BUSINESS MODEL COHERENCE PREMIUM:
WHAT IS IT AND DOES IT EXIST IN THE CONSUMER GOODS INDUSTRY?

A Thesis Submitted in Partial Fulfilment for the Degree of
Doctor of Business Administration

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by

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DECLARATION

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

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When I started out on my doctoral research journey in June 2009, I wanted to understand the "Freemium" business model and the economics of selling free services for Web 2.0 firms. I quickly realised that the discussion of Freemium business models was much broader and was more about a shift in business model design and economics. My research focus then shifted to Business Model Innovation and trying to understand different types of Business Model Innovation. My objective was to create a taxonomy of business model innovation based on Henderson and Clark's Henderson and Clark (1990) innovation framework. However, I found it difficult to complete the analysis, as the business model design ("*Change in Core Concepts*" in the Henderson and Clark framework) was poorly defined, and there was no specific research on this topic. Therefore, in 2015 I decided to pivot my research and focus on defining dominant business model types and understand their correlation to firm performance.

During the past eight years, I have learned that doctoral work is a somewhat lonesome journey. However, I have been fortunate to have people around me who have been incredibly supportive. Each one of them has made a difference by their encouragement and professional feedback, by listening to me, and by being there and accepting that I had to spend weekends and nights on a study they did not appreciate the importance of.

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San Francisco, December 2017

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ABSTRACT

The study of *business models* is an important topic for strategic management research because business models affect firms' possibility for value creation and value capture (Amit and Zott, 2001).

The thesis provides additional evidence to the theory of business models, and the understanding of whether some business model types deliver higher firm performance than others, and whether a higher adherence to a certain business model type delivers above-industry firm performance (the "business model coherence premium").

There is little prior theorising on business models on which to draw in the study of business model coherence. For that reason, a new measurement scale is proposed that allow for better investigating of the business model coherence and the constructs for each company. To calculate the adherence to a certain business model type, the measurement scale sums up the dominant business model score, less the sum of the other business model scores plus 1.

Using a sample of 97 large Consumer Goods companies, a triangulation research method was deployed to determine the business model coherence. For each company, a business model profile was completed and compared to the findings from an external survey with 77 executives.

Based on the findings from the research, the thesis identifies four dominant business model types in the Consumer Goods industry: (i) *Network Model,* (ii) *Solutions Model*, (iii) *Product Model* and (iv) *Operational Model*, hereby adding to the Configuration theory and to Miles and Show's theory of strategy, structure and process (1978), and to existing empirical evidence around business model types (see: Zott and Amit (2008), Libert et al. (2014)).

By deploying a multiple correlation analysis, the thesis empirically demonstrates that the construct of business model coherence is positively associated with firm performance (adjusted $R^2 = 0.204$), thereby adding a new dimension to the theory of business model, by introducing the *notion of business model coherence premium*.

This research found that the business model type was not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry.

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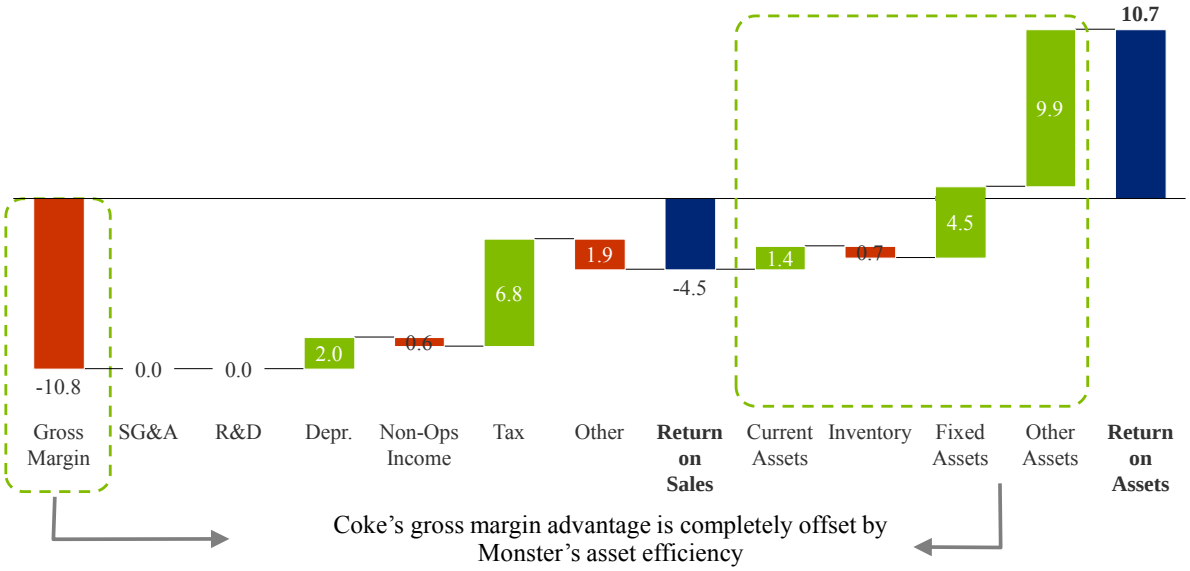
CHAPTER 1 INTRODUCTION

1.1. INTRODUCTION TO THE CONCEPT OF BUSINESS MODEL

Consider the case of Monster Beverage Corporation, one of the fastest growing soft drinks companies (15.9 per cent compound annual growth rate between 2009-2013), with a higher than industry average Return on Assets (10.7 per cent vs. 7.3 per cent for the industry). Monster Beverage's origin can be traced back to 1930s, when Hubert Hansen and his three sons started a business to sell fresh non-pasteurized juices to film studios and retailers in Los Angeles, California. In the 1970's, one of the Hansen's sons introduced natural soda to the business, and the drinks had pretty cans with pictures of fruit on them. Business was profitable but modest by 1992 when Monster Beverage's current CEO Rodney Sacks bought the company for $14.5 million. Then in 2002, Hansen's launched a new carbonated energy drink under the *Monster* brand name. From an early stage, Mr. Sacks decided to outsource all production of Monster drinks to third-party manufacturers, on short duration agreements, and to get third-party full-service distributors to handle the sales and distribution. That left Monster Beverage to focus on innovation and marketing. Its strong focus on brand and product model enabled it to grow revenues from $92 million in 2002 to $2.4 billion in 2014, and it is now the second largest energy drinks company in the world. In 2014, Forbes Magazine ranked Monster Beverage as the 7th most innovative company in the world; The Coca-Cola Company ranked number 93. Trademarks are amongst the most valuable assets of Monster Beverage, and it has more than 5,200 registered trademarks and pending applications. More than two-third of the company's employees work in Sales and Marketing, and it spends almost 10 per cent of annual revenues on marketing communication. Monster Beverage's focused business model allowed it to outperform The Coca-Cola Company in the last ten years through higher assets turnover. Coca-Cola's gross margin advantage was completely off-set by Monster Beverage's high asset efficiency, achieved through its outsourced business model.

Figure 1: Monster Beverage vs. The Coca-Cola Company Return on Assets Analysis



Source: Company Annual Reports, 10-K's, 2003-2014 data

Monster Beverage is an example of what companies can achieve by creating a business model with high coherence to a specific business model type, in this case, *Product Model.*

1.2. THE PROBLEM AT THE CORE OF THE RESEARCH

Due to today's intense competition in increasingly global markets, companies in all industries worldwide find themselves competing under ever-changing conditions (Taran and Boer, 2015). Those changes force companies to rethink their business models more frequently and fundamentally. Across many industries, companies are using innovative business models as a basis for competitive advantage. In recent years, a number of start-ups such as Uber Technologies Inc. and Airbnb Inc. have used multi-sided business models to leverage ordinary resources against established competitors that rely on unique resources (Frery et al., 2015).

A firm's business model is an important locus of innovation and a source of value creation (Amit and Zott, 2001). For example, a survey of more than 4,000 senior managers by the Economist Intelligence Unit (2005) reported that 54 per cent of executives believe that *business model innovation* will become even more important for success than product or service innovation. The analysts concluded that "*the message is clear: how companies do business will often be as, or more, important that what they do*".

A survey of 750 corporate and public sector leaders echoed these results with nearly all leaders polled reporting the need to adapt their business models; more than two-thirds said that extensive changes were required (Giesen et al., 2009). The survey also found that companies whose operating margins had grown faster than their competitors' over the previous five years were twice as likely to emphasise business model innovation, as opposed to product or process innovation.

Strategic management scholars have investigated the definition of the business model (see: (Zott et al., 2010), (Massa et al., 2017)). Despite the overall surge in the literature on business models, **strategic management scholars do not agree on what a business model is**. As suggested by Peteraf (2011), if business models are configurations that suggest room to develop useful taxonomies, and therefore it is important to understand different business model types. Again the academic literature is incomplete. The research stream which, to date, has devoted the greatest attention to business model design is *e-Business*. However, researchers such as Hagel and Singer (1999), Amit and Zott (2001) and (Libert et al., 2014) have defined different business model types that can be applied to companies outside of e-Business.

Zott and Amit (2008) found through empirical research that **the business model can both enhance the firm's performance**, independently as well as jointly with the product market strategy. Their study points to the need to investigate competition among various business models within an industry (Markides and Charitou, 2004). **Such rivalry on a business model level may have implications both for the wealth creation potential of a given business model and for value capture by the focal firm (Zott and Amit, 2008).**

Michael Porter (1985) has noted that strategic diversification is about combining activities that efficiently relate to and mutually reinforce one another, forming a system of activities, as opposed to a collection of isolated activities. The fit within the activities of a business model can reduce costs or enhance differentiation. Indeed, diversified configurations of business models may offer unique opportunities for increased performance. However, academic studies (see: Hamel and Prahalad (1996), Teece (2009), Casadesus-Masanell and Tarzijan (2012)) have found that **firms that operate multiple business models may experience major difficulties** in leveraging their strategic resource base and experience higher coordination and control costs. This is because the underlying configuration of key resources and capabilities that support one particular business model are generally fundamentally different from the resource configuration and capabilities required to operate another. Thus operating multiple business

models can lead to inconsistencies in the information and expertise required to operate the models. Such inconsistencies, in turn, may increase the risk of inappropriate inference and mismanagement. Markides (2008) argues that:

> *The evidence shows that most established companies that attempt to employ duel business models fail to do so successfully – exactly because the presence of conflicts means that by trying to pursue business model B, a company harms its business model A. (p.81)*

However, Markides (2013) proposes that the challenges of managing two different and conflicting business models simultaneously can be framed as an ambidexterity challenge.

1.3. KNOWLEDGE GAP ADDRESSED THROUGH THE RESEARCH

The 15 academic studies examined as part of this research have explicitly or implicitly distinguished between types of business models by providing examples of pioneering business models in either traditional or Internet-related industries (see: Baden-Fuller and Morgan (2010), Teece (2009)). In traditional industries such as the airline, retail and hotel industries, 'discount' or 'no-frills' business models have been regarded as belonging to a business model type, as they are "well documented and regularly referred to as a coherent set of choices that offer the potential for superior performance" Demil and Lecocq (2010). Moreover, with the emergence of Internet-related industries, one of the most widely discussed business model types has been referred to as the 'e-business' model (Timmers, 1998), describing how businesses sell products and services directly to customers using the Internet, instead of physical retail stores. These studies have argued that with the emergence of discount, electronic, and sponsor-based business models in many industries, the question of which business model to focus on represents a significant challenge to an increasing number of firms. This question is important given that business models identify how firms create, deliver and capture value and therefore are directly linked to firm performance. Unfortunately, the literature on business models has not sufficiently explored *which* business models could create the most value and *how*.

The literature review highlighted some issues and gaps in the academic literature around business models:

(i) Despite various attempts by different strategic management scholars to define business model types, no single classification dominates the literature. In addition, most of the proposed taxonomies are based on e-Business models established between 1998 and 2001 and do not take into account the latest developments around networks and ecosystems;

(ii) There is limited empirical research into the relationship between business model types and firm performance within an industry; and

(iii) There is a lack of supporting evidence for whether companies can achieve superior returns by adhering to one business model type, or whether organisations can successfully manage two different and conflicting business models simultaneously (the 'Ambidexterity Challenge').

It was the purpose of this research to provide additional evidence to the theory of business models and understand if some business model types deliver higher firm performance than others do, and whether a higher adherence to a certain business model type (business model coherence) delivers above-industry firm performance. The focus of the research was on the organisation as the *unit of observation* (where data was collected) and business model as the *unit of analysis* (where conclusions were made) because it directly reflects how a business operates, and thereby captures the specific resources and processes needed to create, deliver and capture value (see: Demil and Lecocq (2010), Johnson et al. (2008), Zott and Amit (2008), Teece (2009)).

1.4. RESEARCH QUESTIONS

1.4.1. Core Research Question and Sub-Questions

Applying the business model concept, previous research has improved the understanding of issues that have traditionally been of major interest in the strategy literature, such as competition, organisational design, and innovation. This research sought to provide clarity on an important issue facing managers today: *how to configure the business model to deliver superior performance*. The research contributed to the literature in three ways. Firstly, by confirming the dominant business model types in the Consumer Goods industry, hereby adding to the Configuration theory and to Miles and Show's theory of strategy, structure and

process (1978), and to existing empirical evidence around business model types (see: Weill et al. (2005), Zott and Amit (2008), Bornemann (2009), Libert et al. (2014), Kulins et al. (2015)). Secondly, by developing the construct of *business model coherence*, providing a theretofore unexplored perspective on the business model, and empirically testing whether the construct of business model coherence is positively associated with firm performance. Finally, by testing whether it is possible to deliver above-industry firm performance with any business model type.

The following research questions were addressed:

(i) ***Within the Consumer Goods industry (SIC code 2011 to 2099), what are the dominant business model types?***

Based on the answer to the first research question, the second research question examined the relationship between business model coherence and firm performance:

(ii) ***Do Consumer Goods companies with higher adherence to a certain business type deliver above-industry firm performance?***

Finally, the third research question was focused on whether certain business model types perform better than others:

(iii) ***In the Consumer Goods industry, is it possible to deliver above-industry firm performance with any business model type?***

1.4.2. Scope and Limitations

As stated above, the research is focused on understanding if some business model types deliver higher firm performance than others, and whether a higher adherence to a certain business model type (business model coherence) delivers above-industry firm performance.

The Consumer Goods industry was selected as the relevant industry, as this researcher has more than 20 years of experience in the industry, having previously worked for Kraft Foods and Pepsico, and consulted to leading Consumer Goods companies. According to Euromonitor, the global retail value of the Consumer Goods industry was USD 5.9 trillion in 2013 (Euromonitor), making it one of the largest industries in the world. However, the Consumer Goods industry has experienced declining Asset Profitability over the past 40 years, and Return on Assets (ROA) of US firms fell from its high of 9 per cent in 1966 to around 7 per cent in

2013. Therefore, this industry makes for an interesting study given the long stable history but the challenging future environment.

The research was focused on the business model as the *unit of analysis* and does not examine how different capabilities are prioritised or configured, as part of the business model. This may be an interesting study in its own right and is therefore not covered as part of this research.

CHAPTER 2 LITERATURE REVIEW

This chapter presents the literature review and the theoretical and conceptual basis for the research. This literature review has four main objectives: (i) to review the contingency theory, and define what a business model is and its core elements, based on existing academic literature; (ii) to explore the relationship between business model and strategy, and between business model and firm performance within the context of the *Strategy – Structure – Performance paradigm*; (iii) to describe existing business model types or *gestalts*, and configurational design themes that can serve as a starting point for the business model classification; and (iv) to review the discussion around business model coherence, relatedness and ambidexterity.

The chapter is divided into six main sections:

1. The first part examines configuration theory as part of contingency theory and presents the academic research into the definition of a business model as an organisation configuration.
2. The second section reviews the treatment of the concept of a business model within the mainstream of strategic management literature and focuses specifically on the core elements of a business model to define a theoretical business model framework.
3. The third part considers the relationship between *business model* and *strategy* within the context of the Strategy – Structure – Performance paradigm to understand the difference and linking elements between the two concepts.
4. The fourth section evaluates the different types of a business model or gestalts, and configurational design themes, and concludes with the *four dominant business model types* based on the existing strategic management literature.
5. The fifth part studies how performance has been defined in the current strategic management literature regarding business model effectiveness within the context of the Strategy – Structure – Performance.
6. The final section reviews the current discussion in the strategic management literature around business model coherence and relatedness, and whether organisations can successfully manage two different and conflicting business models simultaneously (the 'Ambidexterity Challenge').

2.1. CONFIGURATION THEORY

In this research, a firm's business model is proposed as a new contingency factor within the Strategy – Structure – Performance (SSP) paradigm, as it can be seen as new structural templates or *gestalts* that interact with strategy variables to determine firm performance.

Organisation theory provides models and systematic approaches to understanding the organisation. An important part of organisation theory is the classification of organisation (McKelvey and Aldrich, 1983). This part aims at providing an overview of *configuration theory* as part of *structural contingency theory* as the underpinning theory for the SSP paradigm.

2.1.1 Structural Contingency Theory

The contingency theory of organisational structure provides a major framework for the study of organisational design (Donaldson, 2006). Contingency theory states that there is no single organisational structure that is highly effective for all organisations (Donaldson, 2006). It sees the structure that is optimal as varying according to certain factors. Thus the optimal structure is contingent upon these factors (Donaldson, 1996). Contingency theory suggests that individual organisations need to adapt to their internal and external environments to survive and thrive (Donaldson, 2006). For better performance in a given environment, the management will select certain strategies and the appropriate organisational structure that helps to implement these strategies (Mintzberg, 1979). Burns and Stalker (1961) were among the first strategic management scholars to consider contingency theory as a way to distinguish between incremental and radical innovation, and between *organic* and *mechanistic* organisations. A mechanistic organisation was described as formal, centralised, specialised and bureaucratic. An organic organisation, in contrast, was characterised as being informal, decentralised and having just a few authority levels. Another important early contribution was made by Chandler (1962), who considered the contingency relationship between a firm's corporate strategy and its internal administrative structure (specifically, divisional versus functional form). Chandler's model proposes that different growth strategies are driven by the accumulation and deployment of internal resources and are matched by different internal structural arrangements such as the functional and multi-divisional organisational structures (Chandler, 1962). Others such as Rumelt (1974) proposed contingency models containing different strategies to explain and predict the utilisation of company structures under different circumstances.

Contingency theory suggests that there is no optimal strategy for all organisations and posits that the most desirable choice of strategy variables alters according to certain contingency factors (Donaldson, 1996). Therefore, strategic management scholars have examined a wide range of contingency factors, such as aspects of the environment (Venkatraman and Prescott, 1990), organisation structure (Miller, 1988), technology (Dowling and McGee, 1994) and marketing choices (Claycomb et al., 2000).

Classical contingency theory asserts that different external conditions might require different organisational characteristics and that the effectiveness of the organisation is contingent upon the *goodness of fit between structural* and *environmental* variables (Donaldson, 1996).

2.1.2 Configuration Theory

A variation of contingency theory is configuration theory, which states that the fit between contingency and structural (and other organisational) variables is limited to just a few configurations, or *gestalts* (Donaldson, 2006). Where contingency theorists implicitly treat organisations as loosely coupled aggregates whose separate components may be adjusted or fine-tuned incrementally, configuration researchers embrace the open system theory and try to understand how *order emerges from the interaction of the parts of an organisation as a whole* (Meyer et al., 1993). **Therefore, configuration theory describes a firm's search for dominant gestalts that may lead to superior performance** ((Ketchen et al., 1993), (Miller, 1996)). A gestalt denotes constellations of elements inside or outside the organisation that come together within a *unifying theme* (Ketchen et al., 1993). Firm performance reflects the degree of consistency or fit among the internal and external variables in a gestalt (Venkatraman, 1989), such that higher fit improves performance and reveals ideal configurations that yield superior performance. Because there is more than one way to succeed, various gestalts can lead to strong performance (Venkatraman, 1989), in a phenomenon called *equifinality* (Meyer et al., 1993).

Two examples of configuration theory that have enjoyed widespread popularity are Mintzberg's (1979) theory of organisational structure and Miles and Snow's (1978) theory of strategy, structure, and process.

Mintzberg's (1979) theory of organisational structure

Mintzberg presented his configuration theory in three parts: (i) a set of *design factors* that can be used to characterise an organisation's structure; (ii) a set of *contingency factors* that can be used to characterise an organisation's context; and (iii) five *ideal types of organisation*

described in terms of the design and contingency factors. An organisation that approximates one of these ideal types is hypothesised to be more effective than other organisations, especially when its context fits the ideal type (Doty et al., 1993). Mintzberg postulates that to be maximally effective, organisations must have gestalts that are internally consistent (design factors) and fit multiple contextual dimensions (contingency factors).

(i) Design factors

In his work, Mintzberg describes the primary design factors such as the key coordinating mechanism, the key part of the organisation and the type and degree of centralisation. He also considers a number of secondary bureaucratic characteristics such as formalisation, specialisation, and hierarchy.

(ii) Contingency factors

Multiple contingency factors define the contextual configurations in Mintzberg's theory, including an organisation's age, size, attributes of its environment and technology.

(iii) Ideal types of organisation

Mintzberg identifies five ideal types of organisation based on the preceding design and contingency factors: *Simple Structure*, *Machine Bureaucracy*, *Professional Bureaucracy*, *Divisionalized* form and "*Adhocracy*."

The primary hypothesis associated with Mintzberg's theory concerns the logical relationship between the design and contextual configurations associated with each ideal type of organisation. However, empirical tests suggest that this hypothesis requires revision, as the classification of organisations by their designs and context on the basis of Mintzberg's theory was not useful for making predictions about the relative organisational effectiveness (Doty et al., 1993).

Miles and Snow's (1978) theory of strategy, structure, and process

In comparison to Mintzberg, Miles and Snow propose alternative ways that companies define their product/market domains and construct mechanisms (i.e., organisational structures and processes) to pursue those domains. Four ideal types of organisation: the *Prospector*, the *Analyzer*, the *Defender* and the *Reactor* were identified based on a unique configuration of

three viable factors: (i) the *domain*, related to how a company orients itself in the market, (ii) the *technical*, referring to the technology and processes used to produce products/services, and (iii) the *alignment/innovation*, embracing how a company attempts to coordinate and implement its strategies. Miles and Snow posited that at least three of these ideal types – the *Prospector*, *Analyzer*, and *Defender* – were effective forms of organisation. Numerous empirical research has been conducted to test the validity of Miles and Snow's theory (Doty et al., 1993). On balance, the empirical work has provided moderate support for their theory. Firms that resemble the *Prospector*, *Defender* or *Analyzer* type appear to be more effective than firms resembling the *Reactor* type (Doty et al., 1993).

As can be seen from the above discussion, the two configuration theories differ in several aspects and ideal types of organisation. However, their logical structures are similar, and both theories contain the argument that the way in which organisational attributes (both design and contingency factors) are configured determines effectiveness.

2.1.3 The Strategy – Structure – Performance Paradigm

The SSP paradigm highlights the significance of contingency factors complementary to strategy, such as organisational structure, to firm performance. Chandler's (1962) theoretical contingency model particularly implies that the match between strategy and structure results in better performance. In Miles and Snow's theory (1978) each strategic type used a different structure. Organisations with *Defender* strategies adopt functional structures; *Prospectors* used divisional structures, and *Analyzers* used matrix structures. The SSP paradigm has become "*arguably the most important sub-stream of research on structural contingency theory*" (Galunic and Eisenhardt, 1994) (p.216). Rather than seeing each strategy or structure alone as having an important impact on performance, the paradigm holds that it is the *linkage between them* that is important (Miller, 1996) (p.510). Firm performance reflects the degree of linkage or fit such that higher fit improves performance (Venkatraman, 1989). Chandler (1962) posits that a *linear relationship* exists such that firms that alter their strategy and structures to create fit achieve superior performance.

How do firms improve strategy/structure fit?

Critique of contingency theory in the context of organisational configuration is that it is static and fails to deal with environmental change and adaptation (Galunic and Eisenhardt, 1994). However, as Andrews (1971) points out, managers cope with changes in their firm's

external environment through the choice of an appropriate strategy and the design of a matching structure. *Adaptation* is a general term that describes a period of gradual, long-continued, and incremental change in response to environmental conditions (Tushman and Romanelli, 1985). Miller and Friesen (1982) show that organisations that radically and quickly altered their formal structures, decision-making routines, and information-processing devices performed better over their lives than firms that changed gradually or incrementally. *Punctuated equilibrium theory* depicts organisations as evolving through relatively long periods of stability (equilibrium periods) in their basic patterns of activity that are punctuated by relatively short bursts of fundamental change (revolutionary periods) (Tushman and Romanelli, 1985). Revolutionary periods substantively disrupt established activity patterns and install the basis for new equilibrium periods.

In this research, the business model was addressed from the perspective of *Configuration theory* and aims at extending the *Strategy – Structure – Performance paradigm* (Galunic and Eisenhardt, 1994) by introducing the firm's business model as a new contingency factor and a structural configuration.

2.2. THE BUSINESS MODEL AS A STRUCTURAL CONFIGURATION

Although defining what constitutes a business model has been the subject of numerous conceptualisations and several empirical studies (see: Mahadevan (2000), Amit and Zott (2001), Chesbrough and Rosenbloom (2002), Morris et al. (2005), Zott et al. (2010), Massa et al. (2017)), no generally accepted method of describing a business model has yet been formulated (Wirtz et al., 2016), despite a business model has the potential to help managers distil complexity and navigate in an uncertain environment (Peteraf, 2011). Understanding the nature of business models is also critical in management research, affecting the possibilities of value creation and appropriation in an organisation (Amit and Zott, 2010). Morris et al. (2005) argue that the business model holds promise as a unifying unit of analysis that can facilitate theory development in strategy and entrepreneurship.

Two dominant theories of what constitutes a business model have emerged from the literature:

i. Business model as an axiomatically grounded approach or *economic logic* by which an enterprise creates value and captures (some of that) value.

ii. Business model as an *organisation configuration or structural template* of what the company offers, to whom, how it delivers on that objective and how it profits from it.

Examination of all 3-star rated scholarly management journals published between 1998 and 2017 reveals a number of studies relevant to the notion of the *business model*. As illustrated in **Table 1**, strategic management scholars define the business model in different ways.

Table 1: Definitions of a Business Model

Authors	Definition	Research Context	Domain
Mahadevan (2000)	A unique blend of three streams each of which is critical to the business. These include the value stream for the business partners and the buyers, the revenue stream and the logistical stream.	e-Business	Structural configuration
Stewart and Qin (2000)	A statement of how a firm will make money and sustain its profit stream over time.	Strategy	Economic logic model
Amit and Zott (2001)	A structural template that describes the organization of a focal firm's activities with all of its external constituents in factor and product markets.	e-Business	Structural configuration
Chesbrough, Rosenbloom (2002)	A coherent framework that takes technological characteristics and potentials as inputs, and converts them through customers and markets into economic outputs.	Technology	Structural configuration
Morris et al. (2005)	A concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create a	Strategy	Structural configuration

	sustainable competitive advantage in a defined market.		
Johnson et al. (2008)	Four interlocking elements (customer value proposition; profit formula; key resources; and key processes) that, taken together, create and deliver value.	Strategy	Structural configuration
Amit and Zott (2010)	A model that depicts the content, structure, and governance of activities designed so as to create value through the exploitation of business opportunities	Strategy	Structural configuration
Teece (2010)	How the enterprise creates and delivers value to customers, and then converts payments received to profit.	Strategy	Economic logic model
Wirtz et al. (2010)	A simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated using a company's value-added component.	Strategy	Economic logic model
Casadesus-Masanell and Ricart (2010)	The 'logic of the firm' and how it operates and creates value for its stakeholders.	Strategy	Economic logic model
George and Bock (2011)	The design of organizational structures to enact a commercial opportunity.	Strategy	Structural configuration
Zott, Amit and Massa (2011)	A set of activities, as well as the resources and capabilities to perform them – either within the firm or beyond it through cooperation with partners, suppliers or customers. It depicts the content, structure, and governance of	Strategy	Structural configuration

	transactions designed so as to create value through the exploitation of business opportunities.		
Lambert and Davidson (2013)	The business model as the basis for enterprise classification	Strategy	Structural configuration
Wirtz et al. (2016)	A business model reflects the operational and output system of a company, and as such captures the way the firm functions and creates value	Strategy	Structural configuration
Massa, Tucci and Afuah (2017)	A description of an organisation and how that organisation functions in achieving its goals (e.g., profitability, growth, social impact)	Strategy	Structural configuration

None of these business model definitions appears to have been unanimously accepted by the academic community, and this may be because various authors have approached the subject from different perspectives (i.e., strategy, e-business, technology), with the viewpoint of each author driving term definition. **Out of the 15 definitions presented in 3-star rated scholarly management journals, 11 are anchored in the business model as a structural configuration, and four are using an economic logic model**.

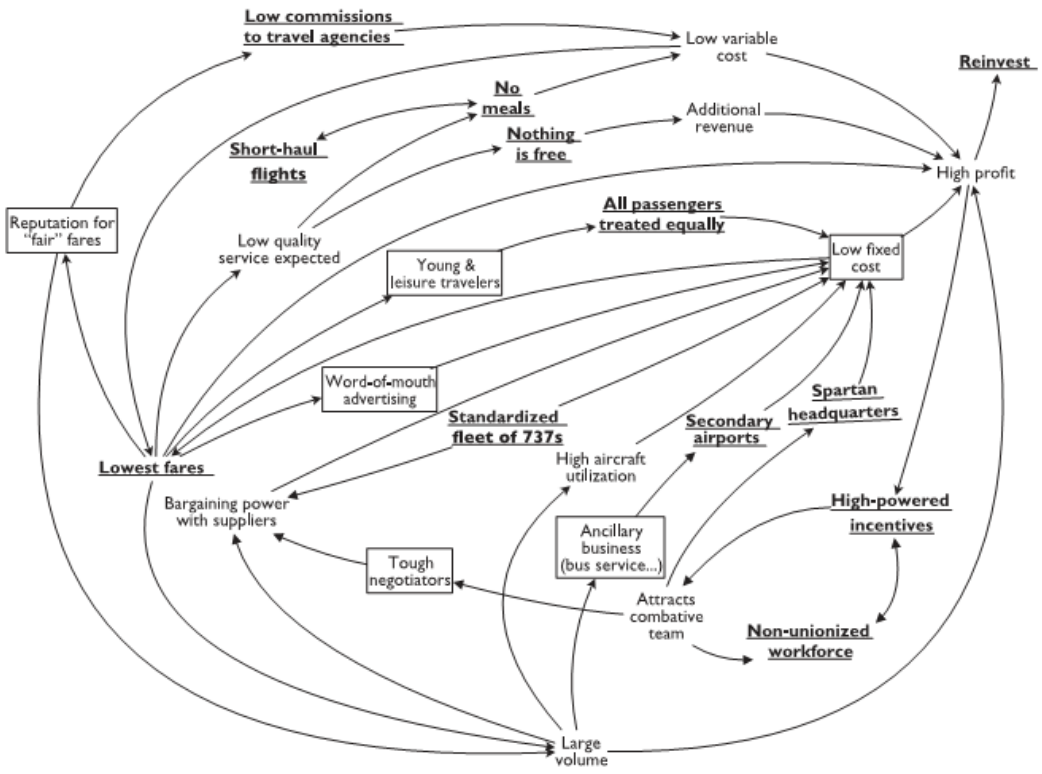
2.2.1 Business Model as the Economic Logic of a Firm

A business model as the *logic of the firm* can be used to explain the causal link between different business model elements and choices (Casadesus-Masanell and Ricart, 2010). For example, Casadesus-Mansanell and Ricart (2010) define a business model as:

'The logic of the firm, the way it operates and how it creates value for its stakeholders.'

They argue that a business model is a reflection of a firm's realised strategy. In their 2010 paper (Casadesus-Masanell and Ricart, 2010), they use a causal loop diagram, based on causality theories, to represent the business model of Ryanair (see **Figure 2**):

Figure 2: Ryanair business model representation (Casadesus-Masanell and Ricart, 2010)



Teece (2010) uses a similar definition and describes a business model as a conceptual, rather than a financial, model of the business that is used to articulate the logic and provide data and other evidence that demonstrates how a business creates and delivers value to customers.

2.2.2 Business Model as Structural Configuration

An alternative view is to define a business model as a *structural template or configuration*. Johnson et al. (2008), for example, define a business model as:

'Four interlocking elements (customer value proposition, profit formula, key resources, and key processes) that, taken together, create and deliver value.'

Amit and Zott (2001) state that a business model elucidates how an enterprise works with those external stakeholders with whom it engages in economic exchanges to create value for all involved parties. Hence, they view the business model as a unit of analysis that centres on a focal firm but that also extends its boundaries. Miller (1996) states that

"Configuration ... can be defined as the degree to which an organisation's elements are orchestrated and connected by a single theme" (p. 509).

2.2.3 Core Elements of a Business Model

At higher levels of abstraction are situated so-called meta-models of business models, which are representations of the business model obtained by enumerating and clarifying its essential components (Massa et al., 2017). However, there is little agreement on which activities are important in business models and therefore should be performed, who performs the activities, how they are performed, when they are performed, where (at what level), and what resources are needed to perform them (Massa et al., 2017). To determine the constituent elements of business model configuration and to bring order to the various perspectives of a business model, the existing business model definitions were compared and contrasted. The objective was to gain a better understanding of (i) what business model core elements are relevant and (ii) the definition of the business model elements.

To understand the different business model elements, a multi-step approach was followed. First, all ranked 3-star or higher scholarly management journals, as defined by the Association of Business Schools' (ABS) Academic Journal Quality Guide (Version 4), were scrutinised for terms containing "business model" in the title, keywords and abstracts. ProQuest was used as the main reference database due to its comprehensive coverage of academic journals and flexibility around search terms (Zott et al., 2010). As a result of this process, 753 articles were identified. After filtering for ABS 3-star or higher scholarly management journals, the total number of papers was reduced to 135. Examination of the paper titles, abstracts and introductions revealed 15 papers that dealt with the concept of the business model as the main topic. Many of the 135 papers were either cases studies or studies in which the business model was not the main subject of the analysis and were therefore excluded from the analysis. The final sample of 15 works is presented in

Table 2.

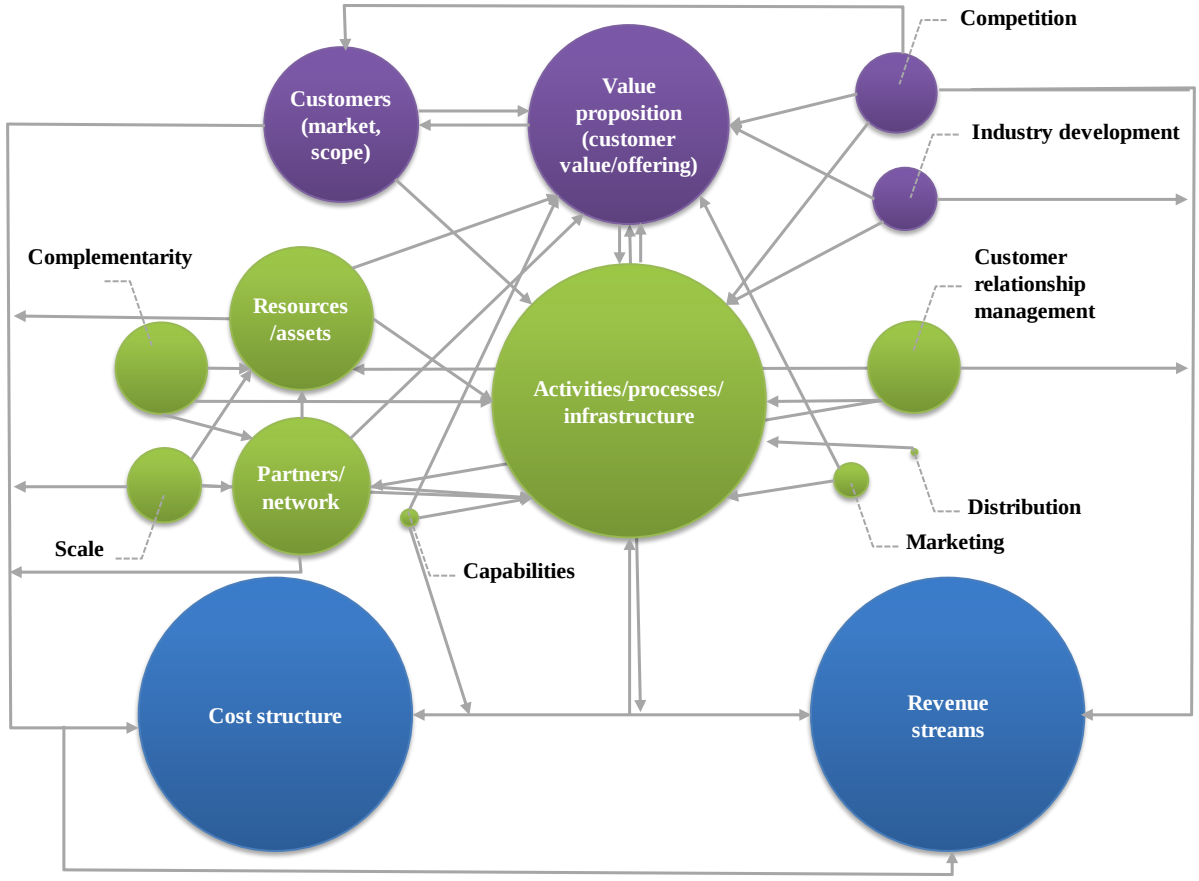
Table 2: Overview of selected business model papers ranked by publication year

Author (Year)	**Publication**
Mahadevan (2000)	California Management Review
Stewart and Qin (2000)	Journal of Public Policy & Marketing
Amit and Zott (2001)	Strategic Management Journal
Chesbrough, Rosenbloom (2002)	Industrial & Corporate Change
Morris et al. (2005)	Journal of Business Research
Johnson et al. (2008)	Harvard Business Review
Teece (2009)	Long Range Planning
Amit and Zott (2010)	Long Range Planning
Wirtz et al. (2010)	Long Range Planning
Casadesus-Masanell and Ricart (2010)	Long Range Planning
George and Bock (2011)	Entrepreneurship: Theory & Practice
Zott, Amit and Massa (2011)	Journal of Management
Lambert and Davidson (2013)	European Management Journal
Wirtz et al. (2016)	Long Range Planning
Massa, Tucci and Afuah (2017)	Academy of Management

Business model framework (primary design factors)

The analysis of the 15 reference papers describing business model components identified a number of different elements that are interrelated (see **Figure 3** for an overview):

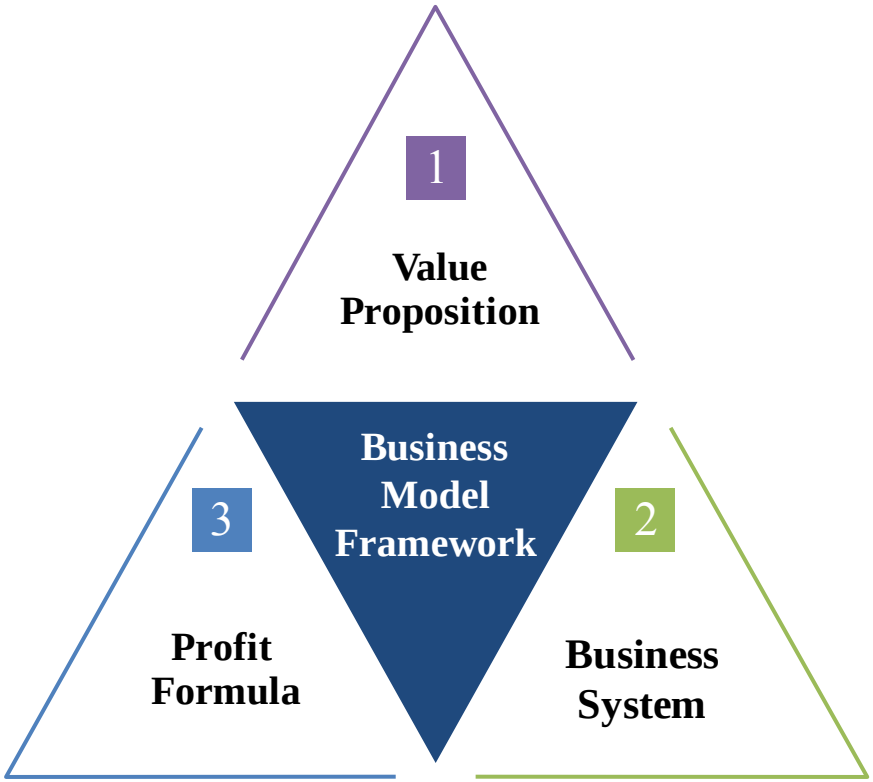
Figure 3: Business model framework



As illustrated in **Figure 3**, there are four dominant business model elements with a high degree of linking elements. A number of elements related to strategy (such as *customers*, *competition* and *industry development*) appear to be clustered around the central notion of the *value proposition* by cross-referencing. Other elements such as *resources*, *partner network*, *scale,* and *complementarity* appear to cluster around the central element related to *infrastructure,* whereas *revenue architecture* and *cost structure* interlink with the main elements of the business model as part of a *profit formula*, as per the definition by Johnson et al. (2008).

Therefore, the main business model elements can be classified into a first-order classification schema, consisting of three main design factors: (i) *value proposition*; (ii) *business system*; and (iii) *profit formula*. See **Figure 4** for a schematic overview of the first-order classification schema and the classification of the main business model elements.

Figure 4: Business model classification schema



1 Value Proposition

- Customers (markets, scope)
- Competition
- Industry development

2 Business system

- Activities, processes and structure
- Resources and assets
- Partners and network
- Complementarity
- Customer relationship management
- Scale
- Marketing
- Distribution

3 Profit Formula

- Revenue streams
- Cost structures

(i) Value proposition (define value)

Teece (2009) describes how a good business model yields *value propositions* that are compelling to customers. It will provide considerable value to the customer and collect a viable portion of this in revenues. Johnson et al. (2008) support that description and expand it with a successful company is one that has found a way to create value for customers and a way to help customers get an important "job" done. Chesbrough and Rosenblom (2002) also cover the value proposition in their description of a business model, including the focus on a market segment, or the users to whom the technology is useful and for what purpose. McGrath (2009) takes a slightly different view and describes the value proposition as the *unit of business*. A unit of business is quite literally the unit of what the firm sells and what the customer pays for. Tovstiga (2010) describes an organisation's value proposition as *"an articulation of the unique and differentiated value the organisation proposes to its customers"* (p.29). Furthermore, the value proposition provides guidance on *where* and *how* the firm will compete, and importantly, it also defines where the organisation will *not* compete (Tovstiga, 2010). According to Tovstiga (2010), the firm's value proposition is based on the organisation's *strategic boundary conditions*. These, in turn, are defined by the *unique competing space* that emerges at the intersection of the customers' needs, the company's capabilities and the competitors' offerings.

(ii) Business System (create value)

Zott and Amit (2009) refer to the selection of activities that a firm performs as *activity system content.* Afuah (2004) builds on this description and finds that in order to produce an offering, be it a service, physical product or experience, the firm must perform a number of activities. Activities require organisation so a business model must, therefore, describe the value configuration and the borders and links to external stakeholders as well as between different internal activities (Afuah, 2004). Understanding the value configuration leads to understanding the fundamental resources and capabilities that underlie activities and structures, and that drive costs and differentiation (Afuah, 2004). Johnson et al. (2008) describe these activities as the '*key processes*' where successful companies have operational (activities) and managerial (value configuration) processes that allow them to create value. Stabell and Fjeldstad (1998) define *value configuration* at three levels: *value chain, value shop* and *value network.*

Value Chain: Porter's value chain framework (1985) remains the accepted model for firm-value creation with the *value chain* the transformation process, the offering, procurement or marketing standardisation benefits.

Value Shop: Transforms the standardisation of the *value chain* into customised product delivery with the Internet providing knowledge management capabilities.

Value Network: applies to contact or networking services, enhanced exponentially by the Internet. Chesbrough and Rosenblom (2002) elaborate on the value configuration with the inclusion of the position of the firm within the *value network.* By that, they mean linking suppliers and customers and identifying potential complementors.

These key activities are supported by '*key resources*' such as assets, people, technology, products, facilities, equipment, channels, and brands - all required to deliver the value proposition (Johnson et al., 2008).

George and Bock (2011) frame a business model as an evolving bundle of activities. Johnson et al. (2008) describe how "*successful companies have operational and managerial processes that allow them to deliver value in a way they can successfully repeat and increase in scale*" (p.53). Processes make the profitable delivery of the value proposition repeatable and scalable. McGrath and MacMillan (2009) include the process in their definition of a business model and describe how practitioners need to make decisions about the process steps, specifically, which sets of activities are employed to deliver the value proposition. Finally, Teece (2009) describes how "*a business model involves determining the set of lateral (complementary) and vertical activities that must be performed and assessing whether and how they can be performed sufficiently cheaply to enable a profit to be earned*" (p.18). Teece continues that firms need to understand the structure needed to combine these activities and both lateral and vertical integration and outsourcing issues need to be considered.

As part of the business system, the *go-to-market approach* is an element to consider. According to Dubosson-Torbay et al. (2002), *customer relationship* potential is often forgotten in the business model. The notion of *branding* has also evolved to include relationship capital, which emphasises the interaction between the firm and the customer (Dubosson-Torbay et al., 2002). Serving the customer includes fulfilment, support, and CRM and a firm must ask itself how it wants to deliver additional value to its customers and what support and service level it wants

to provide (Dubosson-Torbay et al., 2002). Fulfilment and support refer to the way the firm "goes to market" and how it reaches customers (Hamel, 2007).

(iii) Profit Formula (capture value)

Johnson et al. (2008) define the profit formula as *"a blueprint that defines how the company creates value for itself while providing value to the customer"* (p.53). The profit formula consists of the *revenue model* and *cost structure*. A type of innovation in the revenue model is the "freemium" (free and premium) proposition that has been adopted by Adobe, Skype, and MySpace (Teece, 2009).

Each of the categories has a number of related business model components, as illustrated in

Figure . A business model is geared toward total value creation for all parties involved (Zott and Amit, 2009). Hence the depicted business model diagram is focused on how the focal firm creates and delivers value to customers, and then coverts payments received to profit (Teece, 2009).

As Teece (2009) describes the business model framework: "*a good business model yields compelling value propositions for customers and advantageous cost and risk structures that enable the business marketing its services to capture significant value*" (p.3).

The revenue architecture is an important part of understanding how a firm will make money and sustain its profit stream over time, and it is central to the economic logic definitions. For example, Chesbrough and Rosenbloom (2002) describe this as:

"*The architecture of the revenues – how a customer will pay, how much to charge, and how the value created will be apportioned between the customers, the firm itself, and its suppliers*" (p. 7). Johnson et al. (2008) describe the revenue architecture as part of the *profit formula* or the blueprint that defines how the company creates value for itself while providing value to the customer. Teece (2009) describes the revenue architecture as:

"*What is the nature of the appropriability regime?"* (p. 18).

The cost structure is part of the firm's profit formula. It consists of three subcomponents (Morris et al., 2005): (i) operating leverage or the extent to which the cost structure is

dominated by fixed versus variable costs; (ii) the firm's emphasis on higher or lower volumes in terms of both the market opportunity and internal capacity; and (iii) the firm's ability to achieve a relatively higher or lower margins; and the firm's revenue model.

In this research, three main business model elements: (i) *value proposition*; (ii) *business system*; and (iii) *profit formula* were used to identify different business model configurations, as per Mintzberg's Configuration theory (1979).

2.3. BUSINESS MODEL CONFIGURATIONAL THEMES

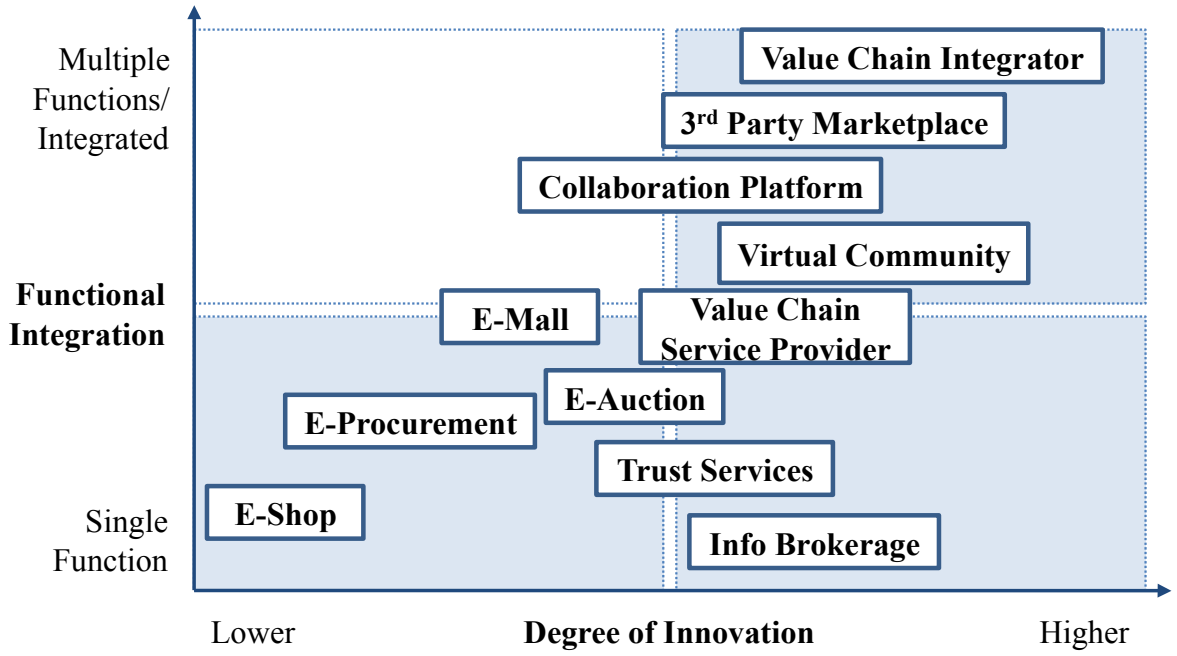
The business model design captures the common threads that orchestrate the focal firm's choice of business model components and how they are linked together through 'themes' to create a type of business model. As Peteraf (2011) suggests: *if business models are configurations or gestalts that suggest room to develop useful taxonomies*.

Classifying enterprises according to their business model provides an alternate perspective from which to view an industry or group of enterprises (Lambert and Davidson, 2013). Taxonomies based on business models provide new ways of dividing enterprise populations into homogeneous groups that can be subjected to other management studies, including research into the relationship between business models and firm performance (Lambert and Davidson, 2013).

The research stream which, to date, has devoted the greatest attention to business model taxonomies is *e-Business*. The e-Business research offers access to a wider range of business model design themes and types (see: Timmers (1998), Mahadevan (2000), Weill and Vitale (2001), (Remenyi, 2001), Amit and Zott (2001)).

Timmers' (1998) early work on classification along two dimensions: (i) functional integration and (ii) degree of innovation (novelty) results in 11 distinct Internet *business models types;* these are named in **Figure 5.**

Figure 5: Timmers' (1998) Business model design themes



Weill and Vitale (2001) identify eight distinct e-Business model types for implementing on their own, within an e-Business context or combined:

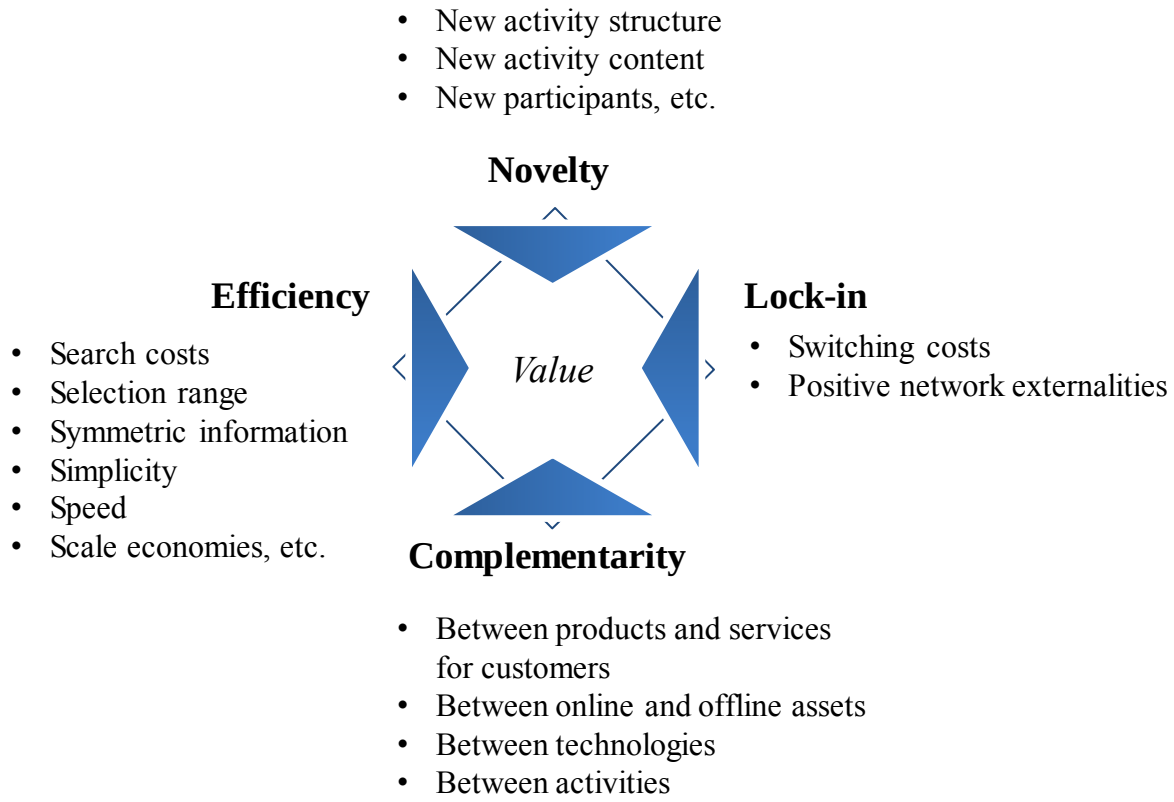
- Content Provider through intermediaries
- Direct to Customer goods and services
- Full-service Provider
- Intermediary
- Shared Infrastructure
- Value Net Coordinator
- Virtual Community
- Whole Enterprise single portal

Amit and Zott's (2001) build on Timmers' e-Business taxonomies and identify four e-Business model design themes; *novelty, lock-in, complementarity, efficiency*. Based on a sample of 59 US and European e-Business firms, Amit and Zott identify the predominant sources of value creation and the resulting business model themes. Based on their case study research, Amit and

Zott define *novelty* as consisting of business models that create value by connecting previously unconnected parties, eliminating inefficiencies in the buying and selling process and by capturing latent consumer needs. At the core of the novelty-based business model are two elements. The first is the introduction of new ways to conduct economic exchange. The second element is the degree of novelty and uniqueness of the business model itself, its ability to create at least temporarily a competitive advantage for the firm. Novelty-based business models can lead to a first-mover advantage. Their definition of *lock-in* is business models that incentivise the focal firm's customer and strategic partners to engage in repeat activities and prevent them from migrating. The central concepts behind this business model design are switching costs and network externalities. The latter are present when the utility that one derives from consumption of a good increases with the number of other persons consuming the same good (Katz and Shapiro, 1985). *Complementarity* consists of business models that facilitate bundling, e.g., combining complementary products, services or activities. Complementarity is present if the value of a product or service increases with the purchase of another product or service (Brandenburger and Stuart, 1996). Designing a business model around this theme is about findings ways to increase profits by bundling products or services to meet specific customer needs. Finally, *efficiency* defines business models that foster transaction efficiency and cost savings through the inter-connections of the activity system. An efficiency-based business model seeks to reduce transaction costs through several methods such as by reducing the complexity of a transaction, or by reducing the information asymmetry between participants through increased transparency.

Amit and Zott's four business model themes are illustrated in **Figure 6.**

Figure 6: Amit and Zott e-Business model unifying themes



Zott and Amit (2008) examined the fit between the firm's product market strategy and its business model. They considered two main business model design themes: (i) novelty-focused; and (ii) efficiency-focused, along with three product market strategy choices: (i) cost leadership; (ii) differentiation; and (iii) and the timing of market entry. Using a random sample of firms that had gone public in Europe or in the United States between April 1996 and May 2000, they found a positive relationship (r^2=.241; p <0.01) between the novelty-focused business model type and the average market value in 2000 (dependent variable); but no correlation between the efficiency-focused business model type and firm performance (r^2=.120; p <0.1). **Zott and Amit's (2008) findings would indicate that certain business model types perform better than others.**

Zott and Amit (2008) point to the need to investigate competition among various business models within an industry. **Such rivalry on a business model level may have implications both for the wealth creation potential of a given business model and for value capture by the focal firm.**

Bornemann (2009) further empirically tested the four business model themes delineated by Amit and Zott (2001). He found that as much as 23 per cent of a firm's performance variable (see **Table 6** for his definition of performance) could be explained by the business model themes. Novelty-centred business models had the strongest impact on firm performance ($b=0.316$, $p<0.001$), followed by the lock-in-centred ($b=0.178$, $p<0.01$). However, efficiency-based ($b=0.088$, $p<0.1$) and complementarities-based business models, while positive, is not significant. Unlike Amit and Zott (2008), Bornemann's results show the explanatory power of the business model value drivers increases when integrating environmental moderators, stressing the importance of integrating contingencies in the business model design for firm performance.

Kulins et al. (2015) build upon Amit and Zott's four business model design themes by introducing a set-theoretic approach investigating interdependencies of complementarity-, efficiency-, novelty- and lock-in-based business models. By applying a qualitative comparative analysis to 41 entrepreneurial firms that went public on U.S. stock exchanges between 2009 and 2013. Their empirical results demonstrate the role of three 'hybrid' business model types.

Hybrid 1: Efficiency and Novelty

The first hybrid business model type presumes the presence of novelty and efficiency and supports Zott and Amit's (2008) findings of the relation of novelty as well as of efficiency to high market value. The results support the hypothesis of Markides (2013) that firms can successfully manage two business models simultaneously (the 'Ambidextrous Challenge').

Hybrid 2: Novelty and Lock-in

The second configuration is the combination of novel business model and elements that help to lock customers in. This configuration also supports the findings of Zott and Amit (2007) who empirically prove the potential for the novelty-focused business model to create value.

Hybrid 3: Efficiency, Complementarities and Lock-in

The third hybrid design contains the presence of three out of the four design themes proposed by Amit and Zott (2001). This rather complex configuration excludes elements from the novelty business model theme and shows that novelty is not a necessary antecedent for business model design elements.

Eriksson et al. (2007) combined an existing typology of four e-newspaper business model types and a customer preference survey with 3,626 responses to derive three potential e-newspaper business models. The three business types are:

i. Ubiquitous
ii. Local
iii. Prestige

Morris et al. (2005) studied 100 high growth enterprises and identified four stable clusters of generic business models namely:

i. Technical Service
ii. Standardised Producer
iii. Product Franchiser
iv. Customised Service

Hagel and Singer (1999) argue that most companies are still an unnatural bundle of three fundamentally different, and often competing, business model types. They introduced a framework to facilitate the understanding of the "unbundled corporation" by illustrating the different roles, economics, cultures, and ways to compete, and as the authors note

> *When the three businesses are bundled into a single corporation, their divergent economic and cultural imperatives inevitably conflict. Scope, Speed and Scale cannot be optimized simultaneously. Trade-offs have to be made* (p. 11).

The three core businesses described by Hagel and Singer (1999) are:

(i) *Infrastructure Management* – high volume, routine processing activities like running assembly line manufacturing, logistics networks or routine customer call centres;

(ii) *Product Innovation and Commercialisation* – developing, introducing and accelerating the adoption of innovative new products and services; and

(iii) *Customer Relationship* – building deep relationships with a target set of customers, getting to know them very well and using that knowledge to become increasingly helpful in sourcing the products and services that are most relevant and useful to them.

Although organisationally intertwined, Hagel and Singer believe that these businesses are very different. They each play a unique role, employ different types of people, and have different

economic, competitive, and even cultural imperatives (Hagel and Singer, 1999). These differences have been summarised in the below table (**Table 3**):

Table 3: Differences in Core Businesses (Hagel and Singer, 1999)

Core Businesses			
	Infrastructure Management	*Product Innovation and Commercialisation*	*Customer Relationship*
Role	Build and manage facilities for high volume, repetitive operational tasks	Conceive of attractive new products and services and commercialise them	Identify, attract and build relationship with customers
Economics	High fixed costs make large volumes essential to achieve low unit costs; economies of SCALE is key	Early market entry allows for a premium price and large market share; SPEED is key	High cost of customer acquisition makes it imperative to gain large shares of wallet; economics of SCOPE is key
Culture	Cost focused, stress on standardisation, predictability, and efficiency	Employee-centric, coddling the creative Stars	Highly service-oriented where customers come first
Competition	Battle for scale, rapid consolidation and with few big players dominating the market	Battle for talent, with low barriers to entry and many small players thriving	Battle for scope, rapid consolidation and with few big players dominating the market

The role of an *infrastructure business* is to build and manage facilities for high-volume, repetitive operational tasks such as logistics and storage, manufacturing and communications. The role of a *product innovation business* is different as it aims to develop new products and services and bring these to market. Finally, the role of a *customer relationship business* is to find customers, build relationships and lock them into the business. While scope drives the relationship management business and speed drives the innovation business, scale is what drives the infrastructure management business. Such businesses require capital-intensive facilities, which entail high fixed costs and thereby create barriers to entry. Since unit cost falls as scale increases, high volume is essential for profitability. In contrast, customer relationship businesses need to achieve economies of scope and offer a customer as many products and services as possible. It is often in their interests to create highly customised offerings to maximise sales. In a product innovation business, speed and not scope drives the underlying

economics. The faster it moves from the development to the market, the more money it can potentially make. Early entry into the market increases the likelihood of capturing a premium price and gaining a strong market share (Hagel and Singer, 1999).

As part of their research (in collaboration with Deloitte) to understand how valuations trends have evolved along with business models and emerging technologies, Libert et al. (2014) identified four dominant business model types as outlined in **Table 4**:

Table 4: Four Business Model Types (Libert et al., 2014)

Business Model	Description	Definition	Unit of Measure	Example
Asset Builder	Make one, sell one	Use capital to make, market, distribute and sell physical products	Production	• Manufacturing • Hospitals • Hotels • Retailers
Service Provider	Hire one, sell one	Use people who produce billable hours for which they charge clients	Billable time	• Consulting • Financial Services • Insurance
Technology Creator	Make one, sell many	Use capital to develop and sell intellectual property	Code or IP	• Software • Biotechnology • Pharmaceuticals
Network Orchestrator	Many make, market and sell to many	Use digital networks of businesses or consumers to create, market and sell goods, services or information	Network size (number of participants)	• Credit card companies • Stock exchanges • Social networks

When applying the four business model types to the S&P 500 Index companies, the researchers found at least two of these business model types within almost every industry. Most recently, Network Orchestrators have emerged to shake up many industries (e.g., Uber Technologies in the taxi and hired-car industries). They also found that the Network Orchestrators receive valuations two to four times higher, on average than companies with the other business models (Libert et al., 2014). They defined the gap between revenues and valuation for a business model type as the "multiplier effect."

Based on the literature review, the following definition of a business model was utilised during the research:

"***A business model is a blueprint that describes how a firm's value proposition, business system, and profit formula are linked through a unified theme and coordinated with other stakeholders to create, deliver and capture value***".

This definition takes into account the activities performed outside the boundaries of the focal firm by its customers, suppliers and partners but coordinated by the company.

2.3.1. Summary: Dominant Business Model Types

The business model design captures the common threads that orchestrate a focal firm's choice of business model components and how they are linked together through 'themes' to create a type of business model.

As noted above, the different business model design theories have some elements in common. **Table 5** summarises these commonalities and the underpinning theory, based on Amit and Zott's (2001) research:

Table 5: Summary of Business Model Types

Authors	**Operational Model**	**Product Model**	**Solutions Model**	**Network Model**
Underpinning theory (according to Amit and Zott, 2001)	*Transaction costs* (Williamson, 1975, 1979, 1983)	*Creative destruction* (Schumpeter, 1934)	*Resource-based View* (Barney, 1991)	*Network effect* (Katz and Shapiro, 1985)
Amit and Zott (2001)	Efficiency	Novelty	Complementarity	Lock-in
Hagel and Singer (1999)	Infrastructure management business	Product innovation and commercialisation business	Customer relationship business	
Libert et al. (2014)	Asset Builder	Technology Creator	Service Provider	Network Orchestrator

This research used the four dominant business model types (*Operational Model, Product Model, Solutions Model* and *Network Model*) as a starting point for the unifying themes that orchestrate the focal firm's choice of activity components, how they are linked and who performs the activities.

2.4. DIFFERENCE BETWEEN STRATEGY AND BUSINESS MODEL

Strategy is perhaps one of the least understood management topics, despite the fact that it is one of the most taught and studied concepts (Ronda-Pupo and Guerras-Martin, 2012). Therefore, the debate about the relationship between business model and strategy has been characterised by two main positions. On the one hand, management scholars suggest that business model research is just a new way of looking at strategy, fundamentally moving under a new umbrella term, questions and concerns that have historically been the cornerstones of research in strategy, thus adding very little (e.g., see Porter (2001)). Business model research adds nothing to the understanding of strategy, and no new theories, beyond established ones such as the positioning view or the RBV, need to be developed to explore business model questions. The general conclusion by those sharing this perspective is that business model research should be abandoned, or at the very least, that researchers should stop referring to it as a separate literature stream. On the other hand, supporters of the business model as a separate field do acknowledge an overlap with strategy but also suggest that business models and strategy are distinct constructs, warranting attention both in isolation as well as jointly (Zott and Amit, 2008). For example, Casadesus-Masanell and Ricart (2010), who see the business model through a strategy lens, suggest that firms compete through business models. Other studies sharing a paradigmatically similar perspective on value capture have focused on the role of the business models in explaining the sustainability of first-mover advantages in relationship to the business models adopted by late entrants (see: Markides (2013), Casadesus-Masanell and Enric Ricart (2007)), the dynamics associated with competing through business models (Casadesus-Masanell and Enric Ricart, 2007) or those related to adopting more than one business model simultaneously (see: Markides and Charitou (2004), Markides (2013)).

The conceptual overlap with the mainstream strategic management field is evident not only in the focus on competition but also in the convergence on embracing activity systems (see: Porter

(1996), Zott et al. (2010)) and the use of activity systems to explain the foundations of competitive advantage. In the words of Porter (1996)

> *Ultimately, all the differences between companies in cost or price derive from the hundreds of activities required to create, produce, sell, and deliver their products and services. [. . .] Cost is generated in performing activities. Similarly, differentiation arises from both the choice of activities and how they are performed. Activities, then, are the basic unit of competitive advantage. Overall companies' advantage or disadvantage results from all a company's activities, not only a few."* (p. 62)

The activity system view suggests that in the same way in which activities can be configured to achieve cost leadership or differentiation, a business model can be designed around efficiency or novelty design themes (Zott and Amit, 2008).

Proponents of the business model perspective argue that studying business models may introduce nuances that have escaped traditional strategy analysis. For example, Zott and Amit (2008) have suggested that by virtue of its unit of analysis, which is nestled between the firm and the network, comprising both (Zott et al., 2011), the business model may broaden the traditional boundaries of mainstream theories of value creation and capture.

Dasilva and Trkman (2013) argue that strategy shapes the development of capabilities that can alter current business models in the future.

Yip (2004) argues that the distinction between '*business model*' and '*strategy'* is more than one of semantics. Rather, they are two different concepts (p. 24). Firms can follow the same strategy using different business models (Porter, 2001). Take, for example, the case of Hewlett-Packard and Dell in the personal computer space. They are both focused on delivering personal computers to businesses and private customers but do so in very different ways. Where Hewlett-Packard produces to stock, Dell produces to demand.

The *business model* is embedded within strategic management because strategy defines the purpose, direction and objective of the business; but the business model is not the strategy (Magretta, 2002):

> *"Business models describe as a system how the pieces of a business fit together. But they do not factor in one critical dimension of performance – competition."* (p. 6)

In the strategy phase, a firm's management makes choices about how it wants to compete against other industry players (see: Casadesus-Masanell and Ricart (2010), Tovstiga (2010)). In this context, strategy is more concerned with value capture and competitive advantage than with value creation, whereas business model combines a concern for sustainable value creation with value capture.

In their research, Zott and Amit (2008) establish empirically that a firm's strategy and its business model are distinct constructs that affect firm performance (p.2). The Pearson correlation between a business model with a novelty-centred design and a differentiation position strategy is low (0.148), as is the correlation between an efficiency-centred business model design and a cost leader position strategy (-0.064). Indeed, the empirical results of their research show that both business model and strategy can enhance a firm's performance, independently as well as jointly (Zott and Amit, 2008).

In this thesis, *strategy* was defined as the choices management makes about *where* and *how to compete* against other industry players (as per Casadesus-Masanell and Ricart (2010), (Tovstiga, 2010)), whereas the *business model* was concerned with *how to create* and *capture value*. The intersection between the strategy and business model was the value proposition (*define value*). It should be noted that while a company can have one broad competitive position, it can operationalise this through different business models.

2.5. BUSINESS MODEL AND FIRM PERFORMANCE

2.5.1. Business Evaluation and Firm Performance

There is no held-in-common measure for evaluating business models and firm performance and **Table 6** sets out a range of firm performance definitions as provided by the researchers already encountered in this review.

Table 6: Definitions of Firm Performance in Selected Empirical Studies

Authors	Definition of firm performance	Context	Empirical support (Y/N)
Rajgopal, Venkatach-alam et al. (2003)	**Market value of equity** measured as average stock prices per quarter x outstanding shares.	Network effect	Y
Weill, Malone et al. (2005)	**Market valuation** (average stock price x outstanding shares), **operating income** and **Economic Value Added** (as measures of profit), **return on invested capital** (ROIC) and **return on assets** (ROA), and **Tobin's Q** (as a measures of market value).	Generic business models	Y
Zott and Amit (2008)	The total value appropriated (TVA) by firm *F*. TVA reflects the company's **cash flows**. A firm's stock-market value reflects the market's expectations of future cash flows to shareholders and hence can be viewed as a measure of perceived firm performance.	e-Business models	Y
Bornemann (2009)	Seven performance indicators: **two items for financial performance**, for **marketing/sales effectiveness** and for **firm growth** as well as one for **market share**.	e-Business models	Y
Libert et al. (2014)	**Price-to-revenue (P/R) ratio** as well as **company market valuation changes** (average stock price x outstanding shares).	Strategy	Y

Each of the authors cited provide differing perspectives on firm performance. Rajgopal, Venkatachalam et al. (2003) review the network effects on stock market value and how this interacts with a firm's business model when measured in relation to variables such as *content provider*, *portal*, *financial services* and whether the firm is operating in the *e-shop* or *auction site* sectors. Weill, Malone et al. (2005) find company business models better predictors of operating income than industry classification and any other variable. Zott and Amit (2008) analysed extensive quantitative data and found, in market capitalisation terms, significant effects of business models on firm performance, especially the *novelty-centred* model. However, on *efficiency-centred* business models there proved to be no anticipated positive interaction between the operation of these models and market value. Bornemann (2009) also found the business model a major driver of performance, and that by calibrating four value drivers into the equation similar to those delineated by Amit and Zott (2001) as much as 23 per cent of the performance variable could be explained.

Libert et al. (2014) found a significant difference in the Revenue Multiplier results for each of the four business models they examined. *Technology Creators* and *Network Orchestrators* were valued two to four times as much as *Asset Builders* and Service Providers. On average, the market paid approximately $8 of valuation for every $1 in revenue generated by a *Network Orchestrator* company. *Asset Builder* companies, meanwhile, received only $1 for every $1 in revenue.

2.5.2. Review and Critique of the Main Research Methodologies

One of the most common taxonomies used to differentiate research is the distinction between *exploratory (inductive)* and *confirmatory (deductive)* studies (Remenyi et al., 1998).

The literature review of all 3-star rated scholarly journals published between 1998 and 2017 found that the predominant research methodology in the area of business models is *exploratory* based on *cross-sectional observations*. However, since 2005 empirical research has become *confirmatory*, testing hypotheses and relationships between business model designs and firm performance. The main academic research studies in the area of business models are outlined in **Table 7.**

Table 7: Overview of Main Research Methodologies

Authors	Nature of the research	Methodology	Context	Nature of data
Timmers (1998)	Definition of e-business taxonomies using two dimensions: (i) functional integration and (ii) degree of innovation.	Case study	e-Business	Observations from "business on the internet and pilot projects."
Mahadevan (2000)	Presentation of a framework to help practising managers understand the notion of a business model in the Internet context.	Case study	e-Business	Selective review of 46 e-businesses from the US
Stewart and Qin (2000)	Discussion of the implication of the internet on a firm's business model and public policy.	Case study	Strategy	Observations from selected e-businesses
Amit and Zott (2001)	Definition of the sources of value of particular importance in e-business and whether unique value drivers can be identified in the context of e-business.	Case study	e-Business	59 public e-Businesses (30 from the US and 29 from Europe)
Weill and Vitale (2001)	Presentation of business model schematics as a useful tool for analysing e-business initiatives.	Case study	Strategy	Observations from selected e-businesses
Chesbrough, Rosenbloom (2002)	Exploring the role of the business model in capturing value from technology examining the of selected spinoff companies from Xerox PARC.	Case study	Strategy	Data from six spinoff ventures from Xerox PARC
Weill, Malone et al. (2005)	Testing the hypothesis that some business models produce higher financial returns.	Large-scale survey	Strategy	1,000 largest publicly traded US

				companies in terms of gross revenues
Zott and Amit (2008)	Testing of how a firm's business model and its product market strategy interact to impact firm performance.	Large-scale survey	e-Business	170 firms that had gone public in Europe and the US
Bornemann (2009)	Testing the impact of four business model designs on the performance of new business enterprises defined as entrepreneurial.	Large-scale survey	e-Business	Online survey of 228 small and medium-size firms in Germany
Casadesus-Masanell and Ricart (2010)	Presentation of a conceptual framework to separate and relate the concepts of strategy and business model.	Case study	Strategy	Case studies of Ryanair and TDC vs Telmore
Libert et al. (2014)	Testing the relationship between four different business model types and shareholder value.	Large-scale survey	Strategy	Companies in the S&P 500 index over a 40 year period

Exploratory, Cross-sectional Studies Based on Case Study Methodology

The main method used in the past to research the subject area of business model has been a *case study*, leading to different definitions and constructs of a business model. Timmers (1998) published his study of emerging business models for electronic markets providing a framework for the classification of these business models. The framework was developed on the basis of current internet business models and experimental work in European Research an Development (R&D) programmes. Although Timmers' work has been widely referenced (1,190 citations between 1998 and 2011) and provided input into other studies on business models for Internet-based e-commerce, it was conducted at the very early stages of e-commerce.

In comparison, Amit and Zott (2001) used a *grounded theory strategy* based on a structured, open-ended question survey among 59 publicly traded US and European e-businesses. They

proposed their business model construct as a unit of analysis for future research on value creation in e-business. However, no other academic researcher adopted their proposed business model construct, and in 2009, Zott and Amit modified their business model definition to focus on *activities* rather than a transaction. (Zott and Amit, 2009).

Chesbrough and Rosenbloom (2002) grounded their business model theory in a detailed analysis of six spin-off ventures from technologies originally developed at the Xerox Corporation's PARC (Palo Alto Research Center Incorporated). However, as described in the literature review section, the authors look at a company's chosen business model as a way to create value from new technology and not a new unit of analysis.

Confirmatory, Cross-sectional Studies Based on Large-scale Survey

In an unpublished paper, Weill et al. (2005) followed up on their business model theory (Weill and Vitale, 2001) with a confirmatory, cross-sectional study of the 1,000 largest US firms in terms of revenues. Using a comprehensive typology questionnaire, Weill and his colleagues at MIT Sloan School of Management classified the business model of each of the companies and compared the financial performance data (see **Table 6** for their definition of firm performance) for the different kind of business models. This study was not focused specifically on e-businesses but rather on all companies in the top 1,000 ranking in terms of revenues. Weill et al. (2005) concluded that business model relatedness is more influential in determining firm performance than industry relatedness.

To confirm the hypotheses and relationships of their business model construct, Amit and Zott (2008) conducted a quantitative survey among a random sample of 170 e-businesses that had gone public between April 1996 and May 2000. Each company was analysed extensively using publicly available data such as initial public offering documents, annual reports, investment analysts' reports and Web sites. The researchers empirically established that a firm's strategy and its business model are distinct constructs that affect firm performance.

Bornemann (2009) deployed the same methodology as Amit and Zott (2008) for a sample of 228 small and medium-sized firms in Germany. His study contributed to the existing literature on business model design by providing a theoretical and empirical investigation of Amit and Zott's (2001) four different business model designs (*Novelty*, *Lock-in*, *Complementarity* and *Efficiency*). Bornemann elaborated on how they are related to firm performance and how the

environment of the firm moderates this relationship. His study provides support for utilising the contingency approach to examine the effects of business model designs.

Both exploratory and confirmatory research strategies are being used in this area depending on the focus of the research. Exploratory studies use an inductive and qualitative approach to developing new business model theories because of the complexity of the interaction being studied and the limited state of knowledge in the subject area at the time. In comparison, confirmatory studies follow a variance, deductive approach looking for causal relationships in business model design and firm performance.

Based on the above analysis, a number of studies have been conducted to explore cross-sectional business model variables and relationships among variables (see: Timmers (1998), Mahadevan (2000), Amit and Zott (2001), Weill and Vitale (2001), Chesbrough and Rosenbloom (2002)). However, few studies have looked at confirming the relationship between business model design and firm performance (see: Weill, Malone et al. (2005), Zott and Amit (2008), Bornemann (2009), Libert et al. (2014)). **Hence, the appropriate research strategy for this research was deemed to be testing of static associations between business model design and firm performance. This approach implies the use of a confirmatory research design.**

2.6. BUSINESS MODEL RELATEDNESS, AMBIDEXTERITY AND COHERENCE

Relatedness

The Resource-based View (RBV) of a firm (see: Barney (1991), Peteraf (1993)) has been widely regarded as providing a valuable theoretical lens for understanding relatedness. Relatedness has been referred to as the degree of commonality or similarities between separate lines of business (Rumelt, 1974). Based on the concept of relatedness, RBV suggests that firms can create value by sharing resources among their line of business (see: Robins and Wiersema (1995), Silverman (1999), Bryce and Winter (2009)). Previous research has distinguished between sharing of strategic resources, such as knowledge and skills, and ordinary resources, such as raw material and equipment (Markides and Williamson, 1994). Strategic resources have been defined as assets, capabilities, and organisational processes that are valuable, rare, difficult to imitate, and have few substitutes (Barney, 1991).

Relying on RBV, the strategic management literature suggests that classification of related businesses should be based on the similarity of their underlying economic logic (see: Rumelt (1974), Prahalad and Bettis (1986)), and the degree of sharing of strategic resources (Markides, 2008).

Ambidexterity

Incumbent firms often respond to the emergence of a disruptive business model by adding a new business model to their existing business model rather than completely replacing their old one. For example, most airline companies responded to entrants in the low-cost, point-to-point segment of the airline market by adopting such techniques, often under a new brand name. Companies in the fast-moving consumer goods industry did the same in response to the entrance of low-cost private label competitors (Massa et al., 2017).

According to Markides and Charitou (2004), the underlying configuration of key resources and processes that support one particular business model can fundamentally differ from the resource configuration required to operate another, unrelated business model. Thus, operating different business models can lead to inconsistencies in the information and expertise required to operate the models. Such inconsistencies, in turn, may increase the risk of inappropriate inference and mismanagement. Markides (2008) argues that

> *The evidence shows that most established companies that attempt to employ duel business models fail to do so successfully – exactly because the presence of conflicts means that by trying to pursue business model B, a company harms its business model A. (p. 81)*

The existence of trade-offs and conflicts means that a company that tries to compete with both business models simultaneously risks paying a straddling cost and degrading the value (Porter, 1996). This is the logic that led Porter (1996) to propose that a company could find itself "stuck in the middle." Porter (1996) identifies three main factors that give rise to these trade-offs:

(i) The set of activities that a company needs to compete successfully in its chosen competitive positioning;

(ii) Coordination and control of incompatible sets of activities; and

(iii) A company's image or reputation.

Hagel and Singer (1999) also argue that focusing on multiple business model types at the same time can create internal friction. For example, if a company wants to build trust with its customers through a *Solutions* business model, it should be prepared to connect its customers with the best products and services to meet customers' needs, even if that involves recommending products and services developed by other companies. If, at the same time, a company is trying to be a *Product* Leader, it may want to restrict the choice offered to customers so that it only involves the products and services developed by itself. In terms of company culture, product developers and marketers often have contempt for the supply chain people who try to confine their creativity by seeking standardisation and cost savings (Hagel and Singer, 1999). The sales people may view back-office operations as an obstacle to effectively serving the unanticipated and unique needs of their customers.

While the idea of competing with dual business models seems attractive to both managers and scholars, it raises several strategic issues and challenges. For example, a fundamental strategy challenge related to managing two business models in the same market is that the two models (and underlying value chains) could conflict with one another (see: Porter (1996), Markides and Charitou (2004). Conflicts could be of various types, the most obvious one being the risk of jeopardising the existing business. For example, by trying to sell on the Internet, a brokerage firm may alienate its existing distributors (e.g., brokers), creating channel conflict. This was one of the earliest observations about e-Commerce channels and was used to explain the difference between Dell's and Compaq's business models (Afuah and Tucci, 2001). However, as a function of two fundamental contingencies, namely the nature of the conflicts between the established business and the innovation (the new business model) on one hand, and the similarity between the two business models on the other, Markides and Charitou (2004) suggest four possible strategies to deal with dual business models: *Separation*, *Integration*, *Phased Separation*, and *Phased Integration*. Markides and Oyon (2010) take the analysis one step further by analysing whether the incumbent should attempt to copy the business model of the "disruptor" and suggest that on average that is not a successful strategy; rather, the second business model should attempt to "*disrupt the disruptor*."

To keep the new business model integrated with the existing organisation, Markides and Charitou (2004) argue that to achieve such a difficult task, firms need to develop an "ambidextrous" organisational infrastructure. Wood et al. (2013) argue that incumbents engaged in disruptive innovation thrive because they demonstrate organisational ambidexterity by exploring new opportunities while exploiting established capabilities, and by differentiating

the organisation into specialised units while also integrating the organisation, as needed. The researchers define ambidexterity as the combination of a set of two discrete capabilities, namely *exploration* versus *exploitation*, *alignment* versus *adaptability*, *radical* versus *incremental innovation*, or *flexibility* versus *efficiency*.

Kim and Min (2015) analyse the performance of store-based retailers that added online retailing as a new business model and find that the presence of complementary assets between the existing and the new business model may lead to increased performance when the new business model is added early as part of the main business.

Coherence

In their paper titled "*Coherence Premium*", Leinwand and Mainardi (2010) argue that companies that figure out what they are good at and develop those capabilities until they are 'best-in-class' and interlocked, can achieve sustainable, superior returns. Leinwand and Mainardi (2010) define *coherence* as when a firm aligns its differentiating internal capabilities (strategic resources) with the right external market position (strategy). The authors believe most companies do not pass the coherence test because they pay too much attention to external positioning and not enough to internal capabilities. To prove their point, Leinwand and Mainardi (2010) examined a number of different industries and mapped the level of coherence of the major players against their operating margins over a five-year period. Their analysis showed that coherence in capabilities correlates with greater profitability, as measured by Earnings before Interest and Tax (EBIT) margin. This was particularly true for mature, post-consolidation industries.

Leinwand and Mainardi (2010) continue to argue that coherence creates value in four ways:

(i) It strengthens a company's competitive advantage as employees become more skilled and systems grow more adept, enabling companies to out-execute their competitors.

(ii) Coherence focuses strategic investment on what matters, enabling companies to make better investment decisions and pursue acquisitions that are in line with their capabilities.

(iii) It produces efficiencies of scale as a company can spend more wisely and grow more easily when it deploys the same capabilities across a larger array of products and services.

(iv) Coherence creates alignment between strategic intent and day-to-day decision making, enabling companies to execute better and faster because everyone in the organisation understands what is important.

In this thesis, *business model coherence* was defined as adherence to a certain business model type that logically connects strategic resources with a certain market position. *Business model relatedness* was defined as the degree of commonality between separate business model types.

2.7. CONCLUSIONS AND HYPOTHESES

The 15 academic studies examined as part of this research have explicitly or implicitly distinguished between types of business models by providing examples of pioneering business models in either traditional or Internet-related industries (see: Baden-Fuller and Morgan (2010), Teece (2009)). Unfortunately, the literature on business models has not sufficiently explored *which* business models could create the most value and *how*.

The literature review highlighted a number of issues and gaps in the academic literature around business models:

(i) Despite various attempts by different strategic management scholars to define business model types, no single classification dominates the literature. In addition, most of the proposed taxonomies are based on e-Business models established between 1998 and 2001 and do not take into account the latest developments around networks and ecosystems;

(ii) There is limited empirical research into the relationship between business model types and firm performance within an industry; and

(iii) There is a lack of supporting evidence for whether companies can achieve superior returns by adhering to one business model type, or whether organisations can successfully manage two different and conflicting business models simultaneously (the 'Ambidexterity Challenge').

Firstly, examining all 3-star rated scholarly management journals published between 1998 and 2012 reveals that authors either describe a business model as an organisation configuration or as an economic logic model. In this thesis, the business model was addressed from the

perspective of *Configuration theory* and aimed at extending the *Strategy – Structure – Performance* paradigm (Galunic and Eisenhardt, 1994). If the structural configuration can be defined as the degree to which an organisation's elements are orchestrated and connected by a single theme (Miller, 1996), then it is important to understand different business model types. Again the academic literature is incomplete. The research stream which, to date, has devoted the greatest attention to business model design is *e-Business*. However, researchers such as Hagel and Singer (1999) and Zott and Amit (2008) defined different business model types that can be applied to companies outside of e-Business. Hagel and Singer (1999) argue that most companies are still an unnatural bundle of three fundamentally different, and often competing, business model types. Current examples of highly successful companies such as Apple and Amazon underline a rather configurational view as they rely on elements from different business model types (Kulins et al., 2015). Therefore, the first hypothesis was to test the dominance of a business model construct within a firm:

(HI)	*Each company has elements of different business model types but has one dominant construct.*

Secondly, little research has been done into the relationship between these different business model types and firm performance. Zott and Amit (2008) tested the relationship between two of these business model types: *Operational Model* (named *efficiency-centred* by the authors) and *Product Model* (named *novelty-centred* by the authors). Previous academic studies have found that firms that operate multiple business models may experience major difficulties in leveraging their strategic resource base and experience higher coordination and control costs (Markides and Charitou, 2004). This is because the underlying configuration of key resources and capabilities that support one particular business model are fundamentally different from the resource configuration and capabilities required to operate another (see: Hamel and Prahalad (1996), Teece (2009), Casadesus-Masanell and Ricart (2010)). Thus operating multiple business models can lead to inconsistencies in the information and expertise required to operate the models. Such inconsistencies may increase the risk of inappropriate inference and mismanagement. Moreover, the organisational culture of different business model types may cause internal conflicts. In referring to dissimilar business model types, (Markides, 2008) argues that

The evidence shows that established companies that attempt to employ duel business models fail to do so successfully – exactly because the presence of conflicts means that by trying to pursue business model B, a company harms its business model A (p. 81).

In summary, these arguments suggest that business model coherence (i.e., the extent to which a firm is adhering to a certain business model type) will increase firm performance. This reasoning leads to the second hypothesis:

(HII) *Business model coherence will be positively associated with firm performance.*

Thirdly, academic studies have found that firms that operate certain business model types might deliver above-industry firm performance. It is of interest to managers whether they should shift their business model to one that potentially delivers better performance and abandons their old model. Zott and Amit (2008) examined considered two main business model design themes: (i) novelty-focused; and (ii) efficiency-focused. Using a random sample of firms that had gone public in Europe or in the United States between April 1996 and May 2000, they found a positive relationship (r^2=.241; p <0.01) between the novelty-focused business model type and the average market value in 2000 (dependent variable), but no correlation between the efficiency-focused business model type and firm performance (r^2=.120; p <0.1). **Zott and Amit's (2008) findings would indicate that certain business model types perform better than others.**

Therefore, the third hypothesis is focused on comparing different business model types and firm performance within the Consumer Goods industry:

(HIII) *Business model A delivers greater firm performance than Business model B, where A and B are different business model types.*

CHAPTER 3 RESEARCH PROCEDURES

This chapter presents the research procedures to address the outlined research questions. Remenyi et al. (1998) describe the research procedure as the overall direction of the research. Building upon the theoretical framework developed in the Literature Review, this chapter will outline how the current research was approached and the chosen research model operationalised.

The chapter is divided into three main sections:

1. The first part outlines the philosophical background to the research by reviewing the different philosophical worldview assumptions, and this researcher's epistemological orientation and overarching approach to risk.
2. The second section outlines the research strategy, and the quantitative research approach is presented in detail and argued that it is a relevant approach to answering the outlined research questions.
3. The chapter then moves on to comment upon the selection of research instruments, and in turn to discuss a number of methodological issues relating to reliability and validity.

3.1. PHILOSOPHICAL BACKGROUND TO THE RESEARCH

When developing a research strategy, researchers need to think through the philosophical worldview assumptions that they bring to the research and how they relate to the research methodology (Creswell, 2009, Remenyi et al., 1998). This section aims to consider empirical and theoretical approaches to research, before going on to assess the issues of positivism, phenomenology and pragmatism. It concludes with a discussion of why this researcher has chosen to take a positivistic approach to the research and how that approach will shape the research strategy and method.

An Empirical vs Theoretical Approach

One of the most commonly used taxonomies used to differentiate research is the distinction between empirical and theoretical studies (Remenyi et al., 1998). In simple terms, the empiricist goes out into the world and observes through experiments or passive observation of what is happening. By studying these observations and collecting related evidence, the empiricist will conclude and claim that something of value has been added to the body of knowledge (Remenyi et al., 1998). The research theorist, on the other hand, studies the subject through the writings of others and through discourse with learned or informed individuals who can comment on the subject area, usually without any direct involvement in observation of behaviour and the collection of actual evidence (Remenyi et al., 1998). However, it would appear that despite these apparent differences, the two approaches are in fact inevitably intertwined. For example, it is arguably impossible to be an empiricist without having a thorough understanding of the theoretical background to the research area, while theoretical research in turn typically involves thinking about and developing the findings of previous empirical research Creswell (2009).

Postpositivism vs Phenomenology vs Pragmatism

There are several distinctive philosophical approaches in the social sciences from which research strategy and methods can be derived. Creswell (2009) discusses four different paradigms: *post-positivism*, *phenomenology/constructivism*, *pragmatism* and *advocacy/ participatory*. The last paradigm has been excluded from this section as it is more relevant to social science research (Creswell, 2009).

Within the *post-positivist* paradigm, the researcher takes the role of an objective analyst and interpreter of tangible social reality. Post-positivists hold a deterministic philosophy in which

causes are likely to determine effects or outcomes (Creswell, 2009). The knowledge that develops through a post-positivist lens is based on careful observation and measurement of the objective reality. Therefore, developing numeric measures of observations and studying the behaviour of individuals becomes paramount for a post-positivist (Creswell, 2009). The implications that have come to be associated with this philosophical paradigm include among others: (i) the researcher is independent of what is being observed, (ii) the problems are reduced into the simplest possible element, (iii) large samples are used in order to be able to generalise, (iv) the concepts are operationalised in a way that enables facts to be measured quantitatively, and (v) the research proceeds through a process of hypothesising and empirical testing (Easterby-Smith et al., 2001). Criticism of post-positivism suggests that this is not an approach that will lead to interesting or profound insights into complex problems, especially in the field of business and management studies (Remenyi et al., 1998).

In contrast to the post-positivist, the *phenomenologist* or *interpretivist* typically focuses on the primary or subjective consciousness and takes the view that each situation is unique, and its meaning is a function of the circumstances and the individuals involved (Remenyi et al., 1998). Furthermore, rather than adopting a reductionist approach, in this paradigm, a holistic approach is adopted, and the researcher is therefore not unique, but rather an intrinsic part of what is being researched (Creswell, 2009). A phenomenologist sees the world as stochastic and believes that it is not composed of a single objective reality, but rather is composed of a series of multiple realities, each of which should be understood and taken into account. The world can be modelled, but not necessarily in a mathematical sense. A verbal, diagrammatic, or descriptive model is also acceptable (Remenyi et al., 1998). The implications associated with the phenomenological paradigm include: (i) the researcher is part of what is being observed, (ii) the research focuses on meanings and tries to understand what is happening, (iii) ideas are developed through induction from data, and (iv) small samples are investigated in depth over time (Easterby-Smith et al., 2001). Criticism of phenomenology suggests that this paradigm is not readily conductive to generalisations, other than the type that states that as the phenomenon has been shown to exist or occur at least once, it is most probable that it will exist or occur again. (Remenyi et al., 1998).

Next, a *pragmatist* focuses on actions, situations and consequences to explain a research problem rather than antecedent conditions, as in post-positivism. Instead of focusing on methods, researchers emphasise the research problem and use all approaches available to understand the problem (Rossman, Wilson 1985 cited by Creswell 2009:10). With Kant (as

cited by Honderich, 2005), Pragmatism insists that since our limitedly human efforts at inquiry can never achieve *totality*, we must settle for *sufficiency*, which is ultimately a practical rather than a theoretical matter. Some implications of the pragmatic paradigm are: (i) researchers will use multiple methods to establish different views of phenomena, (ii) trust is what works at the time and investigators use both quantitative and qualitative data because they work to provide the best understanding of a research problem and (iii) pragmatist researchers look to the *what* and *how* to research (Creswell, 2009).

The Philosophical Position of the Research

The relationship between the philosophical paradigms and the resulting preferences for research methods and ways of looking at data is not mutually exclusive (Remenyi et al., 1998). Easterby-Smith, Thorpe and Lowe (2001) argue that there is a good reason for using different research methods in the same study, not least because of this will, they suggest, prevent data from becoming method bound.

To understand the ontological and epistemological preferences, this researcher assessed his experiential learning style using Kolb's Learning Style Inventory framework (Kolb and Kolb, 2005). The model is built upon the idea that learning preferences can be described using two continuums: *active experimentation-reflective observation* and *abstract conceptualization-concrete experience*. The result is four types of learners: *Converger* (active experimentation-abstract conceptualization), *Accommodator* (active experimentation-concrete experience), *Assimilator* (reflective observation-abstract conceptualization), and *Diverger* (reflective observation-concrete experience).

Even though this researcher has a balancing experiential learning style, a preference for the converging style, according to the Kolb's Learning Style Inventory, has been utilised for this thesis. Normally, a researcher with a converging learning style enjoys gathering information to solve problems and tends to converge on the solution, sometimes assimilating data into models.

This thesis was conducted largely from the *positivist's paradigm*. It was systematic, controlled and empirical, and the variables and constructs that were investigated were all operationalised and measured quantitatively. Furthermore, the research involved testing the hypotheses on a relatively large sample of firms (n=97) where theory played an important part in providing a systematic view of the relations that were studied.

3.2. RESEARCH STRATEGY

Confirmatory research designs can be either *descriptive* or *causal* (Malhotra, 1999). The major objective of descriptive research is to describe something, for example, the characteristics of relevant groups, such as organisations. Causal research is, on the other hand, used to obtain evidence of *cause-and-effec*t (causal) relationships. Since this research aims at examining relationships without having an ambition of testing cause-and-effect, the research questions suggest the use of descriptive research. While descriptive research can determine the degree of association between variables, in this case, it is not appropriate for examining causal relationships (Malhotra, 1999). That is not the intention of the research in this thesis.

Descriptive research may be either cross-sectional or longitudinal (Malhotra, 1999). Cross-sectional designs involve the collection of data from any given sample of population elements at a specific point in time. As Malhotra (1999) notes, they may be either single cross-sectional or multiple cross-sectional. In single cross-sectional designs, only one sample of respondents is drawn from the target population, and data is obtained from this sample at a specific point in time. In multiple cross-sectional designs, there are two or more samples of respondents, and data from each sample is obtained at a specific point in time. He also notes that data from different samples in multiple cross-sectional designs often are obtained at different times. In longitudinal designs, on the other hand, a fixed sample (or samples) of population elements is repeatedly measured. As such, a longitudinal design differs from a cross-sectional design in that the sample or samples remain the same over time. Since the research in this thesis is not focused on testing process theories, but to analyse static associations between variables (described as "factor research" by), multiple period data collections through multiple cross-sectional or longitudinal designs was viewed as not necessary. A single time period data collection through a single sectional design is regarded as more appropriate.

3.3. RESEARCH DESIGN AND METHODOLOGY

Kerlinger (1986) describes research design as the structure of the research problem and the plan of investigation used to obtain empirical evidence on the relations of the problem. He further argues that research design is invented to enable researchers to answer research questions as validly, objectively, accurately, and economically as possible. This is similar to the view presented by Malhotra (1999). He defines research design as a framework for

conducting the research giving the details of the procedures necessary to obtain the information needed to structure or solve the research problem. Malhotra (1999) claims that a good research design will help ensure that the research project is conducted effectively and efficiently.

3.3.1. Independent Variables: Business Model Types

As this research is conducted within the *positivist paradigm* in which the research model and research questions, as outlined in Chapter 1 would be operationalised by appropriate research instruments, a critical decision for the researcher is whether a new instrument should be developed, or alternatively whether an established instrument should be used.

In order to operationalise the research questions outlined in Chapter 1, it was necessary for this researcher to identify scales, which are capable of measuring the construct of *business model types*.

In the philosophy of empirical science, measurement is often referred to as the assignment of numerals to objects or events according to rules (Kerlinger, 1986), or attaching numbers to the properties of the construct at hand (Wrenn, 1997). Consequently, operational definitions specify the activities necessary to measure variables or constructs (Kerlinger, 1986). In most scientific research, multiple-item scales are used for measuring constructs to ensure proper operationalisation and robust psychometric properties for the constructs (see: Kerlinger (1986), Churchill (1979)). Theory also plays a crucial role in measurement. According to Wrenn (1997), theory builds upon tested hypotheses, which contain variables that have been measured and subjected to empirical inquiry. Wrenn also argues that there can be no measurement without theory. While these statements may seem contradictory, they are not. As Wrenn (1997) says, "*measurement, as in scientific discovery in general, (is) an iterative process by which we improve our measures by measuring our theory, which in turn improves our theory, which suggests better measures (p.40)*."

The current research adopts a *comparative approach* to measurement. This implies that all constructs involved are specific and observable, that they are theoretically founded, that numbers are attached to the properties of the constructs, and that multiple-item scales are used to measure the constructs.

Business model types

To determine the different business model types, the existing research into business model typology was used (see: Hagel and Singer (1999), Amit and Zott (2001), Libert et al. (2014)). The business model types are summarised in **Table 8** below:

Table 8: Summary of Business Model Types

Authors	**Operational model**	**Product model**	**Solutions model**	**Network Model**
Amit and Zott (2001)	Efficiency	Novelty	Complementarity	Lock-in
Hagel and Singer (1999)	Infrastructure management business	Product innovation and commercialisation business	Customer relationship business	
Libert et al. (2014)	Asset Builder	Technology Creator	Service Provider	Network Orchestrator

As mentioned in Chapter 2, this research used the four above mentioned business model types (*operational model*, *product model*, *solutions model* and *network model*) as a starting point to determine the dominant business model types.

For each of the business model types, a specific survey was designed, leveraging the questions and statements developed in prior research (see: Amit and Zott (2001), Zott and Amit (2008), Libert et al. (2014)). It was decided to use the same composite scales for business model types as deployed by Amit and Zott (2008) and Bornemann (2009), in order to replicate their research design. For each business model type item, a 4-point Likert scale was used, which was coded into a standardised score: *Strongly agree* (1), *Agree* (0.75), *Disagree* (0.25), and *Strongly disagree* (0). After coding, the scores for each composite scale can be aggregated into an overall business model type score, using equal weights (Mendelson, 2000). This process yields a distinct quantitative measure of business model type. **Table 9** provides an overview of the business model type survey instrument:

Table 9: Business Model Scale Composition

OPERATIONAL MODEL	Strongly Disagree (0.00)	Disagree (0.25)	Agree (0.75)	Strongly agree (1.00)
OE1: Minimises customers total cost by providing reliable products or services at competitive prices	○	○	○	○
OE2: Minimise product expenditures, in particular through process innovation	○	○	○	○
OE3: Emphasise economies of scale with products	○	○	○	○
OE4: Focuses on cost, efficiency and volume	○	○	○	○
OE5: Delivers products and services with minimal difficulty or inconvenience to the customer	○	○	○	○
OE6: Has high expertise in chosen areas of focus	○	○	○	○
OE7: Focus on reducing SG&A costs	○	○	○	○
OE8: Narrow product and service lines	○	○	○	○

PRODUCT MODEL	Strongly Disagree (0.00)	Disagree (0.25)	Agree (0.75)	Strongly agree (1.00)
PL1: Use product- or service-related patents	○	○	○	○
PL2: Produces continuous flow of state-of-the-art products/services with innovative, attractive features	○	○	○	○
PL3: Emphasise growth by acquiring, or merging with R&D intensive firms	○	○	○	○

PL4: Branding and advertising is an important as part of a firm's marketing strategy	○	○	○	○
PL5: Offers new combinations of products, services and information	○	○	○	○
PL6: Relies on trade secrets and/or copyrights	○	○	○	○
PL7: Claims to be a pioneer in its field	○	○	○	○
PL8: Initiate change to which competitors must respond	○	○	○	○

SOLUTIONS MODEL	Strongly Disagree (0.00)	Disagree (0.25)	Agree (0.75)	Strongly agree (1.00)
CI1: Delivers solutions model by segmenting and targeting the market	○	○	○	○
CI2: Tailors the product or service to satisfy specific customer needs within each segment	○	○	○	○
CI3: Is highly customer relationship-driven	○	○	○	○
CI4: Bundles activities within a system that enhances the value of the core products or services	○	○	○	○
CI5: Provides access to complementary products, services and information	○	○	○	○
CI6: Integrates vertical products and services (e.g., after-sales service)	○	○	○	○
CI7: Integrates horizontal products and services (e.g., one-stop shopping)	○	○	○	○
CI8: Is focused on cross-selling of products and services	○	○	○	○

NETWORK MODEL	Strongly Disagree (0.00)	Disagree (0.25)	Agree (0.75)	Strongly agree (1.00)
NF1: Acts as a facilitator between market participants (buyers and sellers)	○	○	○	○
NF2: Gives access to an unprecedented variety and number of market participants and/or goods	○	○	○	○
NF3: Partners have an incentive to maintain and improve their association	○	○	○	○
NF4: Availability and value of complimentary products/services increases as the network expands	○	○	○	○
NF5: Deploys affiliate programmes	○	○	○	○
NF6: The customer value increases as the organisation's network expands (e.g., increases direct access to more resources)	○	○	○	○
NF7: Customers can control use of information	○	○	○	○
NF8: There is an importance of community concept (e.g., community of interest)	○	○	○	○

3.3.2. Assessment of Reliability and Validity

To assess the psychometric properties of a construct, validity and reliability issues must be addressed (Kerlinger, 1986). While some of the reliability and validity issues can be assessed through statistical measurement and analyses (i.e., reliability), others can only be assessed by judgment (i.e., content validity). Of the reliability and validity issues provided in the literature, six are utilised in the current research:

(i) Reliability

(ii) Content validity

(iii) Construct validity

(iv) Conclusion validity

(v) Internal validity

(vi) External validity

Each of the types of reliability and validity is further defined in **Table 10**.

Table 10: Types of Validity and Reliability

Type of validity and reliability	Description
Reliability	Reliability measures the stability of the scale based on an assessment of the internal consistency of the items measuring the constructs (Churchill, 1979). Reliability is the *"degree to which measures are free from error and therefore yield consistent results*" (p.6.) (Peter, 1979)
Content validity	Content validity is the representativeness or sampling adequacy of the content of a measuring instrument (Kerlinger, 1986)
Construct validity	Construct validity is the extent to which a particular item relates to other items consistent with theoretically derived hypotheses concerning the variables that are being measured (Carmines and Zeller, 1981)
Conclusion validity	Conclusion validity refers to the possibility of drawing false conclusions about the presumed relationship between independent and dependent variables (Kerlinger, 1986)
Internal validity	Internal validity is regarded as the approximate truth of cause-effect or causal relationships.
External validity	External validity refers to the extent to which research findings can be generalised to other populations.

The last three of the issues presented above will not be discussed further in this part of the thesis. However, they are considered throughout the research. The emphasis is rather on the first three issues since they relate more directly to the scales utilised in the research.

Since the instrument used in the current research consists mainly of seemingly reliable scales borrowed from other researchers, one could argue that this may strengthen the reliability of the measuring instrument. However, borrowed scales do not necessarily have higher reliability than scales developed for the purpose of the research in question (Churchill and Peter, 1984). Furthermore, research contexts differ, which may have an impact on the reliability of borrowed scales. Hence, despite the reliance on borrowed scales in this research, testing for reliability was still necessary.

Several methods exist for testing reliability, including *test-retest* and *internal consistency*. The latter of these two is the approach followed in the current research. Since Cronbach's (1951) coefficient alpha formula seems to be the most commonly accepted formula for assessing the reliability of multi-item measurement scales (Zott and Amit, 2008), the alpha coefficient was used for assessing the internal consistency of the items measuring the constructs. This formula determines the mean reliability coefficient for all possible ways of splitting a set of items in half (Peter, 1979). If adequate coefficient alpha values are obtained the scales are considered to exhibit sufficient reliability. Since the current research can be categorised as preliminary research, **0.7 is used as a threshold value for acceptance**. This is in accordance with the recommendation made by Nunnally (1978).

While reliability measures the stability of the scale, validity is the degree to which a scale measures the construct it is intended to measure. Particular attention has been paid to the validity of the business model scales in the current research since the whole interpretative framework can collapse on this point alone (Kerlinger, 1986). Content and construct validity (especially the latter) have been pointed out as particularly important in scientific research (Kerlinger, 1986). Content validity can be assessed by proper selection of items that measure the construct and subject them to various stages of pre-testing and pilot testing (Kerlinger, 1986).

3.4. MEASURING FIRM PERFORMANCE

3.4.1. Structured Scoring Model

Financial performance is far and away the most utilised measure of firm performance in management research (Brett, 2000). However, new frameworks seem to extend firm performance perspectives beyond traditional financial measures. **Table 11** summarises the different performance perspectives in the literature.

Table 11: Different Performance Perspectives

"Economic Returns" performance perspective	**"Survival" performance perspective**	**"Excellence" performance perspective**
Total Revenue	Sales Growth Rate	Size
Earnings before Interest and Tax	Market Share Growth Rate	Innovative Capability
Operating Profits	Industry Growth Rate	Bias for Action
Market Share	Selling Intensity	Customer Orientation
Working Capital	Advertising Intensity	Autonomy
Return on Revenue	Asset Intensity	People Productivity
Asset Turnover	Functional Dissimilarity	Concentration
Return on Asset	Product Relatedness	Simplicity of Form
Return on Sales	Firm Size	Loose-tight Authority
EBIT/Asset ratio	Firm Liquidity	Lean Staff
Retained Earnings/Asset ratio	Firm Diversity	Value Orientation
Return on Invested Capital	Acquisitive	People Orientation
Net Present Value	R&D Intensity	Process Orientation
Internal Interest	Seller Concentration	Facts Orientation
Asset Growth	Altman Z-score	Variability Orientation
Sales Growth	Syspan PAS-score	Responsibility Orientation
Market Return	Control Intensity	Coping Capability
Return on Capital Employed	Emergency Preparedness	Commitment Capability

Asset Valuation	Brands Intensity	Condition Capability
Capitalisation of Costs	Behaviour change	Communication Capability
Depreciation	Organisational Structures	Stretch Capability
Goodwill	Techno-culture	
Added Value	Climate	
Working Capital / Asset Ratio	Interpersonal Style	

Adopted from Brett (2000, p.184-185)

"Economic Returns" performance

The "economic returns" performance perspective rests on the use of simple outcome-based financial indicators for the assessment of firm performance. According to Venkatraman and Ramanujam (1986), this approach represents the narrowest conception of firm performance and assumes the dominance and legitimacy of financial goals in a firm's system of goals.

Despite their frequent use in research, measurements of performance rooted in financial accounting are often criticised. The problems related to such an approach are: (i) scope of accounting manipulation, (ii) undervaluation of assets, (iii) distortion due to depreciation policies, inventory valuation and treatment of certain revenue and expenditure items, (iv) differences in methods of consolidating accounts, and (v) differences due to lack of standardisation in international accounting conventions (see: Chakravarthy (1986), Wooldridge and Floyd (1989). Others argue that improvement efforts are often not reflected in improved financial performance (Rai et al., 1997).

"Survival" performance

The "survival" school of thinking rests on the idea that firms cannot afford to only focus on tasks of internal adjustments while ignoring change processes that deal with adaptation to the environment and anticipation of the future (Brett, 2000). Still, a focus on the relationship between economic performance and "survival" is evident in many studies. The bankruptcy model (see: Altman (1971), Argenti (1976)) is perhaps the most known "survival" performance model based on such a focus. Here the emphasis is placed on financial indicators other than pure profitability measures. The bankruptcy model, which has been extensively tested, consists of a multiple discriminant function based on financial ratios called the Z-factor (Altman, 1971). It was initially constructed to predict bankruptcy, but the Z-factor can also be used to measure

a firm's overall well-being (Chakravarthy, 1986). The distance from bankruptcy has, for example, been proposed as an index for measuring organisational performance (Chakravarthy, 1986).

"Excellence" performance

Of the three firm performance perspectives, the "excellence" perspective is certainly the one that focuses most on aspects of the process. An important reason is the great danger in categorising a company as excellent on the basis of financial performance alone (Carroll, 1983). As Ramanujam and Venkatraman (1988) note, excellence and financial performance do not appear to be synonymous. They further argue that excellence typifies an approach to management and is an aspect of "process", while financial performance is a reflection of outcomes.

A main point is that financial and/or equity measures ignore "*the ability of the firm to transform itself to meet future challenges* (p.450)" (Chakravarthy, 1986). This argument is supported by Evans and Wurster (1997) who claim that the true discriminators of "excellence" are the performance measures that help evaluate the quality of the firm's transformations.

In addition to measuring financial performance (or outputs), researchers have therefore also found it necessary to emphasise non-financial aspects of performance that are viewed as enablers to future performance. Among these are indicators such as *innovative capability*, *customer orientation*, *bias for action*, *people orientatio*n, *people productivity*, and p*rocess orientation* among others. The stream of "excellence" performance research can as such be distinguished by its focus on the "*level or intensity of initiatives (enablers) made to assess, define, implement, and control pro- social organisational improvement behaviou*r (p.184)" (Brett, 2000), rather than on the absolutes of firms' financial performance, thereby making excellence research more action-oriented (process) than end-result oriented (output/outcome).

Randomness in performance

However, there is a fourth source of firm performance – *randomness*. According to Henderson et al. (2012), randomness can be misleading in the study of sustained superior performance because researchers can mistakenly perceive patterns in random data leading to false statements in order to explain historical results. Being fooled by randomness is a particular concern when researchers select the dependent variable to identify top performers for study (see: Collins and Porras (1994), Joyce et al. (2003)). Almost all case analyses, whether

published in academic journals or books such as *In Search of Excellence* (Peters and Waterman, 1982), *Built to Last (Collins and Porras, 1994)*, *Good to Great* (Collins, 2001), and *What Really Works* (Joyce et al., 2003), implicitly assume that most if not all firms with performance above some specified level have achieved that success by virtue of some form of superior management.

To address the issue of randomness, Henderson et al. (2012) benchmarked how often a firm must perform at a high level in order to ascertain a firm's performance. They aimed to differentiate measurable success from a false positive that would routinely occur in a large population of identical companies whose performances change over time due to a stochastic process. The authors defined unexpected sustained superiority as a firm's ability to achieve a highly ranked focal outcome (e.g., top 10 per cent return on assets in the industry) often enough across the firm's observed life to rule out, as a complete explanation of the firm's performance. The central research question of Henderson et al. (2012) asked was "*if a firm is observed for 15 years, how often must its ROA be in the top 10 – 20 per cent of the population to be confident that its performance is not a false positive*?" (p.388). For any of a number of performance measures, percentile ranks were used to translate the actual performance of a company (e.g., return on assets) into relative terms. For example, each company's ROA (e.g., 4.3 per cent) in absolute terms is expressed in percentile ranks (e.g., 74 per cent). Henderson et al. (2012) made two interesting conclusions from their research:

(i) For both top-10 per cent and top-20 per cent outcomes, there were many more sustained superior performers than expected. This lends encouragement to theories of sustained advantage, such as the resource-based view and research on dynamic capabilities, as well as for the current research.

(ii) Firms potentially change their performance every year. However, some firms, once they land in a performance state or percentile rank, '*dwell'* there for a number of years before making another random draw that potentially changes their performance. Assessing the length of dwell time, the authors found that Poisson distributed periods, which average 4.3 years, provided a sufficient explanation for the firm's unexpected sustained superiority.

In keeping with prior studies on business model performance (see: Weill et al. (2005), Zott and Amit (2008), Bornemann (2009)), it was decided for the current research to anchor firm performance in the economic returns school and measure performance on an annual basis using two economic return performance measures: *profitability* and *growth*. To address the issue of randomness and false positives, it was also decided to use annual percentile ranks to measure firms on their relative performance for **minimum five years**, as per findings from Henderson et al. (2012).

Profitability. A firm's ability to generate profit determines its solvency. However, simply measuring the value of profit could be misleading, hence, in the current research profitability is measured as a ratio of income to the value of all of the assets (return on assets or ROA).

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

Growth. Where profitability measures the level a firm has achieved instead of the change it has experienced, growth is a different story. Organisations that merely 'stay big' are different from those that continue to grow. Consequently, *growth in revenue* is the relevant measure.

$$Revenue\ growth = \frac{Revenue\ (t)}{Revenue\ (t-1)}$$

Performance percentile calculation. This approach offers considerable flexibility in the ways that performance percentiles are calculated. The algorithm uses performance data, so values of the chosen performance measure are pooled across all companies in a given year in the sample and then chunked into percentile rankings that range from 1 (lowest) to 100 (highest).

3.4.2. Control Variables

Firm Size

Organisational size has been one of the most frequently examined control variables in the study of organisational performance. It is included in the empirical model as a control variable because of its widely recognised influence on performance (see: Slater and Narver (1994), Greenley (1995)). Hence, in the testing of the empirical model, this variable will control for size-related performance benefits. A positive relationship between the size of the business

and firm performance is expected. A number of potential measures for measuring firm size have been identified for use in the current research. These measures are shown in **Table 12.**

Table 12: Potential Measures for Firm Size

Measure	Description	Scale	References
Business size	Average annual sales	Ratio scale – absolute number	Haynes et al. (1998), Teo (2003)
Organisation size	Number of employees in the organisation	Ratio scale – absolute number	Haynes et al. (1998), Teo (2003), Saini and Johnson (2005)
Relative size	The size of the business relative to that of its largest competitor	Itemised rating scale - measured subjectively and in a relative sense on a ranging from "one of the largest" to "one of the smallest."	Slater and Narver (1994), Farrell and Oczkowski (1997)

As shown in **Table 12**, two different approaches for measuring firm size are evident. One approach is to measure size in the absolute sense, collecting data about the company's annual sales or number of employees. The advantage of such an approach (I would clarify the approach with a name here) is, except for the ratio-scale measurement properties of a given firm, the opportunity for researchers to group companies into different size categories, for instance, micro and small and medium-sized enterprises (SMEs).

A second approach is to measure firm size subjectively and in a relative sense. Such measures rely upon the researcher's assessment of the company's size relative to its largest competitor. Measuring firm size in a relative sense would not only increase the likelihood of obtaining size-related data, but it is also a more legitimate measure when controlling for scale advantages.

As financial data was collected in this research, the business size was used as the measure of firm size.

Firm Age

Firm age may influence performance (Baum et al., 2000). Established firms may have a first-mover advantage in obtaining sustained superior performance (Barney, 1991) or, alternatively, newly established companies could enhance their initial performance by forming

alliances with established rivals that provide access to diverse information and capabilities with minimum operational costs and provide more opportunities for learning and less risk of intra-alliance rivalry (Baum et al., 2000). **Therefore, it was decided to include firm age as a control variable and measure it by number of years that the firm had been established**.

Environmental Uncertainty

The positive performance impact of co-alignment between the environment and strategy of a business is an important theoretical proposition in strategic management (Venkatraman and Prescott, 1990). Ronda-Pupo et al. (2012) found that the terms 'firm', 'environment,' 'actions' and 'resources' make up the nucleus of the definition of strategy. In their own definition of strategy, the link between the environment on one side and the firm's actions on the other side is spelled out: *"the dynamics of the firm's relation with its environment for which the necessary actions are taken to achieve its goals and/or to increase performance by means of the rational use of resources"* (p.180). Furthermore, the temporal focus tends to be different in different environments. In stable environments, developments are predictable, and therefore a focus on the distant future is possible. In dynamic environments, the focus tends to be more in the near future, as continuous changes make long-term developments difficult if not impossible to foresee.

The link between the environment and strategy also plays an important part of Mintzberg's (1979) configuration theory. Mintzberg defines a set of *contingency factors* that can be used to characterise an organisation's context or environment. These factors include an organisation's *size, age*, *attributes of its environment* and *technology*. Mintzberg postulates that in order to be maximally effective, organisations must have gestalts that are internally consistent (design factors) and fit multiple contextual dimensions (contingency factors). Porter (1980) developed eight generic environments, which serves to isolate a set of distinct relatively homogeneous contexts for testing the proposition of performance impacts of an environment-strategy fit. In their research on coalignment between environment and strategy, Venkatraman and Prescott (1990) expand on Porter's (1980) environments and define eight generic environments: *global exporting, fragmented*, *stable*, *fragmented with auxiliary services*, *emerging*, *mature*, *global importing*, and *declining*.

In his empirical research of business models and firm performance, Bornemann (2009) note that the explanatory power of the business model increases when integrating environmental moderators, stressing the importance of integrating contingencies in the business model design

for firm performance. Bornemann used a number of environmental environments such as *environmental uncertainty* and *competitive intensity of the environment*.

In their empirical test of the business model and firm performance, Zott and Amit (2008) used a number of control variables including the *age* and *size* (i.e., the number of employees) of the firm. They also controlled for additional dimensions of a firm's strategy, such as the *mode of market entry* and its *product and market scope*. On the industry level of analysis, Zott and Amit controlled for the *degree of competition* and *estimated market size*. Their study points to the need to investigate competition among various business models within an industry in addition to considering product market competition. Such rivalry on a business model level may have implications both for the wealth creation potential of a given business model and for value capture by the focal firm (Zott and Amit, 2008). Klepper (1997) and Geroski (2003) also cover degree of competition in their research and use *industry growth* as a proxy for the intensity of competition.

Since research demonstrates that environmental uncertainty may have an effect on a firm's performance, this environmental contextual factor is one of the variables that is controlled for in the current research when analysing the effects of the business model types on a firm's performance. **Environmental uncertainty will be measured on Miller and Droge's (1986) scales**. The five dimensions that will be measured are (i) volatility in marketing practices, (ii) product obsolescence rate, (iii) unpredictability of competitors, (iv) unpredictability of demand and tastes, and (v) change in production or service modes. On each of these 1 to 5 scales, high numbers indicated high uncertainty. For example, in the marketing practices uncertainty scale, "1" is associated with the statement *"our firm must rarely change marketing practices to keep up with the market competitors,"* while "5" was associated with the statement *"our firm must change its marketing practices extremely frequently (e.g., semi-annually)."* The mean of these five items will be taken to represent overall environmental uncertainty.

The relative cost position of a company compared to its largest competitor in its principal served market segment, as defined by Slater and Narver (1994), was also considered as a control variable. However, as one of the dependent variables is *Return on Assets* where the cost is an input factor, the risk of tautology was considered high, and for that reason, the relative cost position was excluded from the analysis.

3.5. SUMMARY

This chapter has discussed the selection of the research construct and base instruments that were used in the research. These can be summarised as follows:

Table 13: Summary of Research Construct

Construct	Measures	Main references
Dependent Variables: **1. Profitability (ROA)** **2. Revenue Growth**	**Percentile ranks** measuring firms on their relative annual performance for a period of minimum five years. Aggregated overall average score using equal weights.	Henderson et al. (2012)
Independent Variables: 1. **Business model items**	**32 items,** measured on a 4-point Likert scale and with a standardised score: - Strongly agree (1) - Agree (0.75) - Disagree (0.25) - Strongly disagree (0). (see **Table 6** for details of the 32 items)	Zott and Amit (2008), (Libert et al., 2014)
Control Variables: **1. Firm size** **2. Firm age** **3. Environmental uncertainty**	**Firm size**: Business size in terms of latest annual revenue. **Firm age:** Age since foundation of current entity and 2013. **Environmental uncertainty**: Measured as the mean of five dimensions, using 1 to 5 scales: - Volatility in marketing practices - Product obsolescence rate - Unpredictability of competitors - Unpredictability of demand and tastes - Change in production or service modes	Haynes et al. (1998), Teo (2003) Zott and Amit (2008) Miller and Droge (1986)

CHAPTER 4 SAMPLE SELECTION AND DATA COLLECTION METHODS

In this chapter, the sample selection procedures are outlined and discussed. The sample selection involved defining the attributes of the required sample, identifying potential companies and recording these in a database. Based on the sample selection, it was decided that to use a multi-stage approach. Once the final list of sample companies was completed, data for each sample company was collected through a triangulation approach consisting of internal business model profiling, which involved using secondary data, an external executive survey, and an expert survey with Partners and Directors from Deloitte Consulting.

The chapter is divided into two main parts:

1. The first part outlines the sample selection, including sample size considerations and sample selection criteria.
2. The second part covers the data collection methods and describes how three different data points were used for each company in the sample to build a comprehensive view of the business models.

4.1. SAMPLE SELECTION CRITERIA

4.1.1. Sample Size Considerations

Since the size of the sample has a direct impact on the appropriateness and the statistical power of the statistical techniques to be used, such as factor analysis (Nunnally, 1978), it is necessary to address issues affecting the size of the required sample. Hair et al. (2010) argue that sample size affects the generalisability of the results by the ratio of observations to independent variables. If multiple regressions are to be employed as a statistical technique, Hair et al. (2010) recommend that, as a general rule, the subject to item ratio should be 5:1 minimum. The desired level is, on the other hand, between 15 to 20 observations for each independent variable (Hair et al., 2010). This would, according to Hair et al. (2010), make the results generalisable if the sample is representative (see also (Bartlett et al., 2001). In comparison, Bartlett et al. (2001) suggest that the ratio should be 10:1. Applying the general rule provided by Hair et al. (2010), the four independent business model types used in this research would require at **least 60 firms** to achieve the desired sample size.

According to Peter (1979), sampling error provides the opportunity to take advantage of chance. He states that such opportunities are related positively to the number of items in a multi-item scale and related negatively to the number of subjects. As such, Peter (1979) refers to Nunnally (1978) who suggests a useful guideline related to sample sizes for factor analysis. For any type of item analysis (or multivariate analysis) there should be at least ten times as many subjects as items, or in cases involving a large number of items, at least five subjects per item (Nunnally, 1978). Utilising this approach, when undertaking the sampling for this research, each business model variable was provided with eight items in the scale (32 variables in total). This means that based on Nunnally's five subjects per item recommendation, a minimum of 160 observations was needed. When it comes to the use of factor analysis, Bartlett et al. (2001) also argue that such analysis should not be done with less than 100 observations. Hair et al. (2010) give a more moderate recommendation when they argue that "*the researcher would generally not factor analyse a sample fewer than 50 observations, and preferably the sample size should be 100 or larger"* (p.98).

Another recommendation made in the literature is that the required sample should be at least twice as high as the number of items relating to the independent variables and the dependent

variable (aggregated) used in the statistical analysis (Hair et al., 2010). In the current study, the number of items involved is maximum 32 items which gives a required sample of at least 62.

Based on the above recommendations, the targeted number of firms to be included in the current research was 100.

4.1.2. Sample Selection Criteria

To select the relevant sample set, three main criteria were imposed on firms in order to be included in the research:

i. A Consumer Goods company (SIC 2011 to 2099)

ii. Annual revenues greater than USD ($) 1 billion

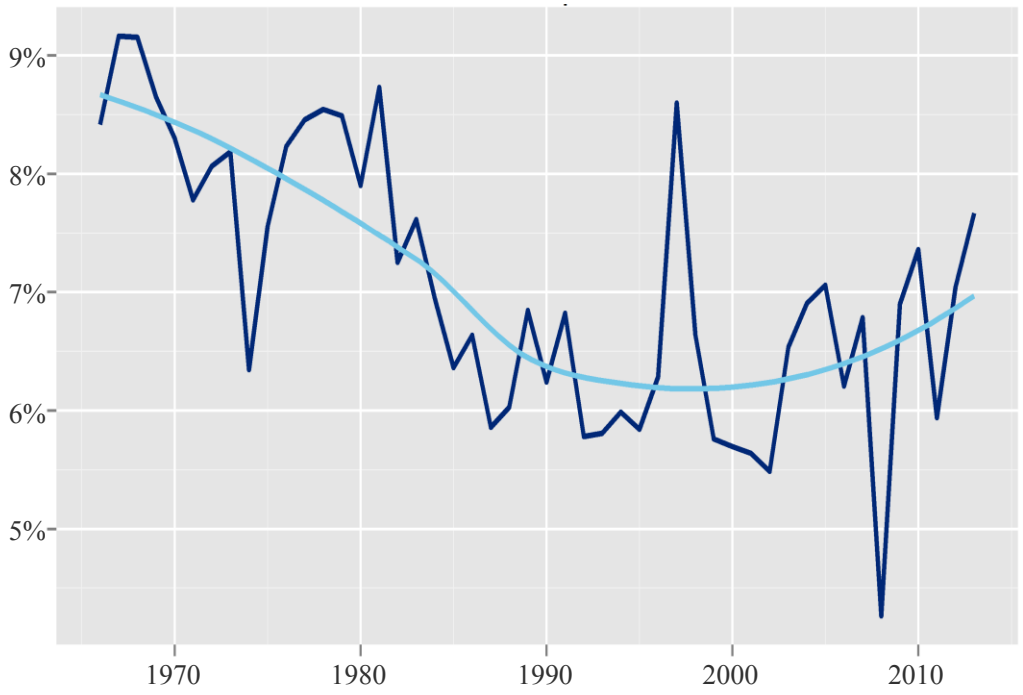
iii. Listed on a major US or European stock exchange

iv. At least five years old (due to the chosen percentile ranking methodology explained in Chapter 7)

(i) Consumer Goods company (SIC 2011 to 2099)

The Consumer Goods industry was selected as the relevant industry, as this researcher has prior experience in the industry, having worked for Kraft Foods and Pepsico, and consulted to leading Consumer Goods companies. According to a leading global market research company, the global retail value of the Consumer Goods industry was USD 5.9 trillion in 2013 (Euromonitor, 2015), making it one of the largest industries in the world. However, the Consumer Goods industry has experienced declining Asset Profitability over the past 40 years, as illustrated in **Figure 7**. The aggregate Return on Assets (ROA) of US firms fell from its high of 9 per cent in 1966 to around 7 per cent in 2013. To increase, or even maintain, asset profitability, Consumer Goods firms must find new ways to generate value from their assets.

Figure 7: Return on Assets for Consumer Goods Companies (1965-2013)



Source: Data from Compustat

In 2013, there were 2,238 Consumer Goods companies listed on public stock exchanges across the world (CapitalIQ, 2015).

(ii) Annual revenues greater than USD ($) 1 billion

It was decided only to include Consumer Goods firms with annual revenues greater than USD one billion, as these companies are more likely to have multiple business models for different parts of the business. For example, Unilever, with annual revenues of USD 62 billion in 2013, has four different businesses (Refreshment, Personal Care, Home Care, and Foods).

Consumer Goods companies with annual revenues greater than USD one billion accounted for 15 per cent of all publically listed companies, or 338 companies, in 2013.

(iii) Listed on a major US or European stock exchange

For practical reasons, it was decided to only focus on Consumer Goods companies listed on a major US or European stock exchange. This was done mainly due to filing requirements and language barriers. The final list of US and European stock exchanges

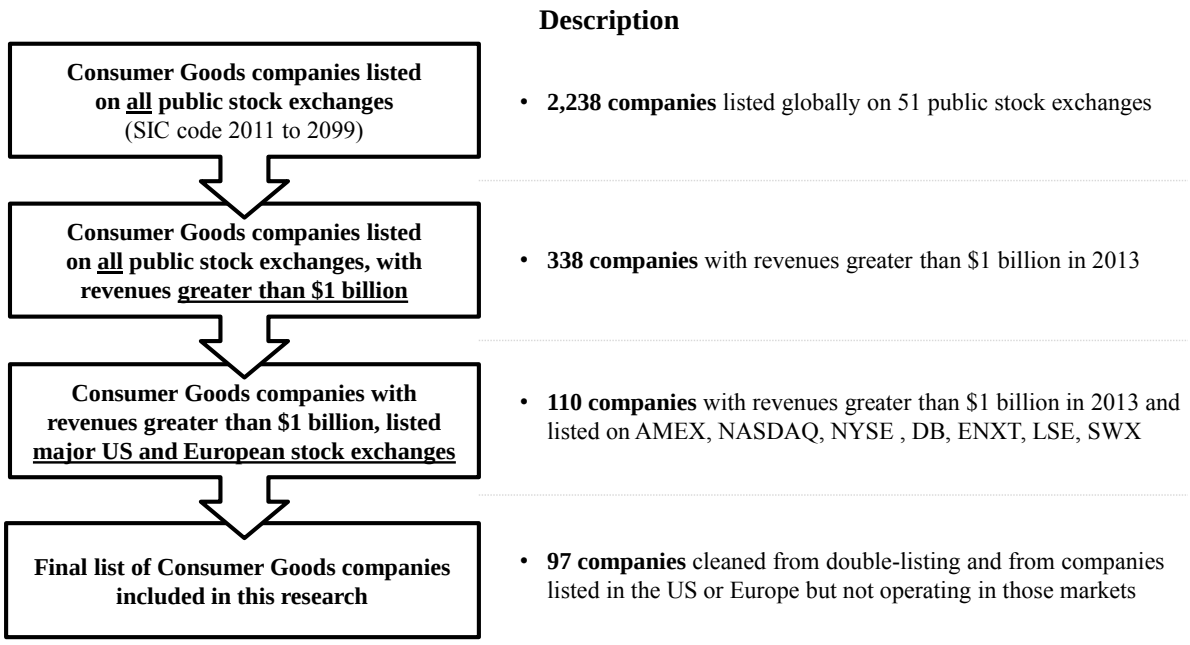
included AMEX, NASDAQ, NYSE in the USA, and DE, ENXT, LSE and SWX in Europe. In 2013, there were 110 Consumer Goods companies with annual revenues greater than USD one billion, listed on the above-listed stock exchanges.

The list of 110 Consumer Goods companies was cleansed to remove: (i) double-entries (e.g., Unilever is listed both on LSE and ENXT); (ii) companies that are listed in either the US or Europe, but are not operating in those markets (e.g., Industrias Bachoco S.A.B. de C.V. listed on NYSE, but operating in Mexico); and (iii) companies that were subsequently acquired by another company (e.g., The Gillette Company acquired by The Procter & Gamble Company). The final list of Consumer Goods companies included in the research is 97, and is in line with the recommended number of firms, as outlined in section 4.1.1.

4.2. SAMPLE SELECTION APPROACH AND RESULTS

The sample selection proceeded in four stages, as illustrated in **Figure 8**.

Figure 8: Data Collection Approach



The final selection of 97 Consumer Goods companies represents four per cent of the total

universe. The representation across different industry sectors varies with the highest representation in Household Products and Meat Processing (17 per cent of all companies listed), and with the lowest representation in Beverages (3 per cent) and Packaged Foods & Meats (4 per cent).

Table 14: Companies Represented by Industry Sector

Sector	**All Companies Listed**	**All Companies with Revenues +$1B**	**All Companies with Revenues +$1B and listed on Major US/European Stock Exchanges** (% of All)
Personal Care	320	39	21 (7%)
Household Products	100	29	17 (17%)
Meat Processing	48	31	8 (17%)
Packaged Foods & Meats	1,392	64	53 (4%)
Beverages	378	64	11 (3%)
Total	**2,238**	**338**	**110**

4.2.1. Summary of Selected Companies

The final list of the 97 Consumer Goods companies included in the research is presented in **Table 15** and ranked by annual revenues in 2013.

Table 15: Selected Sample Companies (n=97)

Company	Revenues in 2013 ($ million)	Listed on Stock Exchange	Comments
Nestlé S.A.	99,367.1	SWX	
Procter & Gamble Co.	83,320.0	NYSE	
Unilever NV	67,200.0	ENXTAM	Excluded. Used Unilever plc instead
Unilever plc	67,200.0	LSE	
Pepsico, Inc.	66,415.0	NYSE	
The Coca-Cola Company	46,854.0	NYSE	
Anheuser-Busch InBev SA/NV	39,758.0	ENXTBR	
Mondelez International, Inc.	35,015.0	Nasdaq	
Tyson Foods, Inc.	33,351.0	NYSE	
L'Oreal SA	29,411.1	ENXTPA	
Danone	27,324.4	ENXTPA	
Heineken Holding NV	24,069.4	ENXTAM	Excluded. Used Heineken NV instead
Heineken NV	24,069.4	ENXTAM	
Henkel AG & Co. KGaA	21,617.0	DB	
Kimberly-Clark Corporation	21,063.0	NYSE	
Associated British Foods plc	18,833.3	LSE	
Kraft Foods Group, Inc.	18,339.0	Nasdaq	
General Mills, Inc.	17,429.8	NYSE	
SABMiller plc	17,120.0	LSE	
Colgate-Palmolive Co.	17,085.0	NYSE	
Diageo plc	16,976.4	LSE	
Reckitt Benckiser Group plc	14,706.0	LSE	

ConAgra Foods, Inc.	14,227.5	NYSE	
Kellogg Company	14,197.0	NYSE	
Smithfield Foods, Inc.	13,109.6	NYSE	
H. J. Heinz Company	11,691.5	NYSE	
Dean Foods Company	11,462.3	NYSE	
The Gillette Company	11,179.0	NYSE	Excluded. Acquired by P&G.
Pernod-Ricard SA	11,139.8	ENXTPA	
Coca-Cola FEMSA	11,113.0	NYSE	
Avon Products, Inc.	10,717.1	NYSE	
Suedzucker AG	10,205.8	DB	
The Estée Lauder Companies, Inc.	9,981.9	NYSE	
Hormel Foods Corporation	8,307.5	NYSE	
Pilgrim's Pride Corporation	8,121.4	Nasdaq	
Campbell Soup Company	8,103.0	NYSE	
Beiersdorf AG	7,908.3	DB	
Coca-Cola Enterprises, Inc.	7,600,0	NYSE	
The Hershey Company	6,644.3	NYSE	
Seaboard Corp.	6,189.1	AMEX	
The J. M. Smucker Company	5,913.4	NYSE	
ARYZTA AG	5,714.2	SWX	Excluded. Dual listing on ISEQ
SCA Hygiene Products SE	5,647.7	DB	Outside SIC codes (pulp & paper)
Newell Rubbermaid, Inc.	5,693.0	NYSE	
The Clorox Company	5,605.0	NYSE	
Bongrain SA	5,347.4	ENXTPA	
Barry Callebaut AG	5,135.5	SWX	Outside SIC codes (cocoa production)

Tate & Lyle plc	4,886.6	LSE	
Constellation Brands	4,870.0	NYSE	
Energizer Holdings, Inc.	4,561.6	NYSE	
Harbinger Group Inc.	4,537.0	NYSE	Outside SIC codes (electronics)
Ralcorp Holdings, Inc.	4,322.2	NYSE	
Dole Food Company, Inc.	4,246.7	NYSE	
Molson Coors Brewing Company	4,206.0	NYSE	
Kimberly-Clark Tissue Company	4,115.1	NYSE	Excluded. Part of Kimberly Clark Corp.
Hillshire Brands Company	4,088.0	NYSE	
Herbalife Ltd.	4,072.3	NYSE	
McCormick & Company, Inc.	4,041.9	NYSE	
Green Mountain Coffee, Inc.	4,040.0	Nasdaq	
Mead Johnson Nutrition Company	3,901.3	NYSE	
L.D.C. S.A.	3,658.2	ENXTPA	Excluded. Operating in Ukraine.
D.E Master Blenders 1753 N.V.	3,625.9	ENXTAM	
Brown-Forman	3,614.0	NYSE	
Fromageries Bel	3,468.4	ENXTPA	
Unibel S.A.	3,468.0	ENXTPA	
Spectrum Brands Holdings, Inc.	3,273.9	NYSE	
Industrias Bachoco S.A.B. de C.V.	3,253.7	NYSE	Excluded. Operating in Mexico.
Emmi AG	3,208.6	SWX	Excluded. Operating in Switzerland.
Chiquita Brands International Inc.	3,078.3	NYSE	
NBTY, Inc.	3,073.8	NYSE	

Flowers Foods, Inc.	3,046.5	NYSE	
Church & Dwight Co., Inc.	2,921.9	NYSE	
Chocoladefabriken Lindt & Spruengli AG	2,883.8	SWX	
Bell AG	2,699.7	SWX	Excluded.
Premier Foods plc	2,699.6	LSE	
Rubbermaid Incorporated	2,511.1	NYSE	
Beam, Inc.	2,460.0	NYSE	
Pinnacle Foods Inc.	2,478.5	NYSE	
Sanderson Farms, Inc.	2,464.0	Nasdaq	
Bonduelle SA	2,444.0	ENXTPA	
Dairy Crest Group plc	2,430.6	LSE	
Wella AG	2,306.7	DB	Excluded. Acquired by P&G.
A. Moksel AG	2,293.7	DB	Excluded. Gone private.
Benckiser N.V.	2,291.9	ENXTAM	Excluded. Duel listing with Reckitt Benckiser Group plc.
The WhiteWave Foods Company	2,289.4	NYSE	
Treehouse Foods, Inc.	2,182.1	NYSE	
Nu Skin Enterprises Inc.	2,169.7	NYSE	
Monster Beverage Corporation	2,060.7	Nasdaq	
Britvic plc	1,931.3	LSE	
Greencore Group plc	1,786.1	LSE	
Central Garden & Pet Company	1,690.4	Nasdaq	
Hudson Foods, Inc.	1,665.1	NYSE	Excluded. Acquired by Tyson Foods.
Alberto-Culver Company	1,663.0	NYSE	
Zhongpin, Inc.	1,639.6	Nasdaq	Excluded. Operating in China.

Snyder's-Lance, Inc.	1,618.6	Nasdaq	
Coca-Cola Bottling Co. Consolidated	1,614.4	Nasdaq	
Fort Howard Corporation	1,586.8	Nasdaq	Excluded. Acquired by Georgia Pacific.
Hilton Food Group plc	1,584.8	LSE	
OJSC Cherkizovo Group	1,581.7	LSE	Excluded. Operating in Russia.
The Hain Celestial Group, Inc.	1,541.7	Nasdaq	
Marionnaud Parfumeries SA	1,524.6	ENXTPA	Excluded. Majority retail business.
Rémy Cointreau SA	1,501.8	ENXTPA	
OAO SUN InBev	1,475.3	DB	Excluded. Acquired by AB InBev.
Revlon, Inc.	1,426.1	NYSE	
MHP S.A.	1,407.5	LSE	Excluded. Operating in Ukraine.
The Dial Corporation	1,344.9	NYSE	
PZ Cussons plc	1,321.5	LSE	
Elizabeth Arden, Inc.	1,317.3	Nasdaq	
Clarins S.A	1,307.5	ENXTPA	Excluded. Taken private.
Cranswick plc	1,299.7	LSE	
Seneca Foods Corp.	1,275.8	Nasdaq	
Helene Curtis Industries	1,255.2	NYSE	Excluded. Acquired by Unilever.
Cal-Maine Foods, Inc.	1,237.4	Nasdaq	
SSL International plc	1,233.6	LSE	
First Brands Corporation	1,225.7	NYSE	Excluded. Acquired by Clorox.
McBride plc	1,182.1	LSE	
Amway Japan G. K.	1,167.3	NYSE	Excluded. Operating in Japan.
Lancaster Colony Corporation	1,162.2	Nasdaq	
Herbalife International, Inc.	1,067.1	Nasdaq	

4.3. CODING OF SAMPLE COMPANIES

To control for the position of the company in the industry alongside environmental uncertainty, each company in the sample was tagged with four specific pieces of information:

(i) Industry sector,

(ii) Firm size (as measured by annual revenues),

(iii) Firm age (as measured by the number of years since establishment to 2013), and

(iv) Perceived environmental uncertainty for the specific industry sector.

(i) Industry Sector

Each company in the sample was grouped into one of five main industry sectors:

(i) Personal Care

(ii) Household Products

(iii) Meat Processing

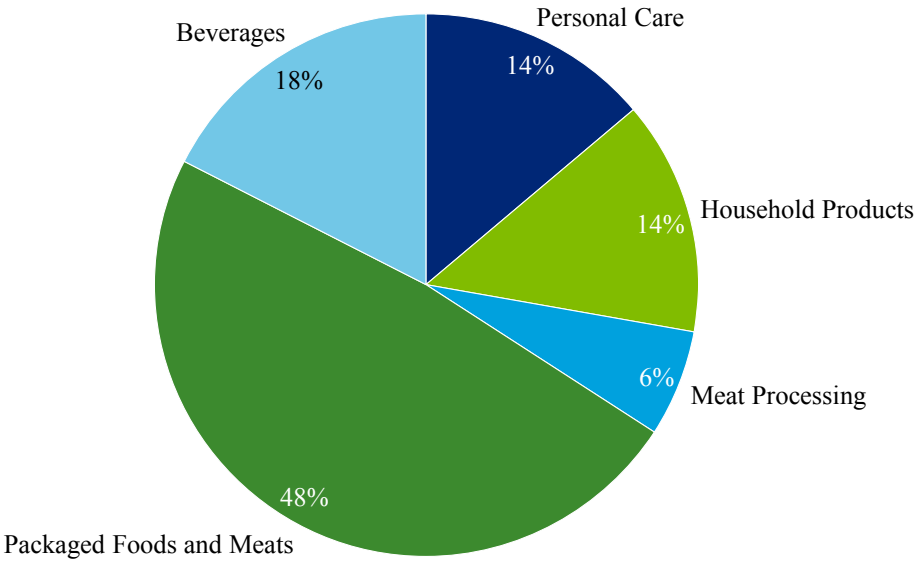
(iv) Packaged Foods & Meats

(v) Beverages

In cases where a company operated in multiple industry sectors, each separate operation was still grouped into one of the above five sectors. For example, in 2013 Unilever operated in Personal Care, Household Products, Packaged Foods & Meats, and Beverages.

The classification by industry sector showed an uneven split, with the majority of companies in the Packaged Foods and Meats category (48 per cent). The second largest industry sector was Beverages with 18 per cent of companies.

Figure 9: Number of Companies by Industry Sector



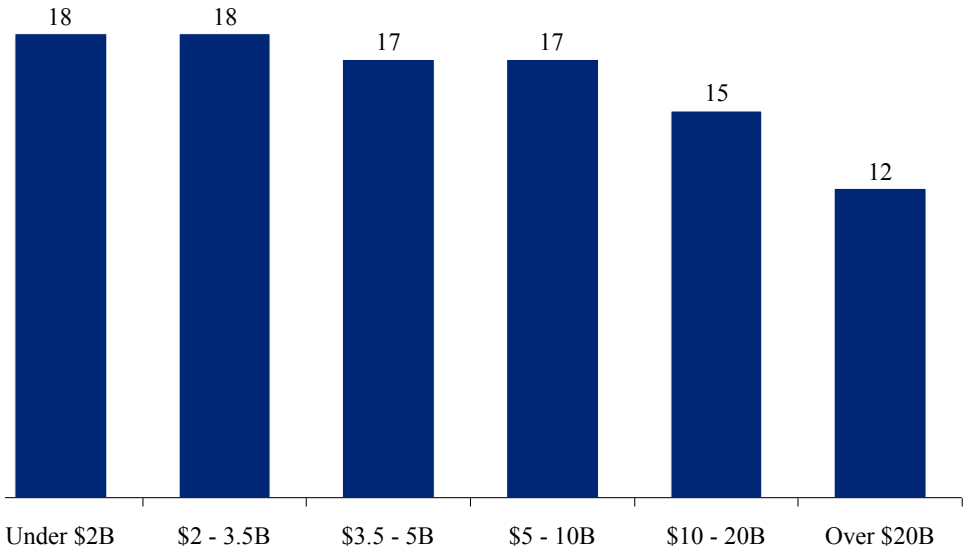
(ii) Firm Size

The following classification was used to group firms into annual revenue bands, based on their 2013 annual revenues:

1. Annual revenues less than USD 2 billion
2. Annual revenues between USD 2 and 3.5 billion
3. Annual revenues between USD 3.5 and 5 billion
4. Annual revenues between USD 5 and 10 billion
5. Annual revenues between USD 10 and 20 billion
6. Annual revenues greater than USD 20 billion

The revenue classification produced a relatively even split of the companies by annual revenue bands, as illustrated in **Figure 10**:

Figure 10: Number of Companies by Annual Revenue Bands



(iii) Firm Age

As described in section 4.4.2, the firm age was included as a control variable and was measured by the number of years that the firm had been established. The youngest company in the sample set was D. E. Master Blenders 1753 NV, which was founded in 2012 when it spun off from Kraft Foods. The oldest company in the sample set was The Colgate-Palmolive Company that was founded in 1806, when William Colgate started a starch, soap and candle business on Dutch Street in New York City. The firm age quintiles by industry sector are presented in **Table 16**.

Table 16: Number of Companies in each Firm Age Quintile

Sector	1-20 years	21-50 years	51-90 years	91-120 years	+ 120 years
Personal Care	1	2	4	2	4
Household Products	1		2	5	4
Meat Processing	2	2	4	1	1
Packaged Foods & Meats	10	9	6	10	7
Beverages	5	5	2	2	4
Median Age	**5.0**	**34.5**	**77.0**	**107.5**	**144**
Total	**19**	**18**	**18**	**20**	**20**

(iv) Perceived Environmental Uncertainty

Perceived environmental uncertainty (PEU) was measured through Miller and Droge's (1986) psychometric scale, as discussed in section 4.4.2. The scale measures the degree of change and unpredictability in market-related and technological factors facing the organisation. Individual items comprising the scale are shown in **Table 17**.

Table 17: Variable Scale Items for Perceived Environmental Uncertainty

Statement	1	2	3	4	5	6	7	Statement
Our firm must rarely change its marketing practices	○	○	○	○	○	○	○	Our firm must change its marketing practices extremely frequently (e.g., semi-annually)
The rate at which products are becoming obsolete is very low	○	○	○	○	○	○	○	The rate of obsolescence if very high, as in some fashion goods
Actions of competitors are quite easy to predict	○	○	○	○	○	○	○	Actions of competitors are unpredictable
Demand and consumer tastes are fairly predictable	○	○	○	○	○	○	○	Demand and tastes are almost unpredictable
The production technology is not subject to very much change and is well established	○	○	○	○	○	○	○	The modes of production change often and in a major way

To determine the PEU for each of the five sectors in Consumer Goods industry, a short survey was conducted among Partners and Directors working for Deloitte Consulting in the US and who also serve clients in the Consumer Goods industry. A link to the online survey was emailed to 34 Partners and Directors across the US. 16 Partners and Directors completed the survey in April 2015, representing a response rate of 47 per cent. The results of the survey are presented in **Table 18**.

Table 18: Results for Perceived Environmental Uncertainty

Consider the conditions for the industry sector in which your clients operate. For each item, please answer by selection the number that best approximates the actual conditions of the industry sector.

Statement	1	2	3	4	5	6	7	Statement
Your client must rarely change its marketing practices								Your client must change its marketing practices extremely frequently (e.g., semi-annually)
The rate at which products are becoming obsolete is very low								The rate of obsolescence if very high, as in some fashion goods
Actions of competitors are quite easy to predict								Actions of competitors are unpredictable
Demand and consumer tastes are fairly predictable								Demand and tastes are almost unpredictable
The production technology is not subject to very much change and is well established								The modes of production change often and in a major way
Average Score								

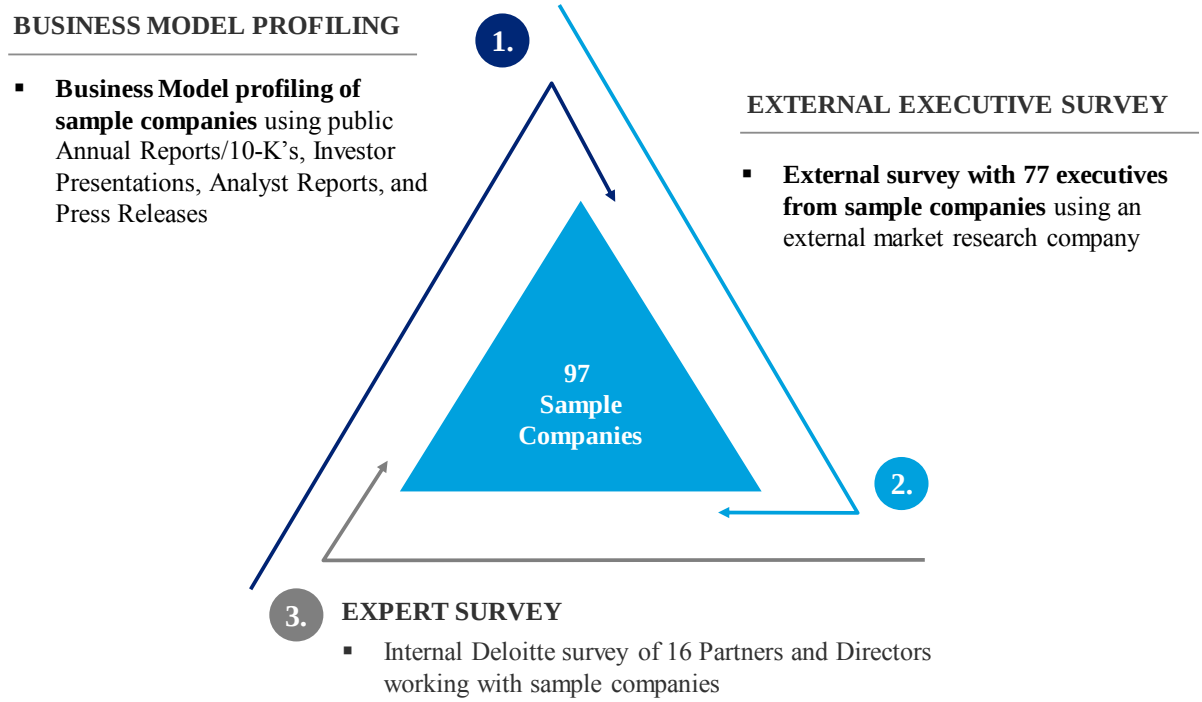
▲ Beverages ● Household Products ◆ Packaged Foods & Meats ⬢ Meat Processing ✚ Personal Care

Each company in the sample was attributed an industry sector PEU score. For companies operating in multiple industry sectors, they were attributed the average score of those industry sectors. For example in 2013, Unilever operated in Packaged Foods and Meats, Personal Care, Household Products and Beverage, and was assigned a "4" PEU score ((4 + 5 + 3 + 4)/4).

4.4. DATA COLLECTION METHODS

To collect data for the 97 Consumer Goods companies in the sample, a triangulation approach was deployed. Firstly, a business model profiling was completed for each company, using public data such as annual reports, investor presentations, analyst reports and press releases. These results were then compared to the findings from an external survey with 77 executives from the sample companies and finally triangulated with the results from a survey with 16 Partners and Directors from Deloitte Consulting.

Figure 11: Data Collection Procedures



4.4.1. Business Model Profiling Done by the Researcher

Using the Business Model scale composition outlined in section 3.3.1, each of the 97 companies in the sample was assessed and rated by the researcher. To collect the data, a Business Briefing package was created for each company, using Factiva's Intelligence Engine™. Factiva's briefing packages rely on 31,000 news and information sources from across 200 countries and are some of the most comprehensive data sources available on public companies.

Each Briefing package contained the following information and data:

1. *Company Snapshot*
    a. Company Overview
    b. Company Structure
2. *Executives and Board*
    a. Board Composition

b. Executive Changes

3. *Current Awareness*

   a. News

   b. Key Developments

   c. Analyst Call Transcripts

   d. Analyst Reports

   e. Earnings Analysis – Thomson

   f. Filings – 10K

   g. Strengths and Weaknesses

4. *Quantitative and Qualitative Risk Factors*

On average, each Briefing package was between 320 and 350 pages, and the data was collected for the period between 1 January 2010 and 19 January 2015. As data was collected for a five-year period, it allowed for collecting time-series data, which are preferable in studies that can draw on secondary sources of data (Bowen and Wiersema, 1999). For each company, it took about one day to understand the business model and to assess the business model. The supporting evidence for the particular score against each of the 32 business model statements was recorded and stored in a database, using Microsoft Access.

Although most companies operate in several business categories with different business models, each company was categorised based on the business model that is used for a significant portion of its business.

4.4.2. External Executive Survey

To compare the internal scores for each of the 32 business model statements, an external survey was conducted between 18 and 25 February 2015. The survey was conducted online and hosted by Gerson Lehrman Group (GLG). GLG is an American expert network that

operates a membership-based platform, providing independent ad-hoc market research services to business professionals around the world. For each Council member in its network, GLG has the entire professional history (curriculum vitae) and has conducted a 45-minute initial screening interview to understand the area of expertise of each member. This researcher's employer, Deloitte Consulting, is a member of the GLG network, and kindly agreed to pay for the external market research with Council members.

Of the 97 Consumer Goods companies in the sample, GLG had at least one Council member, at a Vice President level position or above, in 60 of the firms. In total, there were 201 Council members across those 60 companies. The executives were spread across General Management, Sales & Marketing, Supply Chain, and Strategy & Business Development.

Before launching the survey, three aspects were considered:

(i) Executive level targeted,

(ii) Incentives and rewards, and

(iii) Research ethics and confidentiality.

(i) Executive level targeted

Since the level of the business model theory in the current research is related to strategic dimensions at the firm level, so should the level of measurement. To achieve such conformity, the executive level (Vice Presidents and above) in the organisation was targeted. These executives were asked to make inferences about the business model of their firm.

There were several reasons for selecting the executives as key informants for this research. For studies utilising one respondent per organisation, (Huber and Power, 1985) recommend the person most knowledgeable about the issues of interest to be selected. For the constructs in this research, executives best fulfilled this role. As the survey with these executives was aimed at augmenting the internal business model profiling, the risk of relying on intra-firm respondents for firm-related constructs solely was minimised (see Steinman et al., 2000, Web et al., 2000).

(ii) Incentives and Rewards

Most of the literature reported a consistently positive and significant relationship between incentives and rewards, especially those of monetary nature, and the likelihood of response (see: Kanuk and Berenson (1975), Yu and Cooper (1983), Larson and Poist (2004)). An incentive does not only attract the respondent's attention to the survey at an early phase of the survey response process, but it is in some studies also found to have the best effect on the survey-completion decision process (Helgeson et al., 2002). As the survey for this research was targeted at the executive level, it was agreed with GLG to pay each survey respondent a reward of USD 250 to 300, based on the seniority level (e.g., USD 300 for a senior executive, and USD 250 for a more junior executive). This was deemed a fair compensation by GLG for a 10-15 minute online survey.

(iii) Research Ethics and Confidentiality

On 10 May 2013, an initial Ethic Approval Application was submitted to Henley Business School, covering the original scope of the research. As part of the research ethics procedures, the following rules were implemented:

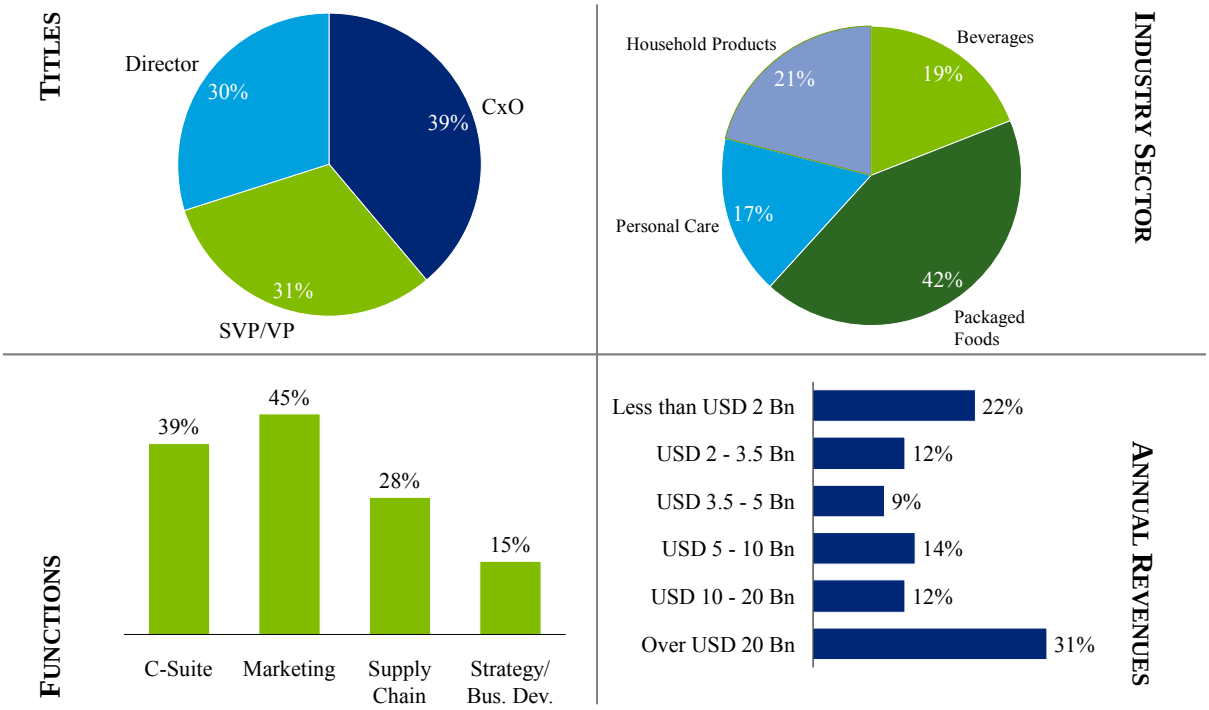
- **Information sheet and consent form**: Before starting the online survey, each respondent had to either agree or decline the consent form. A copy of the consent form is attached in the appendix. After completing the survey, each respondent was sent a 'Thank-You' email with a copy of the consent form.
- **No sharing of individual details**: GLG protected all Council members' personal information. The actual name or email details of each of the respondents were not shared with this researcher.
- **Management of the original data**: to protect the confidentiality of the original data, GLG retained the survey responses and provided a data extract to this researcher for data analysis.

The target for the external survey was 70 completed responses from a selection of the 97 sample companies. In total, 201 Council members across 60 sample companies were contacted and invited to participate in the survey. In the first round, 73 Council members participated. However, three of the responses were incomplete, and the survey was reopened, allowing for

seven additional responses. The final response rate for the survey was 38 per cent. As illustrated in Figure 17, 39 per cent of the respondents were senior executives (c-suite), and 31 per cent were Vice Presidents or Senior Vice Presidents. The balance was made up of Directors. The highest participation came from executives in the Marketing function (45 per cent), followed by General Management (39 per cent), and Supply Chain (28 per cent). Regarding industry sector and company size representation, there was a good distribution of companies compared to the overall sample. 42 per cent of the respondents worked for companies in the Packaged Foods and Meat sector, compared to 48 per cent in the total sample. Household Products companies were slightly over-represented with 21 per cent of the respondents compared to 14 per cent in the total sample. 19 per cent of the respondents worked for companies in the Beverage sector, compared to 18 per cent in the total sample. No respondents from Meat Processing companies participated in the survey (six per cent of the total sample).

The most significant difference compared to the total sample was in the annual revenue. Companies between USD 2–20 billion were under-represented at the expense of large companies with annual revenues of more than USD 20 billion (31 per cent vs 12 per cent in the total sample). This means that every company with annual revenues of more than USD 20 billion was included in the survey.

Figure 12: External Survey Respondents (n=77)



To understand the reliability of the internal business model profiling (as described in section 4.4.1.), and the external executive survey, an inter-rater reliability analysis was conducted. The one-way random intra-class correlation coefficient (ICC) analysis yielded a Cronbach alpha of .885 and an ICC of average measures of .862.

Table 19: Intra-class Correlation Coefficient – Internal vs External Scores

			95% Confidence Interval		F Test with True Value 0			
	N	Intraclass Correlation	Lower Bound	Upper Bound	Value	df1	df2	Sig.
Single Measures	32	0.163	0.126	0.213	7.251	110	3441	.000
Average Measures	32	0.862	0.822	0.896	7.251	110	3441	.000

One-way random effects model

Where there was misalignment between the internal and external business model scores, the external survey took precedence over the internal assessment. This is because it was assumed by the researcher that the executives had better information about their business model than what was publically available.

4.4.3. Expert Survey

The final point of triangulation regarding the business model assessment was a survey that was emailed to 34 Partners and Directors at Deloitte Consulting. The Partners and Directors are the Lead Consulting Partners (LCP) for Deloitte Consulting's Consumer Goods clients. Deloitte Consulting serves 82 per cent of the Fortune 500 Consumer Goods companies and has consulting relationships with 43 of the sample companies. In April 2015, an online survey invitation was sent out by the Deloitte Consulting Consumer Goods Practice Leader, Kim Porter, to 34 Partners and Directors with a consulting relationship with at least one of the sample companies. This second survey was the same as the one that was used for the external executive survey and was hosted by Qualtrics, a web-based survey service. 16 Partners and Directors completed the survey, representing a response rate of 47 per cent.

Similar to the external executive survey, the most significant difference compared to the total sample was in the annual revenue (see **Table 20**). Large companies with annual revenues of more than USD 20 billion were over-represented in the expert survey (25 per cent vs 12 per cent in the total sample). There was also a higher representation of Household Products companies in the expert survey compared to the total sample.

Table 20: Per cent of Companies in Expert Survey vs Total Sample

Sector	Expert Survey (n=16)	Total Sample (n=97)
Personal Care	13%	14%
Household Products	25%	14%
Meat Processing	6%	6%
Packaged Foods & Meats	44%	48%
Beverages	12%	18%
Total	**100%**	**100%**

Annual revenues	Expert Survey (n=16)	Total Sample (n=97)
Under USD 2 Billion	0%	19%
USD 2 – 3.5 Billion	12%	19%
USD 3.5 – 5 Billion	25%	17%
USD 5 – 10 Billion	19%	17%
USD 10 – 20 Billion	19%	15%
Over USD 20 Billion	25%	12%
Total	**100%**	**100%**

To understand the reliability of the internal business model profiling (as described in section 5.4.1.), and the expert survey, an inter-rater reliability analysis was conducted. The one-way random intra-class correlation coefficient (ICC) analysis yielded a Cronbach alpha of .821 and an ICC of average measures of .771.

Table 21: Intra-class Correlation Coefficient – Internal vs Expert Scores

			95% Confidence Interval		F Test with True Value 0			
	N	Intraclass Correlation	Lower Bound	Upper Bound	Value	df1	df2	Sig.
Single Measures	32	0.095	0.062	0.148	4.364	57	1798	.000
Average Measures	32	0.771	0.677	0.848	4.364	57	1798	.000

One-way random effects model

Where there was misalignment between the internal and expert business model scores, the expert survey took precedence over the internal assessment. However, in cases where there was a discrepancy between the expert and external executive survey scores, the external executive scores were used.

4.4.4 Summary

The final list of sample companies and the data collection sources are presented in **Table 22** below:

Table 22: Final List of Sample Companies and Data Collection Sources

Company	INDEPENDENT BUSINESS MODEL VARIABLES			DEPENDENT VARIABLES
	Internal Business Profiling	External Executive Survey	Deloitte Expert Survey	Financial Data
Alberto Culver Company	x			x
Anheuser-Busch InBev SA/NV	x	x (1)		x
Associated British Foods plc	x			x
Avon Products Inc.	x			x
Beam, Inc.	x			x
Beiersdorf AG	x			x
Bonduelle SA	x			x
Bongrain	x			x
Britvic plc	x			x
Brown-Forman	x		x	x
Cal-Maine Foods, Inc.	x			x
Campbell Soup Company	x	x (1)		x
Central Garden & Pet Company	x	x (2)		x
Chiquita Brands International, Inc.	x	x (1)		x
Church & Dwight	x	x (2)	x	x
Coca-Cola Bottling Co. Consolidated	x	x (1)		x
Coca-Cola Enterprises, Inc.	x	x (1)		x
Coca-Cola FEMSA S.A.B. de C.V.	x			x
Colgate-Palmolive Co.	x			x
ConAgra Foods, Inc.	x			x
Constellation Brands	x	x (1)	x	x

Cranswick	x			x
D.E Master Blenders 1753 N.V.	x	x (1)		x
Dairy Crest Group plc	x			x
Danone	x			x
Dean Foods Company	x	x (1)		x
Diageo plc	x			x
Dole Food Company, Inc.	x			x
Dr Pepper Snapple Group, Inc.	x	x (1)		x
Elizabeth Arden, Inc.	x	x (4)		x
Energizer Holdings	x		x	x
Fibria Celulose SA	x			x
Flowers Foods, Inc.	x			x
Fromageries Bel	x			x
General Mills, Inc.	x	x (1)		x
Greencore Group plc	x			x
H.J. Heinz	x		x	x
Harbinger Group, Inc.	x			x
Heineken NV	x	x (1)		x
Henkel AG & Co. KGaA	x			x
Herbalife	x		x	x
Hilton Food Group plc	x			x
Hormel Foods	x		x	x
Industrias Bachoco S.A.B. de C.V.	x			x
Kellogg Company	x			x
Keurig Green Mountain	x		x	x
Kimberly-Clark Corporation	x			x
Kraft Foods	x	x (4)	x	x

L.D.C. S.A.	x			x
Lancaster Colony Corporation	x			x
L'Oreal SA	x			x
McBride	x	x (1)		x
McCormick & Company, Inc.	x			x
Mead Johnson Nutrition Company	x	x (2)		x
MHP S.A.	x			x
Molson Coors Brewing Company	x	x (1)		x
Mondelez	x	x (5)	x	x
Monster Beverage Corporation	x			x
NBTY, Inc.	x	x (2)		x
Nestlé S.A.	x			x
Newell Rubbermaid Inc.	x	x (2)		x
Nu Skin Enterprises, Inc.	x	x (1)		x
OJSC Cherkizovo Group	x			x
Pepsico, Inc.	x	x (6)		x
Pernod-Ricard SA	x	x (1)		x
Pilgrim's Pride Corporation	x			x
Pinnacle Foods, Inc.	x	x (1)		x
Premier Foods plc	x	x (1)		x
PZ Cussons plc	x	x (1)		x
Ralcorp Holdings, Inc.	x	x (1)		x
Reckitt Benckiser Group plc	x			x
Rémy Cointreau SA	x	x (1)		x
Revlon, Inc.	x			x
SABMiller plc	x	x (1)		x
Sanderson	x			x

Sappi Limited	x			x
Seaboard Corp.	x			x
Seneca Foods Corp.	x	x (1)		x
Smithfield Foods, Inc.	x			x
Snyder's-Lance, Inc.	x	x (2)		x
Spectrum Brands Holdings, Inc.	x			x
SSL International plc	x			x
Suedzucker AG	x			x
Tate & Lyle plc	x			x
The Clorox Company	x	x (2)	x	x
The Coca-Cola Company	x			x
Estee Lauder	x	x (2)	x	x
The Hain Celestial Group, Inc.	x	x (1)		x
The Hershey Company	x	x (1)	x	x
The Hillshire Brands Company	x			x
The J. M. Smucker Company	x			x
The Procter & Gamble	x	x (7)	x	x
The WhiteWave Foods Company	x			x
Treehouse Foods, Inc.	x			x
Tyson Foods	x	x (1)	x	x
Unibel S.A.	x			x
Unilever	x	x (2)	x	x

(x) = number of respondents

CHAPTER 5 DATA ANALYSIS AND RESULTS I: DOMINANT BUSINESS MODEL TYPES IN THE CONSUMER GOODS INDUSTRY

The purpose of this chapter is to present a measurement model for different business model constructs. This measurement model will help determine the dominant business model type of each of the 97 sample companies and the coherence to that dominant business model type. It is hypothesised that each company will have elements of different business model types, but each company will have a dominant construct.

The chapter is divided into four main sections:

1. The first part tests the data for the 97 sample companies and finds that the data is suitable for a factor analysis with Bartlett's test of sphericity of .000 (significance < .05), and the Measure of Sampling Adequacy of .603 (above the threshold of .50).
2. The second section presents a theoretical measurement model based on an exploratory factor analysis (EFA). This model has four main business model constructs and 18 items.
3. In the third part, the theoretical measurement model is confirmed using a confirmatory factor analysis (CFA) and the final measurement model with the normalised construct weights is presented.
4. Finally, the chapter finishes with a discussion of the dominant business model types in the Consumer Goods industry and how these compare to the theoretical models presented in Chapter 2.

5.1. INTRODUCTION

As outlined in section 3.3.1, a set of multi-item scales was identified to measure the construct of *business model types*. The measurement scales relied on existing research into business model typology (see: Hagel and Singer (1999), Amit and Zott (2001), Libert et al. (2014)). To determine the factors or components to improve the description of the dominant business model types in the Consumer Goods industry, an exploratory factor analysis (EFA) was utilised. These theoretical constructs were then tested using confirmatory factor analysis (CFA), to determine the variables with the highest loadings that would best describe each business model type. EFA can be described as an orderly simplification of interrelated measures. Traditionally, it is used to explore the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome (Child, 1990). By performing EFA, the underlying factor structure is identified. The CFA is a statistical technique used to verify the factor structure of a set of observed variables. CFA allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. By using both factor analyses, it allowed the researcher to firstly identify the underlying factor structure (EFA) and the using the CFA to confirm the factor loading weights to be used in the overall business model coherence scoring model.

5.2. DATA SET

For the purpose of the factor analyses, the combined data set for the 97 sample companies was used (as described in section 4.3.4). Hair et al. (2010) outline several requirements for a dataset to be suitable for factor analysis:

(i) **normality**

(ii) **linear relations between variables**

(iii) **factorability**

(i) Normality

There are two ways of testing for normality: (a) visual inspection, and (b) statistical tests (Hair et al., 2010)**.**

(b) Statistical test of Normality

A simple statistical test is based on **skewness** and **kurtosis** statistical values (Hair et al., 2010). In addition to the skewness and kurtosis tests, the two most commonly used statistical tests for normality are the Kolmogorov-Smirnow and Shapiro-Wilks tests (Hair et al., 2010). As the sample size is larger than 50, it is recommended to apply the **Kolmogorov-Smirnov test** (Newbold, 1988). The results of the statistical tests for normality and distributional characteristics of the data set are presented in **Table 23**. Please see **Table 9** for an overview of the business model variable statements.

Table 23: Distributional Characteristics, Testing for Normality

	Variable Descriptors				Shape Descriptors				Test of Normality		
					Skewness		Kurtosis		Kolmogorov- Smirnov		
Variable	**Minimum**	**Maximum**	**Mean**	**Std. Div.**	**Statistic**	**z values**	**Statistic**	**z values**	**Statistic**	**Significant**	**Description of the Distribution**
OE1	0.00	1.00	.6168	.33074	-.656	-3.770	-0.927	-2.679	0.343	0.000	Peaked, negative distribution
OE2	0.00	1.00	.6244	.33657	-.622	-3.574	-.999	-2.889	0.325	0.000	Peaked, negative distribution
OE3	0.00	1.00	.6980	.33239	-.849	-4.877	-0.679	-1.961	0.299	0.000	Negative skewed distribution
OE4	0.00	1.00	.7779	.29749	-1.338	-7.687	.633	1.830	0.290	0.000	Negative skewed distribution
OE5	0.00	1.00	.7424	.25866	-1.056	-6.066	.209	.605	0.338	0.000	Negative skewed distribution
OE6	0.00	1.00	.7741	.28300	-1.534	-8.819	1.597	4.616	0.330	0.000	Peaked, negative distribution
OE7	0.00	1.00	.5774	.35719	-.369	-2.118	-1.363	-3.940	0.296	0.000	Peaked, negative distribution
OE8	0.00	1.00	.4683	.35885	.162	.933	-1.491	-4.309	0.277	0.000	Peaked, positive distribution
CI1	0.00	1.00	.7160	.29232	-.952	-5.472	-.244	-.706	0.327	0.000	Negative skewed distribution
CI2	0.00	1.00	.6970	.29273	-0.985	-5.659	-.079	-.228	0.348	0.000	Negative skewed distribution
CI3	0.00	1.00	.6462	.33725	-.596	-3.425	-1.078	-3.115	0.301	0.000	Peaked, negative distribution
CI4	0.00	1.00	.4683	.37194	.032	.185	-1.580	-4.567	0.261	0.000	Peaked, positive distribution
CI5	0.00	1.00	.5409	.35481	-.228	-1.313	-1.445	-4.175	0.287	0.000	Peaked, negative distribution
CI6	0.00	1.00	.3718	.35858	.492	2.828	-1.287	-3.721	0.279	0.000	Peaked, positive distribution
CI7	0.00	1.00	.5114	.37312	-.079	-.453	-1.561	-4.512	0.262	0.000	Peaked, negative distribution

CI8	0.00	1.00	.5409	.34937	-.137	-.790	-1.471	-4.252	0.267	0.000	Peaked, negative distribution
PL1	0.00	1.00	.6132	.33723	-.605	-3.475	-1.020	-2.948	0.326	0.000	Peaked, negative distribution
PL2	0.00	1.00	.6742	.31615	-.771	-4.434	-.691	-1.996	0.320	0.000	Peaked, negative distribution
PL3	0.00	1.00	.4737	.37067	.116	.668	-1.541	-4.453	0.261	0.000	Peaked, positive distribution
PL4	0.00	1.00	.8128	.29861	-1.591	-9.142	1.292	3.734	0.347	0.000	Peaked, negative distribution
PL5	0.00	1.00	.6612	.30988	-.661	-3.798	-.881	-2.546	0.322	0.000	Peaked, negative distribution
PL6	0.00	1.00	.6256	.34592	-.443	-2.547	-1.305	-3.771	0.279	0.000	Peaked, negative distribution
PL7	0.00	1.00	.6526	.34149	-.699	-4.020	-.923	-2.668	0.312	0.000	Peaked, negative distribution
PL8	0.00	1.00	.5435	.32495	-.223	-1.284	-1.385	-4.003	0.307	0.000	Peaked, negative distribution
NF1	0.00	1.00	.3528	.34979	0.489	2.812	-1.313	-3.796	0.266	0.000	Peaked, positive distribution
NF2	0.00	1.00	.4353	.35436	.272	1.563	-1.426	-4.122	0.284	0.000	Peaked, positive distribution
NF3	0.00	1.00	.5216	.36225	-.254	-1.457	-1.483	-4.286	0.305	0.000	Peaked, negative distribution
NF4	0.00	1.00	.3325	.35694	0.539	3.098	-1.335	-3.859	0.249	0.000	Peaked, positive distribution
NF5	0.00	1.00	.3198	.34239	0.700	4.022	-1.001	-2.892	0.280	0.000	Peaked, positive distribution
NF6	0.00	1.00	.3655	.38588	0.438	2.517	-1.492	-4.313	0.262	0.000	Peaked, positive distribution
NF7	0.00	1.00	.3249	.33376	0.567	3.260	-1.225	-3.541	0.269	0.000	Peaked, positive distribution
NF8	0.00	1.00	.4454	.37441	.084	.484	-1.605	-4.638	0.265	0.000	Peaked, positive distribution

The z values are derived by dividing the statistics by appropriate standard errors of .174 (skewness) and .346 (kurtosis)

Bold indicates the z value exceeds the critical value of ±1.96, which corresponds to a .05 error

Using an alpha (α) of .05, the null hypothesis of a normal distribution is rejected if the p-value is smaller than α. As the significance values for all 32 variables are less than .05 the null hypothesis is rejected. However, according to Hair et al. (2010), the test of significance is sensitive in large samples. As none of the variables had a significance value above .05, no data transformation was completed.

(ii) Linear relations between variables

A common factor analysis is based on a reduced correlation matrix. According to Hair et al. (2010), from a statistical standpoint, departures from normality, homoscedasticity, and linearity apply only to the extent that they diminish the observed correlations. Some degree of multicollinearity and linear relations between variables are desirable because the objective is to identify interrelated sets of variables (Hair et al., 2010). **Table 24** presents the correlation matrix and shows a high degree of correlation among the variables (as marked in bold). 106 out of 498 correlation coefficients were significant (.01 level), also indicating the appropriateness of using factor analysis. Please see **Table 9** for an overview of the business model variable statements.

Table 24: Correlation among Variables (Correlation Matrix)

	OE1	OE2	OE3	OE4	OE5	OE6	OE7	OE8	CI1	CI2	CI3	CI4	CI5	CI6	CI7	CI8	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8	NF1	NF2	NF3	NF4	NF5	NF6	NF7	NF8
OE1	1.000																															
OE2	**.313**	1.000																														
OE3	.227	**.404**	1.000																													
OE4	**.343**	.230	**.486**	1.000																												
OE5	.144	.183	.104	.141	1.000																											
OE6	.050	-.100	.064	.071	.019	1.000																										
OE7	.217	.233	**.368**	**.299**	-.066	.040	1.000																									
OE8	-.195	-.165	-.190	**-.286**	-.042	-.030	-.105	1.000																								
CI1	.005	.007	**.289**	**.272**	.170	.210	.006	-.299	1.000																							
CI2	**.281**	.256	.093	.238	-.048	-.127	.214	-.172	.199	1.000																						
CI3	.157	.061	-.017	.097	.205	.187	-.051	.145	.187	.134	1.000																					
CI4	**.349**	.085	.114	**.374**	-.029	.068	.056	-.153	.093	**.338**	**.315**	1.000																				
CI5	.112	.105	.240	.180	.002	-.006	-.043	-.105	.136	.022	.099	.201	1.000																			
CI6	.031	-.012	.015	.178	.130	-.127	-.034	.153	.166	**.288**	.079	**.307**	.171	1.000																		
CI7	.204	.141	.246	.082	.022	-.050	.206	-.039	.148	.137	.166	**.312**	**.307**	**.353**	1.000																	
CI8	.248	.251	.158	**.273**	.130	-.141	-.049	-.098	.153	-.001	.102	.168	**.289**	**.274**	**.414**	1.000																
PL1	.077	.130	.150	.242	.050	.160	.241	-.207	.039	.217	.132	**.306**	.229	.133	.113	.164	1.000															
PL2	**.329**	-.056	.084	.210	.185	.234	.126	-.021	.172	**.305**	.214	**.300**	.137	.217	.182	.107	**.426**	1.000														
PL3	.164	.079	-.169	.044	.166	-.026	-.022	.056	-.003	.106	.123	.205	-.109	.130	.062	.038	.146	**.354**	1.000													
PL4	-.169	-.066	.109	-.168	.153	.072	-.233	-.050	.257	-.041	.004	-.066	.012	.137	.062	.120	.197	.174	-.025	1.000												
PL5	-.027	.003	.034	.098	.113	.014	-.102	.001	.147	.059	.166	.255	**.430**	**.296**	**.425**	**.297**	.227	.243	.177	.114	1.000											
PL6	-.136	.117	.077	.186	.068	.220	.168	-.165	.177	.058	.012	.104	-.033	.008	-.024	.063	**.585**	.050	.029	.142	.155	1.000										
PL7	.010	-.015	-.093	.104	-.151	.241	-.021	-.073	.010	.068	**.346**	.163	.056	.085	.155	.225	.247	**.312**	**.326**	.075	.230	.153	1.000									
PL8	.084	.150	-.040	.051	.149	**.316**	-.028	.046	.080	.007	.199	.058	.138	-.028	.064	.191	.249	**.360**	**.364**	.066	.207	.137	.233	1.000								
NF1	.160	.073	.166	.085	.057	.175	.188	.167	.116	.084	.226	**.367**	.219	**.377**	**.356**	.125	**.291**	.224	.131	-.005	**.337**	.173	.101	.028	1.000						
NF2	**.294**	.193	.172	**.316**	.163	-.116	.137	-.220	.192	**.269**	.119	**.270**	.172	.068	.143	**.281**	**.318**	**.348**	.158	.044	.161	.153	.134	.104	.046	1.000						
NF3	.149	.045	.078	.206	-.027	.128	.081	-.123	**.453**	.211	.251*	.189	-.007	-.003	.119	.028	.072	.223	-.046	.062	.239	.167	.098	.126	.170	.109	1.000					
NF4	**.265**	**.288**	.198	.163	.119	-.032	.175	-.174	.073	.170	**.280**	**.374**	**.268**	.210	**.425**	.220	**.282**	**.270**	**.308**	-.063	**.357**	.135	**.365**	.202	**.456**	.081	.115	1.000				
NF5	.078	-.036	.089	.003	.175	.153	-.114	.172	.140	.037	.230	**.424**	.152	.258	**.370**	.072	.144	**.136**	.263	.142	**.422**	.098	.139	.137	**.439**	-.022	.172	**.304**	1.000			
NF6	.239	.014	-.005	.152	.077	.017	-.034	.006	.227	.179	**.267**	**.315**	.138	**.375**	**.365**	**.332**	.180	**.312**	**.268**	.003	**.560**	.081	.260	.247	**.489**	.165	**.300**	**.499**	**.391**	1.000		
NF7	**.298**	.141	.175	.145	**.282**	.094	.182	.017	.072	.138	.156	.131	.245	**.235**	.246	**.280**	**.297**	**.285**	.260	-.055	**.294**	.119	.145	.186	**.282**	.202	.091	**.277**	.243	.262	1.000	
NF8	.182	.153	.017	-.102	.141	.019	-.042	.193	.186	.202	.144	.213	.047	.219	.222	-.032	-.008	.231	.233	.014	.208	-.112	.109	.179	**.307**	.212	.214	.221	**.340**	**.342**	.215	1.000
Total	**8**	**2**	**3**	**6**	**1**				**1**	**4**	**4**	**9**	**4**	**5**	**6**	**4**	**6**	**7**	**4**		**5**		**1**	**8**	**5**	**6**	**1**	**3**	**2**	**1**		

Bolded values indicate correlations significant at the .01 significant level
Overall Measure of Sampling Adequacy (MSA): .603
Bartlett Test of Sphericity: 869
Significance: .000

(iii) Factorability

In addition to the visual inspection of the relations between variables, it is also necessary to ensure that the data matrix has sufficient correlations to justify the application of factor analysis (Hair et al., 2010).There are two main methods to determine the factorability of the dataset: (a) **the Bartlett test of sphericity**, a statistical test for the presence of correlations among the variables, and (b) **measure of sampling adequacy (MSA)**, where each variable is predicted without error by the other variables.

(a) Bartlett Test of Sphericity

This measure provides the statistical significance that the correlation matrix has significant correlations among at least some of the variables. According to Hair et al. (2010), a statistically significant Bartlett's test of sphericity (significance < .05) indicates that sufficient correlations exist among the variables to proceed. In this dataset, Bartlett's test shows that non-zero correlations, when taken collectively, are significant at the .000 level, and well below the recommended threshold.

(b) Measure of Sampling Adequacy (MSA)

A second measure to quantify the degree of inter-correlation among the variables and the appropriateness of factor analysis is the measure of sampling adequacy (MSA). This index ranges from 0 to 1, reaching 1 when each variable is perfectly predicted without error by the other variables (Hair et al., 2010). The overall MSA value should be above .50 before proceeding with the factor analysis. As shown in **Table 25**, the overall MSA for the dataset falls above the threshold with a value .603. However, an examination of the MSA values identified seven items (OE5, OE6, OE8, CI1, CI3, PL4 and PL7) with an MSA value below .50 (as illustrated in **Table 25**). These items can either be removed to increase the overall MSA value or retained but with the understanding that they will not contribute to the factor analysis. In this case, they were retained as the overall MSA value is already above the threshold of .50. Please see **Table 9** for an overview of the business model variable statements.

Table 25: Measures of Sampling Adequacy (MSA) and Partial Correlations

	OE1	OE2	OE3	OE4	OE5	OE6	OE7	OE8	CI1	CI2	CI3	CI4	CI5	CI6	CI7	CI8	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8	NF1	NF2	NF3	NF4	NF5	NF6	NF7	NF8
OE1	**0.63**	-.135	.010	-.155	.021	-.211	-.062	.210	.309	-.118	-.111	-.064	-.113	.140	-.024	-.243	.174	-.249	-.128	-.006	.305	.086	.260	.169	.020	-.088	-.117	-.049	-.059	-.196	-.163	-.120
OE2		**0.516**	-.381	.084	-.163	-.061	-.036	.061	.231	-.324	-.065	.090	-.038	-.010	.063	-.275	-.021	.312	-.192	.036	-.014	-.106	.071	-.127	-.011	-.025	-.139	-.178	.134	.159	.157	-.221
OE3			**0.547**	-.491	.145	.037	-.167	-.057	-.239	.141	.064	.078	-.016	.187	-.136	.125	.026	-.117	.266	-.291	.027	.105	.090	.051	-.076	-.021	.205	-.129	-.175	.071	-.186	.005
OE4				**0.605**	-.253	-.044	-.133	-.012	-.091	-.030	.095	-.298	-.079	-.241	.212	-.127	-.070	.071	-.102	.353	-.041	-.048	-.191	-.001	.127	-.065	-.191	.122	.115	-.071	.172	.228
OE5					**0.329**	.013	.058	.233	.015	.205	-.389	.304	.170	-.126	.109	-.067	.163	-.281	-.004	-.147	-.085	-.120	.425	-.001	.023	-.090	.215	-.150	-.254	.148	-.218	-.153
OE6						**0.337**	.028	.039	-.311	.230	-.009	-.111	.117	.133	-.026	.312	.041	-.191	.328	.029	-.037	-.139	-.349	-.393	-.275	.237	.212	.278	-.075	.072	-.148	.083
OE7							**0.627**	-.070	-.022	-.089	.096	.104	.199	.076	-.321	.190	-.161	-.021	.038	.210	.068	-.023	-.007	-.038	-.178	-.055	-.036	-.062	.148	.092	-.126	.100
OE8								**0.385**	.407	.076	-.440	.271	.004	-.222	.114	-.163	.269	-.246	-.084	.024	.037	-.142	.239	-.059	-.185	.086	.035	.197	-.234	.058	-.017	-.285
CI1									**0.418**	-.205	-.292	.226	-.225	-.149	.035	-.279	.275	-.051	-.270	-.170	.186	-.215	.308	.127	.039	-.084	-.370	.003	-.051	-.097	.096	-.275
CI2										**0.644**	-.075	-.128	.103	-.244	.001	.246	-.060	-.221	.134	.033	-.012	.005	-.022	-.001	.106	-.028	.041	.065	-.031	-.030	-.102	-.013
CI3											**0.473**	-.332	-.007	.163	-.107	.176	-.176	.187	.148	.061	.045	.214	-.430	-.088	-.037	-.051	-.134	-.058	.121	-.084	-.021	.255
CI4												**0.674**	.007	-.173	-.021	-.125	-.035	-.101	-.110	.039	-.004	-.043	.270	.097	-.087	-.137	-.021	-.165	-.372	.157	.154	-.169
CI5													**0.552**	-.026	-.040	.021	-.193	-.014	.307	.105	-.411	.227	.017	-.204	-.135	-.073	.207	-.156	-.018	.284	-.146	.056
CI6														**0.67**	-.212	-.038	.002	-.051	.055	-.175	.027	.045	-.066	.081	-.209	.161	.203	.057	.079	-.146	-.155	-.033
CI7															**0.762**	-.345	.111	-.051	.027	.003	-.207	.035	.061	.037	.026	-.026	-.004	-.167	-.219	.075	.068	-.089
CI8																**0.516**	-.068	.095	.254	-.096	-.023	.049	-.340	-.250	-.053	-.102	.144	.145	.125	-.177	-.228	.313
PL1																	**0.644**	-.365	.016	-.229	.078	-.559	.089	-.079	-.141	-.083	.114	.016	-.091	-.011	-.164	-.028
PL2																		**0.657**	-.187	-.117	-.070	.282	-.197	-.162	.019	-.170	-.202	-.078	.250	-.016	.066	.049
PL3																			**0.509**	.024	-.101	.064	-.278	-.339	-.083	-.038	.304	-.078	-.178	.038	-.229	.084
PL4																				**0.442**	-.054	.000	-.120	-.007	.041	.006	-.067	.104	-.083	.088	.192	.078
PL5																					**0.749**	-.116	.002	.062	.048	-.056	-.202	.033	-.130	-.407	-.094	.010
PL6																						**0.523**	-.104	-.030	-.049	-.121	-.114	-.102	-.006	.033	-.014	.189
PL7																							**0.435**	.179	.159	-.091	-.023	-.322	-.108	.050	-.004	-.239
PL8																								**0.574**	.273	.036	-.123	-.087	-.010	-.161	.073	-.146
NF1																									**0.776**	.006	-.099	-.226	-.096	-.257	.024	-.105
NF2																										**0.752**	.106	.262	.141	-.036	-.007	-.233
NF3																											**0.539**	.071	-.092	-.035	-.132	-.079
NF4																												**0.764**	.042	-.276	-.005	.025
NF5																													**0.717**	-.096	-.047	-.055
NF6																														**0.777**	.051	-.125
NF7																															**0.728**	-.096
NF8																																**0.593**

Bolded values indicate Measure of Sampling Adequacy (MSA)

5.3. DATA ANALYSIS TECHNIQUES

5.3.1 Exploratory Factor Analysis (EFA)

As described by Hair et al. (2010), an exploratory factor analysis (EFA) is an interdependence technique, whose primary purpose is to define the underlying structure among the variables in the analysis. The objective of the EFA is to provide both data summarisation and identifying the dominant factors, but also provide data reduction among the 32 different business model variables.

To perform the EFA, there are different factor extraction methods. There is considerable debate in the literature (Cliff, 1987) over which factor model is the more appropriate. In a survey of a recent two-year period in PsycINFO, Osborne and Costello (2009) found that in over 1,700 studies some form of EFA had been used. Well over half listed principal component analysis (PCA) with varimax rotation as the method used for data analysis, and of those researchers who report their criteria for deciding the number of factors to be retained for rotation, a majority used the Kaiser criterion (all factors with eigenvalues greater than one). Therefore, for the purpose of this analysis, **PCA** was chosen as the method to determine the number of factors and the items loading on the various factors for this analysis. Hair et al. (2010) also note that in most applications, both **component analysis** and **common factor analysis** arrive at essentially identical results if the number of variables exceeds 30, or the communalities exceed .60 for most variables.

The Kaiser criterion (i.e. Eigenvalues > 1) was selected to emerge significant factors from the factor analysis, and the varimax rotation was used to assess convergent validity of all the main constructs. As shown in **Table 26**, the PCA extraction method identified ten main factors with eigenvalues greater than 1.0, explaining 65.7 per cent of variance (marked as "% variance" in **Table 26**). As described by Hair et al. (2010), in the social sciences, where information is often less precise, it is not uncommon to consider a solution that accounts for 60 per cent of the total variance as satisfactory.

Table 26: Extraction Method: PCA

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**6.090**	**19.031**	**19.031**	**6.090**	**19.031**	**19.031**	**3.452**	**10.786**	**10.786**
2	**2.727**	**8.521**	**27.552**	**2.727**	**8.521**	**27.552**	**2.266**	**7.080**	**17.867**
3	**2.098**	**6.556**	**34.108**	**2.098**	**6.556**	**34.108**	**2.257**	**7.054**	**24.921**
4	**1.859**	**5.809**	**39.917**	**1.859**	**5.809**	**39.917**	**2.181**	**6.815**	**31.736**
5	**1.651**	**5.159**	**45.076**	**1.651**	**5.159**	**45.076**	**2.126**	**6.644**	**38.380**
6	**1.601**	**5.002**	**50.078**	**1.601**	**5.002**	**50.078**	**1.927**	**6.020**	**44.400**
7	**1.468**	**4.587**	**54.665**	**1.468**	**4.587**	**54.665**	**1.922**	**6.005**	**50.405**
8	**1.352**	**4.224**	**58.890**	**1.352**	**4.224**	**58.890**	**1.836**	**5.738**	**56.143**
9	**1.134**	**3.545**	**62.435**	**1.134**	**3.545**	**62.435**	**1.554**	**4.856**	**60.999**
10	**1.048**	**3.275**	**65.710**	**1.048**	**3.275**	**65.710**	**1.507**	**4.710**	**65.710**
11	.989	3.091	68.801						
12	.963	3.009	71.810						
13	.930	2.905	74.715						
14	.817	2.552	77.267						
15	.792	2.475	79.742						
16	.754	2.355	82.097						
17	.698	2.182	84.279						
18	.675	2.108	86.387						
19	.612	1.913	88.300						
20	.518	1.619	89.919						
21	.445	1.392	91.311						
22	.406	1.269	92.581						
23	.354	1.106	93.687						
24	.324	1.011	94.698						
25	.311	0.972	95.670						
26	.286	0.895	96.564						
27	.268	0.838	97.402						
28	.232	.724	98.127						
29	.186	.582	98.708						
30	.166	.520	99.228						
31	.137	.428	99.656						

Because factor loading is the correlation between the variable and the factor, the squared loading is the amount of the variable's total variance accounted for by the factor. In order for each loading to be considered significant on a .05 significant level (α), a power level of 80 per cent, and standard errors assumed to be twice those of conventional correlation coefficients for a sample size of around 100, **a factor loading of .40** and above is considered significant for interpretative purposes (Hair et al., 2010). According to Hair et al. (2010), good practice dictates a minimum of three items per factor, preferably four, not only to provide minimum coverage of the construct's theoretical domain but also to provide adequate identification for the construct in the CFA.

As presented in the rotated component matrix (**Table 27)**, the PCA model generated four factors (1, 2, 3 and 4) with four or more items loading significantly on each factor (marked in grey in **Table 27**). Please see **Table 9** for an overview of the business model variable statements.

Table 27: Rotated Component Matrix

	1	**2**	**3**	**4**	5	6	7	8	9	10
% Variance	**10.786**	**7.080**	**7.054**	**6.815**	6.644	6.020	6.005	5.738	4.856	4.710
NF1	0.776									
NF5	0.726									
NF6	0.576									
CI6	0.568									
NF8	0.482									
NF4	0.467		0.458							
OE8										
CI5		0.734								
CI8		0.709								
CI7	0.495	0.511								

PL5	0.491	0.505											
PL7			0.646										
PL3			0.625										
PL8			0.604										
OE2				0.708									
OE7				0.694									
OE3				0.589									
PL2					0.737								
NF2					0.584								
CI2					0.554								
NF7													
CI1						0.795							
NF3						0.741							
PL6							0.850						
PL1							0.737						
OE4								0.664					
CI4	0.452							0.642					
OE1				0.398				0.465					
CI3													
PL4													
OE6										0.816			
OE5												0.870	

a. Rotation converged in 65 iterations.

On Factor 1, the following nine items loaded significantly:

Table 28: Factor 1 Item Loadings (10.786 per cent of rotated variance)

Item	Description	Loading Value
NF1	Acts as a facilitator between network participants	.776
NF5	Deploys affiliate programmes	.726
NF6	The customer value increases as the organisation's network expands	.576
CI6	Integrates vertical products and services (e.g., after-sales service)	.568
NF8	There is an importance of community concept	.482
NF4*	Availability of complimentary products/services increases as the network expands	.467
CI7*	Integrates horizontal product and services (e.g., one-stop shopping)	.495
PL5*	Offers new combinations of products, services and information	.491
CI4*	Bundles activities within a system that enhance the value of the core products or services	.452

Note: * Cross-loading

The nine Factor 1 items cut across three of the original business model types: *Network Model* (NF), *Solutions Model* (CI) and *Product Model* (PL). However, the NF items are the most dominant ones (five out of nine items), and the name of this construct will be "*Network Model* (NM)." This will be the first construct to test in the CFA.

On Factor 2, the following five items loaded significantly:

Table 29: Factor 2 Item Loadings (7.080 per cent of rotated variance)

Item	Description	Loading Value
CI5	Provides access to complementary products, services and information	.734
CI8	Is focused on cross-selling of products and services	.709
CI7*	Integrates horizontal product and services (e.g., one-stop shopping)	.511
PL5*	Offers new combinations of products, services and information	.505

Note: * Cross-loading

Most of the items (three out of four) loading on Factor 2 are from the *Solutions Model* (CI) business model type. Therefore, the name of this construct will be "Solutions Model (SM)." This will be the second construct to test in the CFA.

On Factor 3, the following five items loaded significantly:

Table 30: Factor 3 Item Loadings (7.054 per cent of rotated variance)

Item	Description	Loading Value
PL7	Claims to be a pioneer in its field	.646
PL3	Emphasise growth by acquiring, or merging with R&D intensive firms	.625
PL8	Initiate change to which competitors must respond	.604
NF4*	Availability of complimentary products/services increases as the network expands	.458

Note: * Cross-loading

Most of the items loading onto Factor 3 are from the *Product Model* (PL) business model type. Therefore, the name of this construct will be "Product Model (PM)." This will be the third construct to test in the CFA.

Table 31: Factor 4 Item Loadings (6.815 per cent of rotated variance)

Item	Description	Loading Value
OE2	Minimise product expenditures, in particular through process innovation	.708
OE7	Focus on reducing SG&A costs	.694
OE3	Emphasise economies of scale with products	.589
OE1*	Minimises customers total cost by providing reliable products or services at competitive prices	.398

Note: * Cross-loading

All of the items loading on Factor 4 are from the *Operational Model* (OE) business model type. Therefore, the name of this construct will be "Operational Model (OM)." This will be the fourth construct to test in the CFA.

As all measured items are allowed to load on only one construct each in the CFA (Hair et al., 2010), the cross-loadings were taken into account and the items on Factor 1 removed.

Figure 13 shows the four constructs and 19 items to be tested in the CFA:

Figure 13: The Four Constructs to be tested in the CFA

FACTOR 1 [10.8% OF VARIANCE]		**FACTOR 2** [7.1% OF VARIANCE]		**FACTOR 3** [7.1% OF VARIANCE]		**FACTOR 4** [6.8% OF VARIANCE]	
Variable	Loading	Variable	Loading	Variable	Loading	Variable	Loading
NF1	0.776	CI5	0.734	PL7	0.646	OE2	0.708
NF5	0.726	CI8	0.709	PL3	0.625	OE7	0.694
NF6	0.576	CI7	0.511	PL8	0.604	OE3	0.589
CI6	0.568	PL5	0.505	NF4	0.458	OE1	.398
NF8	0.482						
CI4	0.452						

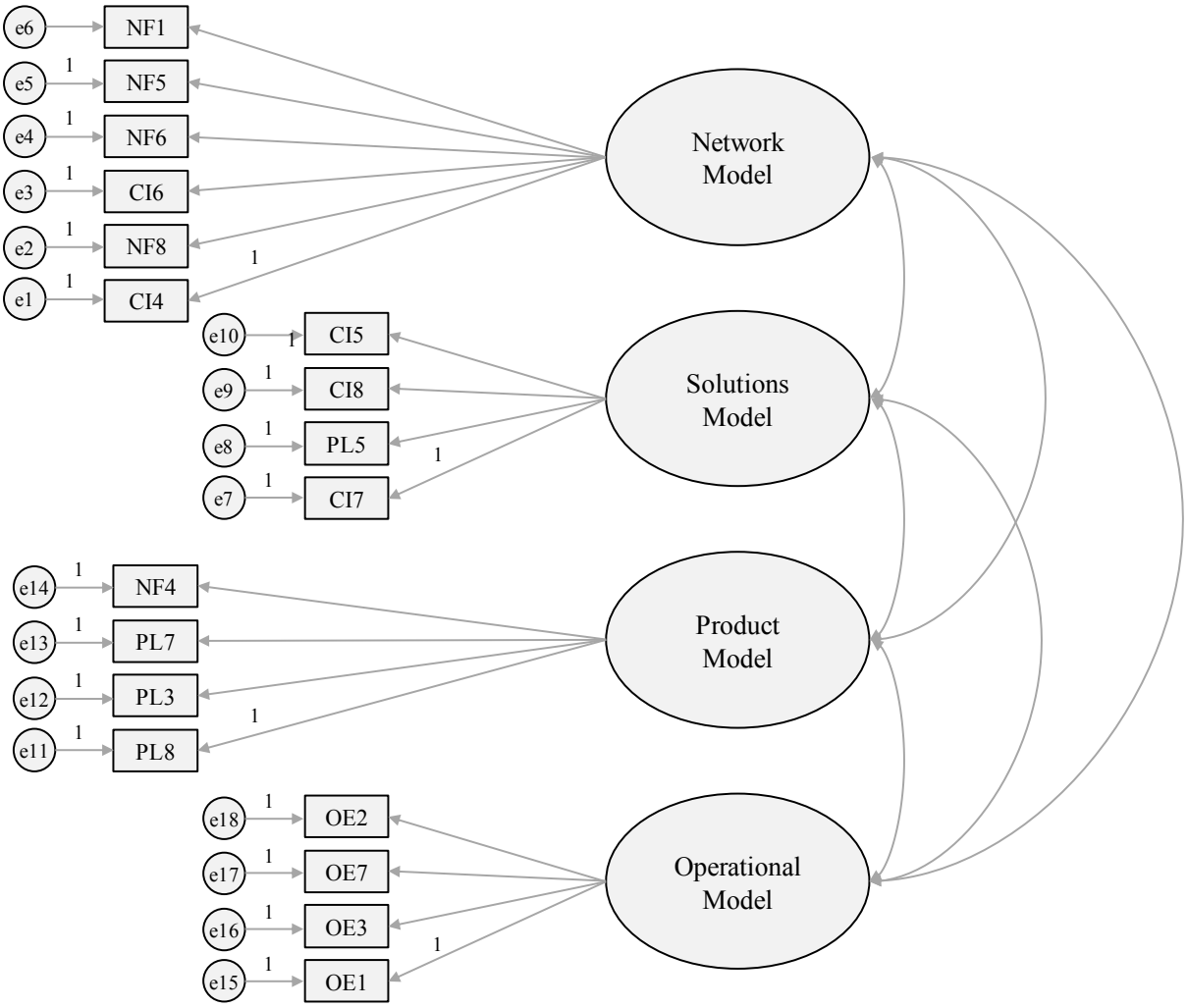
5.3.2 Confirmatory Factor Analysis (CFA)

As Churchill (1979) states, the EFA may be satisfactory during early stages of research. However, it is recognised that a factor analysis done before the purification process may produce many more dimensions than can be conceptually identified. An alternative procedure is to use factor analysis in a confirmatory fashion. One of the primary objectives of CFA is to assess the construct validity of a proposed measurement theory. This procedure involves the calculation of coefficient alpha, the elimination of items, and the subsequent calculation of alpha until a satisfactory coefficient is achieved. The factor analysis is used to confirm whether the number of dimensions conceptualised can be verified empirically (Churchill, 1979).

When CFA results are combined with construct validity tests, researchers can obtain a better understanding of the quality of their measures (Churchill, 1979). CFA statistics tell us how well theoretical specification of the factors matches reality (the actual data).

The first step in the CFA is to specify the measurement model to be tested. To do so, the four model constructs illustrated in **Figure 13** were used. A visual diagram of the measurement model is shown in **Figure 14**. The model displays the 18 measured indicator variables (e_x) and four latent constructs.

Figure 14: Measurement Theory Model (CFA) for Business Models



Every individual construct is identified in the measurement model. The overall model has more degrees of freedom than paths to be estimated. Therefore, in a manner consistent with the rule of thumb recommending a minimum of three indicators per construct, but encouraging at least four, the order condition is satisfied (Hair et al., 2010). In the proposed measurement model, all of the measures are hypothesised as reflective. That is, the direction of causality is from the latent construct to the measured items.

Overall Model Fit

Table 32 includes selected fit statistics from the CFA output.

Table 32: Results of CFA Analysis

Fit Indices	Guidelines*	Model Results
Goodness of Fit Index (GFI)	> .90	.829
Root mean square error of approximation (RMSEA)	≤ .05	.048
Chi-square value ($\chi 2$) divided by the degrees of freedom (CMIN/DF)	≤ 2.0	1.177
P-value	≥ .05	.083
P-value for testing the null hypothesis that the population RMSEA is no greater than .05 (PCLOSE)	≥ .05	.770
Confirmatory fit index (CFI)	≥ .80	.913
Parsimony adjustment to the CFI (PCFI)	≥ .80	.770

* According to Hair et al., 2010

The overall model *goodness of fit index* (GFI) is .829 and below the target standard of .90 or higher and therefore indicates that the observed covariance matrix does not match the estimated covariance matrix within sampling variance. However, given the problems associated with using this test alone (Hair et al., 2010), a number of other fit statistics should be examined. The value for the *root mean square error of approximation* (RMSEA) is .048 and is below the target of .05 or less. The RMSEA, therefore, provides support for model fit. The third absolute fit statistic is the CMIN/DF of 1.177. This measure is the *chi-square value divided by the degrees of freedom*. A number smaller than 2.0 is considered very good, and between 2.0 and 5.0 is acceptable (Hair et al., 2010). Thus, the normed $\chi 2$ suggests a good fit for the CFA model.

Moving to the incremental fit indices, the Confirmatory fit index (CFI) is the most widely used index. In this measurement model, the CFI has a value of .913, which exceeds the CFI guidelines of greater than .80 for a model of this complexity (Hair et al., 2010). The *parsimony adjustment to the CFI* (PCFI) is .770 just below the guidelines of .80 or greater. The *root mean square error of approximation* (RMSEA) value of .048 appears good as well and is below the guideline of .05.

The CFA results suggest the measurement model provides a reasonably good fit, and thus it is suitable to proceed to further examination of the model results.

The first thing to examine is the standardised loading estimates. Factor loadings are the correlation of each variable and the factor (Hair et al., 2010). Loadings indicate the degree of correspondence between the variable and the factor, with higher loadings making the variable representative of the factor. Factor loadings are the means of interpreting the role each variable plays in defining each factor. To determine the construct validity, the standardised loading estimates should be .5 or higher, and ideally .7 or higher (Hair et al., 2010).

As shown in **Table 33**, all of the loadings estimates are statistically significance, thus providing initial evidence of convergent validity. Please see **Table 9** for an overview of the business model variable statements.

Table 33: Factor Loading Estimates

Indicator	Construct	Estimated Loading	Standard Error	P-value
NF8	MM	.939	.313	.003
CI6	MM	1.093	.325	.000
NF6	MM	1.377	.326	.000
NF5	MM	1.317	.347	.000
NF1	MM	1.433	.357	.000
CI4	MM	1.000	-[a]	-[a]
PL5	CS	.825	.174	.000
CI8	CS	.723	.201	.000

CI5	CS	**.621**	.175	.000
CI7	CS	1.000	-[a]	-[a]
PL3	PL	2.161	1.100	**.050**
PL7	PL	1.767	.879	.044
NF4	PL	3.731	1.654	.024
PL8	PL	1.000	-[a]	-[a]
OE3	OE	1.262	.459	.006
OE7	OE	.966	.395	.014
OE2	OE	1.687	.610	.006
OE1	OE	1.000	-[a]	-[a]

a Not estimated when loading set to a fixed value (i.e., 1.0).

Only the indicator CI5 falls below the .7 threshold (estimate: .621) but is within the acceptable range of .5 and .7. Indicator PL3 has a p-value of .05, which is on the border of statistically significant.

The correlations between the constructs were also analysed. As shown in **Table 34,** the correlation between *Network Model* (NM) and *Solutions Model* (SM) is relatively high (.777), and the correlation between *Network Model* (NM) and *Product Model* (PM) is also relatively high (.719). This suggests that companies with a *Solutions* or *Product* business model will also have elements of *Network* in their business model.

Table 34: Construct Correlations

Construct 1	Construct 2	Estimated Correlation
NM	SM	**.777**
NM	PM	**.719**
NM	OM	.187
SM	PM	.626
PM	OM	.405
SM	OM	.306

In addition to evaluating goodness-of-fit statistics, Hair et al. (2010) recommend checking a number of model diagnostics. They suggest the following model diagnostic measures:

(i) path estimates

(ii) standardised residuals

(iii) modification indices

Path estimates. The path estimates were examined earlier, and the results are positive to this point. Only one loading estimate, the .621 associated with CI5, was noted because it fell below the ideal loading cut-off of .7. It did not appear to be causing problems, however, as the overall fit remained high.

Standardised residuals. In **Table 35**, the standardised residuals are presented. No standardised residual exceeds 4.0, the benchmark value that may indicate a problem with one of the measures, according to Hair et al. (2010). The largest residual is 2.650 for the covariance between CI4 (*Bundles activities within a system that enhance the value of the core products or services*) and OE1 (*Minimises customers' total cost by providing reliable products or services at competitive prices*). This residual may be explained by the content of the items as they are both addressing the value of products and services. Given only one measure is higher than 2.5, the standardised residuals analysis does not suggest a great need for improvement to the measurement model.

Table 35: Standardised Residual Covariances

	OE2	OE7	OE3	OE1	NF4	PL7	PL3	PL8	CI5	CI8	PL5	CI7	NF1	NF5	NF6	CI6	NF8	CI4
OE2	0.000																	
OE7	-.533	0.000																
OE3	.036	.687	0.000															
OE1	.195	.081	-.440	0.000														
NF4	.557	.139	-.138	.941	0.000													
PL7	-1.094	-.877	-1.731	-.587	.025	0.000												
PL3	-.222	-.839	-2.338	.794	-.271	1.341	0.000											
PL8	.632	-.725	-.991	.257	-.427	.928	2.124	0.000										
CI5	.087	-.968	1.282	.391	.088	-.627	-1.992	.416	0.000									
CI8	1.334	-1.032	.559	1.569	-.353	.818	-.740	.865	.437	0.000								
PL5	-1.157	-1.735	-.842	-1.067	-.104	.386	.028	.676	.779	-.356	0.000							
CI7	.038	.939	.989	.942	.445	-.256	-.967	-.563	-.243	.597	-.443	0.000						
NF1	-.063	1.135	.767	.902	.365	-.884	-.526	-.991	-.276	-1.105	-.200	-.045	0.000					
NF5	-.946	-1.450	.159	.237	-.553	-.401	.760	.067	-.645	-1.353	.786	.347	.263	0.000				
NF6	-.654	-.848	-.793	1.537	.366	.291	.466	.766	-1.177	.418	1.308	-.283	-.047	-.462	0.000			
CI6	-.634	-.674	-.377	-.104	-.832	-.601	-.134	-1.175	-.159	.689	.195	.669	.321	-.406	.011	0.000		
NF8	.879	-.691	-.291	1.265	-.373	-.202	.941	.754	-.990	-1.696	-.212	-.094	.150	.655	.185	.008	0.000	
CI4	.183	.087	.448	**2.650**	.384	-.003	.437	-.481	-.003	-.305	-.280	.195	.072	.826	-.654	.309	-.151	0.000

Modification Indices. Modification indices were calculated for every fixed parameter. **Table6** presents the modification indices greater than 4.0.

Table 36: Modification Indices

Indicator 1	Indicator 2	Modification Index
OE3	PL3	6.367
OE1	**CI4**	**7.285**
PL3	OE3	5.686
PL3	PL8	5.658
PL3	CI5	4.454
PL8	PL3	5.110
CI5	PL3	4.107
PL5	OE	5.910
PL5	OE1	5.985
CI7	OE7	4.780
NF1	OE7	4.751
CI4	OE1	5.735

With the exception of the covariance between OE1 and CI4 (7.285), already discussed under the standardised residuals test above, there are no major modifications needed to the measurement model. The guideline suggests modification index larger than 20 should be modified or eliminated.

Therefore, a further specification search is not needed because the measurement model has a solid theoretical foundation and because the CFA is testing rather than developing the measurement model. At this point, the business model measurement model can proceed with confidence that the selected business model statements measure the four business model constructs well.

5.4. EVALUATION OF THE RESULTS

As demonstrated above, the CFA results support the measurement model identified in the CFA. The overall model GFI is .829, and below the target standard of .90, however, the value for the RMSEA is .048 and is below the target of .05, and the CMIN/DF value of 1.177 is smaller than 2.0 and considered very good. Thus, the normed $\chi 2$ suggests a good fit for the CFA model. Overall, the goodness of fit statistics suggests that the estimated model reproduces the sample covariance matrix reasonably well.

To use the measurement model to determine the dominant business model construct for each company in the sample, the standardised regression weights were used for each construct and normalised to make them comparable across constructs. **Figure 15** presents the final measurement model with the standardised regression weights and normalised values. These will be used to determine the overall construct value for each company.

Figure 15: Measurement Model with Standardised Weights and Normalised Values

CONSTRUCT 1: NETWORK MODEL

Variable	Weight	Normal.
NF6	.740	.212
NF1	.669	.192
NF5	.607	.174
CI4	.534	.153
CI6	.505	.145
NF8	.432	.124
		1.00

CONSTRUCT 2: SOLUTIONS MODEL

Variable	Weight	Normal.
CI7	.695	.294
PL5	.694	.294
CI8	.491	.208
CI5	.484	.205
		1.00

CONSTRUCT 3: PRODUCT MODEL

Variable	Weight	Normal.
NF4	.852	.432
PL7	.425	.215
PL3	.400	.203
PL8	.296	.150
		1.00

CONSTRUCT 4: OPERATIONAL MODEL

Variable	Weight	Normal.
OE2	.644	.296
OE3	.620	.285
OE7	.461	.212
OE1	.451	.207
		1.00

5.5. DISCUSSION: DOMINANT BUSINESS MODEL TYPES IN THE CONSUMER GOODS INDUSTRY

This chapter set out to define the different business model types in the Consumer Goods industry. It was hypothesised that each company would have elements of different business model types, but each company would have a dominant construct.

Four different business model types were identified based using EFA and CFA analysis:

Network Model

Companies with a *Network* business model act as a facilitator between consumers and producers, or brand owners. For example, Coca-Cola Bottling or Britvic are two examples of companies with a *Network* business model. They do not own the brands, and they are not responsible for marketing the brands. They purchase the soft drink concentrate from Coca-Cola and PepsiCo and then produce the soft drinks and distribute them to the customers. In doing so, they have built a strong business with vertically integrated products and services. For *Network Model* companies, the focus is on *economies of mass and reach*. The more customers and sales points they can reach, the more valuable they are. Another example if Li & Fung, one of the world's largest manufacturers of soft and hard goods. It is involved in the production of 40-50

per cent of all the clothes sold in the US. Li & Fung owns practically nothing. Its role is to figure out a way to orchestrate factories so that by coming together, they can achieve performance that they could never achieve individually. The network uses protocols for rent distribution and dispute adjudication. The goal is to foster long-term trust-based relationships at multiple levels that lead to higher performance by everyone in the network. This business model type is also known as *Network Facilitator* or *Network Orchestrator*.

Solutions Model

The *Solutions* business model is built around economies of scope – creating broader relationships with a growing number of customers. This business model type requires skills related to gathering and analysing large amounts of data to develop a much deeper understanding of the evolving context of each customer. The culture of this business model type is completely focused on the customer – the customer is king no matter how much internal turmoil and heartburn meeting customer requirements might create. Other names for this type of business model include *Service Provider* and *Customer Relationship*.

Within the Consumer Goods industry, there are two different types of *Solutions Model* companies: *Direct Selling* (also called *Multi-Level Marketing*) companies and companies with multiple businesses and product categories put a keen focus on the customers – the retailers, to deliver integrated customer solutions.

Product Model

Companies with a *Product* business model focus on very different economics, skill sets, and cultures to the *Operational Model*. These companies are driven by economies of time – speed to market – and, as a result, require skills focused on rapid innovation and iteration in product development so that that market opportunities can be quickly identified and addressed. The culture prioritises creative talent – everything is oriented towards supporting the development of innovation. This business model has also been referred to as *Product Innovation & Commercialization* or *Technology Creators*.

In some cases, these companies have developed a proprietary technology and formulation. In other cases, they have created strong and distinctive capabilities that allow them to initiate change to which competitors must react.

Operational Model

Companies with an *Operational* business model are capitalising on proprietary capabilities that lower total value chain costs in a differentiated way. These manufacturers are driven by scale economics, requiring capabilities to manage high volume, routine processing activities, and have cultures that prioritise standardisation, cost control, and predictability. The asset trumps the human being. This business model is also referred to *as Infrastructure Management* or *Asset Building*.

The different combination of the original business model measurement items from Zott and Amit (2008) for each of the four dominant business model types confirms the research conducted by Kulins et al. (2015). The researchers also build upon Amit and Zott's four business model design themes (2001) by introducing a set-theoretic approach investigating interdependencies of complementarity-, efficiency-, novelty- and lock-in-based business models. Their empirical results demonstrate the role of three 'hybrid' business model types.

Hybrid: Novelty and Lock-in (Product and Network)

This hybrid is the combination of the novel business model (*Product Model*) and elements that help to lock customers in (*Network Model*). This is similar to the *Product Model* construct identified in this research, consisting of three elements from the novelty-focused model and one element from the lock-in-focused.

Hybrid: Efficiency, Complementarities and Lock-in (Operational, Solutions and Network)

The hybrid design contains the presence of three out of the four design themes proposed by Amit and Zott (2001). This construct is similar to the Network business model identified in this research, which contains four elements of the lock-in-focused model and two elements of the complementarities-focused.

Hybrid: Efficiency and Novelty (Operational and Product Models)

This hybrid business model type combines the presence of novelty- and efficiency-focused models. As shown in the next section, a similar "hybrid" model between Operational and Product models was identified in this research.

CHAPTER 6: DATA ANALYSIS AND RESULTS II: BUSINESS MODEL COHERENCE INDEX

The purpose of this chapter is to present a measurement scale developed by the researcher to determine the business model coherence based on the measurement model defined in Chapter 5. This measurement scale will help calculate the business model coherence for each of the 97 sample companies and identify the dominant business model type in the Consumer Goods industry.

The chapter is divided into three main sections:

1. The first part presents a business model coherence measurement scale developed by the research, and using this scale, the coherence index is calculated for each company.
2. The second section analyses the results of the business model coherence for different business model types and shows the dominant business models in the Consumer Goods industry.
3. Finally, the chapter finishes with a discussion of the dominant business model types in the Consumer Goods industry.

6.1. INTRODUCTION

As described in the Literature Review (Chapter 2), *business model coherence* is defined as the adherence to a certain business model type that logically connects strategic resources with a certain market position. It is hypothesised that each company will have elements of different business model types, but each company will have a dominant construct.

According to Markides and Charitou (2004), the underlying configuration of key resources and processes that support one particular business model can be fundamentally different from the configuration required to operate another, unrelated business model. Thus, operating different business models can lead to inconsistencies in the information and expertise required to operate the models.

Relying on an RBV, the strategic management literature suggests that classification of related businesses should be based on the similarity of their underlying economic logic or business model (see: Rumelt (1974), Prahalad and Bettis (1986)).

6.2. BUSINESS MODEL COHERENCE INDEX

To understand the dominant business models and their construct within each of the 97 sample companies, the business model elements defined and confirmed in Chapter 5 were used. For the purpose of the analysis, the combined data set for the 97 sample companies was used (as described in section 4.2.1).

Figure 16 provides an example of the business model scoring based on the business model measurement model and the combined data for Colgate-Palmolive Company. For each of the business model elements, the normalised values were used (see **Figure 15** for the normalised values) and multiplied by the scores for each company.

Figure 16: Colgate-Palmolive Company Business Model Scores

Operational Model (BM4)

ID	Description	Normalised Values	Score
OE2	Minimizes product expenditures, in particular through process innovation	0.296	1.000
OE3	Emphasizes economies of scale with products	0.285	0.250
OE7	Focuses on reducing SG&A costs	0.212	0.250
OE1	Minimizes customers total cost by providing reliable products or services at competitive prices	0.207	0.750
			0.576

Product Model (BM3)

ID	Description	Normalised Values	Score
PL7	Claims to be a pioneer in its field	0.432	0.000
PL3	Emphasizes growth by acquiring, or merging with R&D intensive firms	0.215	0.250
PL8	Initiates change to which competitors must respond	0.203	0.250
NF4	Availability of complimentary products/services increases as the network expands	0.150	1.000
			0.255

Solutions Model (BM2)

ID	Description	Normalised Values	Score
CI7	Integrates horizontal product and services (e.g., one-stop shopping)	0.294	0.250
PL5	Offers new combinations of products, services and information	0.294	0.000
CI8	Is focused on cross-selling of products and services	0.208	0.250
CI5	Provides access to complementary products, services and information	0.205	0.250
			0.177

Network Model (BM1)

ID	Description	Normalised Values	Score
NF6	The customer value increases as the organization's network expands	0.212	0.000
NF1	Acts as a facilitator between network participants	0.192	0.000
NF5	Deploys affiliate programs	0.174	0.000
CI4	Bundles activities within a system that enhance the value of the core products or services	0.153	0.250
CI6	Integrates vertical products and services	0.145	0.750
NF8	There is an importance of community concept	0.124	0.000
			0.147

See Figure 15 for overview of 'Normalised Values'

As the example of the Colgate-Palmolive Company demonstrates, the company has traits of each of the four business model types. However, the dominant business model type is *Operational Model* (BM4: .576 score). It also has elements of *Product Model* (BM3: .255) and to a lesser extent *Solutions Model* (BM2: .1777) and *Network Model* (BM1: .147).

6.2.1 Business Model Coherence Measurement Scale

(developed by the researcher)

The literature considers coherent configurations of design elements that manifest themselves as peaks in the performance as a good fit (Siggelkow, 2002). As above described, it is hypothesised that each company will have elements of different business model types, but each company will have a dominant construct. Furthermore, it is postulated that the more dominant one business model is over the other business model types, the stronger the business model coherence will be.

There is little prior theorising on business models on which to draw upon in the study of business model coherence. For that reason, a formal measurement scale is proposed that allows for better investigating of the business model coherence and the constructs for each company.

It is proposed that if a company has only one business model type (e.g., *Operational Model*) with little or no other business model types, the coherence will be high (1 score on a normalised scale). On the other hand, if a company has four equally dominant business model types (1 score on a normalised scale for each business model type), it has low business model coherence. To calculate the business model coherence, the following formula is proposed:

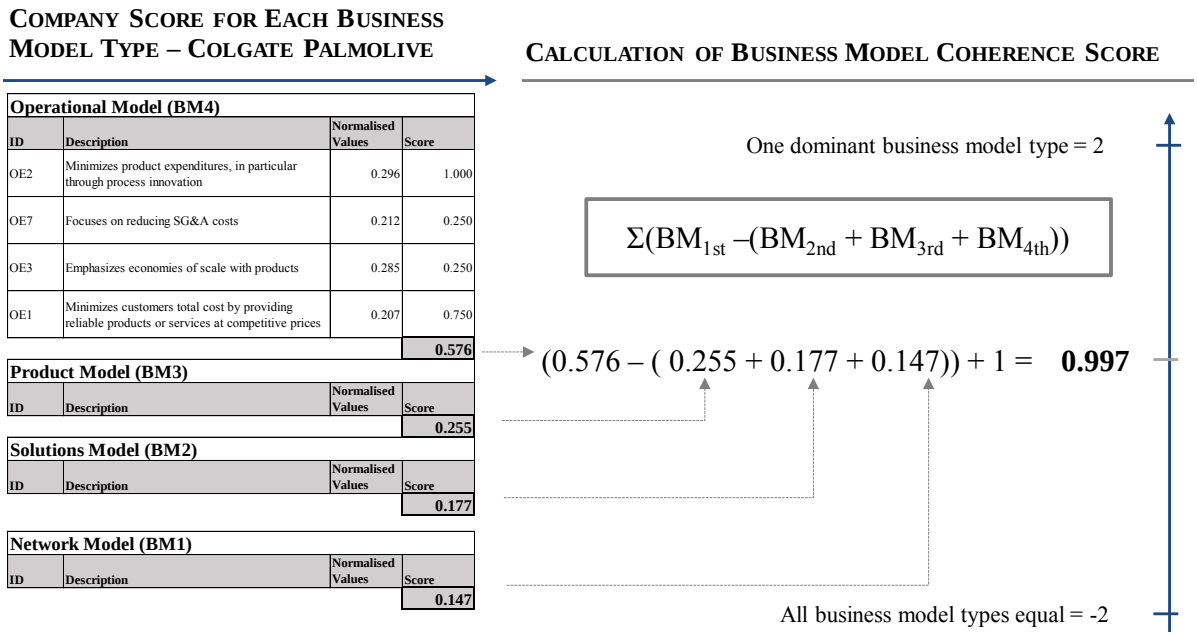
Equation 1: Business Model Coherence Scale

$$\textbf{Coherence} = \Sigma(\mathbf{BM_{1st}} - (\mathbf{BM_{2nd}} + \mathbf{BM_{3rd}} + \mathbf{BM_{4th}})) + 1$$

Using the **normalised values** and business model scores, the overall business model coherence score is the sum of the dominant business model score (**BM_{1st}**) less the sum of the other three business model scores (**BM_{2nd}, BM_{3rd}, BM_{4th}**) plus 1. With this measurement scale, the maximum value is 2, and the lowest value is -2. The theoretical midpoint on the scale is 0 (distance between 2 and -2). Every score above the midpoint should be considered as *coherent*, and a score below the midpoint should be considered as *incoherent*. The reason for the maximum value is that if a company has one dominant business model (**BM_{1st}** = 1) and no other business models (**BM_{2nd}, BM_{3rd}, BM_{4th}** = 0), the total would be 2 (1 – (0 + 0 + 0) + 1). On the other hand, if all four business models were equal, the total would be -2 (1 – (1 + 1 + 1) + 1).

An example of the proposed business model coherence measurement scale is illustrated in **Figure 17** with the scores from the Colgate Palmolive Company.

Figure 17: Example of Business Model Coherence Measurement Scale



As shown in **Figure 17**, the Colgate-Palmolive Company has a business model coherent score of .998, which indicates that it has a coherent business model centred on the *Operational Model* (BM4) business model type.

6.2.2 Probability Distribution of Business Model Coherence Scores

Having scored the 97 sample companies using the business model measurement scale presented above, the next question is whether the distribution of these scores follows a normal distribution and how they fit with the probability distribution.

To determine the probability distribution of the business model coherence scores, a Monte Carlo simulation was conducted. Probabilistic models, such as Monte Carlo simulation, aim to quantify stochastic variability by assigning probability distributions to those inputs subject to variability or uncertainty and using simulation from these distributions to mimic reality (Roelofs and Kennedy, 2011). It is a method widely used in probabilistic risk models to combine random quantities while keeping variability and uncertainty separate. The method uses an outer loop to simulate the uncertainty about model inputs and an inner loop to produce simulations to represent the variability given the inputs (Roelofs and Kennedy, 2011). As Roelofs and Kennedy

(2011) illustrate in their paper on the subject, if variability is characterised using a normal distribution with uncertain mean μ and standard deviation σ, the Monte Carlo simulation would proceed as follows:

(i) Assume a probability distribution for the unknown values of input parameters (μ, σ).

(ii) In the *i*th outer loop, sample value for the parameters μ and σ from their chosen distributions (call these μ_i and σ_i).

(iii) At the inner loop, randomly sample *m* values ($z_{i1},,..., z_{im}$) from the N(μ_i, σ_i) distribution (for large *m*).

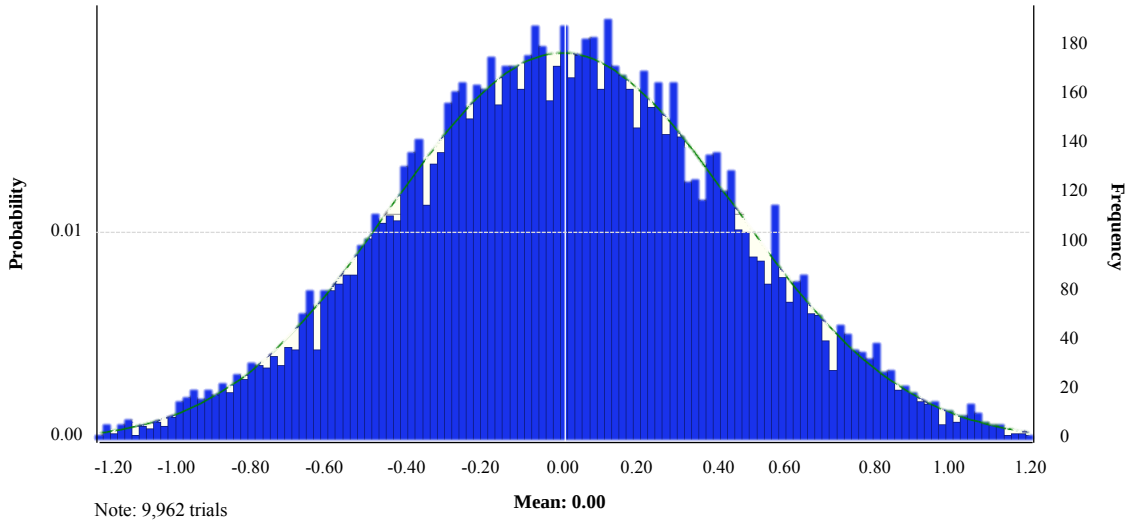
(iv) Repeat steps 2–3 for $i = 1, ... , p$, with large *p*.

The outputs $z_{i\ 1},,..., z_{im}$ from a single outer loop can be used to generate an empirically estimated realisation of the unknown "true" variability distribution function, from which the tail area estimates (exceedance probabilities) can be determined for any given threshold.

To determine the probability distribution for business model coherence scores, the Oracle Crystal Ball Monte Carlo simulation software package was used. Oracle Crystal Ball is the leading spreadsheet-based application for predictive modelling, forecasting, simulation, and optimisation. For each of the variables in the business model coherence measurement scale, a normal distribution was assumed. The minimum score was set at 0 and the maximum score at 1. As recommended by Roelofs and Kennedy (2011) a total of 10,000 simulation runs were conducted.

The results of the probability distribution using Monte Carlo simulation are presented in **Figure 18**.

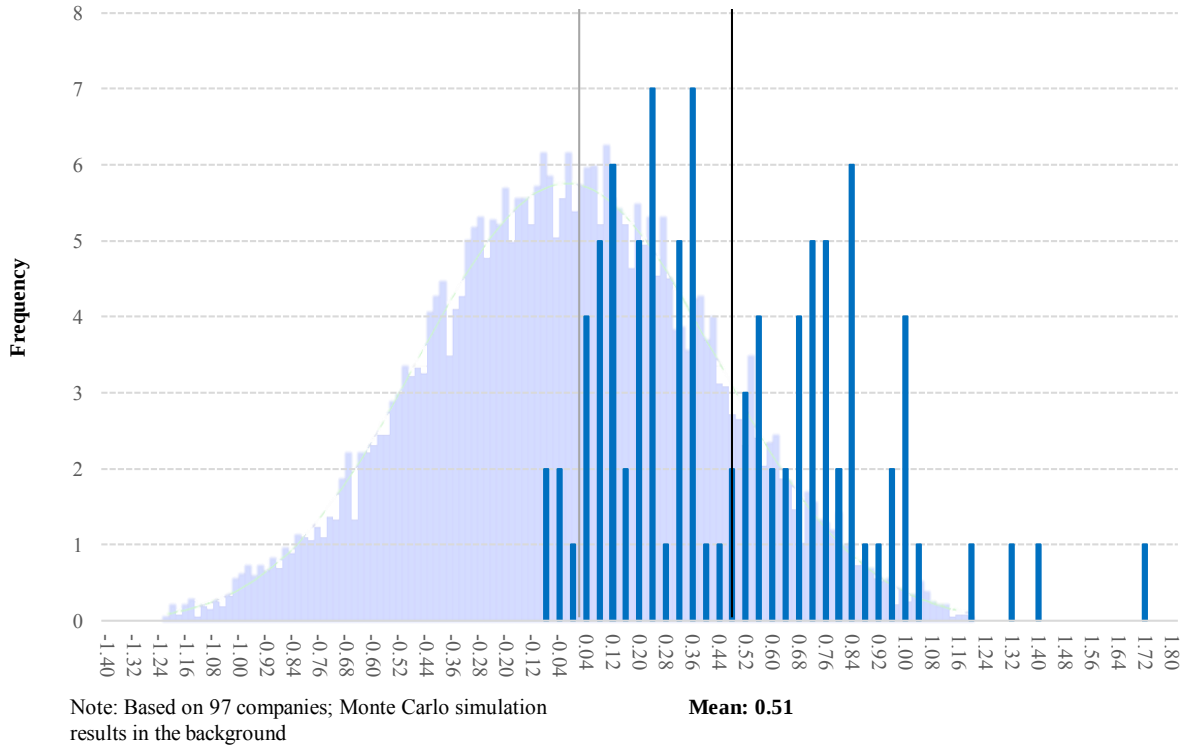
Figure 18: Results of the Monte Carlo simulation



As shown in **Figure 18**, the mean of the probability distribution is 0.00 (the midpoint) with a standard deviation of .41 (variance of .16). The theoretical low is -1.39, and the theoretical high is 1.54. The distribution has a Skewness of .002 and a Kurtosis of 2.91 indicating a **normal distribution of the business model coherence score.**

When comparing the probability distribution with the calculated distribution for the 97 sample companies, it shows that the distribution is positively skewed from the midpoint with a mean of .51 and a standard deviation of .36 (see **Figure 19**).

Figure 19: Business Model Coherence Distribution



Note: Based on 97 companies; Monte Carlo simulation results in the background

The minimum value is -0.07 and the maximum value is 1.75, although only one company achieved that high a business model coherence score (Cal-Maine Foods, Inc). **The distribution of the business model coherence scores for the sample companies indicates that Consumer Goods companies have, to some degree, a dominant business model type (the majority of companies had a coherence score greater than .00)** compared to the normal distribution. The distribution skewness is .632 indicating a positive distribution and with a relatively flat Kurtosis of .282.

It is interesting to note that the distribution of the business model coherence scores in this research appears to fall into two main groups: (i) between 0.00 and 0.50, and (ii) between 0.51 and 1.00. This indicates that a number of companies have low coherence (between 0.00 and 0.50) or have some degree of coherence (between 0.51 and 1.00).

6.3. EVALUATION OF THE RESULTS

An analysis of the dominant business model types was conducted to answer the first research question:

(i) ***Within the Consumer Goods industry (SIC code 2011 to 2099), what are the dominant business model types?***

To categorise the 97 sample companies by their dominant business model type, an overlap margin of five per cent was introduced. If a company has two business model types that are close, and the coherence scores of those two business model types are within the margin of five per cent, the company would be categorised as a *"hybrid"* business model. On the other hand, if the difference between the first and the second business model type is greater than the five per cent margin, the company would be categorised by the first business model type.

As there are no specific guidelines for the right sensitivity level, the five per cent margin was chosen based on a sensitivity analysis, as presented in **Table 37**:

Table 37: "Hybrid" business model type sensitivity analysis

Sensitivity Level	Companies with One Business Model Type	Companies with more than One Business Model Type
3%	83	14
5%	**75**	**22**
7%	68	29
10%	60	37

Using the five per cent sensitive margin, the dominant business model type for each company in the sample was calculated, and all the different business model types (including hybrid business models) were summarised in **Figure 20**.

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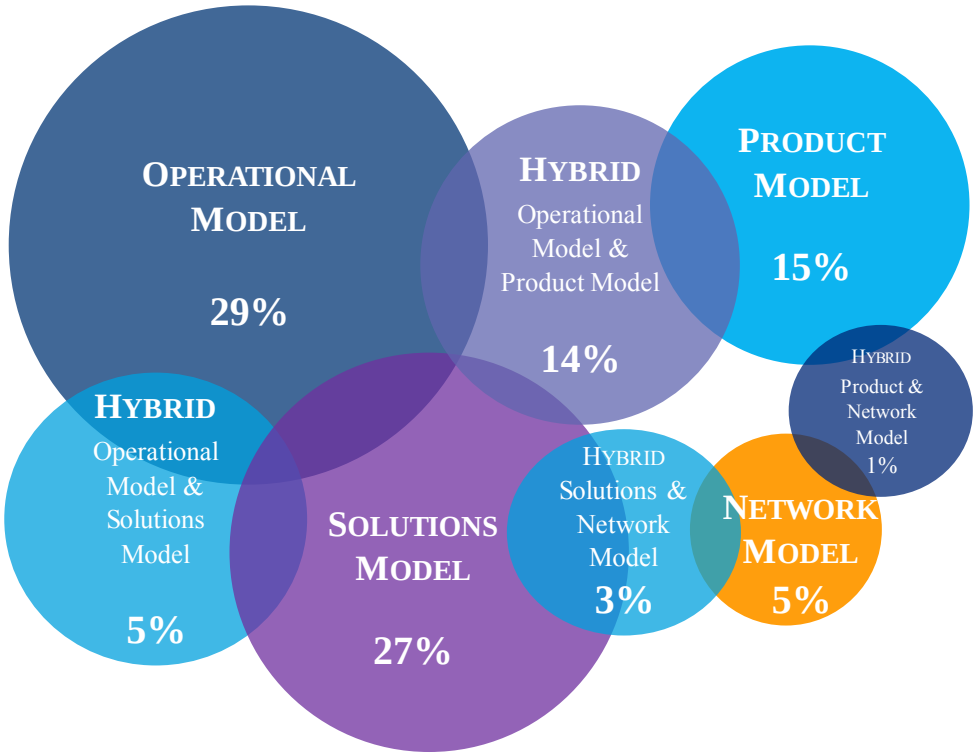
Figure 20: Dominant Business Model Types in the Consumer Goods Industry



Note: Significant overlap in business model type (5% margin)

As shown in **Figure 20**, among the 97 sample companies, the most dominant business model type is *Operational Model* (29 per cent), followed by *Solutions Model* (27 per cent), *Product Model* (15 per cent) and *Network Model* (5 per cent).

Consumer Goods companies with a dominant *Operational* business model type are large branded manufacturers like the Colgate-Palmolive Company and Anheuser-Busch InBev SA/NV, large Private Label manufacturers such as Ralcorp, and commodity producers such as Cal-Maine Foods, Inc. and Cranswick. Given the long history of the Consumer Goods industry (the oldest company in the data set is 206 years old), it is logical that the most dominant business model type is the *Operational Model*.

A further 19 per cent of Consumer Goods companies have some kind of hybrid business model with elements of the *Operational Model*.

Solutions Model is the second largest business model type in Consumer Goods, with 27 per cent of companies deploying it to deliver their strategies. These companies are multi-level marketing (MLM) companies such as Avon and Nu Skin. A further 8 per cent of companies use elements of the *Solutions* business model as part of a hybrid model.

Product Model is the third business model type with 15 per cent of all Consumer Goods companies. As previously described, these are companies that focus on speed to market to build strong brands and launch new product innovations. These are companies like Monster Beverage Company, Reckitt Benckiser and Estée Lauder. A further 15 per cent of Consumer Goods companies have elements of the *Product* business model type.

The smallest business model type in the Consumer Goods industry is *Network Model* with five per cent. These are companies that act as a facilitator between consumers and producers. The Coca-Cola Enterprises Company and Britvic are good examples of a *Network* business model, as they act as a facilitator between brand owners (Coca-Cola Company and PepsiCo, respectively) and consumers. A further four per cent of Consumer Goods companies use elements of the *Network* business model as part of a hybrid model.

A total of 23 per cent of Consumer Goods companies utilised *hybrid* business models, where they focus on several business model elements at the same time. The most prevalent hybrid business model is the mix between *Operational* and *Product Models* (14 per cent). The second largest hybrid business model is the mix between *Operational* and *Solutions Models* (5 per cent).

6.4. DISCUSSION

The above research confirms the first research hypothesis:

(HI)	*Each company has elements of different business model types but has one dominant construct.*

The four business model types were all identified in the Consumer Goods industry, although the *Network* business model accounts for the small percentage of use. Given the nature and long history of the Consumer Goods industry, it is not surprising that the *Network* business model type has the lowest usage. It is a type of business model that is more prevalent in industries such as Insurance, Banking and Media.

Interestingly, 23 per cent of Consumer Goods companies utilised a hybrid business model type, where they focus on several business model elements at the same time. Focusing on multiple business model types at the same time (e.g., *Operational* and *Product Models*) can create internal friction. If a company wants to build trust with its customers through a *Solutions* business model, it should be prepared to connect its customers with the best products and services to meet customers' needs, even if that involves recommending products and services developed by other companies. At the same time, if a company is trying to operate with a *Product Model*, it may want to restrict the choice offered to customers so that it only involves the products and services developed by itself. On the company culture front, product developers and marketers have reservations towards the supply chain people who try to confine their creativity by seeking standardisation and cost savings. In addition, the salespeople may view back-office operations as an obstacle to effectively serving the unanticipated and unique needs of their retail customers.

CHAPTER 7: DATA ANALYSIS AND RESULTS III: RELATIONSHIP BETWEEN BUSINESS MODEL COHERENCE INDEX AND FIRM PERFORMANCE

The purpose of this chapter is to present the results of the statistical analysis and hypothesis testing to provide additional evidence to the theory of business models. Namely, whether some business model types deliver higher firm performance than others, and whether a higher adherence to a certain business model type delivers above-industry firm performance.

The chapter is divided into four main sections:

1. The first section provides an overview of how the dependent variable, *Firm Performance*, was determined and presents the results of a 5-year annual percentile ranking for *ROA* and *Revenue Growth*, and a combined Firm Performance Index.
2. In section 2, the results of the significance testing of the correlation between *Business Model Coherence* (independent variable) and *Firm Performance* (dependent variable) are presented.
3. The third section describes the results of the hypothesis testing of the two main research hypotheses:
    a. *In the Consumer Goods industry, is it possible to deliver above-industry firm performance with any business model type?*
    b. *Do Consumer Goods companies with higher adherence to a certain business model type deliver above-industry firm performance?*
4. Finally, in section 4, the results of the analysis and hypothesis testing are evaluated and discussed.

7.1. INTRODUCTION

The literature review in Chapter 2 highlighted a number of issues and gaps in the academic literature around business models, in particular, the limited empirical research into the relationship between business model types and firm performance. It is the purpose of this research to provide additional evidence to the theory of business models and to examine whether some business model types deliver higher firm performance than others and whether a higher adherence to a certain business model type (*Business Model Coherence*) delivers above-industry firm performance.

7.2. DEPENDENT VARIABLE: FIRM PERFORMANCE

7.2.1 Analysis Technique

In their Strategic Management Journal paper titled "*How Long Must a Firm Be Great to Rule out Chance? Benchmarking Sustained Superior Performance Without Being Fooled By Randomness*", Henderson et al. (2012) benchmark how often a firm must perform at a high level to believe it is not the sort of false positive that would routinely occur in a large population of identical companies whose performances change over time due to a stochastic process. The authors defined unexpected sustained superiority as a firm's ability to achieve a highly ranked focal outcome (e.g., top-10 per cent return on assets) often enough across the firm's observed life to rule out, as a complete explanation of the firm's performance or any of a number of performance measures, percentile ranks was used to translate the actual performance of a company (e.g., return on assets) into relative terms.

In Chapter 3, the reason for anchoring firm performance in the economic returns school and measure performance on an annual basis using two economic return performance measures: *profitability* and *growth* was explained. To address the issues of randomness and false positives, it was also decided to use annual percentile ranks to measures firms on their relative performance for minimum five years to rule out chance, randomness and false positives.

The performance measures were defined as follows:

*Profitability. M*easured as a ratio of income to the value of all of the assets (return on assets or ROA):

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

Growth. Measured as the year-on-year growth in revenue:

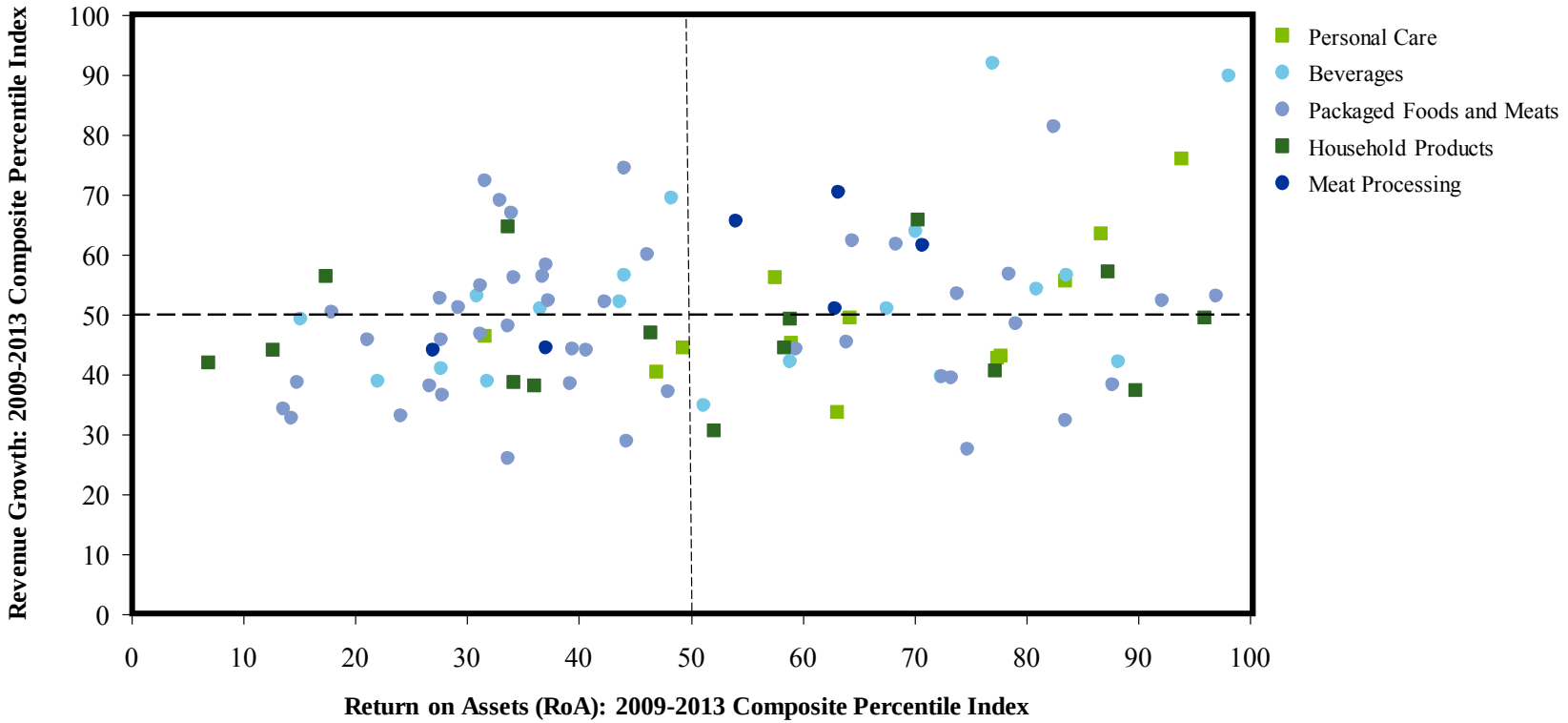
$$Revenue\ growth = \frac{Revenue\ (t)}{Revenue\ (t-1)}$$

Performance percentile calculation. The approach offers considerable flexibility in the ways that performance percentiles are calculated. The algorithm uses performance data, so values of the chosen performance measure are pooled across all companies in a given year in the sample and then chunked into percentile rankings that range from 1 (lowest) to 100 (highest). For the five-year period, the average of all the annual percentile rankings is calculated and used as the final composite percentile index. As per Henderson et al. (2012), each year was weighted evenly in the calculation of the composite percentile index.

7.2.2 Results

Based on the percentile average rank of the 97 Consumer Goods companies on both asset profitability (ROA) and revenue growth, four different groups of firm performance were identified, centred on whether the company was above or below the 50th percentile regarding ROA and revenue growth (see **Figure 21**).

Figure 21: Firm Performance by Business Sector



Note: Includes 97 CPG companies with financials for 2009 – 2013
Composite Percentile Index is calculated as the relative percentile ranking for each year. 100% indicates top percentile in each year.
Source: Annual Reports from 2009 to 2013; Analysis

The first group is below the 50th percentile in both ROA and revenue growth. The 28 companies in this group consistently underperformed the industry in both areas. These companies delivered an average ROA of 4.3 per cent and annual revenue growth of 4.7 per cent, and as a result, saw modest growth in average annual shareholder value return of 8.8 per cent over the period from 2004 to 2013.

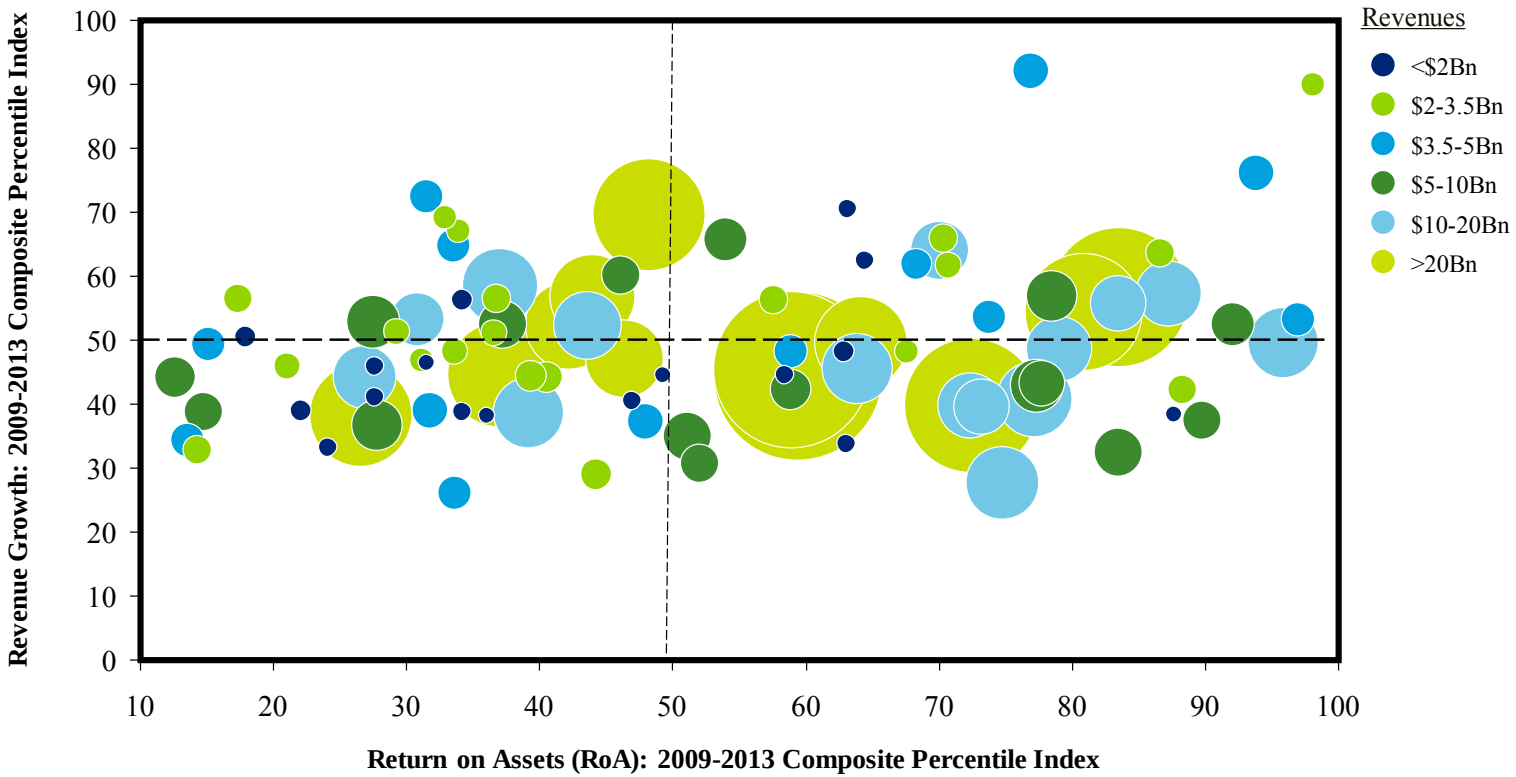
At the other end, there is a group of 25 companies that consistently outperformed their peers over a period of five years and were ranked above the 50th percentile in both ROA and revenue growth. These companies managed to deliver an average ROA of 12.1 per cent and annual revenue growth of 13.3 per cent during the same period and were rewarded with an average annual shareholder value return of 27.1 per cent vs 16.8 per cent for all the companies analysed.

The next group identified consists of 23 companies that consistently delivered ROA ahead of the industry (50th percentile) but had fallen behind regarding annual revenue growth (4.7 per cent vs 8.2 per cent for the industry). Regarding average annual shareholder value return, these companies saw growth of 10.0 per cent.

Finally, there were 21 companies that outperformed their peers regarding revenue growth (13.4 per cent vs 8.2 per cent) but had lower Asset Profitability than their peers (below the 50th percentile). The companies experienced an average annual shareholder value return of 22.8 per cent and showed that revenue growth is often rewarded with higher shareholder value growth.

As shown in **Figure 22**, no single industry sector dominated each of the four performance groups, and the sectors were spread out across all groups. Furthermore, there is no evidence that business performance depends on company size. As **Figure 22** shows, the distribution of companies by total annual revenue in 2013 is relatively even with large and small companies found in each performance group. This will also be confirmed in the multiple regression analysis where company size is used as a control variable.

Figure 22: Firm Performance by Company Size



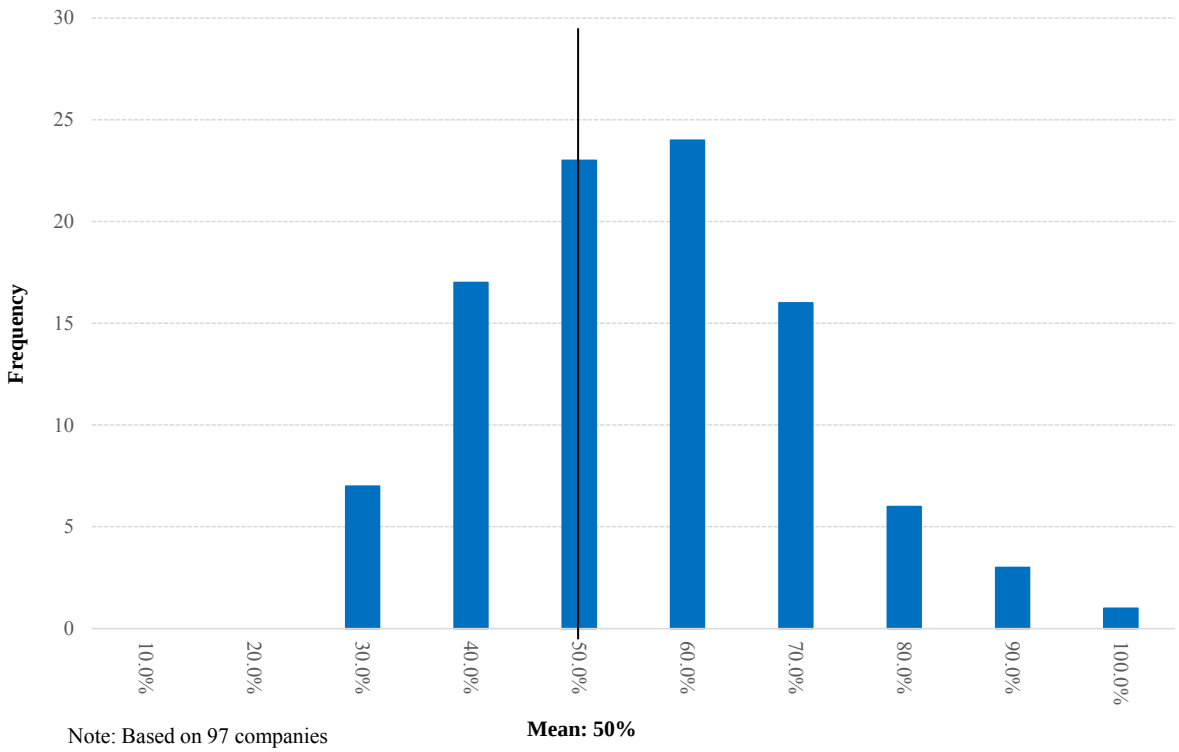
Note: Includes 97 CPG companies with financials for 2009 – 2013
Composite Percentile Index is calculated as the distance from top decile in each year. 100% indicates top decile in each year.
Source: Annual Reports from 2009 to 2013; Analysis

7.2.3 Dependent Variable - Combined ROA and Growth Score

To reflect the different firm performance groups in the Consumer Goods industry, the ROA composite percentile score was added to the revenue growth composite percentile score and divided by two to create an overall average performance score for each company. However, to test the correlation between business model coherence and firm performance, the two variables, ROA and Growth will also be tested separately through the multiple regression analysis.

As **Figure 23** shows, the distribution of the combined ROA and revenue growth scores is positively skewed (.376) and with a Kurtosis of .231. The positive skew in the combined performance composite percentile score is driven by the uneven distribution of companies across the four performance groups.

Figure 23: Distribution of Combined ROA and Growth Percentile Scores



Note: Based on 97 companies

7.3. CORRELATION BETWEEN BUSINESS MODEL COHERENCE AND FIRM PERFORMANCE

7.3.1 Independent Variable: Business Model Coherence

As defined in Chapter 6, the overall business model coherence score is the sum of the dominant business model score (**BM_{1st}**) less the sum of the other three business model scores (**BM_{2nd}, BM_{3rd}, BM_{4th}**) plus 1. Every score above the midpoint of 0 should be considered as *coherent*, and a score below the midpoint should be considered as *incoherent*.

7.3.2 Control Variables

As described in Chapter 3, three control variables were selected:

(i) *Firm size*: Business size in terms of latest annual revenue (2013).

(ii) *Firm Age*: The age since the foundation of the current corporation and 2013.

(iii) *Environmental uncertainty*: Measured as the mean of five dimensions defined by Miller and Droge (1986). The five dimensions that were measured are (i) volatility in marketing practices, (ii) product obsolescence rate, (iii) unpredictability of competitors, (iv) unpredictability of demand and tastes, and (v) change in production or service modes. On each of these 1 to 5 scales, high numbers indicated high uncertainty.

Before proceeding with the multiple regression analysis, the control variables were tested to understand whether there was a correlation between the choice of business model type and the specific control variables. The question to be tested was:

Research question: *"Is the choice of the business model a function of the firm size, age and environmental uncertainty?"*

To answer this research question, a multi-nominal logistic regression analysis was completed. This type of regression analysis is used to predict a nominal dependent variable ("Business Model Type"), given one or more independent variables ("control variables") (Hair et al., 2010). These independent variables can either be nominal (e.g., "environmental uncertainty") or continuous (e.g., "firm size" and "firm age").

Multinomial logistic regression does necessitate careful consideration of the sample size and examination for outlying cases. Specifically, multicollinearity should be evaluated with simple correlations among the independent variables (Schwab, 2002). Sample size guidelines for multinomial logistic regression indicate a minimum of 10 cases per independent variable (Schwab, 2002).

Multicollinearity among control variables

As per Schwab (2002), a multicollinearity test of the control variables was conducted using a regression analysis and looking at the variance inflation factors (VIF) to help detect multicollinearity. The VIF is calculated for each control variable by doing a linear regression of that control variable on the other two control variables. It is called the variance inflation factor because it estimates how much the variance of a coefficient is "inflated" because of linear dependence with other control variables (Schwab, 2002). A VIF of 1 means that there is no correlation between the specific control variable and the remaining control variables, and hence the variance of the main control variable is not inflated (Schwab, 2002). As shown in **Table 38**, the VIF among the selected control variables are all 1, so no multicollinearity among the control variables is assumed.

Table 38: Variance Inflation Factors (VIF) among Control Variables

	Company Size	**Firm Age**	**Environmental Uncertainty**
Company Size		1.000	1.062
Firm Age	1.006		1.062
Environmental Uncertainty	1.006	1.000	

Results of multi-nominal logistic regression analysis

To test the correlation between the business model types (the nominal dependent variable) and the three control variables (independent variables), the multi-nominal logistic regression analysis was conducted on the full data set.

Table 39: Model Fitting – Control Variables

	Model Fitting			
	Model Fiting Criteria	Likelihood Ratio Tests		
	2-log Likelihood	Chi-Square	df	Signif.
Intercept Only	0.235	5	20.000	**0.069**
Final	2.724	95		

As shown in **Table 39**, the model fit is not significant (p > .005), which indicates our full model predicts significantly worse, or less accurately than the null model (Intercept Only). In terms of goodness of fit of the model, the Pearson x^2 is high (440), which indicates a poor fit for the model. As shown in **Table 40**, the p-value is .619 and is not statistically significant.

Table 40: Goodness-of-Fit – Control Variables

	Goodness-of-Fit		
	Chi-Square	df	Signif.
Pearson	440	450.000	**0.619**
Deviance	283	450.000	**1.000**

A further analysis of each of the control variables (see Table 40) showed that none of the model elements was a good predictor of the dominant business model design (p .-value > .005).

Table 41: Model Fitting – Each Model Element

	Model Fitting			
	Model Fiting Criteria	Likelihood Ratio Tests		
	2-log Likelihood	Chi-Square	df	Signif.
Intercept Only	283.29	0	0.0	
Firm Size	292.14	9	5.0	**0.115**
Firm Age	290.94	8	5.0	**0.177**
Environmental Uncertainty	298.45	15	10.0	**0.126**

7.3.3 Significance Testing with Multiple Regression Analysis

The standard multiple regression approach was used to assess the nature of the relationships between the independent variables and the dependent variable and to assess the importance of each independent variable (including the control variables) in explaining firm performance. Standard multiple regression involves entering all independent variables into the regression equation simultaneously and provides an objective means of assessing the predictive power of the independent variables (Hair et al., 2010). In multiple regression analysis, each independent variable is weighted by the regression analysis procedure, and the weights refer to the relative contribution of the independent variables to the overall prediction (Hair et al., 2010). Hence, the set of weighted independent variables forms the regression variate, which is a linear combination of the independent variables that best predicts the dependent variable (Hair et al., 2010).

Hair et al. (2010) recommend a minimum R^2 of 12 per cent for a sample size of 100 and four independent variables with a .05 significant level (α) and with a power (probability) of .80. This means that the analysis will identify relationships explaining about 12 per cent of the variance. In addition, the general rule is that the ratio of observations to independent variables should never fall below 5:1, meaning that five observations are made for each independent variable in

the variate. Although the minimum ratio is 5:1, the desired level is between 15 to 20 observations for each independent variable (Hair et al. 2010). For this research, the sample of 97 observations meets the guideline for the minimum ratio of observations to independent variables (5:1) with an actual ratio of 24:1 (97 observations with one main independent variable (business model coherence) and three control variables). **Table 42** describes the five variables included in the multiple regression analysis.

Table 42: Description – Regression Analysis

	Variable Descriptors			
	Minimum	**Maximum**	**Mean**	**Std. Deviation**
Performance	0.000	1.000	.503	.171
Coherence	0.000	1.000	.508	.366
Environment Score	2.00	5.00	3.760	.880
Revenue Size	1041	95823	11150	16815
Firm Age	1.0	207.0	75.7	52.6

Table 43 provides a matrix of all zero-order correlations between the independent variable, control variables and the dependent variable ("Performance").

Table 43: Pearson's Correlation Matrix – Regression Analysis

	Correlation Matrix				
	Performance	Coherence	Environmental Uncertainty	Revenue Size	Firm Age
Performance	1.000				
Coherence	**.461**	1.000			
Environmental Uncertainty	.122	-.061	1.000		
Revenue Size	.062	-.151	.017	1.000	
Firm Age	.125	.035	-.060	.246	1.000
Total	**1**				

Bolded values indicate correlations significant at the .01 significant level
Overall Measure of Sampling Adequacy (MSA): .603
Bartlett Test of Sphericity: 869

A number of observations can be made from the zero-order correlations exhibited in **Table 44**. Firstly, the correlations between the independent variables (including the control variables) range from .062 to .461. Secondly, due to the lack of any high correlations (generally .90 and higher according to Hair et al., 2010) between the independent variables, there was no indication of substantial collinearity. Lastly, the correlation between *Performance* and *Coherence* is the highest (.461) with none of the control variables having a significant correlation (at the .01 significant level) with *Performance*. The strength of the correlation between *Performance* and *Coherence* is considered medium to high, as per the definition framed by Pallant (2001) where:

r = .10 to .29 (positive or negative) is small

r = .30 to .49 (positive or negative) is medium

r = .50 to 1.0 (positive or negative) is high

The estimated model was examined through overall fit statistics, such as the coefficient of determination (R^2) and a statistical test for the overall model fit in terms of the F ratio (ANOVA analysis). This is supplemented by the assessment of the significance of the regression coefficients. **Table 44** presents the model summary.

Table 44: Regression Model Summary

	Model Summary					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	DF	Signif.
1	0.461	0.213	0.204	0.153	94	**0.000**

Model 1: Coherence

As **Table 44** shows, the adjusted coefficient of determination (R^2) indicates that 20.4 per cent of the total variation of performance in Model 1 is explained by the regression model consisting of only the *Coherence* variable. This is greater than the guideline of minimum R^2 of 12 per cent as above described. None of the control variables significantly contributed to the model and were excluded. As indicated by the results from the ANOVA presented in **Table 45** this regression model reached statistical significance ($p<.005$).

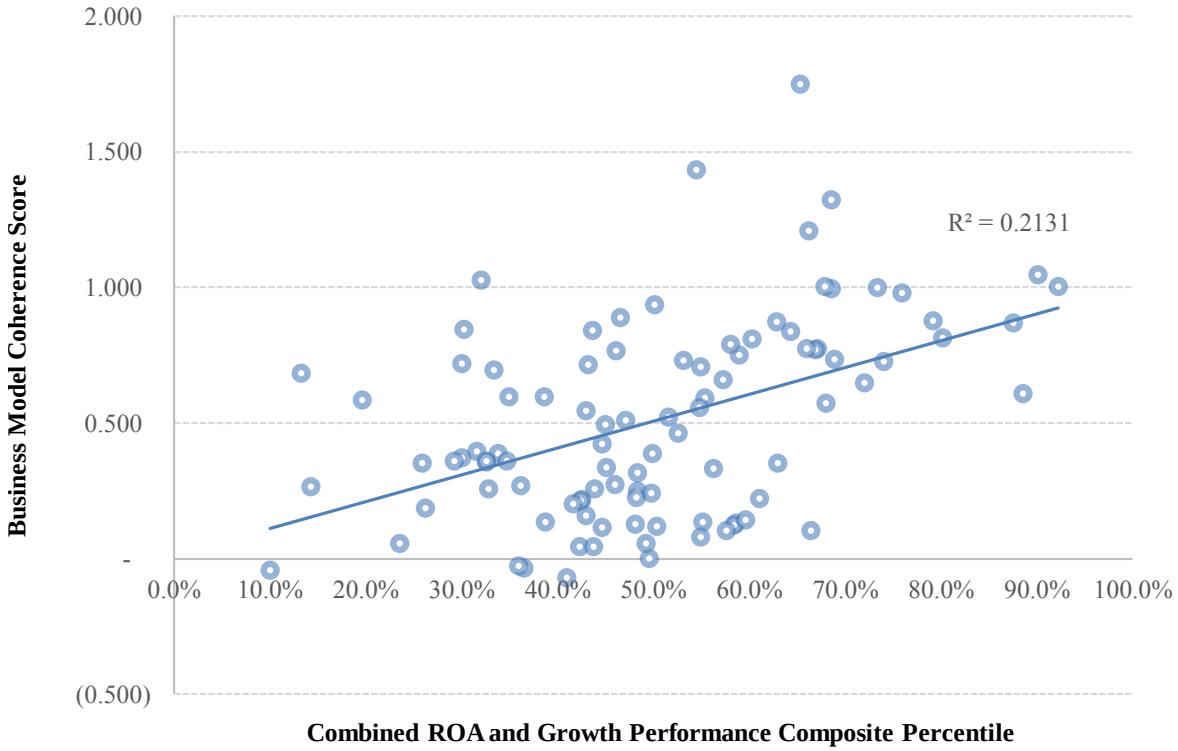
Table 45: ANOVA – Regression Analysis

		ANOVA Summary				
		Sum of Squares	DF	Mean Square	F	Signif.
1	Regression	0.591	1	0.591	25.366	**0.000**
	Residual	2.191	94	0.017		
	Total	2.782	95			

Model 1: Coherence

Figure 24 presents the correlation plot between the business model coherence and firm performance.

Figure 24: Correlation Plot between Coherence and Performance



Evaluating the variate for the assumptions

As described by Hair et al. (2010), meeting the assumptions of regression analysis is essential to ensure that the results obtained are representative of the sample. Any serious

violations of the assumptions must be detected and corrected, if at all possible. The three assumptions to be addressed for the individual variables are (i) *linearity*, (ii) *constant variance (heteroscedasticity)* and (iii) *normality*.

(i) Linearity

Linearity can be assessed through an analysis of residuals and partial regression plots. While the residual plot is assessed to check that it is not exhibiting any nonlinear pattern to the residuals and ensuring that the overall equation is linear, the partial regression plot for each independent variable in the equation is assessed to ensure that the relationships are quite well defined, thereby having strong and significant effects in the regression equation. The studentised residuals plot does not exhibit a nonlinear pattern to the residuals, thus ensuring that the overall equation is linear. The partial regression plots also indicate that the relationship between *Performance* and *Coherence* is reasonably well defined. The relationships between *Performance* and *Company Size, Firm Age* and *Environmental Uncertainty* are much weaker. On the other hand, no nonlinear patterns are shown in the partial regression plots, thus meeting the assumption of linearity for each control variable.

(ii) *Constant variance (heteroscedasticity)*

It is also recommended that homoscedasticity is assessed through examination of residuals. The assumption of homoscedasticity is met if no pattern of increasing or decreasing residuals is shown in the studentised residuals plot (Hair et al., 2010). A visual examination of the studentised residuals plot did not indicate a pattern of increasing or decreasing residuals. Hence, this examination indicated homoscedasticity in the multivariate case.

(iii) *Normality*

The assumption of normality can be checked through a visual examination of the normal probability plot of the residuals. If the values fall along the diagonal with no substantial or systematic departures, the residuals are considered to represent a normal distribution (Hair et al., 2010). A visual examination of this plot showed that the values fall along the diagonal with no substantial or systematic departures. As such, the residuals are considered to represent a normal distribution. The regression variate is found to meet the assumption of normality.

The results reported in this part of the analysis have revealed that the main independent variables and the dependent variable show no violation of the assumptions of *linearity*, *homoscedasticity,* and *normality*.

To test the model reliability, two additional tests were conducted: (i) *sample split*; and (ii) *external responses only*.

(i) Sample Split

The first model test involves splitting the sample randomly into two sub-samples, and then to estimate the regression model for each sub-sample, and compare the results. The sub-samples were created by SPSS through the "select cases" command. **Table 46** contains the regression models estimated for the two sub-samples of 42 (sample 1) and 54 (sample 2) observations. Comparison of the overall model fit demonstrates some similarity of the results in terms of R^2, Adjusted R^2, and the standard error of the estimate. Both sub-sample models are significant at the .001 confident level.

Table 46: Comparison of Sub-sample Regression Models

	Model Summary					
Sub-sample	R	R Square	Adjusted R Square	Std. Error of the Estimate	DF	Signif.
Sub-sample 1 (n=42)	0.515	0.265	0.247	0.156	41	**0.000**
Sub-sample 2 (n=54)	0.418	0.175	0.159	0.152	53	**0.000**

Variable: Coherence

As Hair et al. (2010) note, it is not uncommon that differences occur between the original model and the validation efforts. Overall, the results from the two validation samples are similar to the results in the overall model (adjusted R^2 of .204) and greater than the guideline of R^2 of .12.

(ii) External Responses Only

To test the model and therefore the central research question with external assessments only, the scores for the companies with external responses were selected and a separate sample

set developed (see **Table 22** for an overview of the 39 companies with external responses). The results of the external assessments were compared to the scores for companies with only internal assessment, and for which there was no external respondent and therefore no external corroboration of the business model assessment. As shown in **Table 47**, the external assessment model has an adjusted R^2 of .176, which is above the guideline of .12. This is slightly lower than the overall model with an adjusted R^2 of .204. However, the model is significant at the .005 confident level and is, therefore, consider good. In comparison, the internal assessment model has a lower adjusted R^2 of .156 and is significant at the .001 confident level.

Table 47: Comparison of External and Internal Assessments

	Model Summary					
Sub-sample	R	R Square	Adjusted R Square	Std. Error of the Estimate	DF	Signif.
External Assessment (n=39)	0.444	0.198	0.176	0.163	38.0	**0.005**
Internal Assessment (n=58)	0.413	0.170	0.156	0.145	57.0	**0.001**

Variable: Coherence

Both the external and internal assessment models support the findings of the overall model that there is a positive correlation between firm performance and business model coherence.

7.3.4 Multiple Regression Analysis - ROA

As the dependent firm performance variable consists of two measures: (i) ROA and (ii) Revenue Growth, an additional multiple regression analysis was conducted with each of these two measures as the dependent variable. This was done to understand whether there was a correlation between the business model coherence and each of these individual measures.

Table 48 provides a matrix of all zero-order correlations between the ROA as the dependent variable, business model coherence, and the control variables.

Table 48: Pearson's Correlation Matrix – Regression Analysis for ROA

	Correlation Matrix				
	Performance	Coherence	Environmental Uncertainty	Revenue Size	Firm Age
Performance	1.000				
Coherence	**.340**	1.000			
Environmental Uncertainty	.157	-.061	1.000		
Revenue Size	.146	-.151	.017	1.000	
Firm Age	**.326**	.035	-.060	.246	1.000
Total	**2**				

Bolded values indicate correlations significant at the .05 significant level

The correlations between the independent variables (including the control variables) range from -.151 to .340. The correlation between *ROA* and *Coherence* is the highest (.340) with *Firm Age* having a significant correlation (at the .05 significant level) with *ROA*. This seems logical as older companies (as defined by Firm Age) tend to have greater leverage and therefore higher ROA. However, using Pallant's definition (2005), the strength of the correlation is considered medium.

The step-wise multiple regression analysis defined three possible models: (1) *Coherence*, (2) *Coherence* and *Firm Age*, and (3) *Coherence*, *Firm Age* and *Environmental Uncertainty*.

Table 49 presents the 3-step model summary.

Table 49: Regression Model for ROA

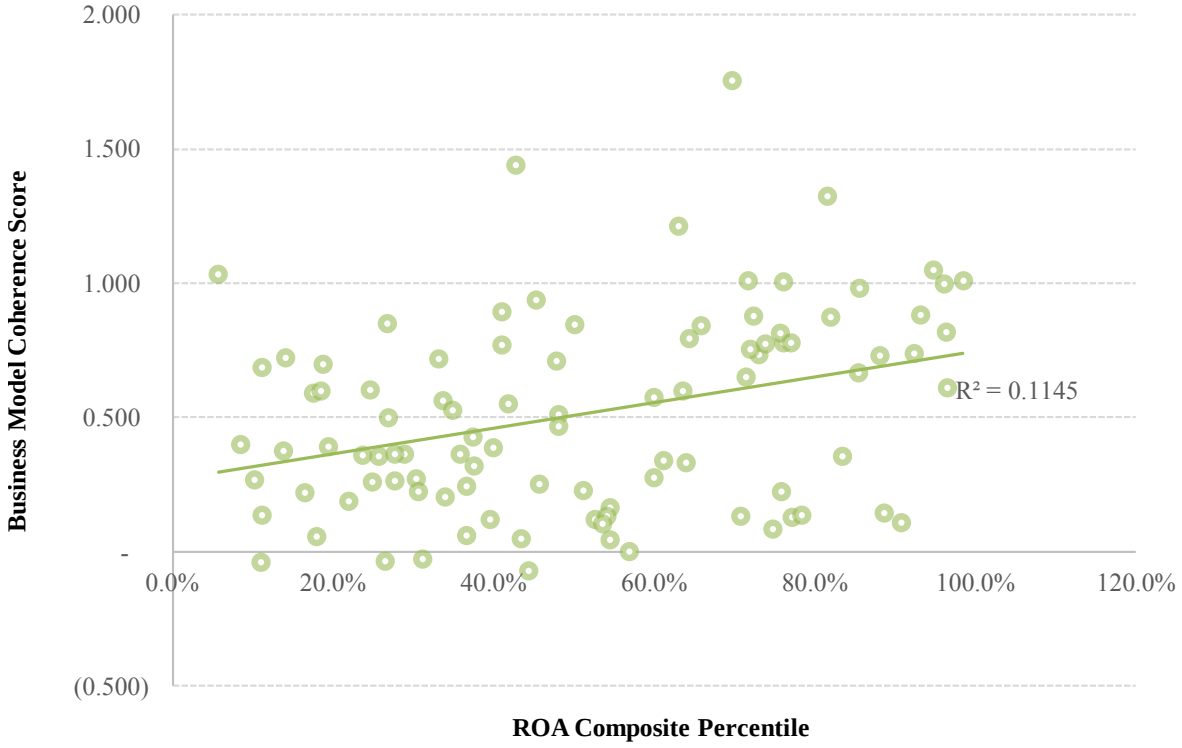
	Model Summary					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	DF	Signif.
1	0.34	0.115	0.106	0.246	94	**0.001**
2	0.462	0.214	0.197	0.233	93	**0.000**
3	0.502	0.252	0.228	0.228	92	**0.000**

Model 1: Coherence
Model 2: Coherence and Firm Age
Model 3: Coherence, Firm Age, Environmental Uncertainty

As **Table 49** shows, the adjusted coefficient of determination (R^2) indicates that only 10.6 per cent of the total variation of performance in Model 1 is explained by the regression model consisting of only the *Coherence* variable. This is slightly lower than the guideline of minimum R^2 of 12 per cent and significant at the .001 level. The adjusted coefficient of determination increases slightly in Model 2 to 19.7 per cent with the additional of *Firm Age*. Model 3 increases the adjusted R^2 to 22.8 per cent.

Figure 25 presents the correlation plot between the business model coherence and ROA.

Figure 25: Correlation Plot between Coherence and ROA



7.3.5 Multiple Regression Analysis – Revenue Growth

Similar to the ROA multiple regression analysis, an additional analysis was completed to understand the correlation between revenue growth, business model coherence and each of these individual measures.

Table 50 provides a matrix of all zero-order correlations between Growth as the dependent variable, business model coherence, and the control variables.

Table 50: Pearson's Correlation Matrix – Regression Analysis for Revenue Growth

	Correlation Matrix				
	Revenue Growth	Coherence	Environmental Uncertainty	Revenue Size	Firm Age
Revenue Growth	1.000				
Coherence	**.439**	1.000			
Environmental Uncertainty	.006	-.061	1.000		
Revenue Size	-.107	-.151	.017	1.000	
Firm Age	**-.264**	.035	-.060	.246	1.000
Total	**2**				

Bolded values indicate correlations significant at the .05 significant level

The correlations between the independent variables (including the control variables) range from -.151 to .439. The correlation between *Revenue Growth* and *Coherence* is the highest (.439) and considered medium to high (Pallant, 2001). *Firm Age is* having a significant correlation (at the .05 significant level) with *Revenue Growth.*

The step-wise multiple regression analysis defined two possible models with Coherence as the main variable and Firm Age as the second variable. **Table 51** presents the regression model summary.

Table 51: Correlation Matrix – Regression Analysis for Revenue Growth

	Model Summary					
	R	R Square	Adjusted R Square	Std. Error of the Estimate	DF	Signif.
1	0.439	0.193	0.184	0.143	94	**0.000**
2	0.521	0.271	0.255	0.137	93	**0.000**

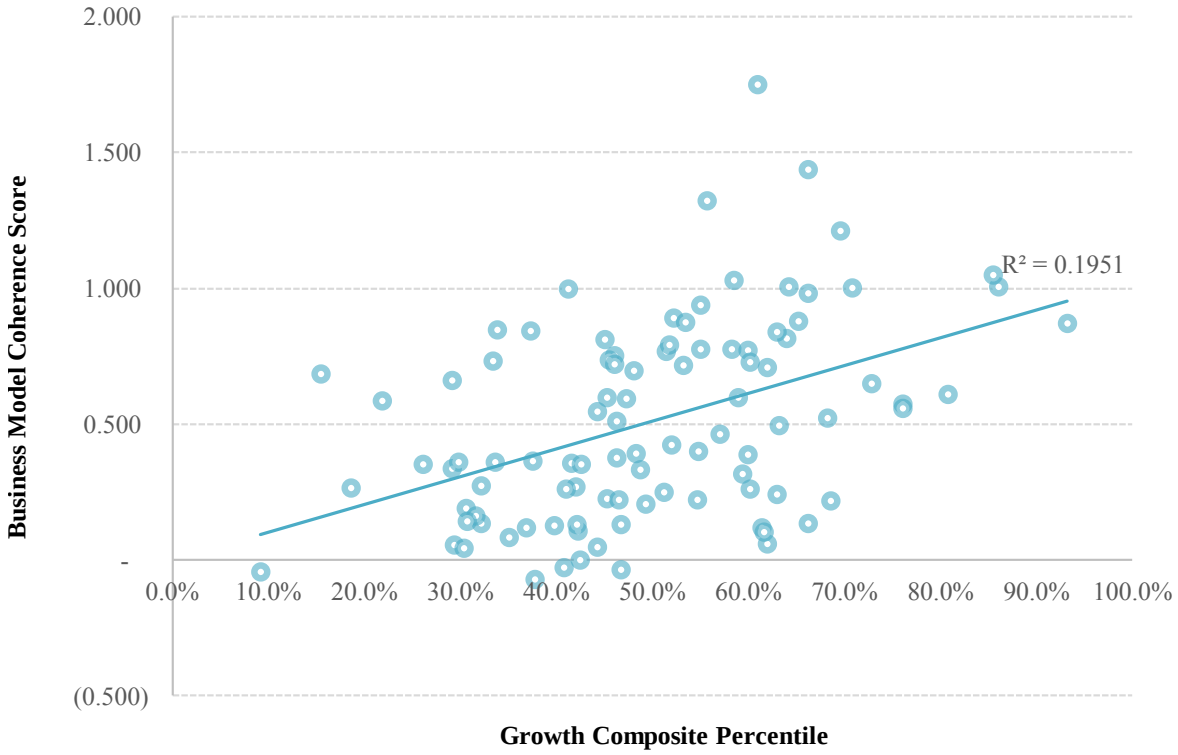
Model 1: Coherence
Model 2: Coherence and Firm Age

As **Table 51** shows, the adjusted coefficient of determination (R^2) indicates that 18.4 per cent of the total variation of performance is explained by the regression model. This is higher than

the guideline of minimum R^2 of 12 per cent and significant at the .001 level. The adjusted coefficient of determination increases slightly in Model 2 to 25.5 per cent with the additional of *Firm Age*.

Figure 26, below, presents the correlation plot between Business Model Coherence and Revenue Growth.

Figure 26: Correlation Plot between Coherence and Revenue Growth



7.4. HYPOTHESIS TESTING

7.4.1 Hypothesis: Relationship between Business Model Coherence and Firm Performance

The research question is formulated as *do Consumer Goods companies with higher adherence to a certain business model type deliver above-industry performance?*

Based on that research question, a hypothesis has been defined:

(H_0) *Business model coherence is <u>not</u> positively correlated with firm performance*

(H_1) *Business model coherence is positively correlated with firm performance*

The analysis presented in Section 7.3. showed that the strength of the correlation between *Performance* and *Business Model Coherence* is considered medium to high (.461), as per the definition framed by Pallant (2001), with none of the control variables (*Firm Size*, *Firm Age*, and *Environmental Uncertainty*) having a significant correlation (at the .01 significant level) with *Performance*.

The adjusted coefficient of determination (R^2) indicates that 20.4 per cent of the total variation of firm performance is explained by the regression model consisting of only the *Business Model Coherence* variable (see **Table 41**). This is greater than the guideline of minimum R^2 of 12 per cent as above described. The results from the ANOVA analysis presented in **Table 52** show that the regression model reached statistical significance ($p<.005$).

Table 52: ANOVA – Regression Analysis

		ANOVA Summary				
		Sum of Squares	DF	Mean Square	F	Signif.
1	Regression	0.591	1	0.591	25.366	**0.000**
	Residual	2.191	94	0.017		
	Total	2.782	95			

Model 1: Coherence

Therefore, the H_0 hypothesis can be rejected as determined by the multiple regression analysis ($F(1,94) = 25.366$, $p = .000$), and it can be concluded *that there is a statistically significant positive relationship between business model coherence and firm performance.*

This implies that high business model coherence will be associated with high firm performance and vice versa.

7.4.2 Hypothesis: High-Performance Business Model Types

As described in Chapter 1, this research seeks to provide clarity on an important issue facing business managers today: *how to configure the business model to deliver superior performance*. When interviewing managers in the Consumer Goods industry, one of the first questions they ask is whether *it is possible to deliver above-industry firm performance with any business model type*?

Based on that research question, a hypothesis has been defined:

(H_0) *Business Model A does not deliver greater firm performance than Business Model B, where A and B are different business model types*

(H_1) *Business Model A delivers greater firm performance than Business Model B, where A and B are different business model types*

To refute the hypothesis, a number of different analyses were completed.

Partial Correlation Analysis of Business Model Types and Performance

To understand the unique correlation between each of the dominant business model types respectively and firm performance, a correlation analysis was completed. **Table 53** summarises the results of the partial correlation analysis.

Table 53: Pearson's Correlation Matrix – Business Model Types

	Correlation Significance (1-tailed)					
	Performance	Coherence	Market Making	Customer Solutions	Product Leadership	Operational Excl.
Performance	1.000					
Coherence	**.461**	1.000				
Market Making	**-.324**	**-.801**	1.000			
Customer Solutions	-.193	**-.556**	**.619**	1.000		
Product Leadership	-.173	**-.614**	**.495**	**0.288**	1.000	
Operational Excl.	**-.400**	**-.307**	.176	.124	-.070	1.000
Total	**3**	**4**	**2**	**1**		

Bolded values indicate correlations significant at the .01 significant level

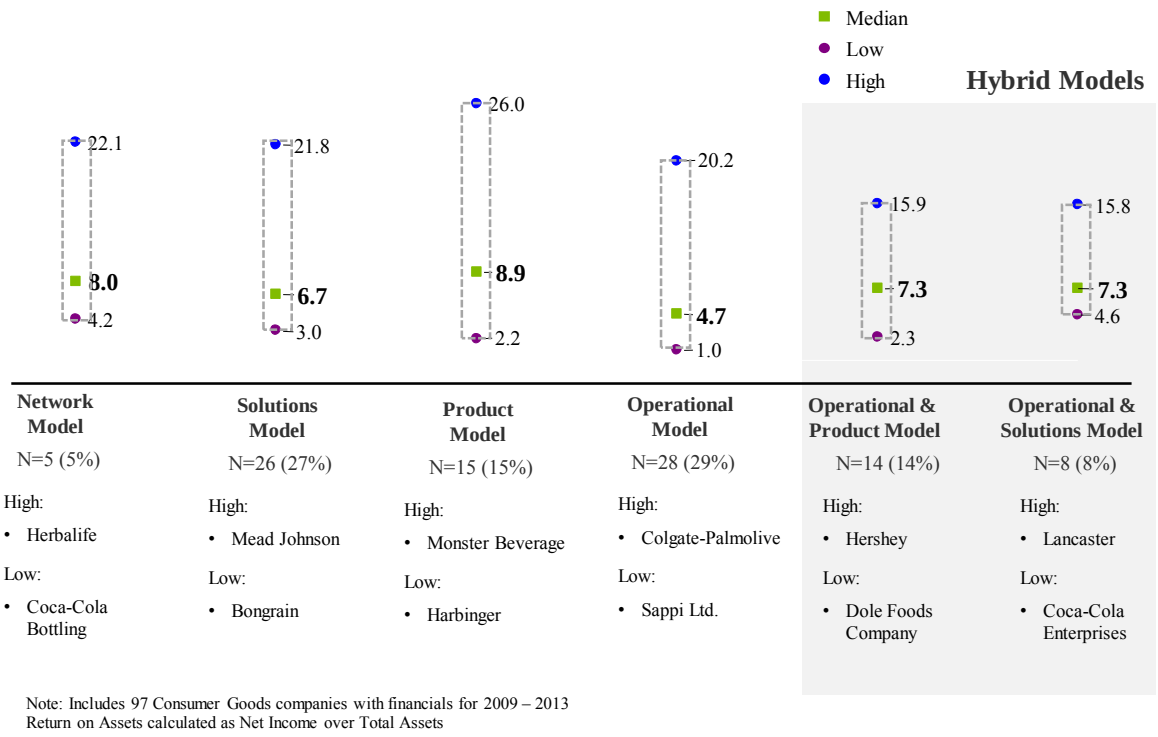
A number of observations can be made from the Pearson's correlations exhibited in **Table 53**. Firstly, the correlations between the business model types (independent variables) and the firm performance range from .173 to .324. As before mentioned, the correlation between *Performance* and *Coherence* is the highest (.461), and each of the business model types (BM 1, BM 2, BM 3, and BM4) are negatively correlated with *Firm Performance* and *Coherence*. The strength of the correlation between performance and the business model types is considered small to medium, as per the definition framed by Pallant (2001). The fact that the business model types are negatively correlated with *Firm Performance* can be explained by the measurement scales. In order for a company to have a high score on one business model type, it logically has to have low scores on the other business model types, in order to have high overall business model coherence. This is also reflected in the negative correlation between the business model types and *Coherence*.

As expected, the correlations between the business model types are high (greater than .50) except *Operational Excellence*. However, as shown in **2**, all the business model types have correlations that are significant at the .005 level and are very close to being significant at the .001 level (1-tailed significance). Therefore, further analysis is needed.

Plotting Financial Performance by Business Model Type

To understand whether certain business model types deliver greater firm performance than others, their 5-year average financial performance was plotted. **Figure 27** presents the average 5-year ROA by the four dominant business model types and two hybrid models.

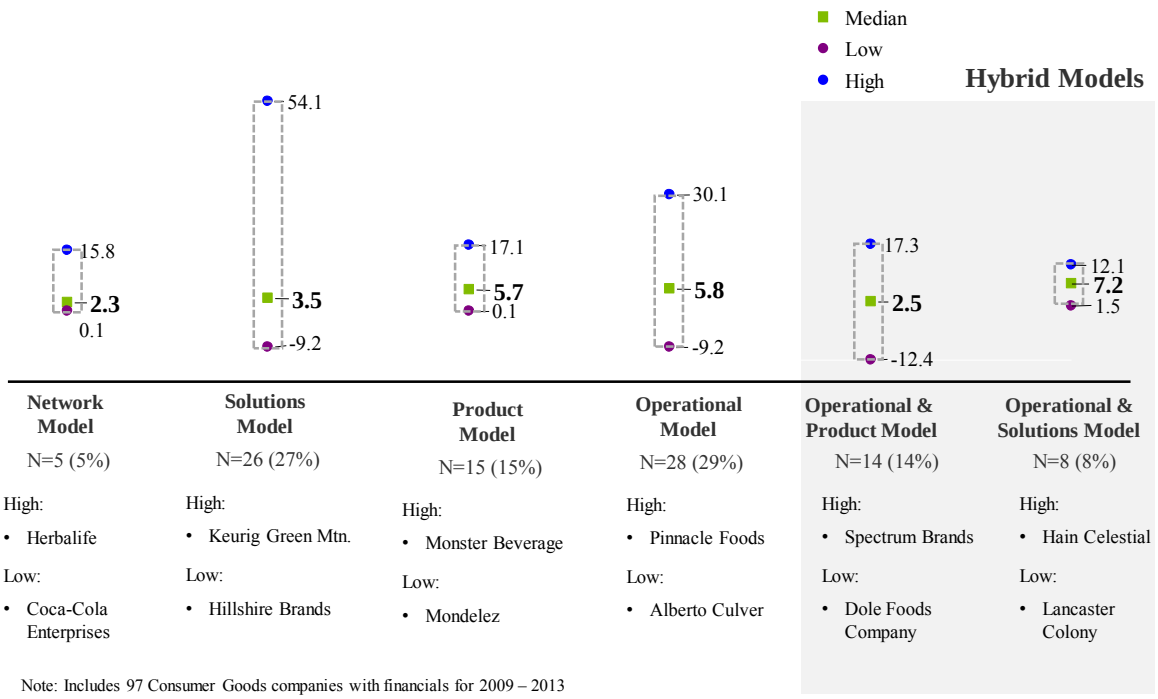
Figure 27: Average 5-year Return on Assets (percentage) by Business Model Type



On average, the *Product* business model type has delivered slightly higher ROA of 8.9 per cent than other business model types and also has the highest performance (31 per cent for Monster Beverage). The *Network* business model has also delivered slightly higher ROA of 8.0 per cent. On the other side, the *Operational Model* is the business model type with the lowest average ROA (4.7 per cent). From an ROA perspective, business model type *Product Model* and *Network Model* would appear to generate greater performance.

However, when comparing 5-year average Revenue Growth by business model type (see **Figure 28**), the *Operational* business model seems to have outperformed other business models. On average, companies with an *Operational* business model type delivered revenue growth of 5.8 per cent, compared to 5.7 per cent for the *Product Model*, 3.5 per cent for the *Solutions Model,* and 2.3 per cent for the *Network Model*.

Figure 28: Average 5-year Revenue Growth (percentage) by Business Model Type



It should be noted that the revenue growth for companies with an *Operational* business model has to some extent been driven by large acquisitions (e.g., InBev's acquisition of Anheuser-Busch). It should be noted in both financial comparisons, the hybrid business model *Operational and Solutions* has performed well with an average ROA of 7.3 per cent and an average Revenue Growth of 7.2 per cent.

Analysis of Variance (ANOVA) between Business Model Types

To statistically test the different mean performance of each business model type (null hypothesis), an Analysis of Variance (ANOVA) was completed of the four dominant business model types and the two hybrid models (six samples in total).

For the purpose of the ANOVA analysis, the hypothesis was presented as follows:

(H_0) $\mu_{BM1} = \mu_{BM2} = \mu_{BM3} = \mu_{BM4}$ *- all the means are the same*

(H_1) *Two or more means (μ) are different from the others*

The hypothesis was tested at the $\alpha = 0.05$ significance level.

As described in section 7.2.3., *Performance* was measured as the combined composite

percentile scores for ROA and Revenue Growth, divided by two to create an overall average performance score for each company.

Table 54: Mean Performance Description – Business Model Types

		Variable Descriptors - Performance			
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Network Model	5	0.614	0.224	.350	.886
Solutions Model	26	0.502	0.173	.236	.901
Product Model	15	0.57	0.17	.326	.923
Operational Model	29	0.44	0.17	.133	.734
Ops. & Product Model	14	0.52	0.16	.101	.792
Ops. & Solutions Model	8	0.554	0.103	.451	.689

Table 54 shows a difference in the mean performance for the different business model types, with the hybrid business model *Operational and Solutions* having the highest (.451), followed by the *Network* business model with a mean performance of .350, and the *Operational Model* delivering the lowest (.133). From this initial analysis, it is already clear that the business models have different performances.

The ANOVA analysis (**Table 55**) shows that there is no statistically significant difference between the business model performance means. The statistical significance value is 0.142 (i.e., $p = .142$), which is above the significance level of .05 and, therefore, the differences between the performance means are not great enough to rule out a chance or sampling error explanation.

Table 55: ANOVA Summary – Business Model Types

	ANOVA Summary				
	Sum of Squares	DF	Mean Square	F	Signif.
Between Groups	0.235	5	0.047	1.703	**0.142**
Within Groups	2.489	90	0.028		
Total	2.724	95			

The F-ratio of the mean squares between the groups and within the groups is also low (1.703), further supporting the evidence that there are non-significant effects of business model types on performance.

The Multiple Means Comparisons (see **Table 56**), which contain the results of the Tukey post hoc test, show the output of the ANOVA analysis for each business model type and compare each of the performance means (Business Model A vs. Business Model B) to examine whether there is a statistically significant difference between the business model types. Again, there is no statistically significance difference between the performance means of the business model types at the .05 significance level. The lowest significance level is between *Network Model* and *Operational Model* with a significance value of .0.07, which is still above .05 and, therefore, there is no statistically significant difference.

Table 56: Mean Performance Comparison – Business Model Types

		Multiple Comparisions - Performance				
					95% Confidencer	
Business Model A	*Business Model B*	Mean Difference	Standard Error	Signif.	*Lower Bound*	*Upper Bound*
Network	Solutions Model	.126	.080	.122	*-.034*	*.285*
Model	Product Model	.066	.084	.438	*-.102*	*.233*
	Operational Model	.146	.080	.070	*-.012*	*.305*
	Ops. & Product Model	.102	.085	.233	*-.067*	*.270*
	Ops. & Solutions Model	.083	.092	.366	*-.099*	*.265*
Solutions	Network Model	-.112	.089	.809	*-.372*	*.148*
Model	Product Model	-.067	.054	.819	*-.224*	*.090*
	Operational Model	.057	.045	.797	*-.073*	*.188*
	Ops. & Product Model	-.016	.055	1.000	*-.176*	*.145*
	Ops. & Solutions Model	-.052	.067	.970	*-.248*	*.143*
Product	Network Model	-.046	.094	.997	*-.318*	*.227*
Model	Solutions Model	.067	.054	.819	*-.090*	*.224*
	Operational Model	.124	.053	.189	*-.030*	*.278*
	Ops. & Product Model	.051	.062	.963	*-.129*	*.231*
	Ops. & Solutions Model	.014	.073	1.000	*-.198*	*.226*
Operational	Network Model	-.169	.089	.403	*-.428*	*.089*
Model	Solutions Model	-.057	.045	.797	*-.188*	*.073*
	Product Model	-.124	.053	.189	*-.278*	*.030*
	Ops. & Product Model	-.073	.054	.754	*-.231*	*.084*
	Ops. & Solutions Model	-.110	.066	.566	*-.303*	*.084*
Operational &	Network Model	-.096	.094	.910	*-.371*	*.178*
Product Model	Solutions Model	.016	.055	1.000	*-.145*	*.176*
	Product Model	-.051	.062	.963	*-.231*	*.129*
	Operational Model	.073	.054	.754	*-.084*	*.231*
	Ops. & Solutions Model	-.036	.074	.996	*-.251*	*.178*
Operational &	Network Model	-.060	.102	.992	*-.356*	*.237*
Solutions Model	Solutions Model	.052	.067	.970	*-.143*	*.248*
	Product Model	-.014	.073	1.000	*-.226*	*.198*
	Operational Model	.110	.066	.566	*-.084*	*.303*
	Ops. & Product Model	.036	.074	.996	*-.178*	*.251*

There is no statistically significant difference between the mean performance of the business model types, as determined by one-way ANOVA ($F(5,91) = 1.703$, $p = .142$). A Tukey post hoc test revealed that none of the business model types had statistically difference performance means. Consequently, the H_0 hypothesis cannot be rejected and therefore *Business Model A does not deliver greater firm performance than Business Model B, where A and B are different business model types.*

From this analysis, it can be concluded that business model type is not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry.

7.5. EVALUATION OF THE RESULTS

This part of the research set out to test the two main hypotheses based on the business model type and business model coherence as the main independent variables, and firm performance (as measured by the combined percentile ranking scores of ROA and Revenue Growth) as the dependent variable. The hypotheses were tested using multiple regression analysis and ANOVA analysis (including partial correlation analysis). Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity.

The reliability of the overall regression model was tested using both a split sample test and also a test of external responses only. In both cases, the correlation between *Firm Performance* and *Coherence* was considered medium to high, and the two models were both significant at the .005 confident level. The *Coherence* was also tested by splitting *Firm Performance* into the two indicators of *ROA* and *Revenue Growth*. In both cases, it was found that the correlation between the Coherence and the dependent variable was significant (at the .001 confident level), further supporting the findings of a positive relationship between business model coherence and firm performance.

The validity of the overall regression model was tested, and it was found that none of the control variables had a significant correlation (at the .001 significant level) with *Firm Performance*.

A summary of the results of hypothesis testing and the conclusions is given in **Table 57.**

Table 57: Summary of Hypothesis Testing

Hypothesis	**Statistical Analysis**	**Conclusions**
Business model coherence is positively correlated with firm performance	The multiple regression analysis rejected the null hypothesis of no correlation between business model coherence and firm performance ($F(1,94) = 25.366$, $p = .000$), and it can be concluded *that there is a statistically significant positive relationship between business model coherence and firm performance.*	High business model coherence is associated with high firm performance and vice versa.
Business Model A delivers greater firm performance than Business Model B, where A and B are different business model types	The one-way ANOVA analysis did not refute the null hypothesis of no difference in performance means between different business model types ($F(5,91) = 1.703$, $p = .142$). A Tukey post hoc test revealed that none of the business model types had statistically difference performance means.	The business model type is not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry.

7.6. DISCUSSION

In the quest to understand what makes some Consumer Goods companies consistently perform better than others, and what makes them different, this research found a small group of 25 companies that, over a period of five years, consistently outperformed their peers. The good news for managers and investors alike is that above-industry firm performance can be achieved across different company sizes and with different business model types. It is therefore within managers' control to deliver sustained firm performance.

Companies that deliver above-industry performance have a clear strategic orientation and organisational culture which focuses on playing to their strengths and which allows them to configure their business model accordingly. The research confirmed that companies with stronger coherence to a certain business model type achieved higher firm performance. The higher the coherence score for a certain type of business model, at the exclusion of other business models, the higher firm performance. As always, there is not a single factor, such as the *Business Model Coherence,* that explains all of the difference in a company's performance. However, given the solid adjusted coefficient of determination (R^2), 20.4 per cent of the total variation of firm performance can be explained by the *Business Model Coherence*. It is postulated that the business model type itself is not the determinant factor in above-industry firm performance, but rather the extent of **coherence to the chosen business model**. As discussed in Chapter 2, this hypothesis has been called the *Business Model Coherence Premium,* and its existence has been confirmed in the Consumer Goods industry.

Surprisingly, the correlations between the business model types are high (greater than .50) except with the *Operational Model*. It seems like the *Operational* business model type is a different choice than the other business models. There is some degree of overlap between *Network* and *Product* and *Solutions Models* and they also have similar elements as part of their definitions. It would appear that some companies with hybrid business models are migrating from *Operational* to *Product* or *Solutions Models*.

It may seem like a contradiction that there is no relationship between the business model type (e.g., *Solutions Model*) deployed by a corporation and its performance, while the business model coherence affects the performance. The reason for this is that companies with high

business model coherence deploy different business model types. For example, the company with the highest business model coherence score (1.752) is Cal-Maine Foods, Inc. that deploys an *Operational Model*. Another company with high business model coherence score (1.048) is NU Skin Enterprises Inc. that has a *Solutions Model*. There is not a single business model type that is consistently deployed by companies with high business model coherence. The same is the case when looking at firm performance. The company with the highest combined firm performance is Monster Beverage Corporation that deploys a *Product* business model type. The second highest is NU Skin Enterprises Inc. that has a *Solutions Model*. Another company with high combined firm performance is MHP S.A. that has an *Operational Model*. Therefore, it is postulated that the business model type itself is not the determinant factor in above-industry firm performance, but rather the extent of coherence to the chosen business model.

The findings from this research partially support the results of Zott and Amit (2008) research. Using a random sample of firms that had gone public in Europe or in the United States between April 1996 and May 2000, Zott and Amit examined two main business model design themes: (i) novelty-focused (*Product Model*); and (ii) efficiency-focused (*Operational Model*). The researchers found a positive relationship (r^2=.241; p <0.01) between the novelty-focused business model type and the average market value in 2000 (dependent variable), but no correlation between the efficiency-focused business model type and firm performance (r^2=.120; p <0.1). **Zott and Amit's (2008) findings would indicate that certain business model types perform better than others.** Bornemann (2009) further empirically tested the four business model themes delineated by Amit and Zott (2001). He found that as much as 23 per cent of a firm's performance variable could be explained by the business model themes. Novelty-centred business models had the strongest impact on firm performance (b=0.316, p<0.001), followed by the lock-in-centred (b=0.178, p<0.01). However, efficiency-based (b=0.088, p<0.1) and complementarities-based business models, while positive, were not significant.

In this research, the efficiency-based business model (*Operational Model*) was also found to have the overall lowest mean performance (see **Table 54**) for the different business model types, but the hybrid business model *Operational and Solutions* had the highest. The novelty-focused business model (*Product Model*) only had the third highest mean performance.

There are a number of plausible explanations for the difference in findings and all relate to the difference in research construct:

(i) Different performance measures as dependent variable

As presented in **Table 6**, Zott and Amit (2008) used a firm's stock-market value as the dependent variable and as a measure of perceived firm performance. Bornemann (2009) used a combination of seven self-reported performance indicators: two items for financial performance, for marketing/sales effectiveness and for firm growth as well as one for market share. In this research, the *performance percentile calculation,* as proposed by Henderson et al. (2012), was used. It defines unexpected sustained superiority as a firm's ability to achieve a highly ranked focal outcome (e.g., top-10 per cent return on assets) often enough across the firm's observed life to rule out chance. It is a new approach to measuring firm performance that was not introduced when Zott and Amit (2008) and Bornemann (2009) conducted their research. It ranks companies on RoA and Revenue Growth over a five-year period in order to determine which companies have consistently performed in the top percentile.

(ii) Company life stages (start-ups vs established companies)

In this research, the focus was on large companies (annual revenues greater than USD ($) 1 billion), with an average annual revenue of USD ($) 11 billion, and an average age of 75 years. In comparison, Zott and Amit (2008) studied 170 e-businesses that had gone public between April 1996 and May 2000 and were at an earlier life stage. Bornemann (2009) analysed 228 small and medium-size firms in Germany with annual revenues less than USD ($) 1 billion. In his books, *Crossing the Charm* (2014) and *Inside the Tornado* (1995), Geoffrey Moore discusses the life cycle of industry, and how it migrates towards *Operational* and *Solutions Models* as it reaches maturity. In the early market development period, when customers are technology enthusiasts and visionaries looking to be first to get on board with the new paradigm, companies are focused on Product Leadership. Geoffrey Moore's hypothesis could explain why Amit and Zott (2008) and Bornemann (2009) both found the novelty-focused business model (*Product Model*) to have a positive relationship with firm performance.

(iii) Industry Sectors

Bornemann (2009) only included industries that could be classified as "knowledge-intensive" and "innovative" based on (i) R&D spending relative to total costs and (ii) number of academics relative to the total number of employees. Using these two criteria, Bornemann constructed a cross-industry sample of small- and medium-size firms. Zott and Amit (2008) collected data on 170 firms that conducted part of their business over the internet (e.g., firms like eTrade, Guess and Priceline), constructing a cross-industry sample. In comparison, this research focused on companies operating in the Consumer Goods industry.

CHAPTER 8: CONTRIBUTION AND LIMITATIONS

In this final chapter, the main conclusions and contribution are addressed. It commences with how the thesis has moved the discussion along and deliberates on the main conclusions from the hypotheses testing conducted in Chapter 5, 6 and 7. The originality of the work conducted and its relevance and contribution to the current theory are then addressed before presenting the implications for managers. In the final section, the implications of the findings for managers and the limitations of this study are discussed.

The chapter is divided into four main sections:

1. The first part discusses the main findings from the research around the dominant business model types, findings from the business model coherence measurement, and the findings from the multiple regression analysis of the relationship between business model coherence and firm performance.
2. The second section reviews the theoretical and applied contributions of the research. It highlights the seven contributions made to current management theory through the clarification of business model coherence.
3. The third part presents the limitations of the research and the assumptions made to support the research.
4. The final section proposes five areas of further research into business model coherence, as well as highlighting ways in which the current findings could benefit from future work in this area.

8.1. INTRODUCTION

The research reported in this thesis has followed a general paradigm of inquiry characterised as the scientific approach, which involves observation, hypothesis, deduction, and experimental verification (see: Kerlinger (1986), Cryer and Miller (1991)). In chapters 5, 6 and 7 the results obtained during the three stages of data analysis conducted within the Business Model were presented, and each of these three chapters concluded with a 'discussion' section in which key themes emerging from the results were explored. This final chapter begins by providing a summary of these issues, before moving on to provide an assessment of the theoretical and applied contributions of the study.

8.2. DISCUSSION OVERVIEW

8.2.1 Findings from Dominant Business Model Types

In the first results chapter of this thesis (Chapter 5), a number of issues were identified as being worthy of particular note. To determine the factors or components to improve the description of the dominant business model types in the Consumer Goods industry, an exploratory factor analysis (EFA) was utilised to examine the underlying patterns of the different business model variables. These theoretical constructs were then tested in a confirmatory factor analysis (CFA), to determine the variables with the highest loadings that would best describe each business model type. Using this approach, a model with four main business model constructs and 18 items was identified.

Relying on the RBV, the strategic management literature suggests that classification of related businesses should be based on the similarity of their underlying economic logic or business model (see: Rumelt (1974), Prahalad and Bettis (1986)). In this research, it was hypothesised that each company would have elements of different business model types, but each company would have a dominant construct. To test that hypothesis, the 97 sample companies were classified by their dominant business model type using the business model coherence measurement scale. If a company had two business model types that were close, and the coherence scores of those two business model types were within the margin of five per cent, the company would be categorised as a “hybrid” business model. However, if the difference between the first and the second business model type was greater than a five per cent margin,

the company would be categorised by the first business model type.

Among the 97 sample companies, the most dominant business model type was the *Operational Model* (29 per cent), followed by the *Solutions Model* (27 per cent), the *Product Model* (15 per cent) and the *Network Model* (5 per cent). However, 23 per cent of Consumer Goods companies had *hybrid* business models, where the focus is on several business model elements at the same time. The most prevalent hybrid business model seen in the research is one that mixes *Operational* and *Product Models*, which accounted for 14 per cent of the companies sampled. The second largest hybrid business model was the mix between *Operational* and *Solutions Models*, which accounted for 5 per cent of the companies sampled

This approach added three additional dimensions to the academic discussion around business models, namely (i) revised measured items for each business model type, (ii) the presence of the *Network Model* as a discrete business model type in the Consumer Goods industry, and (iii) the prevalence of 'hybrid' business models in a mature industry, such as the Consumer Goods sector.

(i) Revised measured items for each business model type

The exploratory factor analysis (EFA) identified the items loading significantly on each of the four main factors. These included a mix of items for the theorised business model types by Hagel and Singer (1999), Amit and Zott (2001) and Libert et al. (2014). For example, the *Solutions* business model type had an element of the *Product Model* in the construct (item PL5), and the *Product* business model had an element of the *Network Model* (NF4) in the construct. The measurement model to determine the dominant business model constructs helped determine 18 items of value from the original research list of 32 and created a standardised regression weight and normalised values for companies in the Consumer Goods industry.

(ii) Network Business Model

Previous research by Hagel and Singer (1999) did not include the *Network Model*. It was first presented by Amit and Zott (2001) in their research into e-Business model design themes. The authors presented the business model as "Lock-in," as it is based on positive network externalities. Although only a small number (5 per cent) of Consumer Goods companies had a *Network* business model type in the research, the descriptions used for "Lock-in" by Amit and

Zott (2001), were found in some the other business model definitions. For example, the *Product* business model had an element of the *Network Model* in the description ("*Availability of complementary products/services increases as the network expands*").

(iii) "Hybrid" business models

A total of 23 per cent of Consumer Goods companies in the sample had *hybrid* business models, where the focus is on several business models at the same time. This was higher than expected and supported the overall research hypothesis that established companies that attempt to employ dual business models fail to do so successfully (Markides, 2008). This high incidence level might be driven by the maturity of the Consumer Goods industry, as companies over time migrated from one business model type to another, and might be retaining elements of a previous business model type. In his books *Crossing the Charm* (2014) and *Inside the Tornado* (1995), Geoffrey Moore discussed the life cycle of industry, and how it migrates towards *Operational* and *Solutions Models* as it reaches maturity. Furthermore, the research provides evidence that some of these companies with a hybrid business model have been successful in delivery value and would warrant further investigation in future research (see the further research section below).

8.2.2. Findings from Business Model Coherence

The literature considers coherent configurations of design elements that manifest themselves as peaks in the performance as a good fit (Siggelkow, 2002). In Chapter 6 of this thesis, it was postulated that the more dominant a certain business model is over the other business model types, the stronger the business model coherence. However, there is little prior theorising on business models in the literature on which to draw on regarding business model coherence. For that reason, a new measurement scale was proposed that allow for better investigating of the business model coherence and the constructs for each company.

It was suggested that if a company has only one dominant business model type (e.g. the *Operational Model*) with little or no other business model type, the coherence would be high. On the other hand, if a company has four equally dominant business model types, it has low business model coherence. To calculate the business model coherence, the following formula was proposed:

$$\Sigma(BM_{1st} - (BM_{2nd} + BM_{3rd} + BM_{4th})) + 1$$

The overall business model coherence score is the sum of the dominant business model score (**BM_{1st}**) less the sum of the other three business model scores (**BM_{2nd}, BM_{3rd}, BM_{4th}**) plus 1. With this measurement scale, the maximum value is 2, and the lowest value is -2. The theoretical midpoint on the scale is 0 (distance between 2 and -2). Every score above the midpoint should be considered as *coherent*, and a score below the midpoint should be considered as *incoherent*.

The distribution of the business model coherence scores for the sample companies indicated that Consumer Goods companies have to some degree a dominant business model type (the majority of companies had a coherence score greater than .00). The distribution skewness was .632 indicating a positive distribution and with a relatively flat Kurtosis of .282.

8.2.3 Findings from Relationship between Business Model Coherence and Firm Performance

This research set out to test two main hypotheses based on the business model type and business model coherence as the main independent variables, and firm performance (as measured by the combined percentile ranking scores of ROA and Revenue Growth) as the dependent variable.

In the quest to understand what makes some Consumer Goods companies consistently perform better than others, and what makes them different, this research found a small group of 25 companies that, over a period of five years, consistently outperformed their peers. Companies that deliver above-industry performance have figured out what they are good at, and configure their business model accordingly. The research confirmed that companies with stronger coherence to a certain business model type achieved higher firm performance. The research confirmed that companies with stronger coherence to a certain business model type achieved higher firm performance. Namely, the higher the coherence score for a certain type of business model at the exclusion of other business models, the higher the firm performance will be. As always, there is not a single factor, such as the Business Model Coherence, that explains all of the difference in a company's performance. However, given the solid adjusted coefficient of determination (R^2), 20.4 per cent of the total variation of firm performance can be explained

by the Business Model Coherence. This theory has been called 'Business Model Coherence Premium' in Chapter 3, and its existence has been confirmed in the Consumer Goods industry.

Using a one-way ANOVA analysis, the research found no statistically significant difference between the mean performance of the different business model types. A Tukey post hoc test revealed that none of the business model types had statistically difference performance means. Consequently, the null hypothesis was not rejected and it was concluded that the business model type was not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry. The good news for managers and investors alike is that above-industry firm performance can be achieved across different company sizes and with different business model types. It is therefore within managers' control to deliver sustained firm performance.

8.3 CONTRIBUTIONS OF THIS RESEARCH TO EXISTING THEORY IN MANAGEMENT STUDIES

In the social sciences, research is often a mixture of both theoretical and applied approaches (Blaikie, 2000). This was certainly the case in this study where it was necessary to develop a new measurement scale for business model coherence to test the application of business model coherence in the Consumer Goods industry and investigate the positive correlation between business model coherence and firm performance.

8.3.1 Theoretical Contributions of this Research

Easterby-Smith et al. (2001) suggest that there are three possible types of theoretical development: 'discovery,' 'invention' and 'reflection.' While *discovery* relates to the identification of a new idea or explanation from empirical research and which has a revolutionary effect on the thinking around a particular topic, *invention* relates to the creation of a new technique, method or idea to deal with a particular problem (Easterby-Smith et al., 2001). *Reflection* relates to the re-examination of an existing idea, theory or technique in a new or different organisational or social context (Easterby-Smith et al., 2001).

The theoretical contributions of this study are *reflective* in nature in that they broadly relate to the application of existing theory regarding business models and the relationship between business model coherence and firm performance. This research proposes a firm's business model as a new contingency factor within the SSP paradigm as it can be seen as new structural templates, or *gestalts*, that interacts with strategy variables to determine firm performance. By improving the *goodness of fit*, companies can improve their performance.

Based on the literature review, three main research questions and hypotheses were developed to guide the research and contribution to existing theory:

(i) ***Within the Consumer Goods industry (SIC code 2011 to 2099), what are the dominant business model types?***

(ii) ***Do Consumer Goods companies with higher adherence to a certain business type deliver above-industry firm performance?***

(iii) ***In the Consumer Goods industry, is it possible to deliver above-industry firm performance with any business model type?***

Contribution 1: Business Model Types

The first research question focused on the dominant business model types:

Within the Consumer Goods industry (SIC code 2011 to 2099), what are the dominant business model types?

As discussed in Chapter 3, to determine the different business model types, the existing research into business model typology was used (see: Hagel and Singer (1999), Amit and Zott (2001), Libert et al. (2014)). The business model types are summarised in **Table 58** below:

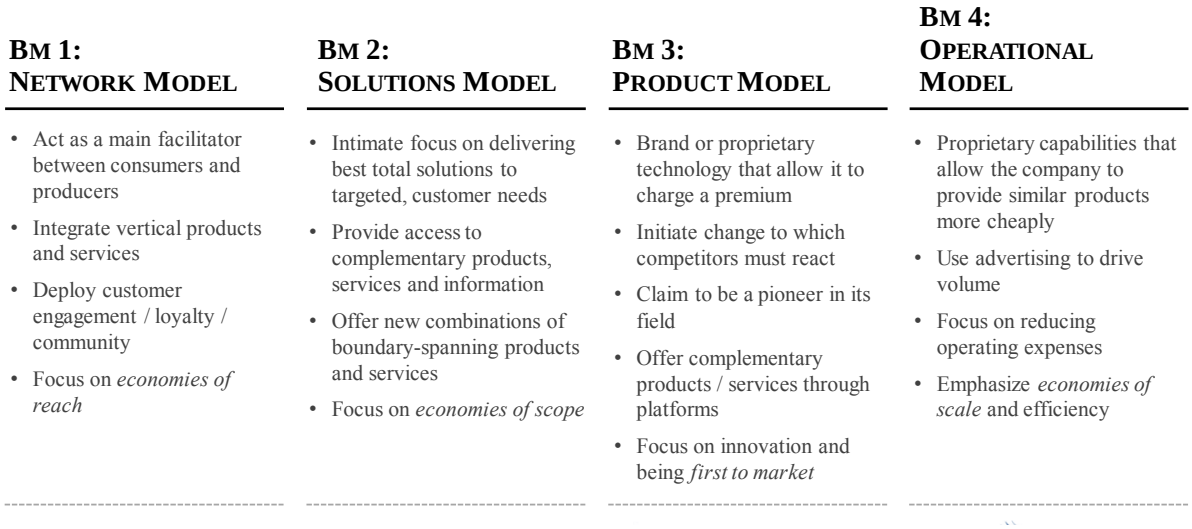
Table 58: Summary of Business Model Types

Authors	**Operational model**	**Product model**	**Solutions model**	**Network Model**
Amit and Zott (2001)	Efficiency	Novelty	Complementarity	Lock-in
Hagel and Singer (1999)	Infrastructure management business	Product innovation and commercialisation business	Customer relationship business	
Libert et al. (2014)	Asset Builder	Technology Creator	Service Provider	Network Orchestrator

To determine the dominant business model types in the Consumer Goods industry, an exploratory factor analysis (EFA) was utilised to examine the underlying patterns of the different business model variables developed by Amit and Zott (2001) and Libert et al. (2014). These theoretical constructs were then tested in a confirmatory factor analysis (CFA), to determine the variables with the highest loadings that would best describe each business model type. Using this approach, a measurement model with four main business model constructs and 18 items was identified.

Each of these business model types can be described by looking at companies within the Consumer Goods industry that have deployed these business models (see **Figure 29**):

Figure 29: Dominant Business Model Types in Consumer Goods industry



Among the 97 sample companies, the most dominant business model type was the *Operational Model* (29 per cent), followed by the *Solutions Model* (27 per cent), the *Product Model* (15 per cent) and the *Market Model* (5 per cent). These findings add further evidence to Geoffrey Moore's life cycle of industries hypothesis (1991, 1995) where he argues that in a mature market the dominant business model types are the *Operational* and *Solutions Models*. In this market, the *Network* business model might be an emerging type, hence the fact that, currently, it has a relatively small presence.

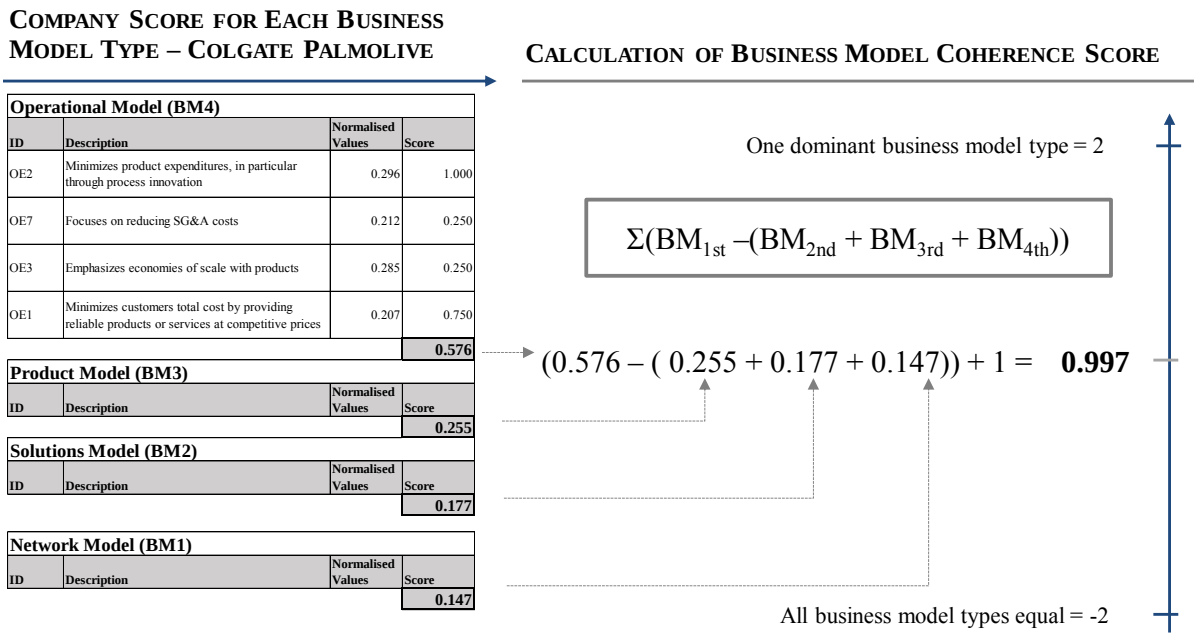
Contribution 2: Business Model Coherence Index

The second research question was:

Do Consumer Goods companies with higher adherence to a certain business type deliver above-industry firm performance?

There is little prior theorising on business models on which to draw in the study of business model coherence. For that reason, a new measurement scale was proposed that allow for better investigating of the business model coherence and the constructs for each company. To calculate the adherence to a certain business model type, the measurement scale sums up the dominant business model score (**BM_{1st}**) less the sum of the other three business model scores (**BM_{2nd}, BM_{3rd}, BM_{4th}**) plus 1. With this measurement scale, the maximum value is 2, and the lowest value is -2. The theoretical midpoint on the scale is 0 (distance between 2 and -2). Every score above the midpoint should be considered as *coherent*, and a score below the midpoint should be considered as *incoherent*.

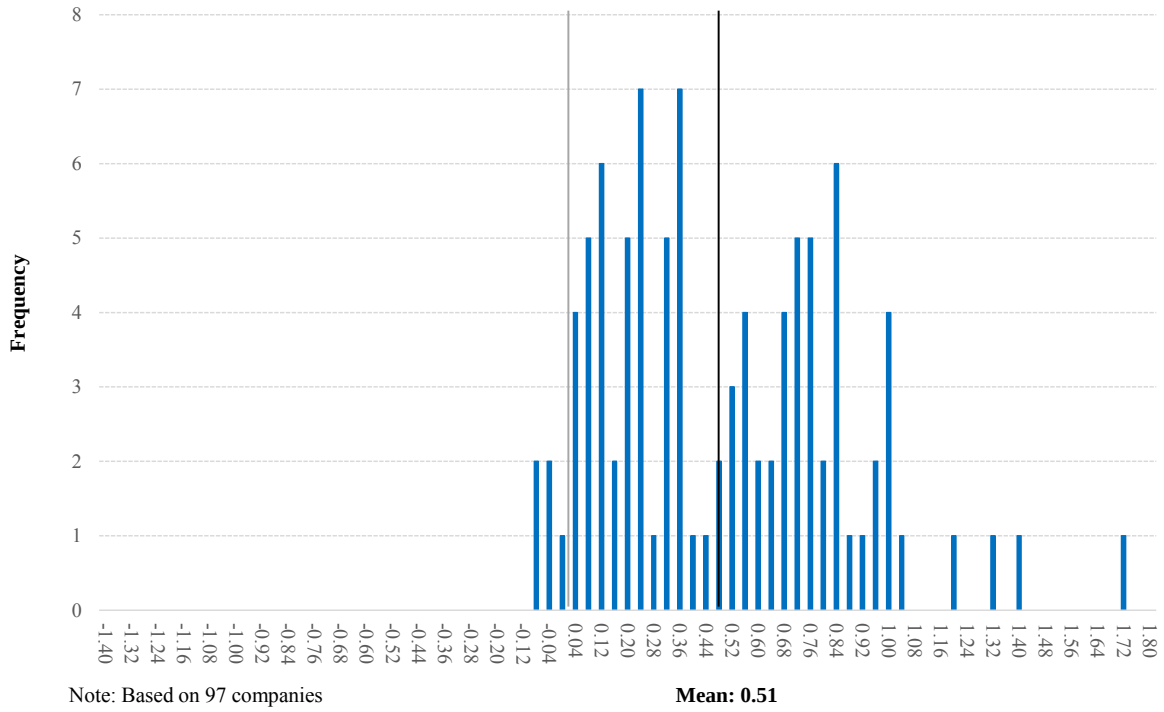
Figure 30: Example of Business Model Coherence Measurement Scale



As shown in **Figure 30**, the Colgate Palmolive Company has a business model coherent score of .998, which indicates that it has a coherent business model centred on the *Operational Model* (BM4) business model type.

The distribution of the business model coherence scores for the sample companies indicated that Consumer Goods companies have, to some degree, a dominant business model type (the majority of companies had a coherence score greater than .00). The distribution skewness was .632 indicating a positive distribution and with a relatively flat Kurtosis of .282 (see **Figure 31**).

Figure 31: Business Model Coherence Distribution



Given Consumer Goods companies have some degree of coherence to a certain business model type, as shown in **Figure 31** above, it was hypothesised that the business model coherence score would be positively associated with firm performance.

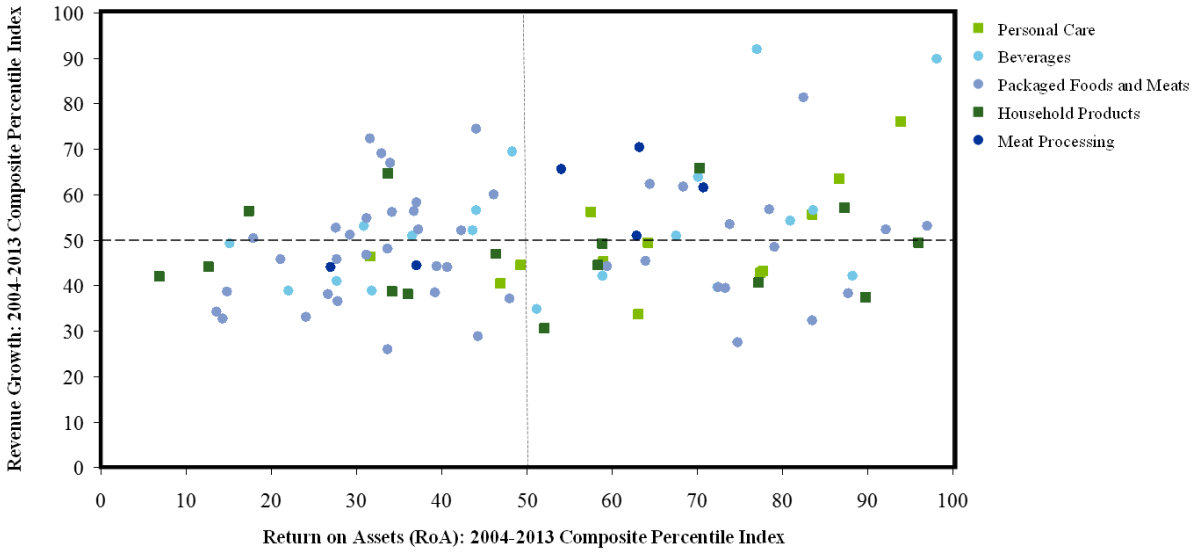
In keeping with prior studies on business model performance (see: Weill, Malone et al. (2005), Zott, Amit (2008), Bornemann (2009), Libert et al. (2014)), the research of firm performance was anchored in the economic returns school and measure performance on an annual basis using two economic return performance measures: *profitability* and *growth*. To address the issue of randomness and false positives, as described by Henderson et al. (2012), it was decided to use annual percentile ranks to measure firms on their relative performance for a minimum of five years.

The use of percentile ranking is relatively new in the strategic management literature. However,

it was seen as a relevant methodology for this study, given (i) the size of the companies in the sample, (ii) the importance of understanding the relevant, consistent performance of the sample companies in order to compare firm performance with business model coherence, and (iii) the desire to address the issue of randomness and false positives, as described by Henderson et al. (2012).

Based on the percentile average rank of the 97 Consumer Goods companies on both asset profitability (ROA) and revenue growth, four different groups of firm performance were identified, and groupings were centred on whether the company was above or below the 50th percentile regarding ROA and revenue growth (see **Figure 32**).

Figure 32: Firm Performance by Business Sector



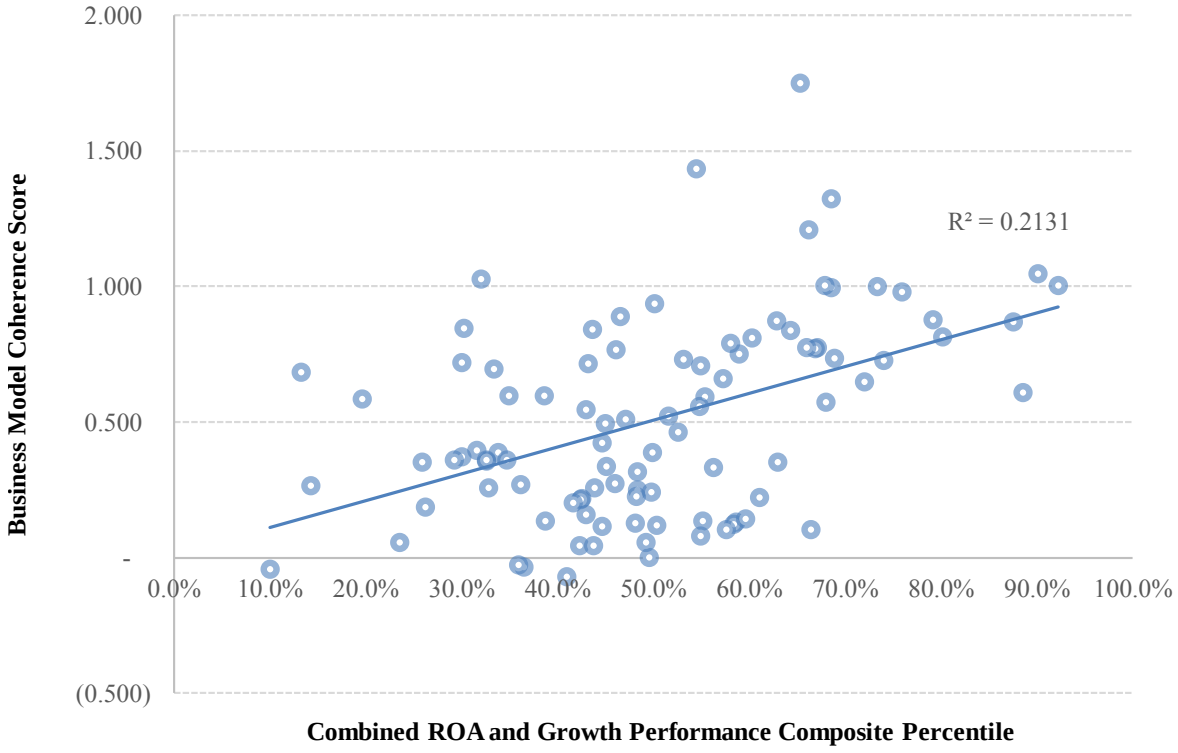
Note: Includes 97 CPG companies with financials for 2004 – 2013
Composite Percentile Index is calculated as the relative percentile ranking for each year. 100% indicates top percentile in each year.

A group of 25 companies was identified that consistently outperformed their peers over a period of five years and were ranked above the 50th percentile in both ROA and revenue growth. These companies managed to deliver an average ROA of 12.1 per cent and annual revenue growth of 13.3 per cent during the same period and were rewarded with an average annual shareholder value return of 27.1 per cent versus. 16.8 per cent for all the companies analysed.

A standard multiple regression approach was used to assess the nature of the relationships between the business model coherence, control variables and the composite percentile score for

firm performance. **Figure 33** presents the correlation plot between the business model coherence and firm performance.

Figure 33: Correlation Plot between Coherence and Performance



The multiple regression analysis rejected the null hypothesis of no correlation between business model coherence and firm performance ($F(1,94) = 25.366$, $p = .000$), and it was concluded that there is a statistically significant positive relationship between business model coherence and firm performance.

Contribution 3: Business Model Independence

The third research question was:

In the Consumer Goods industry, is it possible to deliver above-industry firm performance with any business model type?

It is of interest to managers and investors to understand whether superior firm performance can be achieved with any business model type, or whether they should shift to a different business model that potentially could deliver better performance.

To understand this question, a one-way ANOVA analysis was completed to test the hypothesis that one business model type would deliver greater firm performance than another business model type. However, the research found no statistically significant difference between mean firm performance of the different business model types. A Tukey post hoc test revealed that none of the business model types had statistically difference performance means. Consequently, the null hypothesis was not rejected and it was concluded that the business model type was not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry. The finding suggests that the ability for a company to deliver sustained firm performance is within managers' control.

8.3.2 Applied Contributions

The main findings of this research have implications for both managers and investors.

Implications for Managers

The study of *business models* is an important topic for managers. A survey by the Economist Intelligence Unit (2005) reported that 54 per cent of executives believe that business model innovation will become even more important for success than product or service innovation. A survey of corporate CEOs by Giesen et al. (2009) echoed these results: nearly all leaders polled reported the need to adapt their business models, and more than two-thirds said that extensive changes were required. However, few concepts in business today are as widely discussed, and as seldom systematically studied, as the concept of business models. A number of researchers attribute the success of companies such as Amazon, Facebook and Uber to the ways they used new technologies to create new business models. Despite all the talk and interest, there have been few large-scale empirical studies of business models. For example, it is not known how common different types of business models are in other industries and whether some business models have better financial performance than others.

In this research, it was hypothesised that a coherent business model could potentially make the most efficient use of a company's resources, attention, and time. By allocating capital and expenses more deliberately and effectively, companies would be able to focus more on the capabilities that can create differentiation and enable them to deliver superior firm performance. As a company's business model provides the bridge between strategy and impact, by configuring the business model to create a system of mutually reinforcing capabilities, competitive advantage can be strengthened.

Thus this research can potentially help managers in Consumer Goods companies to examine their business models and assess the level of coherence. Using the four dominant business model types (*Operational*, *Product*, *Solutions*, and *Network*) and the 18 business model statements enable managers to more deeply understand the structural choices they have to make about their own companies' business models, and how to manage these different business models effectively.

The research also informs the discussion around whether to switch from one business model type to another, to improve profitability. As previously discussed, this research found that the business model type was not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry. As previously discussed, this research found that the business model type was not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry. Thus, it is therefore within managers' control to deliver sustained firm performance.

Finally, the findings of this research can also be used by managers to rethink the design of organisational structures and governance systems. While lines of business are often combined within organisational units when they serve similar industry sectors or categories, managers could consider restructuring the business and reallocating decision rights by taking business model types and similarities into account. As a result, restructuring organisational units based on the business model type may facilitate cross-business exchanges of strategic resources, and therefore provide an important potential source of competitive advantage.

Implications for Investors

Previous research has shown that the business model in use by a given company is a better predictor of firm performance than industry classifications (Weill et al., 2005), as business models capture the essence of what a company does more accurately than its industry. In other cases, the industries might seem different but are quite similar when examining the business model types. This research can provide investors with a useful lens for analysing potential investments. Unlike well-known concepts such as industry classification, this research focused on the configuration of the company. Since this perspective is not yet well-known, it may lead to novel insights about which investment opportunities are most attractive. As previously discussed, this research found that business model type was not the main factor of firm performance, and superior performance can be achieved with any business model type in the Consumer Goods industry. This means that investors can focus on companies with a high business model coherence as this will be a potential predictor of future performance.

8.4. LIMITATIONS OF THE RESEARCH

As with all research studies, business model coherence research has ultimately been limited by the theoretical framework against which it has been conducted and in particular by the research questions which have been operationalised. However, at the end of the research journey, it is important for the researcher to reflect upon the approach taken and the results reported (Remenyi et al., 1998). Remenyi et al. (1998) suggest that, when considering limitations, the researcher should consider aspects of the study that they would change if they were able to start the research project again. With respect to this research, adopting such an approach highlights potential limitations, all of which relate to the methodological approach.

Sample selection

One limitation of this research is that it included only the largest Consumer Goods companies listed on the major US and European stock exchanges. This was a conscious choice but makes it more difficult to extrapolate the findings to the entire Consumer Goods industry. Business model types, such as the *Product* or *Network Models*, may be more prevalent among medium to smaller Consumer Goods companies and the research findings

may therefore not be representative of the whole industry. A larger sample size with more medium and smaller companies would have been ideal but was not possible given the time scale and budget constraints.

Data collection procedures

One limitation of this research is that it depends on single respondents from a number of sample companies. Consequently, the current research relies on the judgment of individual executives to measure business model coherence. The executives are among the range of possible informants within a firm and the most likely respondents to be able to provide an informed and relatively objective judgment concerning the firm's business model. Nevertheless, the reliance on self-reported data from single respondents introduces the risk of common method variance. To address this issue, a triangulation approach was deployed. Firstly, a business model profiling was completed for each company, using public data such as annual reports, investor presentations, analyst reports and press releases.

These results were then compared to the findings from an external survey with 77 executives from the sample companies and triangulated with the results from a survey of 16 Partners and Directors from Deloitte Consulting. However, while a triangulation approach aimed at addressing validity issues, not all companies in the sample were evaluated using all three data sources. A broader set of interviews with all sample companies would have been preferred, but this was not possible due to lack of access to executives from these companies and lack of participation in the survey.

Determination of business model type and historic performance data

There is overwhelming evidence that the levels and economic value of a company's resources and competencies evolve in an incremental and path-dependent fashion (see: Barney (1991), Christensen (2001), Tushman and Romanelli (1985)). Since the data obtained in this research are not longitudinal, it precludes definitive causal claims. For example, the business model profiling and executive interviews were based on the current business model type used by each company at the time of the research. Survey respondents were asked to evaluate their business model as it currently operates, while the firm performance of each company was assessed based on 5-year historical data.

It is possible that some of the companies in the sample might have changed their business

model during those five years, and the firm performance may therefore not reflect the current business model type.

To address the issue of historic performance data, a moving average calculator (MAC) algorithm was considered. Firstly, MAC calculates moving averages and thereby penalises a company for any periods of poor performance. Secondly, MAC accounts for "near misses" that fall just below the hard cut-off to discern exceptional outcomes, such as performances at the 89.9th percentile. Thirdly, MAC calculates moving averages to temporally locate periods in which any exceptional streaks occurred.

For example, a company may be exceptional during its early years but may become mediocre afterwards. MAC generates time-varying probabilities that would favour recent years and therefore be closer aligned with the current business model type. After consultation with the supervisors of this research, it was decided to keep the calculation of firm performance simple in order not to distort the results by adding an additional layer of complexity. However, as the use of percentile ranking as a method to determine firm performance becomes more common in academic research, it may be relevant to utilise MAC as a way to address the issue of recency for future research studies of this nature.

Firm performance data

Performance data may be 'noisy', and comparison of performance can be distorted by extreme outliers. To address this issue, this research used the methodology presented by Henderson et al. (2012) whereby companies are benchmarked regarding how often they perform at a high level. This is to ensure the data do not result in the sort of false positives that would routinely occur in a large population of identical companies whose performances change over time due to a stochastic process. The authors defined unexpected sustained performance as a firm's ability to achieve a highly ranked focal outcome (e.g., top-10 per cent Return on Assets) often enough across the observed period to rule out randomness. As mentioned, this methodology is not yet widely deployed in academic research, but given its extensive research and statistical testing, it was considered a viable option for this research.

This research anchored firm performance in the *economic returns* school and measured performance on an annual basis using two economic return performance measures: *profitability* and *growth*. As described in Chapter 4, financial performance is far and away the most utilised

measure of firm performance. However, new frameworks (Brett, 2000) seem to extend firm performance perspectives beyond traditional financial measures. In addition to measuring financial performance (or outputs), researchers have also found it necessary to emphasise non-financial aspects of performance that are viewed as enablers to future performance. Future research into business models may want to consider including "excellence" performance measures as well as financial measures.

8.5. FURTHER RESEARCH

In general terms, this research has highlighted the need for more research, within the context of business models, in which constructs such as business model types, business model coherence and firm performance are assessed. Consequently, the results reported in this research could be further tested and developed. It is the researcher's view that additional research is needed from an empirical perspective within the positivist paradigm, in which this research is framed in order to validate the existence of a business model coherence premium.

8.5.1 Further Validation Studies in Other Industries

The evidence in this study is derived from 97 valid cases in the Consumer Goods industry, and as such, while it has value in terms of examining the existence of a business model coherence premium, it is not conclusive**. A further examination of the nomological validity of the business model coherence scale using new samples and industry contexts is therefore recommended**. Such validation efforts must position their analysis on both objective market and financial performance data and self-reported data from each sample firm based on the business model coherence measurement model. Such efforts are needed and must provide confirmatory evidence demonstrating nomological validity for the business model coherence measurement construct to keep its position as a valid and reliable scale rooted in the excellence perspective of performance measurement models.

8.5.2 Business Model Capability Configuration

According to Markides and Charitou (2004), the underlying configuration of key resources and processes (capabilities) that support one particular business model can fundamentally differ from the resource configuration required to operate another, unrelated business model. To understand how business model coherence is achieved, further research should be conducted into the critical and distinctive capabilities companies focus on in line with their business model type. **The hypothesis is that by creating a self-reinforcing business model based on a set of distinctive capabilities in line with their chosen business model types, companies can deliver sustainable performance and out-perform their competitors over time**. Through identifying a firm's capabilities to deliver a positioning strategy, their area of focus and investment can be better visualised and understood. As Professor Roger Martin and A.G. Lafley (2013) note in their book "*Playing to Win: How Strategy Really Works*," this type of identification enables a company to continue to invest in its current capabilities and to reduce the investment in capabilities that are not essential to the business model (p.131):

> *"Companies can be good at a lot of things. But there are a smaller number ... that together create distinctiveness, underpinning specific where-to-play and how-to-win choices. P&G certainly needs to be good at manufacturing, but not distinctively good at it to win. On the other hand, P&G does need to be distinctively good at understanding consumers, at innovation, and at branding its products."*

From initial research into the area of capabilities, From initial research into the area of capabilities (not covered in this thesis), this researcher has found a set of critical and distinctive capabilities that are unique to each business model type and another set of capabilities that are shared across the different business models. However, further empirical research is required to fully understand these critical and distinctive capabilities and how they enable companies to create business model coherence as part of a self-reinforcing business model system for a certain business model type.

8.5.3 Business Model Relatedness in Mergers & Acquisitions

Recent research by Sohl and Vroom (2014) studied the relationship between business model relatedness and firm performance in the context of business model diversification for multi-business companies. Using a panel dataset of multi-business firms in the retail and

wholesale-trade sector, they found that business model diversification is linked to increased firm performance. Similarly, Weill et al. (2005) also concluded that business model relatedness is more influential in determining firm performance than industry relatedness. One explanation for this result is that the concept of the business model is better able to capture both the effectiveness and extend of strategic resource sharing among businesses.

Shareholder value creation is widely recognised as the main yardstick of Merger and Acquisition (M&A) success. Maximising shareholder value created by an acquisition involves more than a simple by-the-numbers approach of increasing expected synergies while reducing acquisition costs. **It is hypothesised that the alignment of the business model of the target company with that of the acquiring company will create greater overall shareholder value.** Initial research by this researcher has found that Consumer Goods companies with high business model coherence are more likely to acquire target companies that align with their existing business models. This is in comparison to companies with low business model coherence, which are more likely to exacerbate their coherence problems by acquiring companies whose business models are different from their own.

8.5.4 Business Model Cost Structure Benchmarks

A coherent business model can potentially make the most efficient use of a company's resources, attention, and time. By allocating capital and expenses more deliberately and effectively, companies focus more on the strategic resources and capabilities that can create differentiation and enable them to win in the market. However, in conversations with clients about business transformation, this researcher often hears how they are struggling to free up resources (or create "headroom") for reinvestment in transforming the business and making it more coherent.

As one CFO from a leading Consumer Goods company expressed it: "*what should my new cost structure and capital allocation look like, and where do I free up resources today to invest in new distinctive capabilities to change my business model?*" Understanding the "ideal" cost structure by business model type might enable companies to redirect spending and operations to build or strengthen capabilities and respond to a changing marketplace. **Similar to the notion of *"Robbing Peter to pay Paul,"* companies may reallocate resources and capital from**

certain capabilities to invest in others that are more in line with the chosen business model type.

8.5.5 Antecedents of Business Model Changes

As described in the Introduction, this researcher set out to understand the antecedents for different types of Business Model Innovation. However, as the notion of "business model type" was poorly defined, the research focus shifted to defining dominant business model types and understanding their correlation to firm performance. Understanding the antecedents of business model changes is still a rich greenfield for research.

Critique of contingency theory in the context of business model configuration is that it is static and fails to deal with environmental change and adaptation (Galunic and Eisenhardt, 1994). However, as Andrews (1971) points out, managers cope with changes in their firm's external environment through the choice of an appropriate strategy and the design of a matching structure. *Adaptation* is a general term that describes a period of gradual, long-continued, and incremental change in response to environmental conditions (Tushman and Romanelli, 1985). Miller and Friesen (1982) show that organisations that radically and quickly altered their formal structures or business model performed better over their lives than firms that changed gradually or incrementally. *Punctuated equilibrium theory* depicts organisations as evolving through relatively long periods of stability (equilibrium periods) in their basic patterns of activity that are punctuated by relatively short bursts of fundamental change (also known as "revolutionary periods") (Tushman and Romanelli, 1985). **Building on the Punctuated equilibrium theory, one additional research area would be to understand the environmental conditions that lead to certain types of business model changes.**

8.6. FINAL WORDS

Although the completion of this thesis marks the fact that a significant personal milestone has been reached. However, it is the researcher's view that further work is necessary if the research into business model coherence is to achieve the optimum applied contribution possible. In this regard, the words of Remenyi et al. (1998) seem particularly appropriate (p.82):

> *"It is frequently suggested that the best business research should lead to the development of guidelines by which individuals in positions of responsibility can manage their business responsibilities more efficiently and effectively."*

Consequently, this researcher has published a management report in collaboration with a colleague from Deloitte Consulting, in which the critical findings of this research and potential applications are outlined. From a personal perspective, it is unlikely that the researcher will be able to abandon the quest to understand further and explore the issue of business model coherence and innovation. In this regard, the following words seem particularly appropriate to bring this part of the research journey to a close.

> *"Obviously the work is not finished, and can never be finished. There can be no absolute position to be reached in the attempt by men (women) to understand the world in which they find themselves; new experience may in the future refute present conjecture" (Checkland, 1999).*

APPENDIX – Consent Form

I understand that any data or information provided by me as part of this survey may be used by Deloitte Consulting in connection with this survey, other studies, or analyses performed by Deloitte Consulting or in connection with services provided by Deloitte or otherwise.

I understand that any such data or information may be disclosed by Deloitte Consulting to related entities or other third parties, including, without limitation, in publications, in connection with this survey or such studies, analyses, or services, provided that such data or information does not contain any information that identifies me or associates me with the responses I have provided to this survey.

I understand disclosure of such data or information may be required by law, in which case Deloitte will endeavour to notify me.

Deloitte Consulting is not, by means of this survey, rendering professional advice or services to me or my company. This survey is not a substitute for such professional advice or services. Deloitte Consulting is not responsible for any loss sustained by any person who relies on this survey.

I am authorized to complete this survey on behalf of my company, including, without limitation, in accordance with the policies of my company, its board of directors (or similar governing body), and, if applicable, its audit committee.

In addition, I confirm that audit committee pre-approval has been obtained in accordance with the established pre-approval policies and procedures of my company's audit committee for me to participate in this survey in the event that Deloitte & Touche LLP audits my company or one of its affiliates.

Click the appropriate answer:

__ I agree

__ I disagree (If you do not agree with the above statements, you will not be able to participate in this survey)

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