically, the chapter placed special emphasis on the sampling procedure, data collection methods, survey instrument development, and questionnaire administration.

Chapter 5. Data Analysis and Results

5.1 Introduction

This chapter presents the results of the current study. First, the chapter starts with the data screening results in regards to missing data, influential outliers and required assumptions for further analyses. Second, bootstrapping technique results are reported. The third section presents the results of confirmatory factor analysis and model respecification. The fourth section provides a summary of the key descriptive statistics provided to describe the sample characteristics and correlation among variables. Finally, results of the Structural Equation Modelling (SEM) are presented in order to answer the research questions. The chapter ends with a summary of results.

5.2 Data Screening

Before running SEM or any multivariate analysis technique, data should be carefully screened for various characteristics (Tabachnick and Fidell, 2007; Hair *et al.*, 2010). In this study, firstly, the researcher revised the reverse-coded items to prepare the data for subsequent analyses. Secondly, the data was examined for the presence of missing data, influential outliers, normality, linearity, homoscedasticity, and multicollinearity (Kline, 2001). These assumptions were tested using SPSS 21.

5.2.1 Missing Data

According to Hair *et al.* (2010), individual cases with less than 10% missing data can be included in the analysis as long as the data is missing completely at random. Accordingly, all cases that exceeded the 10% missing cut-off point were deleted, and were not considered for further analyses. The dataset included 160 complete responses and for the remaining cases (i.e. 121 cases) the level of missing data was lower than 10% and missing values appeared to be scattered throughout the dataset and hence these would have limited impact on the data analyses (Tabachnick and Fidell, 2007; Hair *et al.*, 2010).

The researcher ensured that values were missing randomly by running a missing value analysis procedure. As shown in Appendix 5 and Appendix 6, the results of Little's

Missingness Completely at Random (MCAR) test showed that the missing value pattern was considered to be completely at random, as evidenced by the non-significant chi-square value, X^2=3000.611, P=.625.

In SEM analysis, two options are available to handle missing values if they are completely missing at random: LISTWISE deletion and imputation. Imputation refers to "the process of estimating the missing data of an observation based on valid values of other variables and/or cases in the sample" (Hair *et al.*, 2010, p.49). In this study, the imputation technique is used since LISTWISE deletion can reduce the number of respondents which can significantly affect the representativeness of the sample. Consequently, missing values in the current study were replaced using the maximum likelihood of estimation, an imputation method, as it is widely considered the most popular estimation algorithm in structural equation modelling (Kline, 2011).

5.2.2 Outliers

Outliers are data values that are extreme on either the independent or the dependent variables or both (Schumacker and Lomax, 2004). There are various reasons for the presence of outliers in a dataset, including observation, data entry, and instrument errors, which relates to design or instructions, or very extreme values from self-reported data (Tabachnick and Fidell, 2007). The presence of influential outliers in a dataset can distort analysis as they greatly affect the values of mean, standard deviation, and correlation coefficients. Accordingly, extreme cases must be explained, deleted, or included in the analysis under the condition of using robust analysis techniques (Schumacker and Lomax, 2004; Field, 2009; Hair *et al.*, 2010). Tabachnick and Fidell (2007) argue that outliers should be evaluated at both univariate and multivariate levels. A univariate outlier has an extreme value on a single variable, while a multivariate outlier has extreme values on two or more variables.

Based on the recommendation of Field (2009), outliers were first examined at the univariate level. This was achieved by comparing all the cases with Z scores that exceeded the cut-off point of 3.29. Z scores were calculated by dividing both skewness and kurtosis by their corresponding standard error. As shown in Appendix 6, several

univariate outliers were identified. As SEM is a multivariate analysis technique, special emphasis is placed on multivariate outliers and univeriate outliers were not taken into consideration in the current study.

Appendix 7 reports the AMOS 21 test of multivariate outliers using Mahalnobis distance (Mahalanobis D^2). D^2 represents a measure of distance in the multidimensional space of each observation from the mean centre of multidimensional centrality (Hair *et al.*, 2010). Typically, an outlying case will have a D^2 value that differs markedly from all the other D^2 values (Byrne, 2013). Furthermore, AMOS provides two additional statistics, p1 and p2. The p1 column indicates the probability of any arbitrary D^2 exceeding the observed value. The p2 column shows the probability of the largest (or second largest, and so on), with D^2 exceeding the observed value. A rule of thumb for determining which observations would be considered as outliers was proposed by (Arbuckle, 1997): "Small numbers in the p1 column are to be expected. Small numbers in the p2 column, on the other hand, indicate observations that are improbably far from the centroid under the hypothesis of normality."

Accordingly, to determine influential outliers in the original data set, all cases listed in Appendix 7 with p2 values less than .1 were individually examined. As expected, in these cases respondents scored either high or low in regard to their firms' emphasis on novel business model design. Thus, these cases do not appear to misrepresent the phenomenon being studied and their variability from the target population is considered minimal. In total, thirty-six cases were initially identified as possible outliers, but upon closer inspection, these proved to be valid data points. Additionally, the results of the fit indices were the same when analysis was conducted with and without these cases and, therefore, all these cases were retained in the data set.

5.2.3 Univariate and Multivariate Normality

Multivariate normality is considered a key assumption for carrying out SEM analysis generally, and more specifically within an AMOS environment (Byrne, 2013). The results of univariate and multivariate normality are shown in Appendix 8. Univariate normality can be inspected by using skewness and kurtosis values. In SEM analysis, it is generally recommended to focus on kurtosis since it significantly affects tests of

variance and covariance (Kline, 2011; Byrne, 2013). An item is considered kurtotic if it has a value equal or higher to 7 (West *et al.,* 1995). A review of the kurtosis values reported in Appendix 8 showed no item to be substantially kurtotic. To check for multivariate normality, Mardia's test was used. In the current study the Z-value was 36 which is significantly higher than the recommended cut-off point of 5, indicating non-normal multivariate distribution. Accordingly, to handle the presence of non-normal multivariate data the researcher used "the bootstrap" procedure (West *et al.,* 1995; Zhu, 1997). Bootstrapping enables the researchers to create a large number of subsamples from the original dataset set and, accordingly, generate their values with a higher level of accuracy (Byrne, 2013). In SEM context, bootstrapping can provide an appropriate solution when the data fails to meet the required statistical assumption of large sample size and multivariate normality (Yung and Bentler, 1996).

5.2.4 Linearity and Homoscedasticity

Linearity indicates a linear relationship between variables, while homoscedasticity refers to the assumption that dependent variable(s) show the same levels of variance across the range of predictor variables (Hair *et al.*, 2010). Linearity and homoscedasticity were evaluated by the inspection of bivariate scatter plots in SPSS (Kline, 2011). In the current study, the inspection of bivariate scatter plots resulted in an oval-shaped array of points, demonstrating that variables are linearly related and their variances are homogenously distributed.

5.2.5 Multicollinearity

Multicollinearity occurs when two or more variables are highly correlated, suggesting that they represent the same underlying construct (Hair *et al.,* 2010). Multicollinearity problems were assessed by examining correlations between latent constructs through the variance inflation factor (VIF). According to Hair *et al.* (2010), a 0.90 or higher correlation between two constructs may suggest multicollinearity issues. The magnitude of multicollinearity is also determined by the size of VIF. The most common rule of thumb is that if VIF>10, then multicollinearity is high (Tabachnick and Fidell, 2007;

Hair *et al.*, 2010). The results of multicollinearity for this study are reported in the descriptive statistics section (See Table 5.11).

5.3 Confirmatory Factor Analysis

The best known statistical technique for examining relations between sets of observed and latent variables is that of factor analysis. Using this approach to data analysis, the research explored the variances and covariances between a group of observed variables in order to collect information on their underlying latent constructs (i.e. factors). As factor analysis is concerned with the degree to which the observed variables are generated by the underlying latent constructs, and thus strengths of the regression paths from the factors to the observed variables are of primary interest. Any regression structure among inter-factor relations is not considered in the factor analysis.

Confirmatory factor analysis is appropriate when the researcher has some knowledge of the underlying latent variable structure. Based on knowledge of the theory, empirical research, or both, the researcher postulates relations between the observed measures and the underlying factors *a priori*, and then tests this hypothesized structure statistically (Tabachnick and Fidell, 2007; Hair *et al.*, 2010). Thus, in the CFA "a researcher hypothesizes a specific theoretical model, gathers data, and then tests whether the data fit the model" (Schumacker and Lomax, 2012, p. 80). Because confirmatory factor analysis focuses solely on the link between factors and their measured variables, it represents what has been termed a measurement model in structural equation modelling. Based on the above discussions, this research takes a confirmatory factor analysis approach to test the fitness of the overall measurement model, which includes 13 latent constructs (i.e. three for market orientation, and five each for entrepreneurial orientation, technological orientation, novel BM, efficiency BM, business performance, and technology turbulence).

5.3.1 Confirmatory Factor Analysis Results

This section reports the goodness of fit indices for the overall measurement model. Fit indicates that a model is able to reproduce the data. A well-fitting model is one that is

highly consistent with the data and, hence, it does not necessarily require revisions or modifications (Kenny, 2014). SEM researchers emphasize that a well-fitting measurement model is required before attempting to interpret the causal paths of the structural model (Schumacker and Lomax, 2012; Byrne, 2013; Kenny, 2014). Therefore, in the situation of a low model fit, it becomes important for researchers to re-specify their models in order to identify a model that statistically fits the data well, and at the same time achieves high levels of practical and substantive theoretical meaning (Hershberger *et al.*, 2003; Schumacker and Lomax, 2012).

5.3.2 Goodness of Fit Results for the Original Measurement Model

Determining the model fit in SEM is considered a hard task as there are large number of fit indices that have been developed over the years (Schumacker and Lomax, 2012). However, Tabachnick and Fidell (2007) argue that all fit indices produce consistent results and the matter of which indices to report relies on a personal preference of the researcher, or even the journal editor. The authors also argue that when results are inconsistent, multiple indices should be reported. The current study follows the suggestions of (Hair *et al.*, 2010) and reports the following fit indices of Chi-square (X^2), Comparative fit index (CFI), Incremental fit index (IFI), Tucker-Lewis index (TLI), and Root mean square error of approximation (RMSEA).

Based on the above discussion, the results obtained for the original overall model are: $X^2(1348)=2066.7, P<.000$, $X^2/df=1.533$, IFI=0.895, TLI=.882, CFI=0.893, RMSEA=0.044. While the results of X^2/df and RMSEA indicate a good fit as their values were less than the cut-off points (i.e. 2 and .06 consecutively), IFI, TLI, and CFI values were lower than the cut-off point of 0.90 and, therefore, the model needs to be re-specified.

5.3.3 Model Re-Specification Process

Due to the complexity of SEM, researchers rarely attain a good model fit for their original models (Hooper *et al.*, 2008). To handle this problem, SEM researchers offer a number of recommendations. For instance, one approach is to use alternative models (i.e. nested models) where researchers propose competing but theatrically justified

models to determines which model better fit the data (Schumacker and Lomax, 2012). An alternative approach is to carry out model re-specification where the initial model is modified by adding or deleting paths until the best fitted model is reached. The current study implemented the guidelines of Hair *et al.* (2010) and Hooper *et al.* (2008) to re-specify the initial model as follows:

Step one: assessment of factor loadings

Table 5.1 shows the results of the standardized factor loadings for the observed variables used in this study. A factor loading determines the degree to which an observed variable is related to a corresponding latent construct (Byrne, 2013). Items that are designed to measure a specific factor, should exhibit high factor loadings on that factor, and preferably low loadings for other factors. To establish the validity of a construct, it is generally recommended that factor loadings should exceed the cut-off point of 0.5 (Hair *et al.*, 2010). Table 5.1 indicates that all values exceeded the acceptable limit except for MO15, NBM7, and NBM8, which makes these items candidates for deletion from the re-specified measurement model.

Table 5.1: Standardized factor estimates

Construct	Label	Factor Loading
Customer Orientation	MO1	0.686
Customer Orientation	MO2	0.682
Customer Orientation	MO3	0.701
Customer Orientation	MO4	0.598
Customer Orientation	MO5	0.542
Customer Orientation	MO6	0.577
Competitor Orientation	MO7	0.744
Competitor Orientation	MO8	0.579
Competitor Orientation	MO9	0.716
Competitor Orientation	MO10	0.664
Interfunctional Coordination	MO11	0.636
Interfunctional Coordination	MO12	0.623
Interfunctional Coordination	MO13	0.762
Interfunctional Coordination	MO14	0.695
Interfunctional Coordination	MO15	**0.361**
Futurity	EO1	0.565
Futurity	EO2	0.694
Futurity	EO3	0.731
Proactiveness	EO4	0.686
Proactiveness	EO5	0.640
Proactiveness	EO6	0.784
Analysis	EO7	0.703
Analysis	EO8	0.778
Analysis	EO9	0.657
Defensiveness	EO10	0.700
Defensiveness	EO11	0.652
Defensiveness	EO12	0.593
Riskiness	EO13	0.725
Riskiness	EO14	0.645
Riskiness	EO15	0.627
Technological Orientation	TO1	0.853
Technological Orientation	TO2	0.908
Technological Orientation	TO3	0.722
Technological Orientation	TO4	0.666
Novelty Business Model	NBM1	0.534
Novelty Business Model	NBM2	0.598

Novelty Business Model	NBM3	0.609
Novelty Business Model	NBM4	0.587
Novelty Business Model	NBM5	0.613
Novelty Business Model	NBM6	0.664
Novelty Business Model	NBM7	**0.334**
Novelty Business Model	NBM8	**0.285**
Novelty Business Model	NBM9	0.512
Novelty Business Model	NBM10	0.596
Novelty Business Model	NBM11	0.544
Novelty Business Model	NBM12	0.611
Novelty Business Model	NBM13	0.664
Efficiency Business Model	EBM1	0.546
Efficiency Business Model	EBM2	0.711
Efficiency Business Model	EBM3	0.661
Efficiency Business Model	EBM4	0.732
Efficiency Business Model	EBM5	0.810
Efficiency Business Model	EBM6	0.821
Efficiency Business Model	EBM7	0.856
Efficiency Business Model	EBM8	0.745
Efficiency Business Model	EBM9	0.599
Efficiency Business Model	EBM10	0.667
Efficiency Business Model	EBM11	0.448
Efficiency Business Model	EBM12	0.720
Efficiency Business Model	EBM13	0.796
Technology Turbulence	MT1	0.763
Technology Turbulence	MT2	0.813
Technology Turbulence	MT3	0.500
Technology Turbulence	MT4	0.598
Business Performance	BP1	0.732
Business Performance	BP2	0.837
Business Performance	BP3	0.675
Business Performance	BP4	0.897

Step two: assessing the residual matrix

Fit can also be improved through the examination of the residual matrix. Residual covariance matrix captures the difference between the model-implied covariance matrix ∑ and the sample (observed) covariance matrix S (Schumacker and Lomax, 2012; Byrne, 2013). These residuals should be small in value and not larger for one observed

variable than another (Schumacker and Lomax, 2004). Significant residuals generally lead to lower model fit. SEM researchers consider residual values >2.58 to be large (Jöreskog and Sörbom, 1993). In the current study, all standardized residuals were lower than 2.58, indicating that residuals are not affecting model misspecifications.

Third: assessing modification indices

Modification indices (MI) provide another solution for model misspecification problems. Modification indices "can be conceptualized as x^2 statistic with one degree of freedom" (Byrne, 2013, p. 86). In AMOS environment, MI is provided for each non-free parameter and reflects the decrease in the overall X^2 value if the parameter is to be freely estimated in the subsequent model. The actual decrease in X^2 value is expected to equate the value of MI; however, it is not rare to obtain a higher reduction. Consequently, researchers can achieve a good fit by freeing parameters with large MIs. Researchers are also advised to examine expected parameter change (Par Change) which is highly associated with MI and reflects the predicted estimated change of each fixed parameter in the model if it were to become free (Schumacker and Lomax, 2004). The MIs and accompanying par change value statistics related to the hypothesized model in this study are reported in Table 5.2.

In the current study, the goodness-of-fit of the model could be improved by freeing paths with high MIs such as NBM7 to NBM8. However, MIs only assist researchers in pinpointing possible areas of misfit and changes in the measurement model are not recommended if it is based solely on MIs results. As shown in Table 5.2, the path from NBM7 to NBM8 has a significantly high MI value (i.e. 39.249). These two items, in addition to MO15, also have low squared multiple correlations, indicating that their deletion could lead to model improvement. The next section reports the CFA results for the re-specified measurement model in order to evaluate the effect of deleting the above three items on the overall model fit.

Table 5.2: Modification indices

Error term (Item)		Error (Item)	M.I	Par Change
e48 (BP1)	<-->	e50 (BP3)	20.69	0.256
e46(NBM12)	<-->	e47(NBM12)	21.903	0.018
e41(NBM7)	<-->	e42(NBM8)	39.249	0.039
e39(NBM5)	<-->	e40(NBM6)	16.407	0.01
e33 (TO3)	<-->	e34 (TO4)	77.246	0.392
e31 (TO1)	<-->	e32 (TO2)	15.843	0.189
e25 (EO11)	<-->	e26 (EO11)	12.408	0.136
e23 (EO8)	<-->	e27(EO12)	12.661	0.125
e23(EO3)	<-->	e26(EO11)	18.497	-0.149
e19 (EO6)	<-->	e33(TO3)	15.097	-0.169
e16(EO3)	<-->	e20(EO5)	16.618	0.188
e15(MO15)	<-->	e50(BP3)	11.027	0.192
e1(MO1)	<-->	e2(MO2)	16.532	0.114

5.3.4 Results for the Re-Specified Measurement Model

A total of 3 items were deleted from the original measurement model (i.e. items MO15, NBM7, and NBM8). This resulted in a specified measurement model consisting of 65 items (14 items for MO, 15 items for EO, 4 items for TO, 11 items for NBM, 13 for EBM, 4 items for technology turbulence, and 4 items for business performance). Researchers frequently observe weaker outer loading in social sciences studies, mainly when newly developed scales are used (Hulland, 1999). Hair *et al.* (2013) advise that indicators with outer loading between 0.40 and 0.70 should be considered for removal from the scale only when deleting the indicator leads to an increase in the composite reliability or the average variance extracted. Sometimes indicators with weaker outer loading are retained on the basis of their contribution to content validity. However, indicators with weaker outer loading (less than 0.40) should always be eliminated from the scale (Hair *et al.*, 2011; Hair *et al.*, 2013). As will be discussed in the next section, the re-specification process has significantly improved both convergent and discriminant validity as evident by Cronbach Alpha and the Average Variance Extracted results. Furthermore, because the scales in this study are reflective, then the nature of

the construct will not change when a single item is dropped (Diamantopoulos and Siguaw, 2006). This is because reflective items are interchangeable. It is only when a construct is formative that removing an item changes the nature of the construct."

The goodness of fit figures for the re-specified model are: X^2 (1192) =1788, X^2/df =1.5, P<.000, IFI=0.912, TLI=0.901, CFI=0.910, RMSEA=0.042. These results indicate that the re-specified model fits better to the sample data than did the original model. Table 5.3 provides a comparison between the fit indices of the initial and modified measurement models. Further information about the re-specified model outputs is provided in Table 5.4, which indicates that the regression weights of all variables loading onto their respective factors was between 0.487 and 0.897, with all critical ratios (t-value) above 1.96 suggesting that all the regressions weights are statistically significant at the 95% confidence level.

Table 5.3: Summary of overall (initial and final) measurement model

Fit Indices	Overall Measurement Model	
	Initial (68 items)	Final (65 items)
X^2(df)	2066.7(1348)	1788 (1192)
X^2/df	1.53	1.5
IFI	.895	0.912
TLI	.882	0.901
CFI	.893	0.910
RMSEA	0.044	0.042

Table 5.4: Loading and goodness-of-fit results for the re-specified measurement model

Label	*R^2*	*Factor Loading*	*C.R. (t-value)*
Customer orientation			
MO1	0.471	0.686	*
MO2	0.465	0.682	9.021
MO3	0.491	0.701	8.852
MO4	0.358	0.598	9.048

MO5	0.294	0.542	8.135
MO6	0.333	0.577	7.925
Competitor orientation			
MO7	0.554	0.744	*
MO8	0.335	0.579	9.439
MO9	0.513	0.716	8.035
MO10	0.441	0.664	9.659
Interfunctional Coordination			
MO11	0.410	0.640	*
MO12	0.423	0.650	8.776
MO13	0.584	0.764	9.408
MO14	0.486	0.697	10.212
MO15**			
Futurity			
EO1	0.319	0.565	*
EO2	0.482	0.694	7.888
EO3	0.534	0.731	9.566
Proactiveness			
EO4	0.471	0.686	*
EO5	0.410	0.64	10.881
EO6	0.615	0.784	10.946
Analysis			
EO7	0.494	0.703	*
EO8	0.605	0.778	10.749
EO9	0.432	0.657	10.084
Defensiveness			
EO10	0.490	0.7	*
EO11	0.425	0.652	9.241
EO12	0.352	0.593	9.492
Riskiness			
EO13	0.526	0.725	*
EO14	0.416	0.645	7.38
EO15	0.393	0.627	7.484
Technological orientation			
TO1	0.728	0.853	*
TO2	0.824	0.908	16.807
TO3	0.521	0.722	15.365
TO4	0.444	0.666	14.388

Novel business model			
NBM1	0.303	0.550	*
NBM2	0.359	0.599	6.88
NBM3	0.371	0.609	6.943
NBM4	0.346	0.588	7.066
NBM5	0.376	0.613	7.666
NBM6	0.441	0.664	7.649
NBM7**			
NBM8**			
NBM9	0.264	0.514	5.592
NBM10	0.356	0.597	6.839
NBM11	0.296	0.544	4.683
NBM12	0.375	0.612	7.332
NBM13	0.442	0.665	7.764
Efficiency business model			
EBM1	0.298	0.546	*
EBM2	0.506	0.711	8.86
EBM3	0.437	0.661	8.482
EBM4	0.536	0.732	9.016
EBM5	0.656	0.81	9.532
EBM6	0.674	0.821	9.594
EBM7	0.733	0.856	9.799
EBM8	0.555	0.745	9.106
EBM9	0.359	0.599	7.957
EBM10	0.445	0.667	8.525
EBM11	0.201	0.448	6.433
EBM12	0.518	0.72	8.929
EBM13	0.634	0.796	9.439
Technology turbulence			
TT1	0.582	0.763	8.86
TT2	0.661	0.813	15.256
TT3	0.250	0.500	15.415
TT4	0.358	0.598	12.917
Business performance			
BP1	0.536	0.732	*
BP2	0.701	0.837	13.488
BP3	0.456	0.675	10.862
BP4	0.805	0.897	14.107

*Critical ratio (t-value) is not available, because the regression weight of the first regression weight for each construct is fixed at 1

**Deleted item

5.4 Constructs Validity and Reliability

This section reports the steps taken by the researcher to ensure construct validity and reliability. The study utilized a two-step approach to assess the properties of the scales for unidimensionality, discriminant validity, and reliability in line with accepted practice (Churchill, 1979; Gerbing and Anderson, 1984; Anderson *et al.*, 1987). In the two-step approach, two distinct models are reported by the researcher: measurement model and structural (latent model). In practice, the researcher first reports the results of the measurement model in order to establish convergent and discriminant validity and, consequently, the results of the structural model are reported for establishing predictive validity (Anderson and Gerbing, 1988).

5.4.1 Construct Validity

Construct validity refers to the degree to which the measurement tool is in fact measure the latent construct being investigated (Tabachnick and Fidell, 2007; Hair *et al.*, 2010).As "both convergent and discriminant coefficients are used to support or refute a claim of construct validity" (Zhu, 2000, p. 190), these are assessed and discussed in this section. Convergent validity, if established, ensures that two measures of constructs that theoretically should be related, are actually related. Discriminant validity, on the other hand, tests whether latent constructs or measures that are supposed to be different are in fact so. Unidimensionality aims to assess the extent to which "a set of items forming an instrument all measure just one thing in common" (Hattie, 1985, p.139). By establishing convergent and discriminant validity, it can be concluded that the unidimensionality of measurement constructs is supported.

5.4.1.1 Assessing Convergent Validity

As discussed above the convergent validity of a survey instrument refers to the degree of agreement or convergence among items of the same trait. To assess convergent validity, this study adopts a CFA approach in line with the recommendation of Anderson and Gerbing (1988). Accordingly, a measurement model that includes all measures in this study (three subscales of MO, five subscales of EO, TO, NBM, EBM,

business performance, and technology turbulence) was estimated using AMOS 21. Following the recommendation of Hair *et al.* (2010) and Tabachnick and Fidell (2007), convergent validity is assessed in a number of ways including the factor loadings of indicators, average variance expected (AVE), and reliability of constructs.

First, higher factor loading means that a factor is strongly defined by its items (Tabachnick and Fidell, 2007). A factor loading is generally perceived as significant if it is more than 0.5 (Hair *et al.*, 2010). As illustrated in Table 5.5, the standardised loading was larger than the minimally accepted level of .50, thus indicating an acceptable measurement model.

Table 5.5: Standardized factor loadings

Construct	Label	Factor Loading
Customer Orientation	MO1	0.686
Customer Orientation	MO2	0.682
Customer Orientation	MO3	0.701
Customer Orientation	MO4	0.598
Customer Orientation	MO5	0.542
Customer Orientation	MO6	0.577
Competitor Orientation	MO7	0.744
Competitor Orientation	MO8	0.579
Competitor Orientation	MO9	0.716
Competitor Orientation	MO10	0.664
Interfunctional Coordination	MO11	0.640
Interfunctional Coordination	MO12	0.650
Interfunctional Coordination	MO13	0.764
Interfunctional Coordination	MO14	0.697
Futurity	EO1	0.565
Futurity	EO2	0.694
Futurity	EO3	0.731
Proactiveness	EO4	0.686
Proactiveness	EO5	0.640
Proactiveness	EO6	0.784
Analysis	EO7	0.703
Analysis	EO8	0.778
Analysis	EO9	0.657
Defensiveness	EO10	0.700

Construct	Label	Factor Loading
Defensiveness	EO11	0.652
Defensiveness	EO12	0.593
Riskiness	EO13	0.725
Riskiness	EO14	0.645
Riskiness	EO15	0.627
Technological Orientation	TO1	0.853
Technological Orientation	TO2	0.908
Technological Orientation	TO3	0.722
Technological Orientation	TO4	0.666
Novelty Business Model	NBM1	0.550
Novelty Business Model	NBM2	0.599
Novelty Business Model	NBM3	0.609
Novelty Business Model	NBM4	0.588
Novelty Business Model	NBM5	0.613
Novelty Business Model	NBM6	0.664
Novelty Business Model	NBM9	0.514
Novelty Business Model	NBM10	0.597
Novelty Business Model	NBM11	0.544
Novelty Business Model	NBM12	0.612
Novelty Business Model	NBM13	0.665
Efficiency Business Model	EBM1	0.546
Efficiency Business Model	EBM2	0.711
Efficiency Business Model	EBM3	0.661
Efficiency Business Model	EBM4	0.732
Efficiency Business Model	EBM5	0.810
Efficiency Business Model	EBM6	0.821
Efficiency Business Model	EBM7	0.856
Efficiency Business Model	EBM8	0.745
Efficiency Business Model	EBM9	0.599
Efficiency Business Model	EBM10	0.667
Efficiency Business Model	EBM11	0.448
Efficiency Business Model	EBM12	0.720
Efficiency Business Model	EBM13	0.796
Technology Turbulence	TT1	0.763
Technology Turbulence	TT2	0.813
Technology Turbulence	TT3	0.500
Technology Turbulence	MT4	0.598

Construct	Label	Factor Loading
Business Performance	BP1	0.732
Business Performance	BP2	0.837
Business Performance	BP3	0.675
Business Performance	BP4	0.897

Second, the average percentage of variance, extracted from a group of construct items can also reflect the convergence between the items and the hypothesised factors. AVE is calculated by summating all the squared standardised loading of the items for each factor divided by the number of items of the same factor. Table 5.6 presents the AVE results for all constructs. The results reveal that the AVE of latent constructs exceeded the acceptable level of 0.5 (Hair *et al.*, 2010). Thus, it is concluded that all the items converged into their respective factors.

Table 5.6: Validity and reliability

Construct	**Average Variance Extracted (>0.5)**
Market orientation	0.644
Technological orientation	0.669
NOBM	0.502
EFBM	0.504
Technology turbulence	0.678
Business performance	0.624
Entrepreneurial orientation	0.544

* Indicates an acceptable level of reliability or validity

**AVE: Average Variance Extracted. This is computed by adding the squared factor loadings divided by the number of factors of the underlying construct.

Finally, convergent validity was also assessed through construct reliability, as measured by the Cronbach's Alpha. Churchill (1979) argues that Cronbach's Alpha is important for assessing convergent validity and that it should be one of the first estimates to be computed to evaluate the psychometric properties of measurement scales. Good construct reliability is frequently indicated by a Cronbach's Alpha of .70 or higher. Other scholars view reliability of .60 and .70 as acceptable (Hair *et al.*, 2010). Table 5.7

presents a comparison of the Cronbach's Alpha between the original measurement model (Model 1) and the modified one (Model 2). All reliability coefficients in the current study ranged between 0.843 and 0.917, exceeding the threshold limit of 0.6 (Nunnally *et al.*, 1967). The comparison also reveals that the re-specification process led to the enhancement of the reliability of two constructs (market orientation and novel business model).

Table 5.7: Cronbach's alpha of constructs

Constructs	**Model 1 (original) Cronbach's Alpha**	**Model 2 (Modified) Cronbach's Alpha**
Market orientation	**.853**	**0.863**
Entrepreneurial orientation	.849	.849
Technological orientation	.888	.888
Novel business model	**.801**	**.843**
Efficiency business model	.917	.917
Technology turbulence	.889	.889
Business performance	.868	.868

5.4.1.2 Assessing Discriminant Validity

Discriminant validity is present when the correlation shared between a construct and any other construct in the model is less than the correlation that construct shares with its items (Fornell and Bookstein, 1982). In the cuurent study, discriminant validity was tested by comparing the square root of the AVE for a specific latent construct with the correlations between that construct and all other latent constructs. If the square root of the AVE value corresponding to a single latent construct is larger than any correlation between any pair of constructs, that construct will be highly correlated with its items than with the other constructs in the model. In Table 5.8, the diagonal elements in the correlation matrix represent the square roots of the AVE. It appears that all constructs in the model diverged strongly from each other, indicating the absence of discriminate validity problems.

Table 5.8: Discriminant validity

	Construct	1	2	3	4	5	6	7
1	Market orientation	**0.802***						
2	Technological orientation	0.415	**0.818**					
3	NOBM	0.563	0.413	**.708**				
4	EFBM	0.100	0.069	-0.184	**0.710**			
5	Technology turbulence	0.269	0.476	0.516	-0.035	**0.823**		
6	Business performance	0.266	0.244	0.283	0.081	0.065	**0.790**	
7	Entrepreneurial Orientation	0.657	0.511	0.580	-0.059	0.217	0.334	**0.738**

* Bold figures represent the square root of average variance extracted from observed variables (items)
Off-diagonal: correlations between constructs

5.5 Overall Results of Measurement Development

In summary, from this section a number of conclusions can be made. Specifically, measurement validation processes as well as the measurement model in CFA were tested and reported in different sections. In the measurement model validation process, measurement model fit through CFA was conducted. In this process, the reliability scores were found to be as low as .843 and as high as .917 (see Table 5.9). A multistep approach was used to eliminate the items contributing most to the lack of fit during CFA, as recommended by Hair *et al.* (2010) and (Byrne, 2013). The overall measurement model was tested and achieved a satisfactory level of fit. Table 5.9 provides a summary of the Cronbach's Alpha of the constructs and the corresponding items that were retained in the modified measurement model.

Table 5.9: Summary of measurement instruments of constructs

Constructs and Items		*Cronbach's Alpha*
Market Orientation		**0.863**
Customer orientation	**.803**	
We constantly monitor our level of commitment and orientation to serving customer needs.		
Our business strategies are driven by our beliefs about how we can create greater value for our customers.		
Our strategy for competitive advantage is based on our understanding of customer needs.		
Our business objectives are driven primarily by customer satisfaction.		
We measure customer satisfaction systematically and frequently.		
We give close attention to after-sales service.		
Competitor orientation	**.755**	
Our sales people regularly share information within our business concerning competitors' strategies		
We are slow in responding to competitive actions that threaten us		
Top management regularly discusses competitors' strengths and strategies		
We target customers where we have an opportunity for competitive advantage		
Interfunctional Coordination	**.701**	
Our top managers from every function regularly visit our current and prospective customers		
We freely communicate information about our successful and unsuccessful customer experiences across all business functions		
All of our business functions (e.g. marketing/sales, manufacturing, R&D, finance/accounting, etc.) are integrated in serving the needs of our target markets		
All of our managers understand how everyone in our business can contribute to creating customer value		
We share resources with other business units		
Entrepreneurial Orientation		**.849**
Futurity:	**.695**	
In making strategic decisions, we look into the future to anticipate conditions		
We are willing to sacrifice short-term profitability for long-term goals		
We emphasize investments that will provide us with a future competitive edge		

Constructs and Items	*Cronbach's Alpha*
Proactiveness	**.755**
In making strategic decision, we constantly seek to introduce new brands or new products to the market	
Whenever there is ambiguity in government regulations, we will more proactively to try to take lead	
In making strategic decisions, we respond to signals of opportunities quickly	**.737**
Analysis	
In making strategic decisions, we emphasize planning techniques and information systems	
In analysing situations, we evaluate possible consequences thoroughly and obtain alternatives	
We seek opportunities that have been shown to be promising	
Defensiveness	**.727**
We emphasize the use of cost control systems for monitoring performance	
We constantly modify manufacturing technology to achieve efficiency	
We put emphasis on following government regulations and make important changes that are specifically allowed	
Risk-taking	**.703**
In making strategic decisions, we tend to focus on investments that have low risk and moderate returns, or high risk and high returns	
We search for big opportunities, and favour large, bold decisions despite the uncertainty of their outcomes	
We approve new projects on a "stage-by-stage" basis rather than "blanket" approval	
Technological Orientation	**.888**
We use sophisticated technologies in our new product development	
Our new products always use state-of-the-art technology	
Technological innovation based on research results is readily accepted in our organization	
Technological innovation is readily accepted in our programme/project management	
Novel business model	**.843**
The business model offers new combinations of products, services, and information	
The business model brings together new participants	
Incentives offered to participants in transactions are novel	

Constructs and Items	*Cronbach's Alpha*
The business model gives access to an unprecedented variety and number of participants and/or goods	
The business model links participants to transactions in novel ways	
The richness (i.e. quality and depth) of some of the links between participants is novel	
Number of patents that the focal firm has been awarded for aspects of its business model	
Extent to which the business model relies on trade secrets and/or copyrights	
Does the focal firm claim to be a pioneer with its business model?	
The focal firm has continuously introduced innovations in its business model	
There are competing business models with the potential to leapfrog the firm's business model	
There are other important aspects of the business model that make it novel	
Overall, the company's business model is novel	
Efficiency business model	**.917**
Inventory costs for participants in the business model are reduced	
Transactions are simple from the user's point of view	
The business model enables a low number of errors in the execution of transactions	
Costs other than those already mentioned for participants in the business model are reduced	
(i.e. marketing and sales costs, transaction-processing costs, communication costs)	
The business model is scalable (i.e. can handle small as well as large number of transactions)	
The business model enables participants to make informed decisions	
Transactions are transparent: Flows and the use of information, services, and goods can be verified	
As part of transactions, information is provided to participants to reduce the asymmetric degree	
of knowledge amongst them regarding the quality and nature of the goods being exchanged	
As part of transactions, information is provided to participants about each other	
Access to a large range of products, services, information, and other participants is provided	
The business model enables demand aggregation	

Constructs and Items	*Cronbach's Alpha*
Technology turbulence	**.889**
In our kind of business, customers' product preferences change quite a bit over time.	
Our customers tend to look for new products all the time	
We are witnessing demand for our products and services from customers who have never bought them before	
New customers tend to have product-related needs that are different from those of our existing customers	
We cater to many of the same customers that we used to in the past	
Subjective business performance	**.868**
Sales growth	
Profitability	
Market share	
Overall financial performance	

*Deleted items

5.6 Basic Descriptive Statistics and Items Correlations

Correlations between the latent constructs were examined before running SEM analysis. Table 5.10 provides a summary of the means, standard deviations, and correlations for all constructs in the study. High correlation between constructs indicates the presence of multicollinearity. In the current study, inter-correlations between latent constructs ranged from .01 to .628. Table 5.11 shows the results of the VIF test. VIF values ranged from 1.253 and 1.671 with acceptable levels of tolerance. Consequently, these results indicate no cause for concern about multicollinearity as these values did not exceed the recommended cut-off values of 0.90 for correlation and 10 for VIF (Tabachnick and Fidell, 2007; Byrne, 2013).

Table 5.10: Basic descriptive statistics and correlations of the constructs

Construct	1	2	3	4	5	6	7	8	9
1. Firm (SBU) Performance	1.00								
2. Market Orientation	.229**	1.00							
3. Entrepreneurial Orientation	.272**	.628**	1.00						
4. Technological orientation	.210**	.353**	.438**	1.00					
5. Novel Business Model	.282**	.467**	.509**	.388**	1.00				
6. Efficiency Business Model	.097	.106	.015	.106	-.113	1.00			
7. Technology Turbulence	.031	.188**	.169**	.340**	.419**	.054	1.00		
8. Firm Age	.051	-.051	.025	-.024	-.092	-.037	-.045	1.00	
9. Firm Size	.048	-.029	-.093	-.032	-.116	.065	-.127*	.108	1.00
Mean	4.99	5.71	5.58	4.92	2.7	2.5	4.50	44.04	819
Standard Deviation	.925	.638	.570	1.21	.36	.47	.797	39.185	2899

Table 5.11: Multicollinearity assessment

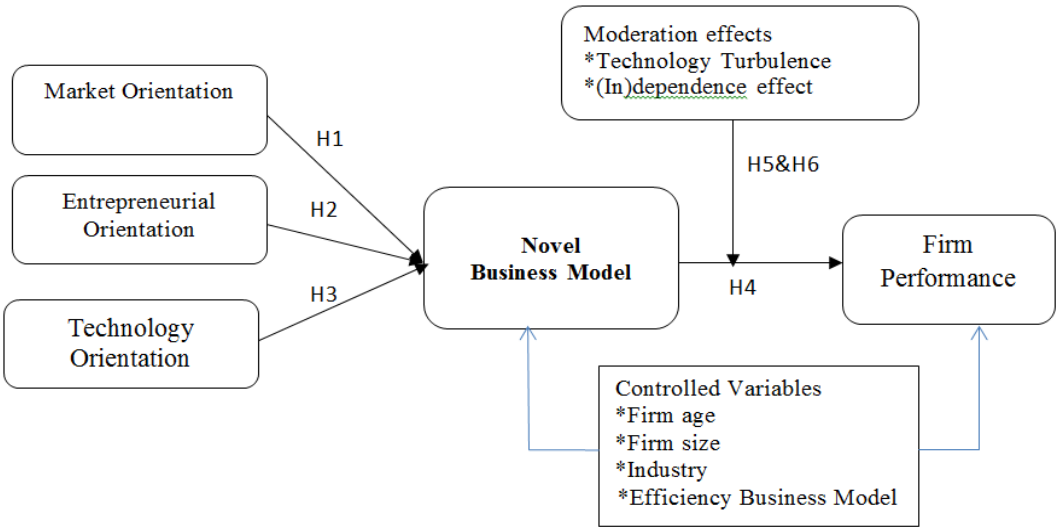
	Construct	Tolerance	VIF
1	Market orientation	.599	1.671
2	Entrepreneurial orientation	.553	1.809
3	Technological orientation	.798	1.253

a. Dependent Variable: Business Performance

5.7 Structural Regression Model

This section reports the findings of the hypotheses testing based on the study's proposed conceptual model, as discussed in the theoretical chapter. To test the hypothesis, the researcher employed structural equation modelling with the maximum likelihood parameter estimation method in covariance based SEM (CBSEM), using the model illustrated in Figure 5.1 as a base model. AMOS 21 (Arbuckle, 2006) was used to carry out the analysis.

Figure 5.1: Research model with hypotheses



Multiple criteria were employed to interpret the Structural Regression model. In order to interpret the overall fit of the hypothesized relationships between the latent constructs to the data of the current study, various model fit indices were examined. These were chi-square, normed chi-square, CFI, P value, IFI, TLI, CFI, and RMSEA. In addition, parameter estimates were examined to interpret the effects on the endogenous variables from other variables presumed to directly predict them. Lastly, squared multiple correlation coefficients were examined to explore the amount of variance in each latent variable that was explained by the model.

In the previous sections, the unidimensionality of the measures was established. Additionally, all the scales used to measure the latent construct showed acceptable levels of psychometric properties of reliability, convergent validity, and discriminant validity. Hence, in line with accepted practice (e.g., Baumgartner and Homburg, 1996; Baker and Sinkula, 1999; Zhou *et al.*, 2005), all the items were combined into a single composite for each factor.

The Chi-square value was significant X^2 (26) =39.703, P<.05, indicating that the model predicted relations that were significantly different from the relations observed in the sample. However, as stated earlier, many problems have been reported related to X^2 as a fit statistics. Therefore, several other model fit indices were examined in terms of their consistency with each other. The normed chi-square (X^2/df) value was 1.527, indicating a reasonable fit. Consequently, IFI=0.975, TLI=0.946, CFI=0.974, and this indicated a reasonably good fit of the model to the data. The RMSEA was =0.032, which also indicates a close fit of the model in relation to the degrees of freedom. In short, the values of the selected fit indices consistently indicated that the hypothesized structural regression model fitted the data well. The regression weight for each variable loading onto its respective factor was between 0.50 and 0.908, with critical ratios (t-value) above 1.96, indicating a statistically significant relationship between each latent construct and its corresponding indicator (see Table 5.12).

5.8 Hypothesis Testing

The conceptual model illustrated in Figure 5.1 has six hypotheses in total. These are focused on the antecedents, consequences, and the moderation effects of novel-business model advantage (i.e. technological turbulence, dependence/independence of SBU). The results of hypotheses testing for the main effects are discussed in detail in four separate sections. Section 5.8.1 discusses the antecedents to novel BM design. Section 5.8.2 discusses the relationship between novel BM design and business performance. Section 8.4.3 discusses the moderation effect of technological turbulence and the in/dependence of the business unit on the BM design-performance relationship. Finally, section 5.8.4 reports the results of control variables. Table 5.12 outlines the results of the hypothesized relationships.

Table 5.12: Standardized structural equation parameter estimates (t-value)

Endogenous Variables	Novel BM	Business Performance without interaction	Business Performance with interaction
Independent variables			
Market orientation	.235*** (3.812)	-	-
Entrepreneurial Orientation	.278*** (4.375)	-	-
Technological orientation	.197*** (3.686)	-	-
Technology turbulence		-.118* (-2.093)	-.068 (.258)
Novel business model	-	.313*** (5.432)	.355*** (6.207)
Novel BM_x_Technology Turbulence	-	-	.122* (2.031)
Control variables			
Age	-0.076 (-1.447)	0.060 (1.407)	
Size	-0.031 (-1.275)	0.058 (1.013)	
EBM	-0.162*** (-3.415)	0.177** (3.102)	
Industry	0.045 (0.513)	-0.035 (-0.607)	
R^2	.367	-	.148
$X^2(26) = 39.703$, $X^2/df = 1.870$, P<.05, IFI=0.975, TLI=0.946, CFI=0.974, RMSEA=0.043			

*p < .05. **p < .01. ***p < .001.

5.8.1 Antecedents of Novel BM Design

The key research question was posited to identify the antecedents of novel business model-based advantage. In this section, the researcher reports the tests of Hypotheses one to three, all of which are assumed to be directly linked to novel business model-based design. Building on the RBV of the firm, it was argued that a firm's strategic orientation represents a key resource or a capability. Resources that are valuable, rare,

inimitable, and non-substitutable allow firms to do a better job by the creation of novel ways of doing business (i.e. novel BM), which in turn leads to superior business performance.

To answer the research question posed in Chapter 1 (section 1.2), a proposed framework and a set of hypotheses were developed in Chapter 3 and these are now tested in this section by using the outputs of the SEM. The reported SEM findings in Table 5.12 were assessed based on the estimated path coefficient β value with critical ratio (C.R. equivalent to t-value), and p-value. The standard decision rules (t-value greater than or equal to 1.96, and a p value of ≤ .05) apply here to decide the significance of the path coefficient between predicator variables and outcome variables (Byrne, 2013).

Market Orientation and Novel BM Design

The standardised estimated path coefficient for the relationship is moderately high (β= .235) and significant (t-value 3.812 with p value <0.001) for hypothesis one. This finding strongly supports the hypothesised relationship between market orientation and novel BMs, as such a higher level of market orientation will lead to novel BM design. This finding is consistent with the previous literature which suggests that market orientation's primary objective is to provide superior customer value, which is based on knowledge acquired from the customer and competitor, and the process by which this knowledge is accumulated and distributed throughout the firm (e.g., Felton, 1959; Narver and Slater, 1990; Kumar *et al.*, 2011). As discussed in chapter three, market orientation resources and capabilities are expected to be positively related to novel BM design. Market-oriented firms tend to have a better understanding of customers expressed and latent needs, competitor capabilities and strategies, and the wide business environment and, hence, they are likely to achieve an advantage through their novel BM design.

Entrepreneurial Orientation and Novel BM Design

As shown in Table 5.12, the path coefficient from entrepreneurial orientation to novel BM design in the proposed model was significant (β=.278 with t-value 4.375, and p ≤ .001), and this supports hypothesis two. The results support previous conceptual

arguments (Morris *et al.*, 2005) and empirical findings (Zott and Amit, 2007) of the positive between entrepreneurial orientation and novel BM design. Thus, the more entrepreneurial orientation capabilities a firm develops, the more it will be able to gain an advantage through the design of novel BM. Am entrepreneurial firm is one that engages in long term planning, undertakes somewhat risky ventures, and also explores new and creative ideas which may lead to changes in the marketplace; this is done proactively ahead of the competition in anticipation of future demand. These behaviours are, thus, of high importance for designing a novel BM.

Technological orientation and Novel BM Design

In hypothesis three, the researcher predicted a positive relationship between a firm's technological orientation and novel-business model advantage. Table 5.12 shows that technological orientation to positively affect novel BM-advantage ($\beta = .196$ with t-value 3.686, and $p < .001$), in support of hypothesis three. Prior research suggests that new technology innovations have no inherent value (See Chesbrough and Rosenbloom, 2002; Chesbrough, 2010), unless these efforts are supported by the creation of novel BM that converts the technical potential into financial outcomes. Thus, technology-oriented firms are likely to innovate or renew their BMs to facilitate the commercialization of new technologies.

5.8.2 Consequences of Novel BM Design

The hypothesis relating novel BM design with performance states that a novelty-centred BM has a positive linear relationship with SBU performance. The capability of bringing a novel BM to market before competitors is considered crucial to firms' success. Consequently, it is hypothesised that a novel BM design is positively related to business performance. The SBU performance was captured by employing four subjective measures that are widely used in strategic management research (i.e. sales growth, profitability, market share, and overall financial performance). The results shown in Table 5.12 indicate a statistically significant positive relationship between novel BM and SBU performance ($\beta=.355$ with t-value 6.207, and $p<.001$). This finding suggests that novel BMs will not, by themselves, develop enterprise-level competitive advantage. However, new BMs, or renewals of existing ones, frequently result in lower costs or

enhanced value to the consumer; if not easily copied by competitors, they can offer an opportunity to produce superior returns to the innovator, at least until their novel features are duplicated (Teece, 2010).

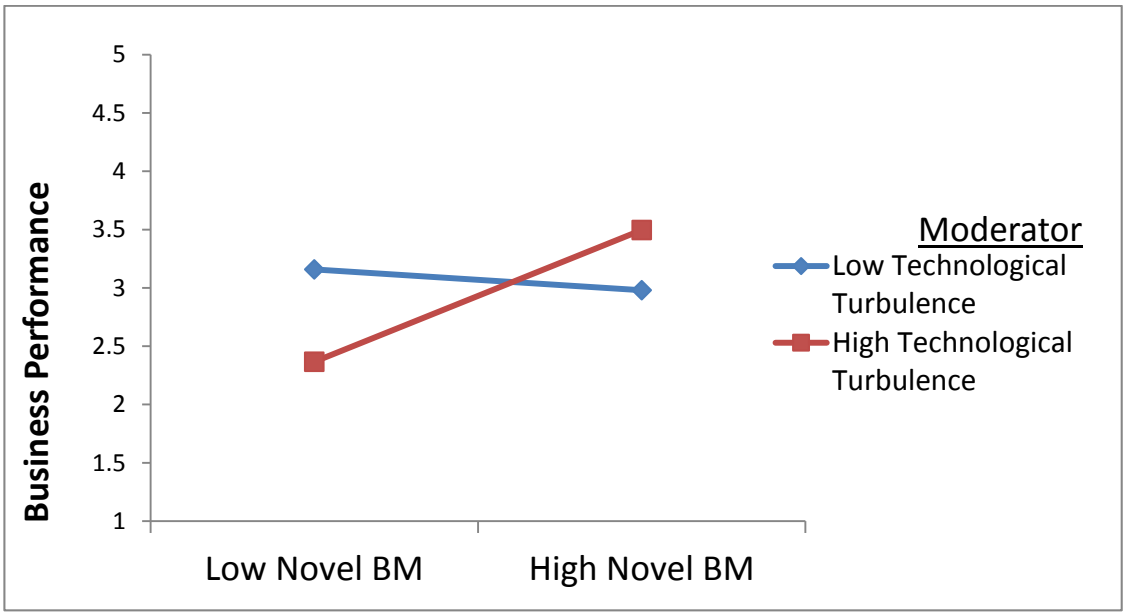
5.8.3 Testing for Moderation Effects

There are growing numbers of studies that question the validity of moderated or hierarchical multiple regressions for testing the interaction effect (Jaccard and Wan, 1995). A common cited problem with the use of these traditional methods is their inability to detect a moderation effect. This might be caused by the inability of multiple regression to assess or correct for measurement error, multicollinearity problems, multivariate normality, low residual variance, and residual variance heterogeneity (Jaccard and Wan, 1995; Ping Jr, 1996). Accordingly, the current study relies on the SEM approach to test for interaction affects. SEM provides remedies for the problems associated with regression, specifically its ability to account for measurement error and correct for attenuation (Kenny, 2014).

The moderation effect of technological turbulence

In the current study, the contingent effect of the environment on novel BM-business performance relationship was evaluated. Specifically, it was predicted that changes in technology turbulence and the positive effect of novel BM on business performance would be stronger. Before testing for the moderation effect, the researcher centralized the data for both constructs (i.e. novel BM and technology turbulence) in order to minimize the effect of multicollinearity. The interaction test was inclusive of control variables to control for their effect on business performance. The results show, as illustrated in Figure 5.2 and Table 5.12, that technology turbulence slightly strengthened the positive relationship between Novel BM and business performance, (β=.355, P<.001) in support of hypothesis five.

Figure 5.2: The moderation effect of technology turbulence



The Moderating Effect of (in)dependence

The strength of the hypothesized strategic orientation novel BM performance relationship was compared between dependent ventures type (n=86) and the strategic business units of established firms (n=191). It was predicted that the effect of novel BM on performance would be more positive for the business units of established companies than for independent ventures. The dependent and independent groups were submitted to multigroup analysis (Arbuckle, 2006) of the hypothesized strategic orientations Novel BM performance relationship. Anderson and Gerbing's (1982) X^2 difference test was used to evaluate if the differences in the modelled relationships were statistically significant across groups. First, the unconstrained model (where all paths of the strategic orientation novel BM performance were allowed to vary freely across groups) was tested and resulted in X^2 = 106.29.731, df = 64. Second, three constrained models were tested: the constrained model A (where the three strategic orientation Novel BM paths were specified as equal across groups) resulted in X^2 = 115.319.0, df = 67; the constrained model B (where only novel BM performance path was specified as equal across groups) resulted in X^2 = 106.654, df = 65; the constrained model C (where both paths of the three strategic orientation, Novel BM, and Novel BM performance were specified as equal across groups, respectively) resulted in X^2 = 115.984, df = 68. The X^2

results of the constrained model A and C were significantly higher than the unconstrained model ($p< 0.05$), whilst the increase of X^2 of the constrained model B was not significant. Details are reported in Table 5.13.

The results indicate that there was a significant difference in the novel BM design performance relationship between the SBU's of established firms and the independent ventures, and thus hypothesis six is not supported. The links of the three strategic orientation, novelty-centred BM, and business performance vary in strength between independent ventures and the business unit of an established company.

More specifically, a significant difference occurred in the strength of the relationship between MO, EO, TO and novel BM, that varied between the independent and the SBU's of established firms. Table 5.14 compares the relational paths of the unconstrained model for both dependent and the SBU's of established firms. It can be observed that the loadings of MO, EO, and TO paths to novel BM for dependent ventures were significantly higher than their loadings for the SBUs of established firms.

5.8.4 Results of the Control Variables

To test the stability of the hypothesized strategic orientations novel BM performance relationship across industry groups, the current study employed multigroup analysis to check if there were any variations across the two broad industry groups: manufacturing (n=130) and services (n=151).The unconstrained model resulted in X^2=93.601, df=57. Three constrained models were compared with this unconstrained model: the constrained model A (where the thee strategic orientation paths to novel BM were specified as equal across groups) resulted in ΔX^2=95.654, df=60; the constrained model B (where only the path of novel BM performance was specified as equal across groups) resulted in X^2=94.660, df=58; the constrained model C (where the three strategic orientation paths to novel BM and novel BM performance were specified as equal across groups, respectively) resulted in X^2=96.713, df=61. The X^2 of each constrained model was not significantly higher than the unconstrained model, indicating there was no difference in the three strategic orientation novel BM performance relationships across the two industry groups. Results are reported in Table 5.13.

The results of the other control variables (i.e. age, size, and EBM) are reported in Table 5.14. While age and size did not have a significant statistical relationship with novel BM and business performance, the results show a negatively significant relationship between EBM and novel BM (β=-.162, P<.001), and a positive relationship between EBM and business performance (β=.177, P<.01).

Table 5.13: Results of the multigroup analysis

	Description	X^2	df	Δ X2***	P
Multigroup analysis By (in)dependence*	**The unconstrained model**	106.29	64	-	-
	Constrained model A: The path of the three strategic orientations to novel BM is specified as equal across groups	115.319	67	Δ X^2=9.1, ΔDF=3	<.05
	Constrained model B: The path of novel BM to firm performance is specified as equal across groups	106.654	65	Δ X^2=.364, ΔDF=1	NS
	Constrained model C: Both of the above paths are fixed as equal across groups respectively	115.95	68	Δ X^2= 9.658, ΔDF=4	<.05
Multigroup analysis by industry type**	**The unconstrained model**	93.601	57		
	Constrained model A: The path of three strategic orientations to novel BM is specified as equal across groups	95.654	60	Δ X^2=2.053, ΔDF=3	NS
	Constrained model B: The path of novel BM to firm performance is specified as equal across groups	94.660	58	Δ X^2=1.058, ΔDF=1	NS
	Constrained model C: Both of the above paths are fixed as equal across groups respectively	96.713	61	Δ X^2=3.111, ΔDF=4	NS

*The total sample size is 281, including 195 dependent ventures, and 86 independent business unit of established firm

**The total sample size is 281, including 130 companies in the manufacturing industry, and 151 companies in the service industry

*** Δ X^2: difference in X^2 value between models; Δ df: difference in the number of degrees of freedom; NS: non-significant; EO, entrepreneurial orientation; BM, business model

Table 5.14: Standardized regressions weights for dependent ventures and SBUs*

	Dependent Venture	SBUs of established firms
MO→novel BM design	0.378***	0.127*
EO→ novel BM design	0.326***	0.262***
TO→ novel BM design	0.244***	0.130*
Novel BM→performance	0.379***	0.266***

*p<.05. **p<.01. ***p<.001.

*MO –market orientation, EO –entrepreneurial orientation, TO –technological orientation, BM –business model.

5.9 Bootstrapping Procedure Results

As discussed above, the sample data in the current study violates one key assumption of SEM, the multivariate normal distribution. One popular procedure of handling this problem is bootstrapping (West *et al.*, 1995; Yung and Bentler, 1996; Zhu, 1997). This approach was first advanced by (Efron, 1979), and its importance to the field of statistics was later emphasized by Kotz and Johnson (1992). It refers to using the sample to know more about the sampling distribution of a statistic without reference to external assumptions –as in "pulling oneself up by one's bootstraps" (Efron, 1979). This means that bootstrapping allows researchers to infer the sampling distribution of almost any statistic via multiple samples taken from the sample itself, as opposed to traditional statistical methods that draw a hypothetical sample from the population (Byrne, 2013). Since the sampling distribution of bootstrapping does not assume normality, it is frequently used to evaluate the stability of model parameters across a large number of samples taken from the same population and, thus, the results can be reported with a higher degree of accuracy (Byrne, 2013). Zhu (1997) compared bootstrapping to traditional inferential techniques and pointed out that, "it may be better to draw conclusions about the parameters of a population strictly from the sample at hand… than to make perhaps unrealistic assumptions about the population" (p.50).

Based on the above discussion, the researcher applied a bootstrap procedure using AMOS 21. The application was requested to perform a bootstrap on 2,000 samples using the ML estimation technique, and to provide bias-corrected confidence intervals for each of the parameter bootstrap estimates with a 95% confidence-level. To evaluate the overall model fit, AMOS was also requested to produce a Bollen-Stine corrected p-value (Bollen and Stine, 1992; Arbuckle, 2006). There were no estimation problems (the minimum was achieved), and the X^2 value was reported as 37.05, with 26 degrees of freedom. The bootstrapping results are summarized in Tables 5.15 and 5.16.

The results indicated a satisfactory model fit, as the obtained Bollen-Stine corrected p-value was .309 and, thus, the model cannot be rejected as it fits the data correctly. To put it differently, the data does not depart significantly from the model at any conventional significance level.

Table 5.15 provides a comparison between the ML and bootstrap standard of errors estimates. It can be noted that the discrepancies between the two sets of standard error estimates are small. This finding indicates that the distribution of these parameter estimates appears to be similar with that expected under normal theory assumptions. Thus, the presence of outliers as well as the kurtotic nature of the data does not appear to greatly affect the robustness of the research findings.

Table 5.16 presents the 95% (default) bias-corrected confidence intervals for the unstandardized path estimates. Confidence intervals with a range that does not include zero will lead to hypothesis rejection. In the current study, the confidence intervals for the main paths do not include zero and, thus, the null hypothesis cannot be rejected. Bootstrapping results confirmed all regression paths that had been previously been found to be significant, with exception of the interaction effect between novel BM and technology turbulence. This regression path was significant at the .05 level in the original regression and the bootstrap had an estimated p value of .062, a slight deterioration.

These results give us some degree of confidence in the stability of parameter estimates despite the moderately low sample size and some deviation from normality.

Table 5.15: Comparison of bootstrap and ML standard errors –unstandardized estimates

Parameter			S.E. ML Estimates	S.E. Bootstrap Estimates
NBM	<---	Market Orientation	0.016	0.017
NBM	<---	Entrepreneurial Orientation	0.019	0.024
NBM	<---	Technological Orientation	0.007	0.008
NBM	<---	Size	0.015	0.015
NBM	<---	EBM	0	0
NBM	<---	Industry	0	0
NBM	<---	Age	0.036	0.036
SBUPerformance	<---	NBM	0.378	0.364
SBUPerformance	<---	Age	0.107	0.105
SBUPerformance	<---	Industry	0.001	0.001
SBUPerformance	<---	EBM	0	0
SBUPerformance	<---	Size	0.259	0.277
SBUPerformance	<---	ZNOBM_X_ZTECT	0.052	0.064
SBUPerformance	<---	Technological turbulence	0.055	0.059

Table 5.16: Bias-corrected confidence intervals –unstandardized estimates

Parameter			Estimate	Lower	Upper	P
NBM	<---	Market Orientation	0.061	0.027	0.094	0.001
NBM	<---	Entrepreneurial Orientation	0.082	0.032	0.128	0.002
NBM	<---	Technological Orientation	0.027	0.011	0.042	0.001
NBM	<---	Size	0.015	-0.013	0.045	0.3
NBM	<---	EBM	0	-0.001	0	0.06
NBM	<---	Industry	0	0	0	0.53
NBM	<---	Age	-0.122	-0.19	-0.049	0.003
SBUPerformance	<---	NBM	1.768	1.055	2.481	0.001
SBUPerformance	<---	Age	-0.065	-0.271	0.147	0.566
SBUPerformance	<---	Industry	0.001	-0.001	0.004	0.304
SBUPerformance	<---	EBM	0	0	0	0.239
SBUPerformance	<---	Size	0.736	0.184	1.28	0.007
SBUPerformance	<---	ZNOBM_X_ZTECT	-0.014	-0.139	0.115	0.824
SBUPerformance	<---	Technological turbulence	0.116	-0.005	0.226	0.062

5.10 Summary of Hypotheses

Table 5.17 presents the results of the hypotheses testing. As expected, all links between independent (exogenous) and dependent (endogenous) variables were found to be statistically significant. The BM performance relationship was also found to be contingent on the business environment. Hence, the interaction effect between novel BM and technology turbulence had slight but statistically significant improvement on business performance. While there were no group differences between services and manufacturing, the results indicated that the dependent business of established firms had a stronger effect on performance compared to independent ventures.

Table 5.17: Hypotheses testing results

Hypothesis	Supported	Coefficient
H1: Market orientation is positively linked to novel BM design	✓	.234***
H2: Entrepreneurial orientation is positively related to novel BM design	✓	.279***
H3: Technological orientation is positively related to novel BM design	✓	.196***
H4: A novel BM design has direct positive link on business performance	✓	.313***
H5: In an environment characterized by high technology turbulence, the positive relationship between novel BM and firm performance will be stronger than in an environment with low technology turbulence	✓	.330***
H6: The effect of novel BM on performance is more positive for business units of established companies than for independent ventures	x	-

5.11 Chapter Summary

This chapter started by detailing the steps taken by the researcher to ensure that the collected data met the assumptions of structural equation modelling. To test the research hypotheses, the researcher employed the SEM with the maximum likelihood method. The robustness of the results was ensured by using the bootstrapping technique.

Structural equation modelling analyses indicated that all of the indicators in the model were explained by their corresponding factors significantly. The measurement (after modification) and structural regression models fitted the data well. All predicator variables (i.e. MO, EO, and TO) had moderately large total standardized effects on novel business model, and novel BM had large total effects on explaining business performance. Technology turbulence was found to moderate the novel BM performance relationship; however, this only resulted in a slight increase in business performance. While novel business design appeared to be important across industries, its impact was found to be less important for business units of established firms than independent ventures. Overall, the hypothesized structural regression model explained a large amount of variance, 32%, in business performance. The implications of these findings for theory and practice, the limitations of the research and directions for future research are discussed in the next chapter.

Chapter 6. Discussion

6.1 Introduction to Chapter Six

The aim of this chapter is to discuss the findings of the current research with regard to the key research objective, which is to shed light on the antecedents and consequences of novel-BM design. This study employed a context that differs from those employed in prior studies in an attempt to increase the generalizability of the results obtained from the survey questionnaire. RBV of the firm is used as the theoretical lens to illustrate why the links are present between market, entrepreneurial, and technological orientations and novel BM, as well as between novel BM and business performance. The theory provides a logical explanation of how valuable, unique, inimitable, and hard to substitute resources or capabilities can lead to sustainable competitive advantage. This research extends the use of RBV to explicate the key strategic orientations capabilities within the firm that are associated with having a novel BM. The information presented will frequently refer to the data presented in the previous chapter –Data Analysis and Results. At the start of the thesis, the following four questions were formulated.

1) What are the key antecedents of novel BM design?
2) What effect does novel BM have on business performance?
3) Does the linkage between novel BM and business performance depend on the environmental context and in/dependence of the new BM?

This chapter will begin by discussing the importance of researching novel BMs for both academics and practitioners. This is followed by a discussion of the key findings with respect to the above four research questions. This study found a significant relationship between novel BMs and business performance and this is discussed in the third section. The fourth section discusses the moderation effects of business performance (i.e. technology turbulence and in/dependence of the business unit). The last section offers a summary of the key points discussed in this chapter.

6.2 Research on Novel Business Models

In recent years, the BM has emerged as a key competitive tool and is widely used by firms either as a substitute or to replace product and process innovations. Value can also be created through novel or revolutionary BMs. Hamel (2000) points out that to prosper in the "age of revolution," firms must design new BMs where both value creation and value capture take place in a value network in collaboration with suppliers, partners, distribution channels, and alliances that extend the firm's resource base. In their seminal work, Amit and Zott (2001) identified novel BM design as an important source for value creation for e-business firms, and their later work (Zott and Amit, 2008) emphasized the positive performance effect of novelty in a firm's BM. The authors argued that entrepreneurial, Schumpeterian novelty in BMs is considered a key factor to firms' success. This led to growing scholars' interest in BM innovation, and the concept developed as an important research discipline in the fields of strategy and entrepreneurship (Chesbrough, 2007; Chesbrough, 2010; Gambardella and McGahan, 2010; McGrath, 2010; Teece, 2010; Zott and Amit, 2010; Bock *et al.*, 2011; Amit and Zott, 2012; Afuah, 2013; Casadesus-Masanell and Zhu, 2013; Markides, 2013; Zott and Amit, 2013; Zott and Amit, 2013).

The above studies have identified numerous benefits that firms can attain from novelty in their BMs. For instance, strategy scholars have stressed that novel BMs provide firms with an important source of sustainable competitive advantage (Christensen and Raynor, 2003; Johnson *et al.*, 2008), while others have recognized BMs as a powerful competitive tool (Amit and Zott, 2010). Entrepreneurial, novel BMs can disrupt current industries and take them in new directions, as well as create new markets (Christensen, 1997; Kumar and Scheer, 2000; Markides, 2008). Based on case study examples, several studies have illustrated how appropriate, novel BM can allow a young, entrepreneurial firm to grow and become a leading force in the market (i.e., Christensen, 1997; Kim and Mauborgne, 2005; Markides, 2008).

The benefits of a novel BM have also been emphasized for incumbent established firms (e.g., Markides, 2008; Sosna *et al.*, 2010). For instance Sosna *et al*. (2010) examined BM innovation in large established firms, taking the case of the Spanish dietary

industry. Based on a single case study design, they found that survival and long term success, mainly in a turbulent environment, can result from designing novel models. However, the findings of the study indicate that the design of a novel BM in large established firms is a complex process that requires a great deal of trial and error learning.

While prior studies are interesting and illustrate the importance of the BM and BM innovation for both academics and practitioners, so far limited research studies have examined the antecedents and consequences of novel BM design. Consequently, the current research is set out to investigate the effect of novel BM design on business performance and the key antecedent drivers to novel BMs in a comprehensive, empirically verified model. This study, thus, fills an important gap in understanding novel BMs and their key antecedent drivers, and the effect of novel BM design on organizational performance.

One key distinctive feature of this research is the investigation of the performance implication of the separation or integration decision. The existing literature so far did not converge in regard to this issue. While some scholars argued that firms who operate with dual BMs could risk increasing the likelihood of failure, others have suggested that integration is highly important for exploiting synergies between the traditional model and the new one. The findings of the data analysis indicated that market, entrepreneurial, and technological orientation are positively related with novel BM design and that novel BMs are significantly related to business performance, specifically when the technological turbulence is high. The results also showed that novel BM impact on business performance is higher for business units of established firms, on confirmation of hypothesis six. The next sections highlight the main findings of this study.

6.3 Antecedent Drivers of Novel Business Model

The first research question shed light on the key antecedents of novel BM design. As discussed in Chapter Two, the extant BM research has just started to explore the antecedents to novel BM design (See Hartmann *et al.*, 2013; Zott and Amit, 2013; Frankenberger *et al.*, 2014). While these studies provide an interesting discussion regarding the antecedents of BM design, and at the same have successfully linked the novel BM model with superior performance (Zott and Amit, 2007), most of the work conducted so far remains conceptual or based on secondary data, and has been largely focused on small entrepreneurial firms operating on the high-tech sector. This stream of research was also unable to link various strategic orientations to novel BM design.

Thus, to answer the first research question, the current study draws from the strategic orientation literature to derive three key antecedents of novel BM design (i.e. market, entrepreneurial, and technological orientations). Previous strategic orientation research has been focused on exploring the direct link between the various strategic orientation and business performance (e.g. Narver and Slater, 1990; Jaworski and Kohli, 1993; Wiklund and Shepherd, 2003). However, insight gained from more recent debate suggests a more complex relationship than was originally anticipated (Hult and Ketchen, 2001; Hult *et al.*, 2005; Ketchen *et al.*, 2007). This study contributes to this ongoing discussion about the link between a firm's strategic orientation and its impact on business performance (Christensen and Bower, 1996; Slater and Narver, 1998; Zhou *et al.*, 2005; Connor, 2007). The study results suggest that the linkage is not linear, but rather is embedded within a more complex web of relationships.

Viewed broadly, the results extend a growing body of literature that support the resource-based view's contention that unique resources influence important outcomes (e.g., Wernerfelt, 1984; Barney, 1991). Accordingly, this study suggests that the construct of BM fits Barney's (Barney *et al.*, 2001, p. 54) resource-framework: "resources are the tangible and intangible assets a firm uses to choose and implement its strategies." Of the three capabilities examined, entrepreneurial orientation had the greatest explanatory power on novel BM followed by market orientation.

The results also indicate that encouraging the aggressive pursuit of opportunities through various acts, initiatives, new administrative techniques, involvement in high-risk projects, and taking bold efforts to exploit opportunities(i.e. entrepreneurship) can be a an important asset. Market orientation should also be taken into account as strategy researchers continue their effort to explain the determinants of performance. Indeed, firms who place much emphasis on market orientation will be able to acquire information about customers and competitors and share such information across all function and, thus, will be better equipped to develop a novel BM. Firms who emphasize technology orientation have been linked to innovative capabilities and, thus, the results of this study confirms our theory in regard to the positive link between technology orientation and novel BM design.

The current thesis clearly delineates the antecedents that can be expected to foster the design of novel BMs. These antecedents are largely controllable by managers and therefore can be changed by them for enhanced novel BM design, which may lead to competitive advantage and better performance outcomes. This study contributes to this ongoing discussion about the role of strategic orientation in affecting business performance (Christensen and Bower, 1996; Slater and Narver, 1998; Zhou *et al.*, 2005; Connor, 2007). The study results suggest that the linkage is not linear, but rather is embedded within a more complex web of relationships. In doing so, the study fills a research gap about which factors trigger and give rise to novel BM design and whether a novel BM design contributes to the competitive advantage of firms (Zott and Amit, 2007; Teece, 2010). Hence, Teece (2010, p. 173) argues that *"*the issues related to good business model design are all interrelated, and lie at the core of the fundamental question asked by business strategists –how does one build a sustainable competitive advantage and turn a super normal profit?".

The direct effect of the three identified strategic orientations on novel BM design is discussed in sections 6.3.1, 6.3.2 and 6.3.3 respectively.

6.3.1 The Link between Market Orientation and Novel BM Design

The survey results clearly illustrate the benefit of a firm's emphasis on MO on the development of a novel BM. The link between MO (consisting of customer orientation, competitor orientation, and interfunctional coordination) and novel BM design was significant (β=.234, $p < .001$). The study results indicate, after controlling for firm size, age, efficiency BM, and industry, that the higher the firms' MO capabilities, the more its culture will be oriented around customers and competitors. Consequently, firms who are highly responsive to the acquired information will be able to design a novel BM and enjoy an advantage over their competitors.

This study has found that MO is a key driver of novel BM, regardless of industry differences. A main focus in developing the proposed relationship between these two variables was that the acquired information allows the firm to have a better understanding of customer and competitors. The discussion of various MO scholars indicates that market-oriented firms strive to understand the latent and expressed needs of customers and, consequently, to develop superior solutions for those needs (e.g., Kohli and Jaworski, 1990; Day, 1994; Slater and Narver, 1995; Slater and Narver, 1999). For instance, Slater and Narver (1999, p. 1165) argue that "market-oriented businesses seek to understand customers' expressed and latent needs, and develop superior solutions to those needs." The authors also stress that understanding the customer's expressed needs is not sufficient for the creation of competitive advantage, a condition that requires firms to develop industry and customer insights (Slater and Narver, 1999) to identify the latent needs of customers. Day (1994) points out that market-oriented firms have processes for gathering market intelligence about customers and competitors and integrating them with a strategic choice. Day argues that market-oriented firms are well equipped to develop market-sensing and customer-linking capabilities that over time become rooted in the organizational culture and, thus, enhance the firm's ability to sense and respond to changing customer wants ahead of competition. Kohli and Jaworski (1990) and Narver and Slater (1990) also emphasize that MO capabilities are essential for gaining insights about market demands and competitive moves.

The MO literature also suggests that innovative processes can be a logical consequence of being market-oriented (Hult *et al.*, 2004). Kohli and Jaworski's (1990) conceptualization of MO includes an action component which relates to the organization-wide responsiveness to market information. In their later work, Jaworski and Kohli (1993, p. 56) contend that "a market orientation essentially involves doing something new or different in response to market conditions, it may be viewed as a form of innovative behaviour." Slater and Narver (1995) argue that if firms do not develop capabilities to use collected information, MO will not have a positive impact on performance. Moreover, an MO promotes a culture of experimentation and an emphasis on continuously enhancing the firm's process and systems. This suggests that developing and enhancing a firm's MO may make a firm's capabilities become more unique (compared to the competition) in the long run, increasing the chances of obtaining sustainable competitive advantage.

Ketchen *et al*. (2007, p. 692) provide a theoretical justification of this relationship. They argue that "a simple resources-performance link obviously lacks face validity." Thus, based on the RBV logic, valuable, rare, inimitable, and non-substitutable resources and capabilities will help firms function better by taking strategic actions. When firms exploit these resources to shape their future actions, they will create sustainable competitive advantage, which consequently leads to better performance outcomes. Mahoney and Pandian (1992, p. 365) point out that "a firm may achieve rents not because it has better resources, but rather the firm's distinctive competence involves making better use of its resources." In a similar vein, Peteraf (1993) and Henderson and Cockburn (1994) have argued that gaining competitive advantage requires that firms not only own and control value resources, but also effectively leverage and manage them.

Based on the above discussion and drawing from the RBV of the firm (Barney, 1991), firms with high levels of MO capabilities are well equipped to gain customer and competitor insights, and these insights are valuable for meeting the expressed and latent needs of customers and, consequently, achieving novel BM based advantage. These results thus extend previous research that has emphasized understanding of "the deep truth" about customer needs and competitors' actions. For instance, Teece (2010, p.87)

emphasizes that designing a novel BM "requires creativity, insight, and a good deal of customer, competitor and supplier information and intelligence." Hamel (2000) highlights "customer interface" as a key component of his BM framework. For Hamel, the customer interface element includes information and insights which refers to the knowledge that is acquired from customers and to the ability of the firm to extract insights so that it can develop novel products and services. In line with this argument, Osterwalder and Pigneur (2010) highlight the customer perspective when designing new products, services, and BMs. For them, firms must "view the business model through customers' eyes, an approach that can lead to the discovery of completely new opportunities" (Osterwalder and Pigneur, 2010, p. 125). Thus, successful BM innovation entails a deep understanding of customers, including their environment, daily routines, concerns, and ambitions.

This finding also supports the literature that relates increased customer and competitor information to the ability to innovate (e.g., Eisenhardt and Brown, 1998; Hamel, 2000; Teece, 2010). In contrast to prior research findings indicating MO may impede innovations (e.g. Bennett and Cooper 1979; Frosch 1996; MacDonald 1995; Meredith 2002), the current study results suggests that MO encourages what Schumpeter (1934) calls "new ways to organize business ", often referred to as BM innovation. One key distinction here is that the previous research has focused on product and process innovation and the current study's findings extend the link to customer and competitor information and novel BMs. Slater and Narver's (1998, 1999) argue that market-oriented firms' not only focus on current customer needs (i.e. customer-led) but show a high commitment to understanding current and latent needs for both existing and potential customers. Thus, MO, when converged with other orientations, as will be explained in the next sections, forms a unique resource which consequently leads to BM-based advantage and superior performance.

6.3.2 The Link between Entrepreneurial Orientation and Novel BM Design

The entrepreneurship literature indicates that rapid changes in business environment have significantly shortened product and BM life cycles, leading to a growing interest in entrepreneurship research (Hamel, 2000; Rauch *et al*., 2009). The uncertainty associated

with profit generation is forcing firms to consistently develop and embrace new business opportunities (Wang, 2008; Rauch *et al*., 2009), and they also explore new and creative ideas which may lead to changes in the marketplace, proactively ahead of the competition in anticipation of future demand. Accordingly, entrepreneurial firms are likely to introduce new products, services, novel technologies, and even new BMs.

This study also attempts to explore the relationship between EO and novel BM as the positive EO-novel BM link is theoretically plausible but so far has received limited empirical attention. Entrepreneurial-oriented firms frequently plan ahead to reach their desired state, and emphasize problem solving as well as cost reduction and efficiency, whilst also continuing to search for market opportunities and taking risks in terms of resource allocation (Venkatraman, 1989; Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003). One of the key design tasks of entrepreneurial firms is to define the ways in which their new businesses interacts with suppliers, customers, and partners (Zott and Amit, 2007). According to Ireland *et al*. (Ireland *et al.*, 2003, p. 53), entrepreneurs frequently "try to find fundamentally new ways of doing business that will disrupt an industry's existing competitive rules, leading to the development of new business models." Thus, the activities of entrepreneurially-oriented firms are highly linked to innovation and, consequently, developing such activities will enable firms to achieve an advantage through the design of novel models.

As noted in Chapter 5, the inclusion of the EO variable contributes significantly to explaining the variance for novel BM design. The results show that the link between MO (consisting of futurity, proactiveness, analysis, defensiveness, and riskiness) and novel BM design was significant (β=.279, $p < .001$). As this study is centred on BM innovation, the link between EO and novel BM seems logical. Drucker (1985, p. 30), for instance, considers innovation as "the specific instrument of entrepreneurship. It is the act that endows resources with a new capacity to create wealth". Thus, firms can create value through a reconfiguration of existing resources (Schumpeter, 1934) in new designs (e.g. novel BM design).

This result highlights the importance of all EO dimensions (i.e. futurity, proactiveness, riskiness, defensiveness, and analysis) for the development of novel BM design. As discussed above, futurity reflects the desired future state of the firm and which business plans need to be developed to research that state (Venkatraman, 1989). This dimension is demonstrated by firms' focus on identifying customer preferences as well as continuous tracking of changes in business environment. Proactiveness indicates a firm's proactive behaviour in terms of joining new industries, experimentations, and seeking new business opportunities that may or may not be relevant to the current businesses (Basu and Gupta, 2013). Riskiness clarifies decisions taken by managers that may potentially affect firms' gains or losses. These decisions are expected to affect resource allocations and product market choices (Venkatraman, 1989). Defensiveness dimension helps in clarifying the defensive behaviour exhibited by a firm. This can be reflected by a firm's emphasis on cost reduction or seeking more efficient operations (Venkatraman, 1989; Basu and Gupta, 2013). Finally, there is the analysis dimension to a firm's overall problem solving stance. This dimension is considered of high importance for taking organizational decisions as it focuses firms' efforts on identifying the roots of the problem and generating the best possible alternatives (Basu and Gupta, 2013).

These findings are very consistent with the RBV logic. EO is argued to represent a unique resource or a capability. This capability is difficult to trade, imitate, or duplicate, and thus it can be a key sources of competitive advantage (Day, 1991; Hunt and Morgan, 1995). Therefore, emphasizing long term planning, the aggressive pursuit for new market opportunities via wide-ranging acts, initiatives, new administrative techniques, involvement in high-risk projects, and taking bold efforts to exploit opportunities (i.e. entrepreneurship) can be a great asset for entrepreneurial firms. Hence, he findings of this study improve our understanding of the EO performance relationship by suggesting a more complex model which links EO to novel BM design, which in turn enhances business performance. As such, the novel aspect of the BM is an important decision for an entrepreneur to exploit new business opportunities as well as a key task for firm managers who are responsible for transforming their old BM to make their firm ready for the future. Thus, the novelty offered by new, effective BMs can be positively linked to superior value creation.

This research finding is consistent with prior conceptual research that links EO to the creation of novel BMs. For example, Teece (2010) stressed that a new venture employs a particular BM for going to the market, regardless of whether it is explicitly or implicitly articulated. In a similar vein, Chesbrough and Rosenbloom (2002, p. 530) argue that "established firms as well as start-ups take technology to market through a venture shaped by a specific business model, whether explicitly considered or implicitly embodied in the act of innovation." Morris *et al*. (2005, p.726) consider the BM as the missing link in the literature, because "ventures fail despite the presence of market opportunities, novel business ideas, adequate resources, and talented entrepreneurs". The creation, growth potential, and market success of new organizational forms is frequently credited to the design of novel BMs, mainly in turbulent industries (Venkatraman and Henderson, 1998; Franke *et al.*, 2008).

The finding of this study is also consistent with the work of Amit and Zott (2007), who examined the effect of BM design on business performance for young entrepreneurial firms. Their study found a statistically significant relationship between novel BM design and business performance and that the strength of this relationship is stable across various environmental contexts. However, Amit and Zott's work is focused on young entrepreneurial and e-business related firms. This study, on the other hand, examines the link between EO and BM design across diverse industries and for both young and established firms.

While various studies have proposed a direct link between entrepreneurial orientations and better performance outcomes (e.g., Wiklund, 1999; Hult *et al.*, 2004; Wiklund and Shepherd, 2005; Keh *et al.*, 2007), other studies have found that entrepreneurial orientation affects performance indirectly through information utilization (Keh *et al.*, 2007), learning orientation (Wang, 2008), or in combination with market-oriented behaviours (Zahra, 2008). This study extends previous work by conceptually arguing and empirically testing a model that links EO to novel BM design, which leads to superior business performance.

6.3.3 The Link between Technological Orientation and Novel BM Design

This study also aimed to explore the link between TO and novel BM design. Firms' with high levels of TO devote their resources and capabilities to acquire new technologies, and developing new processes, products and services (Gatignon and Xuereb, 1997; Zhou *et al.*, 2005). This indicates that customer value and the future success of the firm are best achieved through new innovations, technological solutions, products, services or production processes (Hamel and Prahalad, 1991; Gatignon and Xuereb, 1997; Grinstein, 2008). Accordingly, it was argued that technology-oriented firms are most likely to focus on novel BM design since successful commercialization of new products and technologies relies to a large degree on the implemented BM (Chesbrough and Rosenbloom, 2002; Teece, 2010). As the business environment is becoming highly dynamic, firms are required more than ever to consider not only how to accurately define customer needs and wants, but also how to capture value from new products and services offerings (Teece, 2010). For Teece (2010), a well-crafted BM is highly important as it allow firms to deliver or capture value from their product or service innovations (Teece, 2010). Chesbrough (2002) also notes:

> "The inherent value of a technology remains latent until it is commercialized in some way. In some instances, an innovation can successfully employ a business model already familiar to the firm. In other cases, though, such a business model will not fit the circumstances of the technological or market opportunity. In the latter cases, technology managers must expand their perspectives, to find the right business model, or 'the architecture of the revenue', in order to capture value from that technology" (p.530).

The study's findings indicate that the relational path between TO and novel BM design was significant (β=.197, $p < .001$). This indicates that UK service and manufacturing firms are likely to use technology to support the commercialization of their technology innovations. This is in line with Teece (1986), who noted that "profiting from [an] innovation" framework, where the author has introduced the idea of complementary strategic assets in order to illustrate that technology in itself is not sufficient to generate acceptable level of profits unless it is complemented by other strategic assets (i.e. a brand, production capacity, or a distribution network). In his later work, Teece (2006) incorporated the BM to his framework to articulate the logic of value generation of new

technological innovations. He states that "I have come to recognize that getting the business model right is important to the innovation process and to business performance more generally" (Teece, 2006, p. 1143).

Such results cannot be considered surprising given the inherent theoretical link between technological innovations and BMs. As such, this study supports the argument that TO has an important impact on novel BM design. While MO and TO encourage openness to new ideas, an MO orientation favours ideas that best satisfy the current and latent needs of customers, and yet TO promotes the exploitation of those with novel or state-of-the-art technologies. Because technology-oriented firms are leaders in the use of technological innovation and dedicate a large amount of resources to R&D, they are linked to technical proficiency and flexibility, which are key antecedents to breakthrough innovations (Zhou *et al.*, 2005). Besides, technology-oriented firms frequently encourage employees to think out of the box and to come up with "crazy ideas". In such companies, breakthrough innovations are becoming a priority at both the cultural and strategic levels (Hamel and Prahalad, 1994; Hurley and Hult, 1998). However, technological innovation is just one step to success, and this study shows that without well-articulated BM, firms will have difficulties capturing value from technological innovations.

The above finding extends prior research that has identified new technologies as an important driver of product innovation (Zhou *et al.*, 2005; Calia *et al.*, 2007; Bjorkdahl, 2009). For example, Zhou *et al*. (2005) have linked technological orientation to technology and market-based innovations. The authors found that technology orientation positively affects technology based innovations, and yet no effect was found with market-based innovation. Other studies found that technological orientation has a positive effect on business or new product performance (e.g., Gatignon and Xuereb, 1997; Day, 1999). Gao *et al.* (2007), on the other hand, found that a technologically orientated performance link is contingent on technological turbulence. While the above studies are important for highlighting the relationship between technological orientation and breakthrough innovation, they are mostly focused on product and process

innovations. This study, however, argues for theoretically and empirically testing the link between TO and novel BM design and superior business performance.

Based on the above discussion, the current study extends the previous research by considering technological orientation as a key strategic resource or capability. When appropriately deployed, this exploration or exploitation of technological capabilities can lead to novel-BM based advantage, which in turn leads to superior business performance. This calls for firm managers to integrate both product and technological innovation with BM innovation. This, consequently, translates technical success into market success. This finding is consistent with Teece's (201) conceptual argument that proper BM design and implementation, coupled with careful strategic analysis, is an important factor for technological innovation to succeed commercially.

6.4 The Link between Novel BM and Business Performance

In recent years, firms aiming to attain competitive advantage have started to emphasize BM innovation to complement product or process innovations efforts, or even act as an alternative (Amit and Zott, 2012). This research has linked novel BMs with better performance outcomes. This includes empirically linking novel BM design to stock market performance (Zott and Amit, 2007), case studies which emphasize novel BM design (Magretta, 2002; Kim and Mauborgne, 2005; McNamara *et al.*, 2010; Amit and Zott, 2012), and books on generating BMs (Hamel, 2000; Johnson, 2010; Osterwalder and Pigneur, 2010; Kaplan, 2012). Firms will attempt to develop new and novel BMs that allow them to capture value in ways other firms do not. According to Dosi (1982), firms engage in innovation activities to create variation outside the boundaries of traditional competition by providing the firm with a performance advantage.

While the above literature is interesting and provides evidence of the importance of novel BMs for explaining the variance in business performance, such literature remains largely conceptual and is based on secondary data. This study has developed a unique data set to explore the drivers of BM performance by incorporating firms' market orientation, entrepreneurial orientation, and technological orientation into a structural equation model. The results from the random sample do show that novel BMs and

performance were related and this was a linear relationship in terms of all subjective performance measures ($\beta = .330$, $p < .001$).

According to Schumpeter (1934), value creation through innovation can be achieved in various ways, which include recombining current resources in new BM designs. The results of this study indicate that firms' value creation potential is determined to a large degree by the ways in which transactions are enabled. The winners from BM model innovation are those firms who are first to change the rules of the game by introducing revolutionary BMs. These models do not necessarily involve new product features or even innovating new products. For instance, the Xerox photocopy machine was an outstanding success that was a result of a lease BM, rather than from selling the machine itself.

This finding adds to the ongoing discussion with regard to the performance implications of BM design (Zott and Amit, 2007; 2008). By framing BM design as an important task for both established and entrepreneurial firms, and by recognizing BM innovation as a key source of value creation for firms, this thesis contributes to research that integrates the fields of entrepreneurship and strategy (Ireland *et al.*, 2001; Ireland *et al.*, 2003). The specific effects of BMs can contribute to some unexplained variation in SBU performance. In this regard, BMs can complement, but not necessarily replace, industry-specific and firm-specific factors in deriving firm performance (Rumelt, 1991; McGahan and Porter, 2002). With the frequent changes in business environment towards more global operations and the use of technology, business managers should consider opportunities beyond the current industry and firm boundaries to maximize value creation and capture. This can be achieved by introducing novel BMs that extend firms' links with the external environment.

The evidence from this study supports prior conceptual research focused on the BM performance relationship. This research suggests that firms who are the first to establish a novel BM will be able to offer their customers a unique value proposition that their competitors cannot match, allowing firms to develop a competitive advantage which, in turn, leads to superior business performance (see Teece, 2010). The basic premise was

that firms who devote a great deal of effort to developing their market, entrepreneurial, and technological orientation capabilities will be able innovate their BMs and achieve a competitive advantage. Such advantages can be achieved through connecting transaction parties in new ways, the development of new transaction mechanisms, and the creation of first-mover advantages (Amit and Zott, 2001; Zott and Amit, 2007). Accordingly, these firms can either have cost or differentiation advantages over their competitors (Barney, 1991; Porter, 1991).

Porter (1991) points out that the low-cost and differentiation strategies that firms develop in their product-markets can be linked to "initial condition" and "managerial choices". Zott and Amit (2010) contend that these managerial choices can in fact lead to profoundly different BMs. These transformed BMs frequently involve a unique set of activities as well as resources and capabilities to implement them in collaboration with other business partners. Each of these choices is also expected to have different implications for the performance of the firm. This may involve, for instance, decisions about the size of capital expenditure and prices, as well as the customers and competitors the firm will deal with (Zott and Amit, 2010). More recently, Casadesus-Masanell and Zhu (2013) found that firms can differentiate themselves not only through product quality, but also through BM design, and they emphasize the BM construct as an important strategic competitive tool.

This result is consistent with the finding from the IBM CEO study that found a positive link between BM innovation and business performance (IBM Global Business Services, 2006). Similar findings were reported by (Zott and Amit, 2007; 2008) and Morris *et al.* (2013). However, these studies were focused on a limited context, e-business and food sectors respectively. This study extends prior work by empirically testing the BM performance link on a random sample of manufacturing and service firms.

Theoretically, the current study follows the argument of Hult and Ketchen (2001) and Hult *et al.* (2005) and suggests that market, entrepreneurial, and technological orientation can be considered a unique resource or a capability. It is argued that all three orientations are important antecedent drivers of a novel BM. RBV scholars argue that

simply owning and controlling valuable, rare, inimitable, and non-substitutable resources is insufficient to attain competitive advantage (Mahoney and Pandian, 1992; Barney *et al*., 2001; Barney *et al*., 2011), and that firms are also required to develop capabilities in order to exploit these resources (Newbert, 2008).

The findings of the study suggest that the novel BM design is an important driver of business performance. As such, it appears that managers should strive to pursue BM innovation in their efforts to attain higher business performance. Thus, service and manufacturing firms should consider the BM as a complement, or even an alternative, to product and process innovations, specifically in dynamic environments where the product development initiatives can be costly. In Teece's words (2010, p. 191), "Get the business model wrong, and there is almost no chance of business success, get it right, and customize it for a market segment and build in non-imitable dimensions, and it will contribute to the firm's competitive advantage."

The above result should be interpreted within the larger context of strategic management and entrepreneurship research. Based on the resource-based view (e.g., Wernerfelt, 1984; Barney, 1991), the link between novel business model design and SBU performance is of high importance. Designing an appropriate business model, or adapting current ones, has become critical for the exploitation of opportunities and is dependent on the firm's existing resources or capabilities. To increase the likelihood of success, service and manufacturing firms must place special emphasis on tracking changes in the external environment and direct their efforts toward capitalizing on unique market needs. This also requires changes in the architecture of the BM to enable these firms to create and capture value from new business opportunities.

6.5 The Moderation Effects of Business Performance

This section is divided into two parts. Section 6.5.1 deals with the findings of the moderation effect of technology turbulence, while section 6.5.2 is concerned with the moderation effect of the in/dependence of the new BM.

6.5.1 Moderation Effect of Technology Turbulence

The moderating role of technology turbulence on the relationship between novel BM design and business performance was empirically explored in this study. Prior BM research has stressed the importance of considering the BM performance relationship in a contingency framework (e.g., Zott and Amit, 2007; Bornemann, 2009; Brettel *et al.*, 2011). This study focuses on the "*fit as moderation*" perspective (Venkatraman and Camillus, 1984; Van de Ven and Drazin, 1985; Olson *et al.*, 2005). The moderation perspective indicates that the effect an independent variable has on a dependent variable is contingent on a third variable, termed as moderators (Venkatraman, 1989). Thus, it was argued that the fit between novel BM design and technology turbulence is the key determinant of business performance.

The results show that technological turbulence slightly strengthens the positive relationship between novel BM and business performance (β=.128, P<.05). This result indicates that the impact of novel BM design on business performance is stronger in an environment characterized by frequent changes in technology. Technological turbulence refers to the degree of change inherent in product and process technologies (Jaworski and Kohli, 1993). Thus, when the rate of technological change is high, firms will also be pressured to update or transform their BMs to best fit the change in product or process technologies.

The moderation effect of the business environment has been heavily examined in prior strategic orientation research. For instance, Jaworski and Kohli (1992) and Slater and Narver (1994) found limited support for the proposition that a competitive environment has an effect on the relationship between market orientation and firm performance. Lumpkin and Dess (2001) reported that the effect of proactiveness on performance is moderated by dynamic and hostile environments. In the context of BM research, Zott and Amit (2007) found that the BM performance relationship is likely to be stronger in times of resource munificence. This study extends the work of Zott and Amit by exploring the contingent effect of other environmental factors (i.e. technological turbulence).

This result indicates that BM performance link is stronger for firms that face rapid changes in product and process technologies. BMs are of high importance for capturing value from new technologies (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010), and unless an appropriate BM is developed, firms will not be able to fully capture the economic potential of such technologies. Consequently, changes in technology also require firms' to adjust the current BM or even create a new one. This finding, however, contradicts the findings of Zott and Amit (2007), who found that the BM performance is not moderated by environmental munificence, indicating that the relationship is stable in times of low and high resource munificence. However, it should also be noted that while this study found that technological turbulence positively moderates the link between novel BM design and business performance, the slight change in the variance of business performance indicates that this result should not be overemphasized.

6.5.2 Moderation Effect of In/Dependence of the New Business Model

The current study also aimed to examine the effect of the (in)dependence of the new business model on the relationship between BM-based advantage and business performance. Various studies have argued that it is difficult for a firms to operate more than one BM in parallel within the same industry, and such efforts have been linked to strategic failure (e.g. Markides and Charitou, 2004; Markides, 2008; Casadesus-Masanell and Tarziján, 2012). As a result, the decision to integrate the new BM within the current organizational boundaries or separate it into a physically distinct venture could have significant consequences on firms' performance (Andries and Debackere, 2007). However, there is a situation when a firm may want to address several customer segments, using a specific BM for each one. The current study hypothesized that running a firm/SBU with two or more BMs can lead to better performance outcomes, specifically when the conflicts between these models are low.

The results of the multi-group analysis reveal that between the dependent ventures and the business unit of established firms there were significant differences in the strategic orientations and novel BM design, and the performance relationship. More specifically, the differences occurred in the strategic orientations and the novel BM link; market

orientation, entrepreneurial orientation, and technological orientation had a stronger positive impact on novel BM design for dependent ventures rather than for the business units of an established firm.

This indicates that starting a new business venture for the new BM can have better performance consequences compared to accommodating it within the borders of the current firms' structure; thus, hypothesis six is not supported. This finding, thus, supports previous conceptual research which suggest that a firm or SBU must only compete with one BM since the introduction of a new BM within the boundaries of the firms could increase the likelihood of failure (Porter, 1980). However, recent research suggests that competing with dual BMs can be the optimal strategy in situations when there are few conflicts between the current BM of the established firm and the new BM (Casadesus-Masanell and Tarziján, 2012). The two models can benefit from shared resources and capabilities, in particular, the new business unit can learn and take advantage of an established firm's management skills and expertise (Markides and Charitou, 2004). A competitive strategy allows firms to create an advantage by protecting a unique position and exploiting a distinctive set of resource and capabilities. Taking this view, competing with dual BMs is not a risk; rather, it is a new competitive tool. If appropriately implemented, it will enhance firms' ability to capture value and gain a sustainable advantage (Casadesus-Masanell and Tarziján, 2012).

6.6 Chapter Summary

Drawing from the findings of the survey questionnaire, this chapter has explored the antecedents and consequences of novel business model based advantage at the SBU level. The study makes an important contribution to the literature on business models. First, it establishes the constructs of market orientation, entrepreneurial orientation, and technological orientation as business model antecedents that explain a significant deal of the variation in manufacturing and service firms' novel business models. Second, it examines the contingent role of novel business models in the determination of firm performance. In doing so, the study extends the scholarly inquiry into business model focus as a contingency factor that affects firm performance. While the traditional focus in the literature on firm performance has been on the young entrepreneurial e-business

related firms, the current study extends prior research by exploring the BM performance link across a diverse range of industries in both young and established firms. Hence, the study contributes to the literature on business models and offers the basis for future research directions.

Chapter 7. Conclusions and Future Research

7.1 Introduction to Chapter Seven

This study has explored the antecedents and consequences of novel business model based on a national random sample of UK firms. This chapter starts by presenting the theoretical and managerial implications. The key research limitations are then highlighted, in addition to suggesting significant future research avenues that would provide further development to this important area of research. Finally, the chapter ends by presenting concluding remarks to the research study.

7.2 Overview of the Thesis

A key distinctive feature of this research is the establishment of a novel business model - performance link through a relatively large-scale survey research. Prior conceptual research has suggested a positive impact of business model innovation with performance outcomes, and this has led to a growing interest in the business model construct among both academics and practitioners. Academics have acknowledged the important strategic implications that can be derived from novel business modelss. At the same time, practitioners who seek competitive advantages are now placing higher emphasis on business model innovation as an alternative or to complement their product and process innovation efforts as a result of shortening life cycles of products (Hamel, 2000; Zott and Amit, 2010).

This study has adopted the business model definition proposed by Amit and Zott (2001), who conceptualize the concept as the design of a firm's set of boundary-spanning transactions with external parties (i.e. customer, supplier, and business partner). Utilizing the RBV of the firm, the study focuses on firms' resources and capabilities, which, according to RBV logic, are central to the attainment of competitive advantage and superior performance. Specifically, the RBV assumes that the resources required to formulate, select, and implement strategies are heterogeneous within the industry and that the differences are stable over time (Barney, 1991). Accordingly, firms that own and control value and rare resources will be able to achieve competitive

advantage, and yet to sustain this advantage these resources and capabilities must also be inimitable and non-substitutable (Wernerfelt, 1984; Barney, 1991; Conner, 1991). This study explored drivers within the firm associated with novelty in the business model, including market orientation, entrepreneurial orientation, and technological orientation. Technological turbulence was considered as a key moderator of the novel business model -performance link. Business performance was measured using subjective measures that are widely used in strategy and business model literature.

Data were collected utilizing a survey questionnaire from UK-based service and manufacturing firms relying on a key informant strategy. The sample was obtained from Dun and Bradstreet Commercial Database, UK. The response rate was 11.6%. Structural equation modelling was used to test the correlational paths between the latent construct as well as to test for the moderation effect of technological turbulence. The result indicated that the three strategic orientations are positively related with novel business model. Novel business model was also identified as a key driver of superior performance which confirms the hypothesized relationships. Furthermore, the results of the multi-group analysis revealed that the effect of business model-based advantage on performance was stronger for independent ventures compared to business units of established firms, which did not support hypothesis six. This highlights the importance of the strategic decision to compete using dual business models in the same firm/unit. Managers should only run their units with dual business models when the level of conflict between the two models is high.

The results should be interpreted within the larger context of strategic management theory. Based on resource-based view (Wernerfelt, 1984; Barney, 1991) , the interface between novel business model and the external environment is especially crucial. Appropriate novel business model become critical for exploiting opportunities and are dependent in the firm resources and capabilities. An important implication of the research is that RBV is a useful lens to elaborate mechanisms associated with novel business model and can serve for future research to theoretically ground investigations into innovation in business models. This study contributes to the literature by examining the business model performance by exploring the business model performance based

on an empirically verified model, as well as by identifying the key antecedents drivers of novel business models, a gap that was strongly emphasized in prior business model research (Zott and Amit, 2007).

In the following sections the researcher will discuss the key theoretical and practical implications of this study. This will be followed by the research limitations and recommendations for future research.

7.3 Implications

This research study was carried out with a keen theoretical interest in evaluating the linkage between the antecedents and consequences of novel business model. Recently, the business model has received growing scholar attention, and the construct has been linked to superior business performance (e.g., Zott and Amit, 2007; Teece, 2010; Casadesus-Masanell and Zhu, 2013). However, most business model research can be characterized as conceptual and little is known about the antecedents and consequences of novel business models. For this objective, the researcher secured a relatively large and diverse sample; furthermore, extra care was given to ensure data validity and reliability and, at the same time, control for other business models designs as well as environmental turbulence (Zott and Amit, 2007; 2008). Such steps are hoped to produce more robust and generalizable results.

This research presents important contributions for both academic researchers and managers, and these are addressed in the next section.

7.3.1 Research Implications

The findings of the survey make several contributions to the business model literature. First, perhaps the most significant contribution of this study rest on the identification of key antecedent drivers of novel business models.

Second, this study contributes to the business model literature by exploring the novel Business model- performance in a much wider context, which is hoped to extend the generalizability of my findings.

Third, this study contributes methodologically to the extant business model literature by exploring the performance implications of novel business model through a relatively large empirical survey research.

Fourth, this study also explores the moderation effect of separation or integration of the new business model. This topic has received considerable attention in the literature, however so far scholars are still divided on this issue, and little is known about effect of separate or integrate decision on business performance.

Finally, the combination of the theoretical lens employed in this study and the research design are also a significant contribution to the business model research. The business model is considered a multifaceted concept and, thus, scholars may face difficulties in dealing with this complexity. Employing RBV as a theoretical lens is indeed crucial as it helped the researcher to explain and predict the relationships between internal strategic orientation capabilities and novelty in the firm's business model.

7.3.1.1 Antecedents to Novel BM Design

The key theoretical contribution of this study is the model that links novel business model to performance of firms under varying conditions of technological turbulence. By initiating an explicit effort to empirically test several hypotheses advanced in the literature regarding the antecedents of a novel business model, this study contributes to business model literature by extending its scope of antecedent factors. Consequently, drawing on the strategic orientation literature, this study derives three antecedents of novel business model-based advantage, including market orientation, entrepreneurial orientation, and technological orientation. Prior research has linked these strategic orientations to firms' innovative capabilities (e.g., Zhou *et al.*, 2005), as well as to the creation of positional advantage (e.g., Hult and Ketchen, 2001). Accordingly, these antecedents were theoretically linked to the novel business model advantage and attainment of superior business performance. Accordingly this study could help in

overcoming the barriers seen in prior business model research (Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Sosna *et al.*, 2010).

The findings of this study highlight that novel business model advantage can be developed by employing current strategic orientation capabilities namely; market orientation, entrepreneurial orientation, and technological orientation. The development of the theoretical arguments of the proposed antecedents to novel business model has been largely referenced from the principles of RBV (e.g., Barney, 1991; Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002; Hedman and Kalling, 2003; Afuah, 2013). To the best knowledge of the researcher, this is the only study that has explicitly adopted the theoretical lens provided by the RBV to examine the antecedents and consequences to novel business model. Specifically, insights were gained from the underlying assumption of RBV, namely resource heterogeneity and immobility as well as from recent work that has emphasized resource deployment and the development of new capabilities (See Barney *et al.*, 2011). In this study, it has been argued that firms' managers should exploit their strategic orientation capabilities to achieve sustainable business model-based competitive advantage and better performance outcomes. Due to soaring product innovation costs, firms can use their current innovation capabilities to design novel business models and, thus, achieve and advantage at lower cost (Zott and Amit, 2010).

7.3.1.2 The Context of the Study

In the current thesis, it has been highlighted in various sections that the majority of prior business model research has been focused in young entrepreneurial firms. This line of research has been very promising and offered several insights into the business model of entrepreneurial firms. The sample in the current study is randomly selected and includes small and large firms operating in various industries and, consequently, the results of the study can be generalized to a wider context.

The current study's findings reveal that business model innovation is relevant for both young and large established firms. The link between market orientation and novel business model advantage was significant and helped explain the variance in business

performance. This highlights the importance of acquiring customer and competitor information for the development of novel business model. This involves monitoring competitors' actions as well as sensing customer needs and responding to those needs in a timely fashion to maximize customer satisfaction.

7.3.1.3 The Link between Novel BM Design and Business Performance

Business model research can be described as largely conceptual and large-scale empirical studies are limited, one exception is the work of Zott and Amit (2007, 2008). One reason for this shortage of empirical research relates to the difficulty of operationalizing the business model concept. To deal with this complexity, scholars have applied a number of approaches. For example, Amit and Zott (2001) adopted their own business model framework which is focused on the content, structure, and governance of transaction and hired raters who were trained to evaluate the firm's business model. They identified typologies which were later tested for links to firm performance. However, the sampling frame in these studies was limited to those firms who conducted part of their transactions online, and Zott and Amit also relied on secondary data. Similarly, other studies that empirically analysed the business model concept have also focused on a specific business model type or even components of the model (Bonaccorsi *et al*., 2006; Bock *et al*., 2011; Brettel *et al*., 2011). One common theme in all the previous studies is that they have highlighted one variable or a set of variables that allowed an examination of a specific aspect of the business model concept. Conceptual and qualitative research is considered to be important for building basic knowledge about the business model concept. However, as research advances, more quantitative studies are required where proposed theories can be formally tested (George and Bock, 2011).

In addition, while prior business model research has been focused on examining the direct business model performance link, this study, on the other hand, explores the contingent effect of technology turbulence on the novel business model performance link. The environment has long been viewed as one of the critical contingencies in organization theory and strategic management (See Child, 1972). While Zott and Amit (2007) explored the moderation effect of resource munificence and found that the

business model performance link is robust in an environment characterized by both scarcity and abundance of resources, the current study, in contrast, found that the business model performance link is stronger in highly turbulent environment. Thus, business model innovation is likely to be more relevant in environments characterized by high technological turbulence.

7.3.1.4 The issue of (in)dependence of the New BM

The current study also contributes to the ongoing conceptual debate on the separation or integration decision (SeeChristensen and Raynor, 2003; Markides and Charitou, 2004; Markides, 2008; Markides and Oyon, 2010). Specifically the empirical results indicate that the effect of novel business model in performance is stronger when the new business model is implemented as a separate business venture rather than as an internal business unit. This is mainly true when the level of conflict between both models is high or when the new model will serve a different market segment. In this context, the separate venture will have the total freedom to develop its own strategy, culture, and processes without direct interference from the established firm.

7.3.1.5 The Resource-Based View as a Theatrical Lens

The current study explores the relationships between a firm's internal resources and capabilities with novel business models and novelty in the business model with performance. The researcher used a RBV to support the development of hypotheses and explain the results of the study. The RBV of the firm, which draws heavily on Schumpeter's perspective on value creation, considers the firm as a collection of resources and capabilities. Based on the RBV logic of owning and controlling complementary and specialized resources and capabilities, which are value, rare, inimitable, and non-substitutable, this may allow firms to create value (Wernerfelt, 1984; Barney, 1991; Amit and Schoemaker, 1993; Peteraf, 1993). It assumes that, even in times of economic equilibrium, firms may vary in terms of resources and capabilities endowment, and that these differences will last until Schumpeterian shock occurs. Consequently, RBV theory contends that the services enabled by the firm's unique

collection of resources and capabilities may lead to competitive advantage. The use of the RBV in this research helped the researcher explain the link between strategic orientation and novel business model-based advantage as well the value creation potential of the business model.

The study's results were consistent with RBV logic. For instance, the evidence obtained supports the view that increased emphasis on market orientation, entrepreneurial orientation, and technological orientation capabilities can have a positive impact on novel business model. Ketchen *et al*. (2007) suggested that market orientation as a resource only has potential value. Likewise, DeSarbo *et al.* (2007) emphasised that deploying resources through organization capabilities is in fact more important for firms' success than mere ownership and control of resources. In his discussion regarding variations in performance at the firm level, Porter (1991) stressed that it is a firm's attainment of competitive advantage that leads to superior performance. From the above discussion, since market orientation, entrepreneurial orientation, and technological orientation as an organizational resource and performance are not directly linked, it becomes important to focus on the process through which these resources can be translated into better business outcomes. Consequently, it is emphasized in this study that only firms who take appropriate strategic action to exploit the strategic orientation of resources will be able to develop a competitive advantage based on the their ability to design novel business models (Teece, 2010).

Prior research has explored the mediating role of innovation capabilities and competitive advantages in the market orientation-performance link (Han *et al.*, 1998; Zhou *et al.*, 2005). Other studies have empirically illustrated that strategic orientation only affects performance by developing positional advantage (Hult and Ketchen, 2001). Tied to the RBV, the finding of this study suggests that market, entrepreneurial, and technological orientations represent unique resources that are significant to the design of novel business models and, thus, achieve better performance outcomes. Overall, the results indicate the important role of the 'organizing' component as a means to fully utilize firms' resources and capabilities and, thus, it contributes to RBV literature by

exploring its key assumption that resources lead to actions which, in turn, leads to competitive advantage and better performance outcomes (Ketchen *et al.*, 2007).

This study has defined the business model concept in line with Amit and Zott (2001) as the content, structure, and governance of transactions with external parties, including customers and suppliers among others. Since value is created when a firm provides products and services with higher benefits to customers than the costs they incur, and an appropriate value when the price paid for the products or services exceeds the costs (Lepak *et al.*, 2007), the above definition of the business model is considered rooted in resources and the activities that exploit or use the resources to create and appropriate value (See Markides and Geroski, 2005; Chesbrough, 2007; Casadesus-Masanell and Ricart, 2010; Gambardella and McGahan, 2010; Afuah, 2013). Hence, it contributes to the business model literature by highlighting the link between activities and resources and the business model concept.

7.3.2 Managerial Implications

Novel business model is of particular importance to entrepreneurs (Zott & Amit, 2007) as well as established firms (Sosna *et al.*, 2010) due to its links to competitive advantage and superior business performance. The concept of business model became popular in the late 90s, and since then has largely attracted the attention of managers. Specifically, business model innovation is becoming highly relevant in today's rapidly changing and highly dynamic business environment. It can provide a way for firms to sustain the competitive pressure by complementing products or process innovation. The current research extends previous conceptual research by validating the performance relevance of the business model by the mean of data collected from business units' managers across wide range of industries.

The results of the business model antecedent and performance analysis conducted in this dissertation have profound implications for entrepreneurs, managers, and consultants. Managers today are well aware of the importance of business model innovation and know that novel business models often lead to superior performance.

Novel business model is a consequence of efforts generated from multi-dimensional capabilities, as highlighted in the study's conceptual model. For business model innovation to occur, firms must make an effort to develop their capabilities in market orientation, entrepreneurial orientation, and technological orientation.

The insights gleaned from this research can be used to guide the development of business models that involve market, technology, and entrepreneurial orientations. Moreover, the study suggests the need for firms to consider the integration or separation of the new business model as a key strategic issue. Managers are, thus, encouraged to create a distinct business unit for the new business model that is physically separate from the traditional business. To maximize the chances of success, managers and entrepreneurs should facilitate the development of a new culture, processes, and strategy for the new venture without direct interaction from the parent firm. Firms' managers should carefully assess their business environments as the results of this research indicate that novel business models impact on performance is stronger in dynamic and highly turbulent markets. It is hoped that the findings of this study lead to improved managerial practices and future research that delves more deeply into these constructs and their interrelationships in a variety of settings among manufacturing and service firms.

7.4 Limitations

The current research followed a logical design for quantitative research. Although the researcher attempted to ensure that the conceptual model and hypotheses were rigorously generated and developed from a strong theoretical background and extant empirical research findings, the researcher acknowledges the presence of several limitations. For instance, for validation and generalisation purposes, it is becoming important for researchers to implement a triangulation research strategy and use multiple research methods from the same or different research paradigms. From this standpoint, this research can be enhanced by incorporating either a focus group before finalizing the conceptual model and hypotheses, or case studies after the discussions and

research findings from the questionnaire survey. Both focus groups and case studies can guide the researcher to specific organisational contexts to search for insightful and concurrent understanding of issues in relation to novel business model design and performance. However, due to restrictions of resources, these measures were not possible in this research.

Another area in which this research is limited which will potentially receive questions from journal reviewers is the selection of Amit and Zott's (2001) conceptual framework and definition of the business model construct. As discussed in Chapter 2, several business model frameworks were proposed by various scholars and the business model construct has been defined according the author phenomena of interest. So far, none of the frameworks or definitions appears to be standard in the literature. However, one positive aspect of these frameworks is that they frequently focus on the idea of value creation and capture and have several areas where they overlap. Also, the theoretical logic that underlies this research into antecedents associated with novel business models should be relevant across the different frameworks. In regard to the definition, Amit and Zott's (2001) business model definition was deemed appropriate for various reasons, as discussed in detail in Chapter two, but mainly because the definition allowed the researcher to focus on key design themes (i.e. transaction content, transaction structure, and transaction governance) that can be empirically tested and linked to competitive advantage.

Second, the use of RBV as a theatrical lens for this study could be problematic due to the static nature of the theory (Priem and Butler, 2001). The definition of the basic concepts can have significant implications for the scope of this study. The concept definitions should be based on the selected research fields. Consequently, it should be noted that the study relates primarily to the strategic management field, and more specifically to the RBV of the firm. As discussed in Chapter 2, the RBV literature has been centred on the identification of the so-called complementary resources and capabilities in addition to the resources that fulfil the VRIO criteria (Barney, 2011) and enable a sustainable competitive advantage for a firm. Thus, the recent discussion and research on dynamic capabilities (e.g., Makadok, 2001; Wang and Ahmed, 2007; Helfat *et al.*, 2009) are outside the scope of the current study, although it relates closely to the

RBV domain. Utilising the RBV as the main theoretical lens imposes specific limitations on this work, and these are discussed in more detail in Chapter 2.

There are several other potential limitations that are commonly cited in management research that are also pertinent to this study. For instance, this study relies on subjective, self-report indicators to measure the research constructs in the survey questionnaire. Taking the SBU performance measurement as an example, it is widely agreed that objective indicators such as cost, total sales, or profitability would improve accuracy of research findings. However, these measurements are also sensitive and difficult to be remembered precisely at the times by informants. Furthermore, the inclusion of such questions in the questionnaire may lead to a lower response rate. In fact, the survey instrument relied solely on managers' self-report regarding their perceptions of the various strategic orientations, novel business model, and SBU performance. Although most researchers contend that these managers are the most likely among the firm's employees to be able to provide an informed and relatively objective judgement about issues at the company/SBU level, such a perception might be highly affected by the respondents' frame of reference and experience, and the management practices in their firm/SBU. One solution to this issue would be to survey multiple informants within an SBU. Innovation in business models is difficult and in large firms/SBUs a single person often does not have the influence, authority and abilities to successfully pursue business model innovation. Consequently, collecting data from various managers may improve our understanding of the novel business model performance link, and would reduce any potential bias in the data associated with the level of the informants. However, the difficulty and cost of doing so has been widely recognised. For this reason, it was not possible for this research due to resource limitations.

Finally, the current study utilized population-wide, cross-sectional data of UK firms. While providing key insights into the drivers of a novel business model, it does not allow business model researchers to fully understand the effect of adaptation, experimentation and trial and error learning on the novelty of a firm's business model. For example, Teece (2010, p. 187) argues that "an entrepreneur may be able to intuit a new model but not be able to rationalize and articulate it fully, so experimentation and learning is likely to be required." In this regard, it would be useful to conduct a

longitudinal study of organizations engaged in business model innovation in order to examine the long term implication of novel business models.

7.5 Recommendations for Future Research

This research has focused on, and further developed, the business model - performance link, incorporating market orientation, entrepreneurial orientation, technological orientation, and the contingent effect of business environment on the novel business model and business performance link. Based on the prior discussion, the research limitations and the contribution to knowledge, this research lays down the basis for further research.

The recommendations for future research can be broken down into both methodology employed and the substantive findings of this research.

- This research was designed and tested in cross-sectional contexts. It is therefore important for future research to examine the long-term impact of novel business models in a longitudinal design. Recent research has emphasized the role of experimentation and trial and error learning on the designing revolutionary novel business models. This finding of these studies indicates that it is unlikely for managers to get the right business model in the early stages of a venture or technology. The process requires learning, fine tuning and adjustment to the original model. Thus, future research on business models should compare both the short and long term effects of novel business model design.
- The same applies to future research in different cultural settings. The sample of this research was collected from UK-based firms with 50 or greater employees. Therefore, before extending the research findings to companies in other nations, further research is needed. One point is certain –the soundness of the proposed model would benefit from a larger sample size. Future work should also target industries undergoing shifts/revitalizations.
- Another area for further research is the replication of the study's findings. As previously noted, this research used self-report subjective measures. To avoid the frame reference of a single respondent in the company, it is important to replicate the research models using multiple informants from each firm/SBU,

e.g. R&D managers, marketing managers, and/or new service development managers. A side-effect from this later replication is the response rate, since concentrating on a more homogeneous sample would encourage respondents to participate.

- This study focuses primarily on the link between strategic orientations and novel business model. Additional research should expand the study conceptual model by considering other important firm resources and capabilities, such as learning orientation.
- This study concluded that the business environment is a key contingent factor of the business model performance link. Specifically, it was found that a novel business model effect is stronger in environments with high technological turbulence. However, future research should address the moderating effects of other environmental contingences (i.e. market turbulence and competitive intensity).
- Finally, business model researchers can contribute to the business model literature by examining the link between business model choices and risk. Specifically, researchers should provide answers to questions such as which business mdoel choices allow for reduced risk, and which ones allow for increased revenues, decreased costs, improved reputation? Are some types of business models more prone to generate and appropriate value? How can they ensure the sustainability of novel business model-based advantage? How do competing business models interact and perform?

Appendices

Appendix 1

Subject: **Invitation to participate in the NUBS Business Model Study**

Dear Mr.

This survey is part of a research project at Newcastle University Business School, focused on the structure of transactions with the external partner and its link to value creation and value capture. The survey typically takes about 15 minutes to complete.

You were selected based on a random national sample drawn from **Dun and Bradstreet Database**.

Your input can help us better understand the link between a firm's emphasis on various strategic orientations and value creation and capture.

Benefits to you:

- A summary report detailing key findings of the study.
- Entry into a prize draw to win one of five £50 Amazon vouchers, alternatively, the prize will be donated to a charity of your choice.

Simply click on the link below or copy and paste the entire URL into your browser to access the survey:

Survey link: https://www.surveymonkey.com/s/YWHTTH6

If you have any questions in regard to this study please call us at 07405850796 or email me at r.shahwan@ncl.ac.uk

Thank you very much for your interest and time. I am looking forward to receive your response.

Yours faithfully,

Rani Shahwan
PhD Candidate and Teaching Assistant

Appendix 2

Dear Mr

We recently contacted you on behalf of Newcastle University Business School to request your participation in the business model study. If you have already completed the online- survey, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because it is only by asking people like you to share your experience that we can understand how firms create and appropriate value.

You can give us your thoughts by filling in the online survey by clicking here. The survey should take around 12 minutes to complete.

As a small 'thank you' for your time, you can enter a prize draw to win **one of five £50 Amazon vouchers**.

If you have any questions about the survey, please contact me at r.shahwan@ncl.ac.uk or call 07405850796.

Yours faithfully,
Rani Shahwan
PhD Candidate and Teaching Assistant

Click here to take the survey.

Unsubscribe from our emails

Appendix 3

Business Model Research

Part 1: Company and business unit Information.

The following items ask you to identify your company and the business unit you are most familiar with. Business unit is defined as a freestanding part of a larger organization with its own financial reporting that produces unique products and services from other business units in the same company. Sometimes business units are called divisions.

Name of your company.		**Company year of establishment**	
If applicable, what is the name of your business unit?		**Business unit year of establishment**	
Your position			
Type of your business.	**1. An independent venture** **2. A Business unit of an established firm.**		
Industry.			
Main products.	**1._____2._____3._____**		
Approximately how many people are employed in:	**1. Your organization----------. 2. Your business Unit----------**		
Expenditure on R&D	**_____% of total sales.**		
Business unit operating profit			

in 2012	
Business unit total assets in 2012	
Business unit total equity in 2012	

Part 2: Please choose the degree to which you agree to the following statements with reference to your **business unit's**. Please tick (✓) a number (ranging from 1, "strongly disagree" to 7, "strongly agree") that approximate the actual conditions in your business unit's principal industry.

	1	2	3	4	5	6	7
1. We constantly monitor our level of commitment an orientation to serving customers needs.							
2. Our business strategies are driven by our beliefs about how we can create greater value for our customers.							
3. Our strategy for competitive advantage is based on our understanding of customers needs.							
4. Our business objectives are driven primarily by customer satisfaction.							
5. We measure customer satisfaction systematically and frequently.							
6. We give close attention to after-sales service.							
7. Our salespeople regularly share information within our business concerning competitors' strategies.							
8. We are slow in responding to competitive action that threaten us. ®							
9. Top management regularly discusses competitors' strengths and strategies.							
10. We target customers where we have an opportunity for competitive advantage.							
11. Our top managers from every function regularly visit our current and prospective customers.							
12. We freely communicate information about our successful and unsuccessful customer experiences across all business functions.							
13. All of our business functions (e.g., marketing/sales, manufacturing, R&D, finance/accounting, etc.) are integrated in serving the needs of our target							

markets							
14. All of our managers understand how everyone in our business can contribute to creating customer value.							
15. We share resources with other business units.							
16. Managers basically agree that our business unit's ability to learn is the key to our competitive advantage.							
17. The basic values of this business unit include learning as key to improvement.							
18. The sense around here is that employee learning is an investment, not an expense.							
19. Learning in my organization is seen as a key commodity necessary to guarantee organizational survival.							
20. Our culture is one that does not make employee learning a top priority. ®							
21. The collective wisdom in this enterprise is that once we quit learning, we endanger our future.							
22. There is a well-expressed concept of who we are and where we are going as a business unit.							
23. There is a total agreement on our business unit vision across all levels, functions, and divisions.							
24. All employees are committed to the goals of this business unit.							
25. Employees view themselves as partners in charting the direction of the business unit.							
26. Top leadership believes in sharing its vision for the business unit with the lower levels.							
27. We do not have a well-defined vision for the entire business unit. ®							
28. We are not afraid to reflect critically on the shared assumptions we have about the way we do business.							
29. Managers in this business unit do not want their "view of the world" to be questioned. ®							
30. Our business unit places a high value on open mindedness.							
31. Managers encourage employees to "think outside of the box."							
32. An emphasis on constant innovation is not a part of our corporate culture. ®							
33. Original ideas are highly valued in this organization.							
34. In making strategic decisions, we look into the future to anticipate conditions.							
35. We are willing to sacrifice short-term profitability for long-term goals.							
36. We emphasize investments that will provide us with a future competitive edge.							
37. In making strategic decision, we rarely seek to introduce new brands or new products in the market ®							
38. Whenever there is ambiguity in government regulations, we will more proactively to try to take lead.							

39. In making strategic decisions, we respond to signals of opportunities quickly.							
40. In making strategic decisions, we emphasize planning techniques and information systems.							
41. In analysing situations, we evaluate possible consequences thoroughly and obtain alternatives.							
42. We seek opportunities that have been shown to be promising.							
43. We emphasize the use of cost control systems for monitoring performance.							
44. We constantly modify manufacturing technology to achieve efficiency.							
45. We put emphasis on following government regulations and make important changes that are specifically allowed.							
46. In making strategic decisions, we tend to focus on investments that have low risk and moderate returns, or high risk and high returns.							
47. We search for big opportunities, and favour large, bold decisions despite the uncertainty of their outcomes.							
48. We approve new projects on a "stage-by-stage" basis rather than "blanket" approval.							
49. We use sophisticated technologies in our new product development.							
50. Our new products always use state-of-the-art technology.							
51. Technological innovation based on research results is readily accepted in our organization.							
52. Technological innovation is readily accepted in our program/project management							

Part 3. Please tick (✓) the box that match your views in each of the following statements at your business unit. Please answer each question as accurately as possible. There are no right or wrong answers.*

	SD	**D**	**A**	**SA**
1. The business model offers new combinations of products, services, and information.				
2. The business model brings together new participants.				
3. Incentives offered to participants in transactions are novel.				
4. The business model gives access to an unprecedented variety and number of participants and/or goods.				
5. The business model links participants to transactions in novel ways.				
6. The richness (i.e., quality and depth) of some of the links between participants is novel.				

	0	1 -2	3-4	>4
7. Number of patents that the focal firm has been awarded for aspects of its business model.				

Note: SD-strongly disagree, D-disagree, A-agree, Sa-strongly agree.

	No at all	A bit	Substantially	Radicall y
8. Extent to which the business model relies on trade secrets and/or copyrights.				

9. Does the focal firm claim to be a pioneer with its business model?	Yes	No

	SA	D	A	SD
10. The focal firm has continuously introduced innovations in its business model.				
11. There are competing business models with the potential to leapfrog the firm's business model.				
12. There are other important aspects of the business model that make it novel.				
13. Overall, the company's business model is novel				
14. Inventory costs for participants in the business model are reduced.				
15. Transactions are simple from the user's point of view.				
16. The business model enables a low number of errors in the execution of transactions.				
17. Costs other than those already mentioned for participants in the business model are reduced (e.g., marketing and sales, transaction processing, communication costs).				
18. The business model is scalable (i.e., can handle small as well as large number of transactions).				
19. The business model enables participants to make informed decisions.				
20. Transactions are transparent: flows and use of information, services, goods can be verified.				
21. As part of transactions, information is provided to participants to reduce the asymmetric degree of knowledge among them regarding the quality and nature of the goods being exchanged.				
22. As part of transactions, information is provided to participants about each other.				
23. Access to a large range of products, services and information, and other participants is provided.				

	Yes	No
24. The business model enables demand aggregation.		

	SD	D	A	SA
25. The business model enables fast transactions.				
26. The business model, overall, offers high transaction efficiency.				

*Strongly Agree (coded as 1); Agree (0.75); Disagree (0.25); Strongly Disagree (0); Yes (1), No (0); Radically (1); Substantially (0.66); a bit (0.33), not at all (0); 0 (0), 1–2 (0.33), 3–4 (0.66), >4 (1).

Part 4. Please tick (✓) a number (**ranging from 1, "much worse" to 7, "much better")** that corresponds to your business performance in comparison with your main competitor in the last three years.

	Much worse						**Much better**
	1	2	3	4	5	6	7
1. Sales growth							
2. Profitability							
3. Market share							
4. Overall financial performance							

Part 5. Please tick (✓) a number (**ranging from 1, "strongly disagree" to 7, "strongly agree"**) that match your views in regard to the external business environment.

	SD						**SA**
	1	**2**	**3**	**4**	**5**	**6**	**7**
1. In our kind of business, customers' product preferences change quite a bit over time.							

2. Our customers tend to look for new product all the time.							
3. We are witnessing demand for our products and services from customers who never bought them before.							
4. New customers tend to have product-related needs that are different from those of our existing customers.							
5. We cater to many of the same customers that we used to in the past.							
6. The technology in our industry is changing rapidly.							
7. Technological changes provide big opportunities in our industry.							
8. A large number of new product ideas have been made possible through technological breakthroughs in our industry.							
9. Technological developments in our industry are rather minor. ®							
10. Competition in our industry is cutthroat.							
11. There are many "promotion wars" in our industry.							
12. Anything that one competitor can offer, others can match readily.							
13. Price competition is a hallmark of our industry.							
14. One hears of a new competitive move almost every day.							
15. Our competitors are relatively weak.							

----------The End ----------

Thank you very much!

Appendix 4:

Summary of Feedback of Pilot Questionnaire

	Issues Raised	Actions Taken
Clarification of incentives	Receiving and executive summary of the final report is a fair inducement to encourage the recipient to spend 20 of the availability of the minutes blasting through a battery of research report summary. questions, concluding with some quite sensitive performance scoring. But can they see where this particular exercises heading(i.e . What will the executive summary's' story line be?) and - if all goes to plan - when can they expect it? Will you be prompt back?	The final page of online survey indicates a proposed time of the availability of the research report summary.
Clarification of wording	Some words caused confusion. For example, question 13 of novel business model, 'leapfrog', the respondent asked for more clarification. Another example is "blanket approval" of question 13 od EO scale.	All ambiguous words have been clarified.
	Does 'strongly agree' mean 'yes', and 'strongly disagree' mean 'no'?	More narrative explanation of these scales are included in the instructions
	Demand aggregation appears to be a specialist term.	

Structuring	The structure of the questionnaire: the Company and business unit Information section requires respondents to provide exact number about the firm or the business unit. Therefore it may give the impression that the questionnaire is very heavy or difficult to answer	This section has been removed into the middle of this questionnaire. Also sub-titles have been removed to avoid putting people off.
	*When I tested you survey online, I could see that if previous questions are not answered, the respondents cannot proceed further. This can reduce the response rate. **I will suggest that in your introductory letter, you add a note about the importance for respondent to answer all the questions to ensure the accuracy of the survey	*The force-response was removed from the online survey. ** A note was added in the introductory letter.
	The online survey, it will help if you could also label the scale from 1- 7.	A clear description of the scale labels and their meaning was provided in the online survey.

Appendix 5

Missing Value Analysis

Slected outpout:

Univariate Statistics

	N	Mean	Std. Deviation	Missing Count	Missing Percent	No. of Extremes* Low	No. of Extremes* High
MO1	281	6.13	.893	0	0.0	17	0
MO2	281	6.08	.964	0	0.0	13	0
MO3	280	6.32	.720	1	.4	3	0
MO4	280	5.68	1.038	1	.4	9	0
EO1	281	5.52	1.479	0	0.0	20	0
EO2	279	2.62	1.550	2	.7	0	0
EO4	281	5.36	1.553	0	0.0	0	0
EO5	281	4.90	1.297	0	0.0	2	0
TO1	280	4.83	1.511	1	.4	5	0
TO2	281	4.62	1.476	0	0.0	5	0
TT1	275	4.93	1.492	6	2.1	1	0
TT2	276	5.29	1.407	5	1.8	36	0
BP1	272	4.93	1.129	9	3.2	2	0
BP2	273	4.98	1.126	8	2.8	1	0
BP3	273	4.93	1.048	8	2.8	2	0
BP4	272	5.14	1.115	9	3.2	1	0
Age	279	44.04	39.293	2	.7	0	30
Size	270	819.52	2957.368	11	3.9	0	43
NOM3	279	.4928	.27475	2	.7	0	0

*Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

EM Means*

MO1	MO2	MO3	EO1	EO2	EO3	TO1	TO2	TT1	TT2	BP1	BP2	Age	Size	NBM1
6.13	6.08	6.32	5.96	5.52	5.90	4.84	4.62	5.07	3.08	4.93	4.97	44.05	791.96	.7535

*Little's MCAR test: Chi-Square = 3000.611, DF = 3026, Sig. = .625

Appendix 6

Skewness and Kurtosis Statistics

	MO1	MO2	MO3	MO4	MO5	MO6	MO7	MO8	MO9	MO10	MO11
Valid	281	281	281	281	281	281	281	281	281	281	281
Mean	6.13	6.10	6.25	5.86	5.87	5.94	5.66	2.33	5.51	5.90	5.03
Skewness	-1.133	-.962	-.905	-.971	-.953	-.566	-1.35	.761	-1.29	-1.090	-.885
Std. Error of Skewness	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145
Skewness/Std Error	-7.79	-6.62	-6.22	-6.68	-6.56	-3.89	-9.31	5.24	-8.90	-7.50	-6.09
Kurtosis	1.353	1.467	2.237	2.55	3.453	1.329	2.33	.843	1.662	3.343	-.158
Std. Error of Kurtosis	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290
Kurtosis/Stds Error	4.67	5.06	7.72	8.81	11.92	4.59	8.05	2.91	5.74	11.54	-0.54

	MO12	MO13	MO14	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8
Valid	281	281	281	281	281	281	281	281	281	281	281
Mean	5.37	5.63	5.71	5.98	5.73	5.94	2.26	5.02	5.51	5.10	5.38
Skewness	-1.126	-1.140	-1.165	-1.329	-1.069	-1.322	.347	-.559	-.747	-.716	-1.086
Std. Error of Skewness	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145
Skewness/Std Error	-7.75	-7.84	-8.01	-9.15	-7.35	-9.10	2.38	-3.84	-5.14	-4.92	-7.47
Kurtosis	1.197	1.834	1.264	4.100	.976	2.848	-.633	.010	.410	.415	1.814
Std. Error of Kurtosis	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290
Kurtosis/Stds Error	4.13	6.33	4.36	14.15	3.37	9.83	-2.18	0.03	1.42	1.43	6.26

	EO9	EO10	EO11	EO12	EO13	EO14	EO15	TO1	TO2	TO3	TO4
Valid	281	281	281	281	281	281	281	281	281	281	281
Mean	5.83	5.65	5.35	5.23	5.68	5.52	5.73	4.84	4.63	4.99	5.23
Skewness	-.491	-1.021	-.587	-.642	-1.359	-.837	-1.51	-.578	-.428	-.524	-1.017
Std. Error of Skewness	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145
Skewness/Std Error	-3.38	-7.03	-4.04	-4.42	-9.35	-5.76	-10.4	-3.98	-2.95	-3.60	-6.99
Kurtosis	1.146	1.297	.743	.577	4.097	3.138	5.54	-.438	-.618	-.141	.857
Std. Error of Kurtosis	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290
Kurtosis/Stds Error	3.95	4.48	2.57	1.99	14.14	10.83	19.1	-1.51	-2.13	-0.49	2.96

	NBM1	NBM2	NBM3	NBM4	NBM5	NBM6	NBM8	NBM9	NBM10	NBM11
Valid	281	281	281	281	281	281	281	281	281	281
Mean	3.10	3.12	2.49	2.69	2.59	2.75	2.29	1.57	2.91	2.64
Skewness	-.018	.106	.335	-.016	.151	.223	.191	-.267	-.483	-.031
Std. Error of Skewness	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145
Skewness/Std Error	-.13	.73	2.30	-.11	1.04	1.53	1.32	-1.84	-3.33	-.22

Kurtosis	1.366	.318	-.273	-.217	-.473	-.628	-1.071	-1.943	1.049	-.244
Std. Error of Kurtosis	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290
Kurtosis/Stds Error	4.72	1.10	-0.94	-0.75	-1.63	-2.17	-3.70	-6.71	3.62	-0.84

	NBM12	NBM13	ET6	ET7	ET8	ET9	BP1	BP2	BP3	BP4	Firm Size
Valid	281	281	281	281	281	281	281	281	281	281	281
Mean	2.90	2.75	4.94	5.30	5.06	2.69	4.93	4.97	4.92	5.13	819.06
Skewness	-.073	.129	-.581	-1.028	-.693	1.021	-.225	-.271	-.396	-.442	6.721
Std. Error of Skewness	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145	.145
Skewness/Std Error	-.50	.89	-4.00	-7.07	-4.77	7.02	-1.54	-1.86	-2.73	-3.04	46.24
Kurtosis	-.381	-.484	-.405	.362	-.391	.659	.356	.285	.749	.385	51.91
Std. Error of Kurtosis	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290	.290
Kurtosis/Stds Error	-1.32	-1.67	-1.40	1.25	-1.35	2.27	1.23	0.98	2.59	1.33	179.18

Appendix 7

Observations farthest from the centroid (Mahalanobis distance)

Selected AMOS 21 output:

Observation #	Mahalanobis d-squared	p1	p2
221	115.779	0	0
28	59.791	0	0
82	47.663	0	0
32	36.269	0	0
246	33.987	0	0
234	33.044	0.001	0
4	32.033	0.001	0
247	31.34	0.001	0
101	31.334	0.001	0
137	30.914	0.001	0
239	30.708	0.001	0
77	29.214	0.002	0
233	27.861	0.003	0
235	27.669	0.004	0
87	27.202	0.004	0
157	26.975	0.005	0
105	26.652	0.005	0
258	24.82	0.01	0
211	24.399	0.011	0
195	23.698	0.014	0
208	23.329	0.016	0
69	22.19	0.023	0
243	22.096	0.024	0
13	22.081	0.024	0
7	21.793	0.026	0
41	21.654	0.027	0
9	20.824	0.035	0
217	20.776	0.036	0
144	20.412	0.04	0
83	19.812	0.048	0
162	19.005	0.061	0.001

Appendix 8

Assessment of Normality

AMOS 21 report:

Variable	min	max	skew	c.r.	kurtosis	c.r.
EBM1	0	1	-0.75	-5.135	-0.757	-2.591
EBM2	0	1	-0.604	-4.132	-1.03	-3.524
EBM3	0	1	-0.078	-0.536	-1.994	-6.822
EBM4	0	1	-0.493	-3.371	-1.239	-4.241
EBM5	0	1	-0.284	-1.941	-1.432	-4.899
EBM6	0	1	-0.397	-2.72	-1.309	-4.479
EBM7	0	1	-0.952	-6.514	-0.331	-1.134
EBM8	0	1	-1.157	-7.917	0.469	1.605
EBM9	0	1	-0.857	-5.865	-0.424	-1.452
EBM10	0	1	-0.279	-1.911	-1.508	-5.16
EBM11	0	1	-0.35	-2.392	-1.39	-4.757
EBM12	0	1	-0.432	-2.957	-1.301	-4.451
EBM13	0	1	0.326	2.233	-1.475	-5.046
TT4	1	7	-1.016	-6.95	0.626	2.142
TT3	1	7	-0.689	-4.718	-0.405	-1.385
TT2	2	7	-1.022	-6.996	0.335	1.145
TT1	1	7	-0.578	-3.955	-0.419	-1.434
q43	1	7	-0.44	-3.011	0.357	1.22
q42	1	7	-0.394	-2.698	0.715	2.446
q41	1	7	-0.27	-1.845	0.258	0.884
q40	1	7	-0.223	-1.528	0.328	1.124
EO13	2	7	-1.352	-9.251	4.003	13.698
EO14	2	7	-0.832	-5.695	3.061	10.476
EO15	2	7	-1.51	-10.331	5.424	18.559
EO10	1	7	-1.079	-7.386	1.703	5.828
EO11	1	7	-0.596	-4.078	0.874	2.99
EP12	1	7	-0.812	-5.556	1.801	6.162
EO7	2	7	-0.742	-5.078	0.435	1.49
EO8	1	7	-1.222	-8.365	2.333	7.983
EO9	3	7	-0.623	-4.262	1.653	5.658
EO4	3	7	-0.345	-2.359	-0.643	-2.2

EO5	1	7	-0.826	-5.653	0.554	1.896
EO6	1	7	-0.743	-5.087	0.382	1.307
EO1	2	7	-1.322	-9.049	4.006	13.707
EO2	2	7	-1.063	-7.276	0.938	3.209
EO3	1	7	-1.802	-12.335	4.145	14.182
TO1	1	7	-0.575	-3.934	-0.452	-1.545
TO2	1	7	-0.426	-2.915	-0.628	-2.149
TO3	1	7	-0.521	-3.566	-0.16	-0.547
TO4	1	7	-1.011	-6.919	0.82	2.807
MO11	1	7	-0.88	-6.023	-0.176	-0.603
MO12	1	7	-1.12	-7.664	1.154	3.95
MO13	1	7	-1.133	-7.757	1.781	6.093
MO14	1	7	-1.159	-7.928	1.22	4.175
MO7	1	7	-1.346	-9.213	2.268	7.761
MO8	3	7	-0.649	-4.445	0.534	1.828
MO9	1	7	-1.286	-8.801	1.611	5.513
MO10	2	7	-1.084	-7.418	3.263	11.164
MO1	3	7	-1.127	-7.712	1.307	4.474
MO2	2	7	-0.957	-6.552	1.42	4.857
MO3	3	7	-0.9	-6.158	2.177	7.447
MO4	2	7	-0.966	-6.609	2.486	8.505
MO5	1	7	-0.948	-6.488	3.371	11.534
MO6	2	7	-0.563	-3.852	1.284	4.394
NBM13	0	1	-0.336	-2.299	-1.354	-4.634
NBM12	0	1	-0.661	-4.521	-0.811	-2.777
NBM11	0	1	-0.29	-1.987	-1.481	-5.068
NBM10	0	1	-1.118	-7.653	0.432	1.48
NBM9	0	1	0.266	1.818	-1.929	-6.602
NBM6	0	1	-0.261	-1.786	-1.438	-4.92
NBM5	0	1	-0.119	-0.815	-1.643	-5.624
NBM4	0	1	-0.343	-2.35	-1.35	-4.618
NBM3	0	1	0.184	1.258	-1.587	-5.431
NBM2	0.25	1	-1.31	-8.965	2.333	7.982
NBM1	0	1	-1.475	-10.093	3.327	11.385
Multivariate					401.63	36.07

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