IMITATIVE MARKET ENTRY STRATEGIES: THE ROLE OF STRATEGIC ORIENTATION, RESOURCES, CAPABILITIES AND ABSORPTIVE CAPACITY

by

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Summary

Despite being more common than innovation, little is known about the strategies involved in imitative market entries and the capabilities enabling their executions. Drawing on the Resource-based View and Competitive Dynamics perspectives, the study examines the role of marketing capability, technological capability and absorptive capacity in aiding technological firms to engage in successful imitative market entries. The research also examines the relationship between strategic types and resources as well as the relationship between resources and capabilities. Finally, the research investigates the role of capabilities as determinants of entry timing, relative product advantage and relative price, which in turn influence product performance.

The research provides important managerial and theoretical implications. First, the integration of the RBV and Competitive Dynamics perspectives provides a richer explanation of the heterogeneity in firms' performance. Second, the findings show that firms' strategic orientation determines the level of marketing and R&D resources. Third, the interaction between technological capability and marketing capability accelerates imitative market entry. Fourth, technological and marketing capabilities have a U-shaped relationship with market entry. Finally, the present study found marginal support for the prediction that entry timing, relative product advantage and relative price increase the likelihood of product survival.

The U-shaped relationship observed between technological and marketing capabilities with market entry illustrate the double-edged sword nature of capabilities. Although strong technological and marketing capabilities facilitate firms' swift entry into the market for some, for others they may cause them to be trapped in existing product, lock them in with existing customers and prevent them from being receptive to the new opportunities in the environment. Finally, because marketing and technological capability interaction is significantly related to earlier entry and earlier entry is associated with a higher product survival rate, managers considering an imitative market entry need to invest in the development of these two capabilities.

Key word: imitation, marketing capability, technological capability, absorptive capacity, entry timing

Dedication

To James Rance - the one who makes me laugh

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CHAPTER 1: INTRODUCTION

1.1. Introduction

Contrary to the normative idea that imitation is a defensive, sub-optimal strategy, scholars argue that imitation is as important to firms as innovation; that is, it provides positive outcomes and facilitates firms' survival and growth (Shenkar 2010; Levitt 1966). In his seminal paper, Levitt (1966) stresses that it is important for firms to realise that "…no single company can afford to try to be first in everything in its field" (p. 65) and called for a balanced policy of imitation and innovation by firms. Hence, in order to remain competitive in the marketplace, firms need to incorporate their imitation activity into a planned process similar to the process used to guide their innovation activities rather than treating imitation merely as a reaction to a competitor's move.

Scholars have noted that copying an innovator's move blindly may result in a negative outcome, as the innovation may not be well received by the market. On the other hand, by ignoring an innovation, a firm may miss a significant opportunity and fall behind its competitor (Semadeni and Anderson 2010). Furthermore, if the firm decides to imitate, it needs to address what imitation type to adopt (e.g., pure imitation or creative imitation), when, how and whether or not they possess the capability to do so (Shenkar et al. 2010; Semadeni and Anderson 2010). In short, imitation is a rational decision comprising a complex process and requires specific firm capabilities to enable effective execution of the strategy. Drawing upon the Resource-based View (RBV) and the Competitive Dynamics theory, this thesis proposes and empirically tests an integrated model of antecedents and outcomes of imitative product market entry strategies.

This chapter provides a general outline and overview of the thesis. It starts with an introduction of the research background, which is then followed by a review of the extant studies on imitation. It then identifies the gaps in the literature followed by specific research objectives of this study. The chapter subsequently highlights the importance of this research and its potential usefulness for managers. Finally, the chapter ends with an outline of the structure of this thesis.

1.2. Research Background

"Imitation is not only more abundant than innovation, but actually a much more prevalent road to business and growth and profits" (Levitt 1966).

In his seminal paper, Levitt argues that that not only is imitation more common than innovation but it is also critical to firms' survival and growth. Consistent with Levitt's view (1966), Mansfield and colleagues' (1981) study of legal imitation of 48 product innovations in the chemical, drugs, electronics and machinery industries in the US shows that even with patent protection, imitation occurs quite frequently and relatively quickly after the introduction of an innovation. They found that 60% of the patented innovations in the sample were imitated within four years of their introduction. Furthermore, patenting increases the cost of imitation only by 6 to 11 percent. Although patents are effective in providing protection against imitation in the pharmaceutical industry where patents raise imitation costs by 25 to 40 percent (Levin et al. 1987), in most industries, rivals' are able to invent around patented innovations (Gallini 1992).

In further support of the prevalence of imitation, Agarwal and Gort (2001) report that the average time to a widespread imitation declined from 23.1 years between 1877 and 1930 to 9.6 years for products introduced between 1930 and 1939. The average time declined even further to 4.9 years for products introduced after 1940. Furthermore, imitation lag that was previously twenty years in 1961 became four years in 1981 and was down further to twelve to eighteen months by 1985 (Shenkar 2010). Due to globalisation, codification of knowledge and the weakening of protection provided by legal and marketing efforts, imitation is becoming more viable and quicker than ever before (Shenkar 2010).

Despite the negative stereotype of imitation (Levitt 1966), examples of imitators outperforming innovators abound. For instance, a Korean company called Saehan introduced the first portable audio player in 1998 (Abel 2008). However, it was Apple's iPod that was introduced three years later that became the market leader. Some may even argue that Apple skilfully borrowed and merged external technology with its own to create its portable audio player (Shenkar 2010). For example, the scroll wheel technology used in Apple's iPod was first developed by another portable media player manufacturer, Creative Technology (Manjoo 2010).

Although the iPod was not the first digital-music player, it surpassed the innovator and all of the other competitors by creating an ecosystem for customers to easily purchase, transfer, organise and store music (Abel 2008). Similarly, it was Nokia that introduced the first smartphone in 1996 only to be overtaken by Apple that entered almost ten years later. Osborne Computer, the pioneer of portable computers in 1981 shared the same fate with Nokia and Saehan by losing its short-lived market leadership to Hewlett-Packard and Compaq.

A case study on Samsung also demonstrates the viability of imitation strategy. Samsung is an example of a company that consistently adopted imitative entry and often late entering each market. Despite that, it managed to surpass the pioneers in many of the product categories it decided to enter including memory chips, microwave ovens and mobile phones.

Samsung decided to enter the memory chips or DRAM (dynamic random access memory) market in 1983 three years after its competitors did. Leveraging on its cheap manufacturing capability, Samsung thrived in the DRAM chips business because it is a standard product that requires little design capability but offers significant scale economies (Cho et al. 1998). In the microwave oven market, Samsung acquired the existing microwave oven technologies by reverse engineering the then world's top model microwaves. They successfully penetrated the US market by first relying on its efficient and cheap manufacturing capability, supplying cheaper models for JC Penney and General Electric (Magaziner and Patinkin 1989).

In the mobile phone industry, when entering the market around 1988 (Lee and Lee 2004), Samsung initially relied heavily on the knowledge spillover from Motorola's patents, the then market leader, as a method to catch up (He et al. 2006). Samsung begun to thrive after the mobile phone industry shifted from 2G to 3G technologies. The 3G emphasised multimedia know-how, which allowed Samsung to utilise its complementary core technology strengths in electronics (He et al. 2006). Only after it caught up with its competitors that Samsung began to reduce its reliance on

Motorola and to develop a strong patent portfolio (He et al. 2006). As a result, Samsung was reported to hold 31.3% of the world's smartphone market share in 2013 (IDC 2014).

Besides the evidence provided by anecdotes and case studies, a number of scholars have also promoted early imitation as an alternative to pioneering (e.g., Baldwin and Childs 1969; Gal-Or 1985; Kamien and Schwartz 1978; Katz and Shapiro 1987; Smith et al. 1992; Teece 1986; Drucker 1985), citing the ability to learn from the first mover's experience, risk reduction and lower R&D costs as the main advantages. However, it is important to note that despite numerous examples of successful imitators, there are also plenty of cases of failed imitators. To name a few, Dell DJ and Microsoft Zune had to withdraw from the portable audio player market, Blackberry Playbook and HP's Touchpad failed to make a profitable venture in the tablet market and Dell's Venue and Venue Pro made their exits soon after they entered the smartphone market. The examples of the successes and failures of imitating firms show that the ability to imitate is not equally distributed. Some firms such as Samsung and Apple have shown an ability to imitate effectively so much so that they repeatedly seized the leadership position from pioneers and innovators. The observed heterogeneity of performance among imitative firms suggests that not only imitation involves an amalgamation of complex strategies; it also requires deployment of specific resources and capabilities for successful execution of such strategies.

Although there is a recent surge of research that explores the viability of imitation as a strategy (e.g., Rivkin 2000; Ethiraj and Zhu 2008; Csaszar and Siggelkow 2010), many of the current themes take the perspective of the imitated firms (Posen et al. 2013). Therefore, little is known about what may constitute an effective imitation strategy or the capabilities required to execute such strategy, whereas abundant prescriptions exist for firms seeking to protect themselves against imitation. The emphasis on the perspective of the imitated firms has led to the negative view as well as the lack of interest in the potential power of imitation.

In response to the gap in the extant literature, this study examines a powerful role of imitation in enabling firms not only to catch up with pioneers but also to surpass them; hence facilitating their survival and growth. The ultimate objective of the present study is to examine the antecedents of imitative entry strategies, identify what constitutes as effective imitative entry strategies and their subsequent outcome.

1.3. Overview of the Literature on Imitation

When faced with the dilemma of whether to innovate or imitate, firms are often guided by a number of factors in making their decision: (1) the relative cost of imitation in comparison to innovation, (2) the incumbent reaction and, (3) the level of profitability from entering the market with a product similar to current offerings as opposed to the level of profitability predicted from the market-related uncertainty accompanying the introduction a novel product (Ofek and Turut 2008). Put differently, cost benefit, potential retaliation and uncertainties are important factors underlying firms' propensity to imitate.

A large portion of studies on imitation has explored the reasoning, justification and rationale as to why firms imitate others. Ordanini and colleagues (2008) conducted a systematic review on sixty articles spanning strategy, economics, institutional sociology, and population ecology to understand firms' motivation behind their imitation activities. Their review concludes that environmental uncertainty, perceived information asymmetry, resource similarity reactions, outcome uncertainty, resource gap, complex decision-making and low linkage causal ambiguity are the main the driving forces of imitation. In general, firms adopt an imitation strategy to reduce the risks associated with their strategic decision-making and to reduce the competitive gap between themselves and their innovative competitors.

Similarly, Lieberman and Asaba (2006) argue that all forms of imitation including introductions of new products and processes, new market entries, adoption of managerial methods and organisational forms and the timing of investment have some rational basis. In their extensive review of scholarly articles on imitation, they delineate existing theories of imitation into two broad categories: information-based theories, where firms follow others because they perceived them as having superior information; and rivalry-based theories, where firms imitate others to maintain competitive parity or limit rivalry (Lieberman and Asaba 2006).

The following section briefly discusses the two broad categories of imitation and the theories underlying the categories. Table 1.1 summarises the two categories underlying the drivers of motivation and the prominent empirical studies under each theory.

1.3.1. Drivers and Motivation of Imitation

1.3.1.1. Information-based Theory

A firm is said to engage in an information-based imitation when the imitator and the imitated firm differ in market position, size, or resources or when uncertainty is high (Lieberman and Asaba 2006). In high uncertainty environments, where managers have difficulties to ascertain the associations between actions and outcomes, they may rely on information implicit in the actions of other firms perceived as having superior information.

The information-based theories of imitation have been derived from the economic theory, organisational sociology and ecology theory and organisational learning theory. This type of imitation has been documented in empirical studies spanning a number of strategic decisions including diversification (Fligstein 1991; Haveman 1993), organisational structure (Fligstein 1985), adoption of management practices (Abrahamson 1997; Burns and Wholey 1993), innovations (Greve and Taylor 2000, Rogers 1995) and location choices (Henisz and Delios 2001).

1.3.1.1.1. Economic Theory

Economic scholars have developed the herd behaviour theory to explain the motivation behind imitation. Herd behaviours are often explained by the information cascades theory, which posits that “when it is optimal for an individual, having observed the actions of those ahead of him, to follow the behaviour of the preceding individual without regard to his own information” (Bikhchandani et al. 1992, p. 994).

As such, the information cascades theory predicts that firms copy other market players despite having better internal information. By taking a decision that is more widely adopted by others, firms reduce the risk associated with the decision-making in an uncertain environment (Banerjee 1992). Furthermore, through imitation, firms avoid the potential negative reputation consequences of their key decisions. Bonabeau (2004) summarises this logic as “failure is ok, so long as one fails conventionally” (Bonabeau 2004, p.47).

A typical situation exemplified by this theory is when a customer who intends to visit a specific restaurant is swayed to go to another restaurant upon observing a long queue outside this restaurant. The long queue is perceived to provide a signal of the quality of the restaurant, persuading a potential customer to disregard his own information about the first restaurant (Lieberman and Asaba 2006).

Another example is the imitative behaviour engaged by established and start-up firms alike leading to the Internet bubble in the late 1990s (Lieberman and Asaba 2006). The growing entries into the Internet sector were seen as a signal that others posses superior information about the prospects for Internet retailing; hence convincing the firms to ignore their initial beliefs.

A number of empirical studies have documented the herd behaviour theory in guiding firms’ imitation decision. For example, when observing the phenomenon of clustering of bank branches, Chang and colleagues (1997) found that branch openings were found to follow other existing branches. Likewise, securities analysts’ choice to initiate and abandon their coverage of firms listed on the NASDAQ follow the decisions of their peers (Rao et al. 2001). In addition, Kennedy (2002) revealed that when introducing new programmes, television networks behave according to the herd theory.

1.3.1.1.2. Organisational Sociology and Ecology Theory

Mimetic isomorphism, a type of institutional isomorphism under the organisational sociology theory provides another rationale as to why firms choose to imitate. This theory posits that in coping with uncertainty, firms minimise search costs by engaging in mimetic isomorphism process through replication of actions by others perceived to be more successful (Lieberman and Asaba 2006). By copying the behaviour of more prestigious firms, imitating firms send a signal to their competitors about their own legitimacy (DiMaggio and Powell 1983; Fligstein 1985, 1991; Westphal et al. 1997).

In the field of organisational ecology, scholars argue that by acquiring a threshold number of entrants, a new industry obtains a legitimacy that facilitates its growth (Carroll and Hannan 1995; Hannan and Carroll 1992). As legitimacy increases, it is easier for firms to secure capital from banks and investors as well as to hire potential employees (Lieberman and Asaba 2006). This in turn increases the number of firms adopting imitative entries into the new industry.

Mimetic behaviours have been shown to underlie imitation behaviours in areas such as corporate acquisition decisions (Haunschild 1993), new market entry in the savings and loan industry (Haveman 1993), adoption of new formats by radio stations (Greve 1995, 1996), choice of investment bankers (Haunschild and Miner 1997), international plant location decision (Henisz and Delios 2001), choice of firms' coverage by securities analysts (Rao et al. 2001), foreign expansion decisions (Guillen 2002) and implementation of TQM (Westphal et al. 1997).

1.3.1.1.3. Organisational Learning Theory

Scholars from the organisational learning perspective argue that firms engage in imitation if they perceive a need to act early but expect experiential learning to be slow and time consuming (Lieberman and Asaba 2006). As experience learning is more costly and time consuming than imitation (Baum et al., 2000; Cyert and March 1963; March and Simon 1958) in highly uncertain environments that demand speedy actions, imitating others is a preferred alternative.

In the presence of several alternative exploration paths with outcome uncertainties (Levitt and March 1988), imitating others allow firms to rely on others' actions to guide their choices (Baum et al. 2000) and to let others absorb the costs and the risks of experimentation and discovery (Dutton and Freedman 1985). Rosenkopf and Abrahamson's (1999) simulation model of innovation adoption shows that when faced with a low level of uncertainty, firms prefer to wait until an innovation is proven profitable. In contrast, when uncertainty is high, firms disregard their information on profitability and therefore lacks basis to not engage in imitation.

The organisational learning theory argues that firms learn from others. Hence, they learn by imitating firms they have no direct links with (vicarious learning) or by engaging in a formal relationship with other organisations (contact learning) (Miner and Haunschild 1995). Empirical studies in this field provide evidence that firms engage in vicarious learning when making several organisational-level decisions such as foreign market entries (McKendrick 2001), chain units' locations (Baum et al. 2000) or entries into emerging industries (Srinivasan et al. 2007). In terms of contact learning, a prior study shows that interlocking directories encourage imitation among these connected firms (Galaskiewicz and Wasserman 1989).

1.3.1.2. Rivalry-based Theories

Another set of theories explaining why firms engage in imitation is the rivalry-based theories in which firms used imitation as a competitive response to mitigate rivalry and risk. Rather than imitating others because they possess superior information, a firm imitates to maintain its relative position or to neutralise rivals' competitive actions (Lieberman and Asaba 2006).

1.3.1.2.1. Industrial Organisation Theory

Industrial organisation theory posits that matching a rival's action is a rational way to constrain competitive intensity, avoid price wars and produce tacit collusion (Porter 1979). Empirical studies on action-response dyads (Chen and MacMillan 1992; Chen et al. 1992) show that a firm matches a competitor's move in order to defend the status quo or the current market equilibrium. For example, Casio and Sharp repeatedly matched each other's strategies by introducing similar product lines in electronic calculators throughout the 1970s (Lieberman and Asaba 2006). In doing so, they maintained their relative positions as the market leaders and increased entry barriers for new entrants (Lieberman and Asaba 2006).

A rivalry-based imitation is prevalent in situations where firms have similar resource endowments and compete in the same geographic market and product lines (Lieberman and Asaba 2006). A rivalry-based imitation can lead to intense competition and the erosion of prices and profits (Peteraf 1993). Although firms can avoid this situation by pursuing differentiation strategies (Baum and Haveman 1997; Deephouse 1999; Gimeno and Chen 1998) to insulate themselves from rivals' actions, differentiation strategies are often risky as firms are uncertain about the outcomes. As such, firms often react to the competitive moves of their rivals by matching their actions; hence, choosing a homogeneous strategy rather than a differentiation strategy (Lieberman and Asaba 2006). Furthermore, a recent study shows that imitation is a preferred approach to differentiation in maintaining one's competitive position when consumers' preferences are context-dependent (Naramsihan and Turut 2013).

In short, by matching a rival's action through imitation a firm attempts to ensure that the competitive parity remains balanced. Empirically, rivalry-based imitation has been observed in the clustering of foreign direct investments (FDI) in which rivals matched each other's entries into foreign markets (e.g., Knickerboxer 1973; Flowers 1976; Caves et al. 1980; Kogut and Chang 1991).

Information-based and rivalry-based imitation may coexist when firms are rival (Lieberman and Asaba 2006). For example, in their study of Japanese manufacturing plant entries into foreign countries, Delios and colleagues (2008) found that the propensity of a firm to imitate the rival firm's action predicted by information-based theories is moderated by the home competitive context of the industry.

Table 1.1: Drivers of Motivation and Prior Empirical Studies under Each Theory

Imitation Driver Category	Theory	Topic Area of the Empirical Study
Information-based theories of imitation: A firm imitates the actions of another firm perceived as having superior information (Lieberman and Asaba 2006).	Economic Theory • Herd Behaviour	1. Clustering of bank branches (Chang et al. 1997). 2. Securities analysts' decision to cover specific firms listed on the NASDAQ (Rao et al. 2001). 3. Television networks' decision to introduce new programmes (Kennedy 2002).
	Organisational Sociology and Ecology Theory	1. Corporate acquisition decisions (Haunschild 1993). 2. New market entries in savings and loan industry (Haveman 1993). 3. Adoption of new formats by radio stations (Greve 1995, 1996). 4. Choice of investment bankers for acquisitions (Haunschild and Miner 1997). 5. International plant location decisions (Henisz and Delios 2001). 6. Foreign expansion

		decisions (Guillen 2002). 7. Implementation decisions of TQM (Westphal et al. 1997).
	Organisational Learning • Vicarious Learning	1. Foreign market entry decisions (McKendrick 2001). 2. Location choice of chain units' (Baum et al. 2000). 3. Decisions to invest in the emerging industries (Srinivasan et al. 2007).
	Organisational Learning • Contact Learning	1. Firms' network through interlocking directories facilitates imitation (Galaskiewicz and Wasserman 1989).
Rivalry-based Theories: A firm uses imitation as a competitive response to mitigate rivalry and risk (Lieberman and Asaba 2006).	Industrial Organisation	1. Rivals matched each other's entries into foreign markets (e.g., Knickerboxer 1973; Flowers 1976; Caves et al. 1980; Kogut and Chang 1991).

1.3.2. Environment that Favours Imitation

Scholars point out that the first step of an imitation strategy is for firms to determine the appropriateness of imitation. Firms need to scan the external environment and identify if the environmental forces indeed favour imitation strategies (Cho et al. 1998).

Theoretical insights also suggest that imitation is appropriate and may result in superior performance when there are significant free-rider effects, weak intellectual property protection, low switching costs, high market and technical uncertainties, rapid information flow, mistakes made by pioneers, scope economies are high, or significant preference asymmetries exist (Bolton 1993; Schoenecker and Cooper 1998; Carpenter and Nakamoto 1990; Kerin et al. 1992; Lieberman and Montgomery 1988; Schnaars 1994). Schnaars (1994) even argues that the opportunities for imitation are greatest when small firms pioneer new markets because in most cases of competitive imitation, the big companies prevail over the small upstarts.

Relating to patent protection, Ethiraj and Zhu's study (2008) suggests that the imitator's likelihood of success increases with the quality of information about the innovator's product that is available for potential imitators. A case study of the US animation industry shows that the reasons that late entrants prevailed over pioneers include the limited protection of patents and mobility of staff with expertise in the new technology. In short, ease of information flow facilitates imitation (Bryman 1997).

Finally, imitation strategies may also be appropriate in fast cycle markets. In these markets, technology is diffused quickly, making imitation rapid and inexpensive. For example, Dell and Compaq largely imitated parts of the original PC design to create their own products, which shows that imitation of many fast-cycle products is relatively easy and it is a viable business strategy in this type of market (Volberda et al. 2011).

1.3.3. Imitation Target (Whom and What)

In addition to the drivers and motivation of imitation, scholarly work in this area has also focused heavily on the characteristics of firms that are most likely to become the target of imitation.

The information cascade theory posits that firms that are perceived as likely to having superior information or ‘fashion leaders’ (Bikhchandani et al. 1998) are likely to become the target of imitation. However, most of the studies exploring ‘who’ imitates ‘whom’ were conducted by mimetic isomorphism scholars from the field of organisational sociology.

Scholars of mimetic isomorphism identify a number of criteria used by the would-be imitators in the process of selecting whom to imitate. They include network peers (Haunschild 1993; Kraatz 1998; Westphal et. al. 1997); larger size firms (Fligstein 1991; Haveman 1993; Haunschild and Miner 1997); more successful firms (Burns and Wholey 1993; Haunschild and Miner 1997; Haveman 1993) and firms within the legitimacy-based reference group (Barreto and Baden-Fuller 2006). Organisational sociology scholars also argue that actions taken by larger, more successful, or more prestigious firms are perceived to provide more valuable information (Lieberman and Asaba 2006). Along similar lines, a firm’s organisational innovativeness or a good track record for innovation increases its overall likelihood to be imitated (Semadeni and Anderson 2010). Furthermore, high offering relatedness signals greater competency in a particular market area, which also increases a firm’s chances of being an imitation target (Semadeni and Anderson 2010).

In addition, the organisational sociology theory also holds that a given firm’s likelihood to be imitated increases with its greater of degree of network with other firms (Lieberman and Asaba 2006). Greater network ties between firms provide them with more information about each other, which facilitates imitation (Granovetter 1985; Gulati et al. 2000). Effects of network ties on firms’ propensity to imitate were observed in a number of empirical studies. For example, imitation was found to be more likely to occur between firms with interlocking directors and managers (Davis 1991; Haunschild 1993), radio stations were more likely to follow other stations that belonged to the same corporation (Greve 1996) and even minor network structural features can have significant influences on the diffusion process among members of a social network (Abrahamson and Rosenkopf 1997).

Under the conditions of high uncertainty, the organisational sociology theory suggests that firms tend to follow the decisions of other salient firms (Haveman 1993; Haunschild and Miner 1997; Rao et al. 2001). Salient firms are those from similar backgrounds (DiMaggio and Powell 1983), firms competing in the same prior industries (Benner and Tripsas 2012) or firms that are comparable rather than firms they perceive as distant (Haveman 1993; Haunschild and Miner 1997; Baum et al. 2000). For example, firms tend imitate their peers from the same industry background in their choices of digital camera features during the introductory period of digital camera, which was marked by high technological change and uncertainty (Benner and Tripsas 2012). Similarly, a study examining imitation behaviours of the automobile manufacturers also show that firms tend to imitate other firms that are similar to them (Rhee et al.2006). The study also found that the confidence of would-be imitators in their imitating behaviour is determined by the variance and size of its reference group. The imitating behaviour intensifies as the confidence increases. The tendency to follow the behaviour of firms facing similar institutional environments has also been observed in civil service reforms (Tolbert and Zucker 1983), multidivisional structures (Fligstein 1985), naming conventions (Glynn and Abzug 2002) and mergers and acquisitions in the financial service industry (Yang and Highland 2006).

In their review of imitation literature, Ordanini and colleagues (2008) offer insights into the targets of imitation according to each theory of information-based imitation. The mimetic isomorphism theory suggests that firms tend to imitate the decisions of key players, or those heavily represented in their fields in order to gain legitimacy and reduce uncertainty. Under the information cascades theory, firms try to reduce the consequences of bad decisions by following the decisions heavily diffused in the market, or those adopted by the best performing players in the industry. As the industrial organisation theory hypothesises that firms imitate others to reduce competition, firms are likely to copy other firms who have similar resources and compete for the same market space (Caves and Porter 1977; Hsieh and Vermeulen 2013). The organisational learning perspective holds that the most successful players and peers are more likely to be imitated (Ordanini et al. 2008).

Finally, the RBV posits that a firm generally imitate decisions that are low in causal ambiguity made by those who are perceived to be the best players in the market (Rivkin 2000). Table 1.2 provides a summary of the interorganisational imitation targets in terms of 'whom' and 'what' according to each theory.

Table 1.2: The Interorganisational Imitation Targets (Whom and What)

Theory	**Whom**	**What**
Information Cascades	1. Fashion leaders (Bikhchandani et al. 1998) 2. Best performing firms.	The decisions that are heavily diffused in the market.
Mimetic Isomorphism	1. Network peers (Haunschild 1993; Kraatz 1998; Westphal et. al. 1997). 2. Larger size firms (Fligstein 1991; Haveman 1993; Haunschild and Miner 1997). 3. Successful firms (Burns and Wholey 1993; Haunschild and Miner 1997; Haveman 1993). 4. Firms within the legitimacy-based reference group (Barreto and Baden-Fuller 2006).	1. The decisions of key players. 2. The decisions that are heavily represented in the fields.
Organisational Sociology	1. A larger, more successful, or more prestigious firm (Lieberman and Asaba 2006) 2. A firm with a good track of innovation record	The decisions that are taken by the best players and by peers.

	(Semadeni and Anderson 2010) 3. Other firms within the network ties (Granovetter 1985; Gulati et al. 2000; Davis 1991; Haunschild 1993; Greve 1996; Abrahamson and Rosenkopf 1997).	
Industrial Organisation	Firms who have similar resources and compete for the same market space (Caves and Porter 1977; Hsieh and Vermeulen 2013).	The decisions that are taken by peers.
Organisational Learning	1. Another firm with a formal relationship or a direct link with (contact learning) (Miner and Haunschild 1995). 2. The most successful players and peers (Ordanini et al. 2008).	The decisions that are taken by the most successful players and peers.
Resource-based View (RBV)	1. The most successful players in the market (Ordanini et al. 2008).	1. A decision with low causal ambiguity (Rivkin 2000). 2. The decisions that are taken by the most successful players.

Besides targeting other firms as a source of imitation, scholars also argue that there are three levels of imitation (firm level, market level and industry level) occurring independently and simultaneously, which have significant impact on a firm's choice of mergers and acquisitions (Yang and Highland 2006). Similarly, Cappelli and colleagues (2013) identify three different sources of knowledge spillover: competitors, customers, suppliers or research institutions. Whether the spillover results in innovation or imitation is determined by the source of the spillover. Knowledge of spillover from rivals is normally utilised for imitation while knowledge inflows from research institutions, suppliers and customers may result in process and product innovation.

Scholars have also explored sources of imitation outside of firms' industry and market. For example, in the context of Indonesian commercial banks, McKendrick (1995) found that imitating banks used a wider variety of channels and multiple sources to improve their process capabilities than did innovating banks. Non-market-mediated and informal sources of imitation (know-how) such as inter-firm personnel flow, training, accumulated experience and government institutions were ranked higher by the imitating banks than formal sources such as JV partners and foreign suppliers of computer hardware and software.

In the same vein, scholars have argued that looking for a source of imitation outside one's industry may increase the value of innovation (Enkel and Gassmann 2010). Cross industry spillover enables analogical thinking that enhances product innovation at the firm level (Gassmann and Zeschky 2008). Examples of technological spillovers from other industries include BMW's iDrive system that was transferred from the game industry and Nike's shock absorbers, which were adapted from Formula One racing technology (Enkel and Gassmann 2010).

Finally, previous studies in the area of imitation also offer insights into how firms decide to imitate some selected decisions and avoid others. This is an important consideration as not all strategies are equal to the firm. According to the review by Ordanini and colleagues (2008), a firm is more likely to copy those decisions that are salient, new to the firm, complementary to existing set of resources or routines, low in complexity and causal ambiguity and not firm specific.

1.3.4. Barriers to Imitation

Saloner and colleagues (2001) point out that there are two types of barriers to imitation: (1) positional barriers, and (2) capabilities-based barriers. A positional based barrier exists when imitation is physically impossible, legally prevented or economically unattractive. Capabilities-based barrier is said to exist when would-be imitators are unable to imitate because they lack the required resources, capabilities and knowledge to do so.

The use of patents to erect a positional-based barrier has been substantially discussed in the economic literature (e.g. Mansfield et al. 1981). In terms of making imitation economically unattractive, industrial economists emphasise the use of potential moves by incumbent firms that may reduce the incentives of imitation such as by making retaliation threats credible (Rivkin 2000).

The literature stream on barriers of imitation has been extensively explored by the RBV perspective. Inimitability is central to the RBV theory because without it, a firm is unable to sustain its competitive advantage (Dierickx and Cool 1989; Barney 1991; Peteraf 1993). Therefore, scholars have made a significant progress in understanding the mechanisms that increase the barriers to imitation (e.g., McEvily and Chakravarthy 2002; Reed and DeFillippi 1990; Rivkin 2000; Szulanski 1996). The mechanisms that deter imitation include causal ambiguity, complexity, resource heterogeneity and the evolutionary nature of resource development (e.g. Barney 1991; Dierikx and Cool 1989; Lippman and Rumelt 1982).

Of all the mechanisms, causal ambiguity has attracted the most attention of the RBV scholars. Lippman and Rumelt (1982, p. 418), argue that "…basic ambiguity concerning the nature of the causal connections between actions and results" produces performance heterogeneity among firms because "…the factors responsible for performance differentials resist precise identification." In other words, in the presence of causal ambiguity, competitors cannot be certain about the origin of competitive advantage; that is, imitators are unable to understand the linkage between resources and competitive advantage (Andersen 2007). Therefore, causal ambiguity delays imitation because it increases uncertainty about what to copy and raises the costs of imitation (Barney 1991; Lippman and Rumelt 1982; Schoemaker 1990). In addition, the intrinsic characteristics of capabilities (complexity, tacitness, and specificity) increase causal ambiguity because they make the sources of superior performance obscure (Amit and Schoemaker 1993; Reed and DeFillippi 1990; Winter 1987; Ordanini et al. 2008). Furthermore, empirical studies by Szulanski (1996) and Ounjian and Carne (1987) provide support for the hypothesis that causal ambiguity and complexity impede firms' imitation process.

To increase causal ambiguity, Reed and DeFillippi (1990) propose that firms build their competence around tacit, firm specific knowledge and complex sets of activities. This is consistent with prior views that characteristics of competencies namely tacitness (Polanyi 1967), complexity (Barney 1985; Nelsen and Winter 1982) and specificity (Williamson 1985) are simultaneous sources of advantages and ambiguity. In addition, the level of reinvestments in causally ambiguous competencies to protect existing advantages relies upon: (1) existing imitation barrier height, (2) the rate of decay in barriers to imitation caused by a competitive action and, (3) the potential payoff from the advantages (Reed and DeFillippi (1990).

Although it provides protection against imitation, causal ambiguity simultaneously increases a firm's vulnerability to substitution. The presence of causal ambiguity stimulates competitors to invest on innovations that render a firm's current competencies obsolete (McEvily et al. 2000). In line with this argument, prior studies on causal ambiguity have raised the tension between deterring imitation and avoiding substitution and the need for firms to manage such tension (McEvily et al. 2000; Polidoro and Toh 2011).

Despite its role in increasing barriers to imitation, (Ryall 2009) shows that causal ambiguity alone is not sufficient to sustain capabilities-based advantage but has to be complemented with combinatorial complexity. Combinatorial complexity imposes a barrier to explorative and active learning (Ryall 2009) while causal ambiguity casts a barrier to absorptive or passive learning. By solely relying on causal ambiguity as a barrier to imitation, given enough experimentation or explorative learning, a competitor will eventually discover the source of competitive advantage. In contrast, when combinatorial complexity is high, local exploration is much less effective. Therefore, combinatorial complexity can be a source of sustained capabilities-based advantage (Ryall 2009).

In the same vein, Rivkin (2000) posits that the complexity of a strategy raises the barriers to entry. He argues that the complexity of a strategy can be enhanced by increasing the number of decisions that embody a strategy and by making them tightly linked to one another. Imitation by would-be imitators will be constrained because the interactions among the decisions make the strategy formulation intractable while the large number of decisions makes strategy evaluation time consuming (Rivkin 2000).

Besides causal ambiguity and complexity, RBV scholars also argue that imitation process is constrained by firms' current resource endowments (e.g., Collis 1991; Teece et al. 1997). Despite two firms operating in the same environment, one firm imitating the actions of another is only possible when their resource endowments are comparable. For example, Helfat (1997) shows that only those firms with requisite competence in petroleum refining R&D were able to invest in synthetic fuels. Similarly, Makadok's (1998) study of the money market mutual fund industry demonstrates that despite the low entry barrier and the ease of imitation of product innovation in this industry, key resources such as economies of scale and scope and access to customer are difficult to imitate. This in turn results in the sustainability of competitive advantages derived by early movers.

Resource can also be a barrier to imitation due to the path dependency and the evolutionary nature of resources (Nelson and Winter 1982). Firms build and continuously improve resources over time often through learning-by-doing (Arrow 1962; Hollis 2002), which makes each individual firm a unique entity and gives them an advantage over competing firms that are trying to catch up. This is consistent with prior RBV view that the degree of imitability of a particular resource is determined by the characteristics of resource accumulation process (Dierickxs and Cool 1989).

In addition to the barriers that are erected by the pioneering firms, imitation barriers can also stem from the internal resistance within the imitating firms. Over and above technical limitations, internal resistance caused by 'frictions' or 'inertia' delays firms' imitation efforts (Bromiley 2005; Rumelt 1995; Schoemaker 1990; Jonsson and Regner 2009). In addition, the institutional literature highlights that institutionalised norms can constrain firms' imitation efforts (Davis and Greve 1997; Jonsson 2009). For example, practices and introduction of new products that deviate from social norms is less likely to be imitated by firms in the industry (Scott 2001; Jonsson and Regner (2009). Table 1.3 provides a summary of barriers to imitation discussed by the extant literature.

Table 1.3: Barriers to Imitation

Type of barrier	**Description**
1. Causal Ambiguity	• The uncertainty of connections between actions and results (Lippman and Rumelt (1982). • The ambiguity of the linkage between resources and competitive advantage (Andersen 2007).
2. Combinatorial Complexity	A barrier to explorative and active learning, which impedes a competitor's ability to discover the source of a competitive advantage (Ryall 2009).
3. Complexity	Complexity can be attained by increasing the number of decisions that embody a strategy and by increasing the interactions among the decisions (Rivkin 2000).
4. Resource constraint	The imitation process is constrained by a firm's resource endowments (e.g., Collis 1991; Teece et al. 1997), the path dependency and the evolutionary nature of resources (Nelson and Winter 1982).
5. Internal resistance	Internal resistance can be caused by frictions' or 'inertia' (Bromiley 2005; Rumelt 1995; Schoemaker 1990; Jonsson and Regner 2009) and

	institutionalised norms (Davis and Greve 1997; Jonsson 2009).

Besides the central focus on understanding the barriers to imitation, there is a growing literature stream focusing on the strategies to deal with the threat of imitation. For example, MacMillan et al. (1985) estimated competitors' response time to easily imitated new products. The study suggests that the greater the level of visibility, perceived potential and perceived threat of the new product, the shorter the expected response time by its competitor. In contrast, a high level of product radicality, product complexity and organisation misfit leads to a longer response time.

By modelling the competitive dynamics between an innovator and imitator, Casadesus-Masanell and Zhu (2013) found that an innovator's decision whether to strategically reveal or conceal an easily imitated business model innovation relies on the quality of its product relative to the incumbent's product. In addition, Mukherjee and Pennings (2004) propose two ways of discouraging technology imitation: (1) using technology licensing and, (2) delaying the adoption of a technology with intermediate levels of imitation costs.

1.3.5. Implications of Imitation

In general, imitation can generate significant positive and negative outcomes for individual firms, individual industries and society as whole. For example, imitation can either intensify competition or promote collusion among rivals and speed up the diffusion of a valuable innovation, or it can amplify the errors of pioneers (Lieberman and Asaba 2006). Various imitation theories have also discussed in detail the negative impact of imitation on pioneers' profitability, market share and competitive advantage (e.g., Lee et al. 2000) and its positive impact on imitators' performance (e.g., Shankar et al. 1998). This section provides a snapshot of both benefits and negative outcomes of imitation to society, industries and individual firms.

Although viewed negatively from the perspective of imitated firms, imitation can yield positive outcomes to society and consumers. For example, information-based imitation can speed up the diffusion and adoption of useful innovations while rivalry-based imitation can encourage firms to improve their products and services (Lieberman and Asaba 2006). Imitations of a valuable innovation help to accelerate the industry's acceptance of a good solution and promote network effects and common standards, which benefits firms and consumers (Lieberman and Asaba 2006).

In situations where imitators complement each other such as in the environments with network externalities or agglomeration economies, imitation can be socially beneficial and profitable (Lieberman and Asaba 2006). In the hotel industry, newcomers tend to follow the decision of pioneers by building their new hotels close to established hotels. This, in turn attracts people, goods and services (Baum and Haveman 1997). As a consequence, the attractiveness and reputation of the location increases which then benefits both the customers and the hotels.

The threat of imitation can also be detrimental to innovation activities. Despite mixed empirical evidence, the growth literature argues that anticipated competition predicted from potential imitation reduces the incentive for firms to engage in innovation activities as the reward from innovation is reduced (Mukoyoma 2003).

Furthermore, in highly uncertain environments herd-like imitation can lead to speculative bubbles and excessive investments on ventures that prove to be unprofitable (Lieberman and Asaba 2006). Speculative bubbles from Holland's tulip craze around 1636 to the recent bubble in the Internet sector of the late 1990s have cost individuals and firms significant losses (Bonabeau 2004). The Internet bubble in particular resulted in the overpopulation of imitative start-ups in the industry and poor profit outcomes for many of the firms.

Barreto and Baden-Fuller's (2006) examination of Portuguese bank branching decisions between 1988 and 1996 shows that legitimacy-based reference groups guide firms in their mimetic behaviours. That is, firms undertake imitation despite their own prior information on locations' attractiveness and that legitimacy-based imitation contributes negatively to firms' profitability. Likewise, Westphal and colleagues (1997) found a negative association between efficiency and hospitals' conformity in the adoption of total quality management. These studies show tradeoffs between legitimacy and profitability (DiMaggio and Powell 1983; Meyer and Rowan 1977) and highlight the tension between the pressure to conform through imitation and the pressure to perform faced by managers (Barreto and Baden-Fuller 2006).

Imitation can also lead to an industry-wide ‘competency trap’ if the firms in the industry collectively adopt a poor decision (Levitt and March 1988; Miner and Haunschild 1995). For example, Japanese electronic firms had wrongly embraced the analog technology during the early development period of high-definition television (HDTV), which then hampered the growth of HDTV worldwide (Lieberman and Asaba 2006). In sum, information based imitation in the presence of uncertainty can lead to homogeneous actions by firms that amplify the collective risk of firms in an industry.

Furthermore, the matching of rivals’ actions can intensify competition, which then leads to the erosion of prices and profitability (Rivkin 2000; Peteraf 1993; Deephouse 1999; Ghemawat 1991; Odagiri 1992). Imitation can also lead to the opposite effect of competition, which is collusion among rivals (Lieberman and Asaba 2006). Collusion can lead to a decrease in the variance of price among firms (Abrantes-Metz et al. 2006); hence, hurt customers (Strutton et al. 2001).

At the firm level, by quickly imitating new product introductions, firms can erode the first mover advantages of pioneers by sharing and/or reducing their potential profits (Lee et al., 2000). For the individual firms, benefits of imitation include avoiding unsuccessful products, lower expenditures of R&D, smaller costs of educating consumers about the products, an opportunity to leapfrog pioneers and an opportunity to learn from pioneers’ experience (Sands 1979; Schnaars 1994).

Mansfield and colleague’s (1981) influential study provide further support for the benefits of imitation. Although imitation is not without cost, on average, they report that imitation is less expensive than innovation in terms of expenses (e.g., R&D expenses, investment in plant and equipment and manufacturing and marketing start-up) and time. Their findings indicate that the ratio of the imitation cost to the innovation cost was about 0 to 65, and the ratio of the imitation time to the innovation time was about 0 to 70 (Mansfield 1981).

Imitation is also a beneficial form of vicarious learning in which firms enter a new market or industry by imitating the market leaders before they develop a new technology or innovative product of their own. For example, in the telecommunication industry, Samsung initially depended heavily on the knowledge spillover from Motorola, the industry leader between the 1980s till early 2000 as a means to catch up (He et al. 2006). Similarly, Toyota entered the automobile industry in 1930s using the knowledge it learned from the Ford production system, and then improved upon it to create a more efficient production system called the 'lean production system' (Mukoyoma 2003).

Prior scholarly studies in imitation also offer an explanation to how imitation enables firms to surpass pioneers. Scholars argue that imitation is a complex activity, which is constrained by firms' bounded rationality especially in the presence of complexity (Levinthal 1997; Rivkin 2000; Ethiraj and Levinthal 2004), knowledge tacitness (Zander and Kogut 1995), evaluation uncertainties (Greve 2009) and causal ambiguity (Lippman and Rumelt 1982; Ryall 2009). Referred to as imperfect imitation, bounded rationality provides a mechanism for imitators to engage in a search process resulting in outcomes that are superior than the innovator's product; thus, benefitting the imitating firm as well as the industry as a whole (Posen et al. 2013).

Due to the large benefits associated with imitation, imitation scholars have engaged in empirical studies to establish the relationship between imitation and performance. Early evidence for the positive outcomes of imitation strategy is mainly provided by case studies and historical analyses (e.g., Cho et al., 1998; Golder and Tellis 1993; Schnaars 1994; Bryman 1997). For example, a case study of the US animation industry shows that imitators outperformed innovators through superior quality animation, low cost position with minimal inventions and a utility strategy of low cost and differentiation (Bryman 1997).

Despite the positive findings from case studies, the empirical findings of the relationship between imitation and performance are inconclusive (Lee and Zhou 2012). While some scholars find positive outcomes of imitation (e.g., Shankar et al. 1998), others indicate that imitation results in negative growth and lower financial returns (e.g., Barreto and Baden-Fuller 2006; Lee and Zhou 2012). In a study of new product performance in China, Zhou (2006) found that an innovation strategy leads to better new product performance than an imitation strategy. The study also found that the greater the market demand uncertainties, the faster the rate of technological changes and the more intense competition becomes, the stronger the impact of innovation strategy over an imitation strategy on performance.

On the other hand, in a study that distinguishes between pure imitation and creative imitation, Lee and Zhou (2012) found that creative imitation has a stronger positive effect on financial performance than pure imitation. However, both pure imitation and creative imitation, when coupled with strong marketing capability have positive effects on market share. In a study on the branded drug industry, Ethiraj and Zhu (2008) show that greater time imitation lag allows imitating firms to use the leaked-out information from an innovator's product to create a superior product through vertical differentiation. The study indicates that the greater the level of vertical differentiation relative to the innovator's product, the higher the likelihood that the imitator will beat the innovator in sales.

Finally, prior empirical research also provides some evidence that competitive imitation erodes the durability of first mover advantages enjoyed by pioneers. In their analysis of stock market reactions to new product introductions and subsequent imitations, Lee and colleagues (2000) found that competitive imitation dissipates the first movers' shareholder wealth gains. Furthermore, their sub-sample analysis shows that the first mover advantages were completely erased by the sum effect of an early and late imitation. As such, although imitating others may or may not lead to a positive outcome as demonstrated by the inconclusive empirical evidence, imitation can still hurt the performance of pioneers by taking away the advantages built during the monopoly period.

Mixed findings regarding the relationship between imitation and performance indicate that perhaps the relationship is better modelled using a contingency perspective. Studies showing positive outcomes of imitation indicate that an imitation strategy is a good predictor of performance when coupled with marketing capability (Lee and Zhou 2012), product differentiation (Ethiraj and Zhu 2008) and early entry (Lee et al. 2000). Therefore, the positive relationship between imitation and performance may be mediated by specific product market strategies accompanying a firm's imitative entry such as entry timing, relative product advantage and relative price.

1.3.6. Imitation Enabling Capabilities

After determining the appropriateness of imitation as a strategy, a prospective imitator must determine whether it is able to imitate. That is, it needs to evaluate whether it possesses, or could acquire, the resources and capabilities necessary to implement the imitation decision (Semadeni and Anderson 2010). However, except for a limited number of studies, capability is an aspect of imitation that has largely been neglected by scholars in this field.

Zander and Kogut (1995) clearly distinguish between the imitation of innovations and imitation of capabilities; that is, the imitation of innovations does not necessarily involve the imitation of capabilities. The empirical study shows that that the degree to which important aspects of manufacturing capabilities spill over among firms has a significant effect on the speed of imitation of a particular innovation. They argue that on top of manufacturing capability, successful imitation by a firm is also determined by its possession of a number of other capabilities such as designing, testing, modifying, marketing and servicing the product.

Shenkar (2010) identifies imitation capabilities as the ability to build a culture and mind-set that encourages imitation as much as innovation; the ability to seek and identify imitation models of potential value; the ability to contextualise imitation ideas into current circumstances and external environment; the competency to understand the cause-and-effect relationships; and the ability to implement and operationalise imitated elements (p.113). These capabilities have been deduced based on interviews and secondary data analysis but have not been verified through hypotheses testing.

In the field of technology management, Schewe (1996) attempted to empirically examine the capabilities a firm must have in order to carry out an imitation strategy successfully. The findings identify imitation capability as strengths in the areas of technology, marketing and production and competence in market and competitor intelligence. The findings highlight that although competitor intelligence capability and production potential have a positive relation to imitation success, the two are negatively correlated. This implies that companies need to ensure that existing production capabilities do not hinder information gathering on competitor activities and market structure. Schewe (1996) also shows that technological capabilities lead to a situation in which "high imitation degree" cannot be realised because firms possessing high technological capability tend to create a new innovation.

Although this research adds to the extant knowledge of imitation and capability, the imitation activity studied is specific to technology imitation rather than product imitation. Furthermore, because imitation success is operationalised as imitators' satisfaction level on how close the imitation product is to the original, the research does not measure how these identified capabilities relate to firm performance, which is one of the main concerns in the field of strategy.

Ethiraj and Zhu (2008) show that within the branded drug industry, for imitators to be able to use the information leaked from the innovator they need the requisite absorptive capacity (Cohen and Levinthal 1990). Absorptive capacity is an outcome generated from the cumulative investments in R&D. This then suggests that the ability to imitate an innovative drug and subsequently improve the product hinges on its absorptive capacity and technological capability. In the same vein, Huang and colleagues (2010) argue that technological capability is a prerequisite for firms aiming for successful imitative innovation.

1.3.7. The Distinctions and Overlaps between Imitation and Innovation

Schumpeter (1934) distinguishes three phases of the innovation process: invention, innovation and imitation. Invention refers to a creation or a discovery, innovation involves commercialization of the invention, while imitation refers to the diffusion of that innovation (Bolton 1993). The difference between invention and innovation as well as invention and imitation has been established. However, the distinctions and overlaps between imitation and innovation are often unclear. The difference between the two becomes even fuzzier when a product or a service does not contain pure imitation but also include improvements and adaptations. This type of imitation has been labelled as creative imitation by scholars (Schnaars 1994; Shenkar 2010). This section will first discuss the underlying causes for the difficulties in differentiating imitation and innovation. Next, the overlaps and the distinctions between the two will be discussed along a number of relevant dimensions.

The overlaps and distinctions between innovation and imitation can be traced along the product life cycle. In the beginning of a product life cycle, firms compete for a dominance of their versions of technology or product design (Anderson and Tushman 1990). Therefore, innovation approach is more prevalent in the early stage of product lifecycle. However, following the emergence of a dominant design, firms combine imitation and innovation by incorporating successful product innovations of their rivals in one period with their own innovation into their standard product in the next phase (Klepper 1996). Consistent with Schumpeters' definition of imitation as the diffusion of an innovation (1934), eventually, almost all successful product innovations are copied and incorporated into the standard product by the players in the market while allowing for some level of product differentiation (Klepper 1996).

In addition, the classifications of imitator and innovator among firms are not exclusive. That is, some firms can be categorised as an innovator in one product category, but an imitator in another. No single company regardless of the size of their resources have the ability to be the innovator of every single product in the industry it competes in Levitt (1966). Furthermore, due to the need to balance the norms of rationality against the norm of progressiveness (Semadeni and Anderson

2010), firms often approach innovation and imitation simultaneously or sequentially. Although innovativeness represents progressiveness, being too innovative can threaten legitimacy (Deephouse 1999) and negatively affects performance (Levinthal and March 1993; March 1991). At the same time, the norm of rationality favours imitation because in order for a product to gain market acceptance, it needs to appear reasonable and in sync with the market (Abrahamson 1996). The need to balance the norm of rationality against the norm of progressiveness requires firms to combine or continuously switch between innovation and imitation strategy (Semadeni and Anderson 2010).

Furthermore, although pure imitation utilises external knowledge completely, both innovation and creative imitation are derived from knowledge recombination of new and existing knowledge. Scholars highlight that innovation is the outcome of recombination of existing knowledge (Schumpeter 1939) developed internally or externally (Cohen and Levinthal 1990). According to Bolton (1993), even the purest form of innovation incorporates some external information or pre-existing principles or processes, providing explanation as to why it is often difficult to differentiate between the two strategies.

Having discussed the underlying factors behind the overlaps of imitation and innovation, the next discussion focuses on the dimensions of imitation and innovation where the differences and the similarities can be observed. Table 1.4 highlights the definitions, distinctions and overlaps along a number of dimensions of innovation, pure imitation and creative imitation.

One of the major distinctions between imitation and innovation lies in the degree of novelty or the newness of the outcome of imitation and innovation (Levitt 1966). However, the target and the outcome of an innovation, pure imitation and creative imitation are often indistinguishable. An innovation can be a technology, product, service, trade dress, design, procedure or a process strategy (Schnaars 1994; Shenkar 2010), which will be subsequently imitated or improved. Another primary difference between innovation and pure imitation is the type of learning involved in the process. Innovation requires experiential learning (Posen and Chen 2013; Ryall

2009) or learning-by-doing (Bolton 1993). By contrast, pure imitation entails vicarious learning (Posen and Chen 2013), learning by observing (e.g., Baum and Ingram 1998) or learning from external information (Bolton 1993). Positioned in between innovation and pure imitation, creative imitation requires a combination of both experiential learning and vicarious learning (Posen and Chen 2013) involving knowledge derived internally and externally (Bolton 1993). R&D investment required and the risk involved are high for innovation (Levitt 1966), low for pure imitation (Lieberman and Asaba 2006) and moderate to high for creative imitation depending on the level of improvements incorporated in the product or service (Semadeni and Anderson 2010; Lieberman and Asaba 2006).

Regarding capability, scholars specified R&D capability, technological capability, marketing capability and IT capability as the capabilities required to execute an innovation strategy (e.g., Dutta et al. 1999; Song et al. 2007; Schoenecker and Cooper 1998). On the other hand, pure imitators tend to have high process innovation and manufacturing capability (Lieberman and Montgomery 1988). Finally, creative imitators leverage on their R&D capability and technological capability to create a better product (Song et al 2007; Naramsihan and Zhang 2000). They also rely on their marketing capability to surpass innovators using their brand equity and marketing efforts (Sullivan 1991; Robinson et al. 1992).

Table 1.4: The Distinctions and the Overlaps between Imitation and Innovation

	Innovation	**Pure Imitation**	**Creative Imitation**
Definition	• Commercialisation of an invention (Schumpeter 1934) • Organisation's 'first use ever' of a new product, service, process, or idea	• Diffusion of an innovation (Schumpeter 1934) • Replication of an innovation (Schnaars	• Replication, repetition, adaptation and improvement of an innovation (Schnaars 1994; Shenkar

	(Mansfield 1963) • A strict definition of innovation is 'the application of something that is entirely new, which has never been done before' (Levitt 1966) • A more relaxed definition of innovation is 'the application of something which may have been done elsewhere, but used for the first time in a new industry or setting' (Levitt 1966)	1994) • Subsequent usage of a new product, service, process, or idea by other organisations (Mansfield 1963)	2010) • Copying and making incremental improvements on existing product (Schnaars 1994) • Adapting existing products to new situations (Schnaars 1994)
Degree of Newness	• High (Levitt 1966)	• Low (Shenkar 2010)	• Medium to high (Shenkar 2010)
Outcome/ Target	• Technology, product, services, trade dress/ design, procedures, processes strategies (Schnaars 1994)	• Technology, product, services, trade dress/ design, procedures, processes strategies (Schnaars	• Technology, product, services, trade dress/ design, procedures, processes strategies (Schnaars

		1994)	1994)
Primary Process	• Learning by doing (Bolton 1993) • Experiential learning (Posen and Chen 2013; Ryall 2009)	• Learning by watching (Bolton 1993) • Vicarious learning (Posen and Chen 2013) • Learn by observing rival's practices (Baum and Ingram 1998; Haunschild and Miner 1997), observing rival's choices (Simon and Lieberman 2010) and learn by observing rival's patents and publications (Gittelman and Kogut 2003)	• Learning by watching adaptation/ modification (Bolton 1993) • Experiential learning and vicarious learning (Posen and Chen 2013)
Source of knowledge	• Internal and external (Bolton 1993)	• External (Bolton 1993)	• Internal and external (Bolton 1993)
Required	• Heavy (Bolton 1993;	• Low (Bolton	• Moderate

R&D Investment	Schnaars 1994)	1993; Schnaars 1994)	(Bolton 1993)
Risk	• High (Levitt 1966)	• Low (Lieberman and Asaba 2006)	• Medium to high depending on the level of differentiation and innovation incorporated in the product, service, etc. (Semadeni and Anderson 2010; Lieberman and Asaba 2006)
Capability	• R&D capability (Dutta et al. 1999) • Technological and marketing resources (Schoenecker and Cooper 1998) • Technology and IT capabilities (Song et al. 2007)	• Process innovation, manufacturing and marketing (Lieberman and Montgomery 1988)	• Possess R&D capability and technological capability in order to make improvements to innovator's product (Song et al. 2007; Naramsihan and Zhang 2000) • Possess marketing capability such

			as brand equity (Sullivan 1991; Naramsihan and Zhang 2000) to surpass pioneers through marketing efforts

1.4. Research Gap

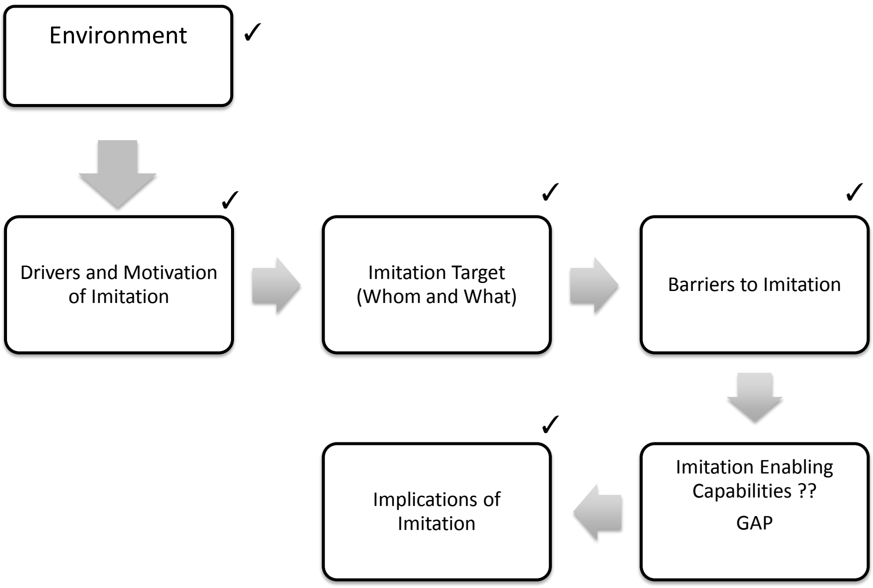
To date, scholars have made significant progress in expanding the extant knowledge on the drivers and motivation of imitation, environment that favours imitation, targets of imitation (whom and what), positive and negative outcomes of imitation and barriers to imitation. However, there are still a few important areas that are in critical needs of further development.

First, as many imitation studies took the perspective of the imitated firms, a lot is known about the type of companies that become the targets of imitation. In contrast, the types, attributes or organisational configurations of companies that tend to imitate and doing so successfully are largely unknown. So far, the progress made in this stream of imitation is provided by anecdotal evidence and case studies (e.g. Schnaars 1994; Bryman 1997; Shenkar 2010), while empirical research is lacking.

Second, although scholars have noted that the underlying resources and capabilities of firms determine the outcomes of their imitation efforts, to date, empirical work in this area is still scarce. Shenkar (2010) refers to imitation capabilities as the ability to unravel a successful model by another firm and apply and implemented it according to its culture, needs and circumstance (p.112). Nonetheless, there is insufficient theoretical and empirical investigation of specific type of resources and capabilities that enable effective imitation strategies. As such, managers lack a clear framework that could guide them in deciding if they have the right set of resources and capabilities required.

Third, the prior scholarly work on imitation has not addressed what constitutes as an effective imitation strategy. Scholars have so far noted that there are two major types of imitation strategy: pure and creative (Grahovac and Miller 2009; Shenkar 2010). While a pure imitation strategy involves direct replications of rivals' existing products and sells them at much lower prices (Levitt 1966), creative imitation strategy entails replication and improvement on competitors' products (Shankar et al. 1998). Except for one study by Lee and Zhou (2012) no other study empirically compares the impact of the two types of imitation strategy on performance. Another consideration highlighted by scholars is when to imitate; that is for firms to either adopt the fast second strategy or the late entry strategy (Shenkar 2010). Prior studies on imitation have not explored the relationship between timing and performance empirically while the empirical findings from entry timing and first mover advantages literature have been inconclusive. Finally, the number of empirical studies examining the relationship between imitation strategy and performance has been limited and they produce mixed findings. As such, there is a need to examine the antecedents of resources and capabilities, specifically their organisational configurations, which then drive imitation strategies and the resulting performance outcomes of implementing such strategies. Figure 1.1 illustrates the areas that have been discussed in detail by extant studies and highlights the area that constitutes the main gap, which requires further development.

Figure 1.1: Extant Research and Gap in Imitation Studies



1.5. Research Objectives

This study aims to fill the gap in the extant literature by developing and empirically testing an integrated model of the antecedents and outcomes of imitative market entry strategy using the RBV and competitive dynamics perspective. The model identifies the antecedents influencing firms' imitative market entry strategies and establishes the link between the strategies and product performance. In this study, imitative market entry is identified as the subsequent market entry following an initial entry made by a pioneer in a new product category (Lee et al. 2003, p.758). This work categorises imitative product market entry strategies as entry timing, relative product advantage and relative price and tests the effects of these strategies on product survival.

The study has the following objectives: (1) to identify whether firms' organisational configuration categorised by Miles and Snow 's (1978) strategic types determine firms' resources, (2) to determine if resources influences specific capabilities developed within the imitating firms, (3) to investigate the role of capabilities in determining entry timing, relative product advantage and relative price which constitute imitative market entry strategies and (4) to establish the link between these strategies and product performance.

1.6. Value of the Study

This study provides value to both academic researchers and business practitioners. For academic researchers, the present study is one of the rare works from the RBV perspective that views imitation in a positive light. The omnipresence of imitation (Shenkar 2010; Mansfield 1981), the difficulty for a firm to persistently be the innovator of every product it chooses to produce (Levitt 1966) and the critical role of imitation in ensuring firms' growth and survival (Levitt 1966) suggest that RBV scholars can no longer afford to view imitation with suspicion and deal with imitation from purely a defensive and self-protection perspective. Rather, firms need to treat imitation as a strategic decision, which requires an effective deployment of specific resources and capabilities and a careful formulation and execution of strategies that accompany such decision.

One of the main contributions of the present research is the reconciliation of the previously two competing theory: the RBV and competitive dynamics in determining firms' performance. The RBV theory has been criticised for not explaining the process of the resource deployment and the leveraging actions that lead to a competitive advantage (Priem and Butler 2001) as well as their relative silence on the role of competition (Ndofor 2011). On the other hand, the competitive dynamics perspective, which central focus is on actions neglects the role of capabilities in enabling those actions. The present research integrates the two theories by examining how firms' specific resources and capabilities as well as their interaction determine their imitative entry strategies. Imitative entry strategies comprising of timing of entry, relative product advantage and relative price represent competitive actions that a firm can undertake when faced with an introduction of a new product innovation by a rival. Hence, the present study enriches the intellectual understanding of how imitative entry strategies can be executed effectively and highlights the management imperative for applying them as powerful competitive responses.

The findings of this study also shed some light in explaining the heterogeneity of performance among firms adopting imitative entry strategies. The present study provides some answers to why firms adopting imitative entries like Samsung and Apple consistently outperformed the pioneers and existing players while others failed. Therefore, the study is valuable for business practitioners as it provides a seminal and actionable framework to guide prospective imitators on their imitative entry strategies based on their organisational configuration, resources and capabilities.

1.7. Organisation of the Thesis

The thesis consists of eight chapters. The current chapter, Chapter 1 provides an introduction to the thesis, presents the background and the context of the study, describes the objectives of the research and discusses the value offered by this research.

Following the introduction, Chapter 2 reviews the literature on competitive dynamics and the RBV perspective, the theoretical underpinnings of the thesis. This chapter is divided into three sections. The first section is a detailed review and discussion on the extant development of the theoretical and empirical research within the competitive dynamics perspective. The second section provides a critical review and discussion of the RBV literature. The final section of this chapter provides an evaluation of the problems and gaps of both perspectives and presents a case for an integration of the two perspectives.

Chapter 3 provides a review of the relevant theoretical and empirical literature along with their research gaps on concepts related to imitative entry strategies. A number of pertinent concepts are examined such as Miles and Snow strategic types, marketing and technological capability within the RBV perspective, absorptive capacity and first move advantages (FMA).

Chapter 4 discusses the conceptual model and the development of research hypotheses of this thesis, which are the outcomes of the literature review in Chapter 2 and Chapter 3. The chapter presents the hypotheses with reference to the current literature and provides the theoretical justification of each hypothesis.

Chapter 5 presents a comprehensive discussion on the research design and the methodology of the present study. It begins with a discussion on the research paradigm and philosophical perspectives underpinning the research, followed by a discussion on research design identification. The chapter then ends with a description of operationalisation of constructs.

Chapter 6 provides the results of the descriptive analysis and explanation of the data. It provides a description of the statistics relating to the central tendency, measures of dispersion and others. The chapter also presents an overview of data preparation and screening procedures and describes the tests performed to ensure that the assumptions underlying the regression techniques were met.

Chapter 7 reports the findings of statistical analyses testing the hypothesised relationships discussed in the conceptual framework section. The results presented in this chapter leads to the discussion of findings in Chapter 8.

Drawing on the findings presented in the previous chapter, Chapter 8 concludes the thesis by providing a discussion on research findings and their theoretical and managerial implications. Finally, the limitations of the present study are discussed along with recommendations for future research directions.

CHAPTER 2: THEORETICAL UNDERPINNINGS: THEORIES OF COMPETITION AND THE RBV

2.1. Introduction

This chapter has three main goals: (1) to provide the theoretical underpinnings explaining the relationship between imitative market entry and performance using Competitive Dynamics and the RBV theory; (2) to identify current deficiencies and problems of both perspectives by means of thorough and critical review of relevant literature; and (3) to identify a case for the integration of the two theories for the present study.

2.2. Theoretical Underpinnings

> *"…what a firm does with its resources is at least as important as which resources it posseses"* (Hansen et al. 2004).

Empirical studies indicate that while the industry in which firms compete in only explains about twenty percent of their profitability, thirty six percent of the variance in firms' profit is attributed to their characteristics and actions (McGahan 1999; McGahan and Porter 1997). Therefore, it is not surprising that two of the most influential theoretical perspectives enriching the understanding of the drivers of superior performance are the Resource-based View (RBV) and Competitive Dynamics (Ndofor et al. 2011). However, considering resources or actions independently provides an incomplete understanding of the underlying factors behind firms' performance. If viewed separately, each perspective focuses on one of these important drivers at the expense of the other. Together, these two perspectives complement each other as the drivers of competitive advantage and superior performance (Ndofor et al. 2011).

The RBV perspective emphasises that resources that are valuable, rare, inimitable or non-substitutable provide a source of competitive advantage and superior performance (Barney 1991). However, this theory has been criticised for its lack of explanation on the process involved in turning resources into a sustainable competitive advantage (Priem and Butler 2001). The theory has also been criticised for being relatively silent on the role of competition on strategy formation (Costa et al. 2013) and its effects on firms' performance. The prescience on competition is especially important in the light of the competitive literature reporting findings that market leaders are replaced more frequently than is commonly believed (Ferrier et al. 1999; Smith et al. 2001), more aggressive firms are more successful (Ferrier 2001; Ferrier et al. 2002) and firms which performance affected by their rivals' actions require new moves to remain competitive (D'Aveni 1994; Derfus et al. 2008). With concerns of rivals' competitive actions looming in the backdrop, the process on how resources are deployed to achieve competitive advantage remains in the 'black box' (Priem and Butler 2001). Scholars lament that the extant literature on the RBV appears to take for granted that firms know how to utilise their resources when the process involved is not necessarily self-evident (Barney and Arikan 2001).

While the RBV focuses on resources, the Competitive Dynamics emphasises on competitive actions. The goal of engaging in an action from a competition perspective is to disrupt, outperform or overthrow rivals (Ferrier et al. 1999), defend one's turf (Livengood and Reger 2010) or to improve one's position relative to its competitors (Smith et al. 1991). Despite acknowledging the necessity of resources to engage in a competitive action (e.g., Grimm and Smith 1997), little research has been done within the field to expand extant knowledge on how resources enable a firm's competitive actions and in turn generates a competitive advantage to the firm (Smith et al. 2001). Competitive Dynamics scholars have largely addressed the role of resources by controlling for the effect of liquid financial capital (Ferrier and Lyon 2004). However, this empirical work is not sufficient to explain the role resources play in enabling action. Furthermore, it does not meet the RBV criteria of resource that is rare, valuable and, inimitable and non-substitutable (Ndofor 2011).

To explicate the explanatory power of these two evidently complementary theories on performance, previous scholars have suggested that they are integrated. For example, Grimm and Smith (1997) and Grimm et al. (2006) propose that the relationship between resources and performance is mediated by actions. Peteraf and Bergen (2003) argue that a resource provides value through its application in generating actions that satisfy customer needs in the product market. Sirmon and colleagues' (2007) resource management model proposes a linkage between resources, actions and performance. More recently, research shows that resources enable competitive actions and that superior performance occurs when these actions leverage the firm's resources (Ndofor et al. 2011).

By integrating the RBV and Competitive Dynamics literature, the present study aims to enhance the understanding on how resources allow a firm to engage in an imitative market entry, a competitive action commonly taken by firms to defend or improve its competitive position.

2.2.1. Competitive Dynamics Theory

2.2.1.1. Early roots of Competitive Dynamics: theory of disequilibrium

The Competitive Dynamics stream of research has been built upon the assumption that entrepreneurship, actions and market disequilibrium are the weapons firms may use when competing in rapidly changing conditions (D'Aveni et al. 2010). Competitive Dynamics research therefore focuses on specific actions taken by a firm and how rivals react to these actions; specifically it investigates the action/reaction relationship (D'Aveni et al. 2010).

The assumption of market disequilibrium adopted by the Competitive Dynamics literature can be traced back to the Austrian economist, Schumpeter (1934) and the subsequent Austrian economics school of thought (Jacobson 1992; Kirzner 1973). The Austrian school of economics views competition as a dynamic process in which firms continuously take actions to outperform each other (Jacobson 1992; Kirzner 1973; Schumpeter 1934). Schumpeter (1934) coined the concept of the 'perennial gale of creative destruction' to explain the dynamic market process by which market leaders and their competitors engage in 'an incessant race to keep ahead of one another' (Kirzner 1973, p. 20).

In the 'disequilibrium' nature of market process, companies are often involved in competitive rivalries that create winners and losers (Ferrier et al. 1999). Under this perspective, no leadership position is secure as the competitive status quo will be inevitably neutralised or destroyed through the dynamics of new competitive moves by rivals (Ferrier et al. 1999). Schumpeter (1934) argues that any competitive action that generates above normal returns leading to a winning market position will motivate competitors to react. If a market leader does not aggressively act itself 'by creating new ways of doing things and new things to do' (Kirzner 1973, p.79), it will eventually succumb to the moves of its aggressive competitors.

Dickson (1992) provides further support for the theory of market disequilibrium. In his paper, he argues that because both demand and supply change heterogeneously, the market will always be in a state of supply-demand flux. Sellers' offerings are always changing in nature and quantity leading to the change of heterogeneity in supply. The change in sellers' product offerings is a result of the disparity among firms in terms of their speed of learning, their resource endowment, their propensity to take risk and their ability to act quickly. Therefore, he implies that the market state of disequilibrium is linked to the heterogeneity of resources possessed by firms, similar to the argument of the RBV theory.

The change of supply heterogeneity leads to the change of heterogeneity in demand because different buyers respond differently to a change in the supply. Not unlike suppliers, buyers learn about the product at different rates, their interest in the product varies, and they have variable amount of discretionary income. Such heterogeneity in buyers' response changes the nature of market segment and their attractiveness. The more attractive market will attract a high number of suppliers (Day et al 1979; Dickson 1982; Dickson and Ginter 1988; Wind 1978; Dickson 1992), which will in turn result in excess of supply over demand in the attractive market segments.

Similar to the arguments of the Austrian school of economics, Dickson (1992) argues that the disequilibrium compels firms to experiment with new ways of serving customers. In order to improve their relative positions, companies experiments with product features, design, service, or price are, which will further disturb the market. Touching on the core of the present research, Dickson (1992) further argues that the most competitive firms in a dynamic market are the firms that implement strategies that consist of both imitation and improvements of what have been learned from the market, such as their competitors' actions. In short, although the diffusion of an innovation and buyers' responses to an innovative pioneering product counts, it is also the actions of competitors serving the market that contributes to the disequilibrium.

The theory of disequilibrium and its importance to firms' competitive strategy receives further support from the development of 'hypercompetition' research stream. D'Aveni (1994) defines hypercompetition as 'an environment characterised by intense and rapid competitive moves, in which competitors must move quickly to build advantage and erode the advantage of their rivals' (pp. 217-218). In a hypercompetitive environment, a firm must engage in continuous competitive behaviours that generate new competitive advantages to neutralise the rival's competitive advantages. The competitive behaviours will then create disequilibrium, destroy perfect competition and disrupt the status quo of the market (D'Aveni 1994, p. 218).

Previous studies in hypercompetition indicate that competitive pressure tends to cause abnormal returns to dissipate over time, regressing to mean levels (Mueller 1986; Jacobsen 1988). Two competitive forces that have been identified as the main threats to the sustainability of a market leaders' competitive advantage are innovation and imitation. As such, the rate of regression to the mean of abnormal returns is highly influenced by the intensity of its competitors' innovation and imitation (Pacheco-De-Almeida 2010).

A number of scholars have embarked on empirical research to shed some light on the validity of hypercompetition. Ferrier et al. (1999) found that market leaders across a wide range of industries are likely to succumb to market share erosion and dethronement when challenged by relatively more aggressive rivals. Foster and Kaplan (2001) examined McKinsey sample of 1008 firms over 36 years and found that even the most well respected firms were unable to maintain their above market performance beyond 10-15 years. More recently, findings from Wiggins and Ruefli's study (2005) suggest that companies' periods of persistent success have become shorter overtime and hypercompetition can be found throughout most industries and is not limited to high-technology industries.

Empirical findings within the literature of first mover advantage (FMA), a distinct but a related field, have also provided support on the effects of firms' competitive actions and the validity of hypercompetition. Although FMA literature predicts pioneers and early entrants enjoy competitive advantage, the empirical findings have been mixed with several studies finding no advantages to early entry (Vanderwerf and Mahon 1997). This implies a competitor's counter move in introducing a competing product affects a pioneer's performance. First mover advantage, despite being prolonged by longer lead time, dissipates over time and is eroded by a competitive entry (Lieberman and Montgomery 1998). Studies also suggest that latecomers may be able to 'leapfrog' over pioneers through superior product features (Bryman 1997; Zhang and Markman 1998) or enhanced product quality (Bryman 1997; Lilien and Yoon 1990; De Castro and Chrisman 1995; Szymanski et al. 1995; Kerin et al. 1996; Green et al. 1995) and through differentiation or a low cost strategy (De Castro and Chrisman 1995).

The above research findings and theoretical insights from hypercompetition and FMA literature highlight the importance of competitive actions on firms' strategy and their performance. Furthermore, the highlighted effects of competitors' actions in a dynamic market challenge the RBV assumptions of equilibrium, the conception of market as stable and its prediction that a firm's competitive advantage is sustainable.

2.2.1.2. Analysis of Competitive Dynamics Literature

Having explained the disequilibrium nature of the market and the prevalence of hypercompetition, the present research continues to explore the importance of competitive action as theorised by Competitive Dynamics advocates to be the force behind firms' superior performance.

Schumpeter (1934; 1950) views the market as an arena through which competitors experiment by taking specific action. Any action that generates above normal returns will eventually meet potential counteraction from competitors (Schumpeter 1934; 1950). The focus of Competitive Dynamics research is consistent with the interdependent nature of competition conceptualised in the Austrian school of economics (e.g. Schumpeter 1934; Kirzner 1973). The interdependent nature of competition dictates that firms react according to their rivals' competitive actions (Hsieh and Chen 2010). As such, the Competitive Dynamics research stream focuses on the causes and consequences of the action and reaction of firms within industries (Smith et al. 2001; Halebliean et al. 2012). Research in Competitive Dynamics not only recognises the interdependent nature of the entire population of firms within industries but also notes that as the actions from an increasing number of rivals' increase, remaining firms are forced to respond to the rising competitive tension (Hsieh and Chen 2010). Therefore, Competitive Dynamics provides a framework to explore actions and firm responses that not only applies to specific dyadic settings but also to broader industry settings (Halebliean et al. 2012).

A competitive action is defined as a move engaged by a firm to defend or improve its relative position (Smith et al. 1991, p.61). Hence, any newly developed market-based move by a competitor that challenges the status quo of the market process may be characterised as a competitive action (Ferrier et al. 1999). For example, Debruyne's study (2010) defines new product introductions as a form of competitive action. On the other hand, a competitive reaction is a specific countermove that a firm takes to defend or improve its position in the industry (Chen 1996) in response to an observed competitive action (Kuester et al. 1999). A competitive response may include a number of dimensions such as the speed of response, the marketing mix instrument used (e.g. price, advertising or new product introduction) and the breadth of reaction, i.e. the number of marketing mix utilised (Gatignon et al. 1997).

Early research on Competitive Dynamics focused on action-reaction dyads to understand how characteristics of individual competitive actions affect the likelihood, speed, and type of competitive actions and in turn, their effects performance (Chen and MacMillan 1992; Chen et al.1992; MacMillan et al. 1985; Smith et al. 1989; Grimm and Smith 1997). Subsequent research established a link between action and performance by aggregating effects of competitive actions, (Ferrier et al. 1999; Smith et al. 1992; Young et al. 1996). The following research focuses on companies' action repertoires (Deephouse 1999; Miller and Chen 1994; 1996) while recent research shifted its focus to uninterrupted sequences of competitive actions that constitute competitive attacks (Ferrier 2001; Ferrier and Lee 2002).

With regard to the relationship between competitive action and response with performance, research findings reveal that aggressive competitive behaviours are associated with better organisational performance (Ferrier 2001). Studies have shown that the characteristics and expected return of a competitive action are significant predictors of competitive response (Grimm and Smith 1997). Furthermore, the more actions a firm carries out and the greater the speed of execution, the better its financial performance (Ferrier 2001). In other studies, the findings show that firms that undertake a broad, complex repertoire of actions achieve higher profitability and market share than firms that carry out a narrow, simple range of actions (Deephouse 1999; Ferrier et al. 1999; Miller and Chen 1994; 1996). Firms that responded quickly to new product introductions were found to have stock market returns that were superior to the pioneers (Lee et al. 2000). Finally, recent research indicates that superior performance results when competitive actions leverage the firms' resources (Ndofor et al. 2011).

Competitive dynamic researchers have also been investigating the relationship between firms' competitive activities and their shifting competitive advantages (Rindova et al. 2010). Competitive moves can improve the competitive advantages of a particular firm and at the same time, undermine its rivals' advantages (Chen and Hambrick 1995; Ferrier et al. 1999; Katila and Chen 2008). As such competitive actions such as pricing, routing and advertising moves initiated to defend the firm's existing position (Miller and Chen 1994; Smith et al. 2001) and capacity and geographic expansion moves to enhance their position (Miller and Chen 1994; Smith et al. 2001) have been examined. Scholars also argue that firms' competitive reactions to their competitors' move determine their ability to sustain or enhance its competitive advantage and therefore, shape their organisational performance (Kuester et al. 1999; Porter 1980). Thus, the Competitive Dynamics view conjectures that a firm's actions as well its reactions to its competitors' actions determine its performance outcome (Smith et al. 2001).

Competitive Dynamics scholars have also examined why some companies decide to enact in frequent competitive moves while others do not. Research shows that firms engage in more frequent competitive moves when they are not performing well but less so when they are profitable (Greve 1998, 2003; Smith et al. 2001). Other researchers found evidence that firms engage in more frequent moves when they recognise that their competitors are not likely to respond effectively (Evans and Kessides 1994; Chen 1996; Gimeno 1999) while others posit that resource-endowed firms are able to engage in many competitive moves. In sum, researchers in the field point out a number of incentives as the underlying motivation for firms to make frequent moves.

The Competitive Dynamics literature has also empirically investigated the factors predicting competitors' competitive reaction. For example, the likelihood of competitors responding to the introduction of new products has been predicted to depend on (1) the size of the firms introducing the new product (Bowman and Gatignon 1995; Shankar 1999; Aboulnasr et al. 2008); (2) the size of the market the product is introduced in (Gruca et al. 1992; Gruca et al. 1995; Shankar 1999; Aboulnasr et al. 2008); (3) whether the new product involves radical or incremental innovation (Aboulnasr et al. 2008) and (4) the similarity in terms of size and resources of the new entrant and incumbent firms (Debruyne and Reibstein 2005).

Lastly, the Competitive Dynamics literature has also identified three underlying drivers of rival behaviour: (1) the awareness of a rival's competitive action, (2) the motivation which is underlined by the incentives (disincentives) to take action and (3) the capability to do so (Smith et al. 2001). Awareness refers to firms' understanding of their competitive context, which includes competitors, industry and the general environment (Smith et al. 2001). Past performance, market dependence (Chen 1996) and competitors' activity (Ferrier 2001) have been linked to the motivation to engage in a competitive counter action. Finally, a firm's ability to implement a competitive counter move is determined by its resource endowment (Ndofor 2011; Grimm and Smith 1997; Grimm et al. 2006).

2.2.1.3. Criticism and Research Gap

Competitive Dynamics research has discussed in depth the effects of 'awareness' and 'motivation,' but thus far research in this field has not made a significant progress in addressing the 'resource' portion of this theory (Smith et al. 2001). Ndofor et al. (2011) attempted to bridge this gap and found evidence that the breadth of a firm's technological resources positively affects the complexity and the deviance of it competitive actions. When these competitive actions leverage the firms' resources, it results in superior performance (Ndofor et al. (2011).

Although an excellent starting point in exploring capability or the role of resources in enabling a firm's competitive move, technological resource is only of one of the many resources that may be deployed in competitive actions in order to improve or defend a firm's relative position. FMA literature highlights a number of strategies late movers may engage in order to surpass pioneers. They include offering superior products and features (Bryman 1997; Zhang and Markman 1998) or employing differentiation or low cost strategies (De Castro and Christman 1995). Similarly, Gatignon et al. (1997) posit that a firm may engage in a number of competitive response such as coming up with a speedy reaction, utilise marketing mix instrument such as price, advertising or new product introduction or using a combination of any of the marketing mix. This implies that on top of technological resources other resources such as marketing may be leveraged to achieve this end. This, in turn raised an opportunity to examine the role both of these resources played in enabling competitive actions, which complements the other theoretical foundation of the present research: the resource-based view of the firm (RBV).

In line with the Competitive Dynamics view in which the market is consistently in flux, the present research proposes that an imitative market entry is a form of competitive reaction to a pioneer's introduction of a new product. Driven by the awareness of their competitors' actions, motivated by the incentives of the actions and finally, endowed by the capability that allows the company to take action (Chen 1996), companies engage in imitative product market entry. Imitative market entry is a type of strategic action engaged by firms to disturb market equilibrium, to erode the advantage of the pioneers and to improve their own relative positions in the market. Consistent with Schumpeter's (1934, 1950) view of 'perennial gale of competition' and D'Aveni's (1994) theory of hypercompetition, Lee and colleagues (2000) demonstrate that competitive imitation by early and later movers dissipate the first movers' shareholder wealth gains, thus eroding the first mover advantages.

Although competitors can respond to a new production introduction with other elements of marketing mix, this present research focuses on imitative market entry as a form competitive reaction. This is because prior research suggests firms often respond to their competitors' actions in a reciprocal manner. For example, product actions tend to provoke product responses and price actions prompted price responses (see Axelrod 2002; Bowman and Gatignon 1995). Furthermore, competitors are likely to respond using product dimensions when challenged by the introduction of highly innovative products (Kuester et al. 1999).

Mirroring Dickson (1992) and the Austrian view of market as a disequilibrium system, the present research argues that an imitative market entry is a form of competitive action that is critical for the survival and growth of firms. Although innovation has been championed by academics and managers alike, Levitt contends that it is extremely difficult for firms to be the innovator of every product in its portfolio (1966). This is especially true in an industry that is characterised by hypercompetition. A company that refuses to imitate and clings to its innovation philosophy will experience either losing market share or losing an opportunity to profit in a growing market.

2.2.2. Resource-based View (RBV) Perspective

Prior research in the field of Competitive Dynamics indicate a positive relationship between the amount of organisational slack (a type of resource) and the level and speed of competitive response (Smith et al. 1991). This finding can be interpreted as an indication of the potential complementary nature of the two perspectives. From the RBV perspective, heterogeneity in resources leads to market disequilibrium as companies that are superior in terms of resource endowment and their ability to deploy their resources are more equipped to produce superior product offerings compared to their rivals (Dickson 1992).

Although acknowledging competitive conditions, the RBV has been relatively silent regarding the influence of rivals' competitive moves in shaping companies' strategy and their ability to sustain their competitive advantages. Another relatively overlooked assumption in the RBV is that firms know how to leverage their resources to gain competitive advantage leading to superior performance (Barney 1991). Yet, the connection between resources and leveraging actions has largely been unexplored by the extant RBV literature (Ndofor 2011). Integrating Competitive Dynamics, an action-based view perspective with the RBV provides an opportunity to explain the process of resource deployment or leveraging actions that have been the main concern of RBV critics.

This section will be organised as follows. First, a brief literature review on the RBV will presented. Past work on the RBV conceptual and empirical work and the criticism on the theory will be discussed. Subsequently, the section will link the RBV with the Competitive Dynamic perspective, which will then be the foundation and the theories that underpin this present research.

2.2.2.1. Analysis of the Resource-based View (RBV) Literature

In contrast to the industry analysis framework (Porter 1980; Schmalensee 1985) that holds the view that the sources of profitability come from the characteristics of the industry and the firm's position within the industry, the Resource-based View posits that firm's profitability is largely determined by the type, size and nature of a firm's resources and capabilities (Amit and Schoemaker 1993).

Penrose (1959), one of the first scholars to highlight the importance of resources to a firm's competitive advantage argues that a firm consists of 'a collection of productive resources' (p.24). These resources may only contribute to a firm's competitive position if they are exploited in such a manner that they produce potentially valuable services for the firm (Penrose 1959). In other words, firms' current resource stock and how they are deployed shape the direction and speed of firm's growth (Penrose 1959). Like Penrose, Rubin (1973) recognises that resources are only of value if they are exploited. He argued that 'firms must process raw resources to make them useful' (p. 937). Following Penrose and Rubin, Wernerfelt (1984) conjectures that by identifying and acquiring resources that enable execution of effective product market strategies firms may gain above normal returns.

Barney (1991) was regarded as the first paper that attempted to formalise the Resource-based View literature into a comprehensive and empirically testable theoretical framework. The RBV framework articulated by Barney (1991) assumes that resources and capabilities are heterogeneously distributed among firms and are imperfectly mobile. These assumptions allow the differences in firm resource endowments to exist and persist over time and therefore resulting in firms with superior resource endowments to enjoy competitive advantage (Newbert 2007). Firms that possess resources that are valuable, inimitable and non-substitutable will be able to ward off competitors and sustain competitive advantages over time (Barney 1991).

Barney's (1991) theoretical framework was however criticised for it static nature (Priem and Butler 2001). Priem and Butler (2001) argue that very little is understood about the process (often referred to as the 'black box') involved in turning valuable, rare, inimitable and non-substitutable resources into a sustainable competitive advantage.

In response to the missing link between resource possession and resource exploitation, RBV scholars begun to emphasise the importance of the process involved in transforming resources into financial performance and competitive advantage. For example, Mahoney and Pandain (1992, p.365) propose that it is the firm's distinctive competence in leveraging its resources that contribute to firms achieving rents rather than because it has better resources. Similarly, in order to attain competitive advantage, a firm needs to leverage (Peteraf 1993) and manage (Henderson and Cockburn 1994) its assets. Makadok (2001) emphasises that even though a particular resource or capability offers a potential latent value, each will not work in isolation. He argues that a firm may generate economic profit if it acquires better resources than competing firms and exploit them effectively with proper capabilities. Equally, a firm's capabilities will not create value if the firm fails to acquire the required resources. Furthermore, Srivastava et al. (2001) argue that the process by which resources are transformed into output has been overshadowed by the role of resources in creating competitive advantage.

As the scholars beginning to conclude that easily acquired resources such as business assets and standardised process solutions will not necessarily lead to sustainable competitive advantage (Miller 2003; Ray et. al. 2004), the RBV literature begun to shift its attention from resources to the processes in which resources must be subjected to in order to exploit their values. The scholarly work on processes includes core capabilities (Leonard-Barton 1992), competences (Fiol 1991; Reed and DeFillippi 1990), combinative capabilities (Kogut and Zander 1992), transformation-based competencies (Lado et al. 1992), organisational capabilities (Russo and Fouts 1997) and capabilities (Amit and Schoemaker 1993). The RBV scholars also started focusing on the effects of these resource deployment processes (e.g., Barney and Mackey 2005; Sirmon et al. 2007) or capabilities (e.g., Kale and Singh 2007; Slater et al. 2006) on firms' performance.

The emphasis on the role of capability extends the RBV theory as it suggests that resource deployments may be more effective drivers of sustainable competitive advantages than resources alone (e.g. Teece et al. 1997; Teece 2007). Other scholars argue that a firm's ability to deploy resources through organisational capabilities may be more important than the absolute resource levels in driving performance (e.g. DeSarbo et al. 2005).

RBV scholars defined capability as 'a firm's capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end' (Amit and Schoemaker 1993). For firms to benefit from their resources, they must possess capabilities, described as bundles of skills and knowledge for deployment of competencies and coordination of its activities in such a manner that competitive advantage is created (Lippman and Rumelt 1982; Rumelt 1984; Barney 1986; Day 1990, p. 38).

Despite the growing conceptual and theoretical work on processes of resource deployment and capabilities, little empirical work has been done to verify this theory (DeSarbo et al. 2006). In his review of the RBV, Newbert (2007) highlighted that only 8 of 55 related articles appearing in leading management journals examined aspects of both strategy and capabilities. Within those eight articles, only about half of the hypotheses tested were supported (Newbert 2007). Other scholars highlight that the intervening processes between resources and performance remain poorly understood and require further examination (Ketchen et al. 2007; Sirmon et al. 2007; Crook et al. 2008).

In addition to the above criticism, recent reviews of the RBV empirical findings produce conflicting results, raising concerns among scholars about the validity of the RBV as a theory. Barney and Arikan's (2001) qualitative assessment of 166 article found that only four or two percent (2%) of the studies produce results that are at least partially inconsistent with RBV prediction. Their assessment then concludes that the results of empirical investigations are consistent with resource-based expectations, which appears to validate the RBV theory as true (Newbert 2007).

On the other hand, Newbert (2007) in his assessment of empirical work on RBV concludes that the RBV has received only modest support overall (p.121). Crook et al. (2008) criticising Newbert's statistical approach (2007) as being subjected to important limitations such as not accounting for sampling error claims found in his study that the possession of resources especially resources that meet RBV criteria outlined by Barney (1991) (it is valuable, rare and difficult to imitate or substitute) drive organisational performance. Their study concluded that the RBV theory's prediction that resources drive performance has strong support, contrary to Newbert's finding of RBV has 'received only modest support overall' (2007).

In a different study, Newbert (2008) found that resources that are valuable and rare may not automatically result in good performance. To be able to reap any performance gain from resources and capabilities, a firm must first achieve the competitive advantages resulting from the combined exploitation that enable the firm to reduce costs, exploit market opportunities or neutralise competitive threats.

2.2.2.3. Criticism and Research Gap

While more empirical work is required to test the validity of RBV, the theory has also been criticised for not paying enough attention to the role of competition on firms' strategy formation (Costa et al. 2013). Barney defines resources as being valuable when they help a firm to take advantage of an opportunity in the firm's environment or when they help neutralising a threat or protect the firm against the threat (1991). This implies that the RBV scholars are aware of the role of potential competition (Foss and Knudsen 2003). Nonetheless, as pointed out by Foss and Knudsen (2003), the literature on RBV has paid little attention to how dynamics of competition and rivalry may take place and occur. As the performance differences in an industry is not just a function of a firm specific resources and entry barriers, but also the form of competition that takes place in that industry, one of the major limitations of the RBV theory is its neglect of the role of competition (Foss and Knudsen 2003).

Barney and Zajac (1994) argue along the same line of reasoning: it is inappropriate to assume that strategy implementation processes can be studied independent of the content of a firm's strategies, and independent of its market and competitive context. Previous researchers have investigated how competition leads to competence (Barnett et al. 1994; Rao et al. 1994; Levinthal and Myatt 1994) and competitive implications of a firm's resources and capabilities (Barney and Hansen 1994) but more research is needed to explain the link between resources, competencies and capabilities with the competitive environment that a firm is operating in (Barney and Zajac 1994).

2.2.3. Integrative View of the Competitive Dynamics and the Resource-based View (RBV)

The present research argues that the Competitive Dynamics and the RBV perspective complement each other as the drivers of competitive advantage and superior performance. Competitive Dynamics and the RBV are linked by the role of resources and capabilities as enablers of competitive actions. The AMC framework proposed by the Competitive Dynamics literature suggests that a rival will launch a competitive reaction or counter move if they are aware of a competitive action, is motivated to react due to the incentive to improve their relative position and if they have the capability to do so.

As a competitive action like a new product introduction in a growing market will always attract rivals, resulting in a continuous state of disequilibrium, a competitive advantage will only be achieved by companies that can deploy their resources and capabilities to create value to customers by either (1) offering products that have superior features and attributes through innovation or (2) cheaper than the products that are already in the market. Critics of the RBV have highlighted that RBV scholars need to focus their research on the process of how resources can be deployed effectively to generate competitive advantages. This present research aims to provide some insights to this black-box area of the field. Specifically, this present research aims to unfold the process of how some companies are able to deploy their unique, valuable and inimitable resources and capabilities more effectively by producing products that offer more value to customers in the context of imitative market entry as a specific competitive action.

Research findings reveal that companies are increasingly enjoying shorter competitive advantages in recent years, resulting in firms having to jump from a temporary advantage to another (D'Aveni 1994; Thomas and D'Aveni 2009). This phenomenon is not mainly safe inflicted (i.e., caused by companies not managing their resources and capabilities effectively), but caused by competitive actions initiated by competitors such as an introduction of a new product using a new technology that renders a company's competitive advantage obsolete. However, the speed that a competitive advantage enjoyed by a pioneering firm can be undermined depends upon the ability of a competitor to acquire the resources needed to initiate a competitive offensive (Grant 1996).

While the Competitive Dynamics scholars in general have neglected the capability factor of a firm's decision to engage in competitive reaction, the RBV has been silent about the effects of competition in resource management and firms' competitive advantage. Therefore, an important contribution of this research is to integrate the

RBV, which has been focusing inward on internal firm attributes with theories on firms' competitive environment.

Whereas the type of resources investigated under the Competitive Dynamics literature has been limited to organisational slack (Smith et al. 1991), liquid financial capital (Ferrier and Lyon 2004) and technological resources (Ndofor 2011), the RBV empirical research has also fallen short in providing insights on which capabilities that are most valuable to companies in creating value in the marketplace, hence becoming the source of competitive advantage. This present research aims to enhance the understanding on resources and capabilities under both theories that not only enable a competitive action but also when leveraged and deployed effectively, will create a competitive advantage to the firm. Specifically, the present research investigates the importance of marketing resources and capability, technological resources and capability and firms' absorptive capacity for firms engaging in imitative product market entry.

2.3. Summary

This chapter provides a critical review on the RBV and Competitive Dynamics perspective, which make up the theoretical foundation of the present study. Critical analysis of the RBV and Competitive Dynamics literature indicates that even though they differ in many respects, potential complementarities in explaining firm performance exist which lend support to an integrative view of these perspectives. Their integration can provide insights into the role of resources and capabilities in enabling firms to engage in a competitive action. In addition, the Competitive Dynamics theory can enrich the RBV literature regarding the influence of competition in resource management and firms' competitive advantage.

CHAPTER 3: LITERATURE REVIEW OF RELATED CONCEPTS: FIRMS' STRATEGIC ORIENTATION, CAPABILITIES, ABSORPTIVE CAPACITY, ENTRY TIMING & FIRST MOVER ADVANTAGE

3.1. Introduction

This chapter has four main goals: (1) to incorporate relevant literature and identify pertinent research streams for theoretical ground and empirical investigation (2) to identify deficiencies and gaps by means of a thorough and critical review of the relevant literature; and, (3) to identify possible research opportunities for the present study. This chapter is organised as follows.

The chapter provides a thorough review of relevant research streams related to the context of imitative entry, which are crucial in enriching the understanding of heterogeneity of imitative market entry performance among firms. The relevant gaps pertaining to these research streams are detailed out at the end of each section, which will then become the foundation of the conceptual model and research hypotheses development for the next chapter. Finally, a summary is presented at the end of the chapter.

3.2. Strategic Orientation

3.2.1. Miles & Snow Typology and Other Types of Organisational Configurations

The Miles and Snow (1978) typology and Porter's (1980) generic strategies have become the two dominant frameworks of business strategy (Slater and Olson 2001). Porter's (1980) generic strategies have played a major role in management research whilst Miles and Snow's (1978) book has been cited more than 1,800 times since it was published (Short et al. 2008).

Strategic orientation or typologies (Miles and Snow 1978) and generic strategies (Porter 1980) are two of the many different labels of research under organisational configurations (Short et al. 2008). Other labels include gestalts (Miller 1981), modes (Mintzberg 1973), archetypes (Miller and Friesen 1978), strategic groups (Porter 1980), strategic scope groups (Houthoofd and Heene 1997), competitive groups (e.g., Leask and Parker 2007) and taxonomies (e.g., Hambrick 1984). Configurational research approach provides descriptions of organisations by grouping similar firms according to important dimensions other than firm-level dimensions such as age and size (Short et al. 2008). The fundamental assumption behind this research stream is that firms can be better understood via “identifying distinct, internally consistent sets of firms than by seeking to uncover relationships that hold across all organisations” (Ketchen et al. 1993, p. 1278). This research field argues that some configurations fit better than others within any given context and hence attributes to a firm’s success. Configurational research approach therefore, seeks to explain performance by predicting which sets of firms will thrive under a specific set of circumstances (Short et al. 2008).

Configurational research’s popularity can also be attributed to its multidimensional nature. The research stream acknowledges that fit and competitive advantage do not rely on a single attribute but instead on the relationships and complementarities between multiple characteristics (e.g. Burton and Obel 2004; Miller 1996; Siggelkow 2002). Furthermore, because it recognises the complex and interdependent nature of organisations, configurational research produces theories that integrate multiple causal relationships linking firms’ structure, strategy and the environment (Child 1972; McPhee and Scott Poole 2001). For example, Miles and Snow‘s (1978) typology and Porter’s (1980) generic strategies take into account firms’ view of the competitive process and their approach towards the competitive market (Engelland and Summey 1999).

True to the characterisation of configurational research, Miles and Snow’s (1978) typology categorises firms according to their decision patterns by which they align themselves with the environments. To be specific, the typology represents the rate of changes firms make to their products or markets in response to the environment (Walker et al. 2003). Miles and Snow’s framework summarises the alternative ways in which firms deal with entrepreneurial, technological and administrative decisions. The entrepreneurial problem concerns the product-market domain; technological problems deal with production, distribution and delivery as well as efficiency issue; and the administrative problem involves organisational structure and policy processes (Conant et al. 1990). Subsequently, Miles and Snow (1978) proposed four archetypes on how firms deal with these issues: prospectors, defenders, analysers and reactors.

Prospectors continuously try to identify and exploit new product and market opportunities and create change. Defenders seek to create a stable set of products and customers by securing a portion of the total market. Analysers, occupying an intermediate position between the two strategies, share the characteristics of both the Prospector and Defender. Analysers cautiously follow Prospectors into a proven profitable new product-market domain while protecting its existing market. Lastly, the Reactors respond to the entrepreneurial problem in an inconsistent, uneven and transient ways (Conant et al. 1990).

Not unlike Miles and Snow's framework, Porter's generic strategies (1980) provide alternatives on ways in which firms can create superior performance and a competitive advantage. According to Porter, a generic strategy is an "internally consistent" approach "for creating . . . a defendable position in the long run and outperforming competitors in an industry" (Porter 1980, p.34). To enhance a firm's competitive advantage, Porter's generic strategies consist of a differentiation, cost leadership, focused or market-wide approach.

For the purpose of this study, Miles and Snow's strategic orientation or typology is adopted instead of Porter's generic strategies. There are a number of reasons for choosing Miles and Snow typology. First of all, the number of researches using Porter's (1980) generic strategies has significantly declined since Dess et al.'s (1993) review, whereas the Miles and Snow (1978) typology continues to receive strong support (Short et al. 2008). Secondly, not only Miles and Snow's typology is argued to be one of the most widely used, most validated and enduring typology of organisations under configurational research (Hambrick 2003), considerable empirical support for it has also been found (e.g., Doty et al. 1993; Hambrick 1983; Ketchen et al. 1993). The typology has been tested in a number of settings including hospitals, industrial product and life insurance companies, book publishing, food processing and many more whereby researchers have found strong and consistent support for the typology (Fiss 2011; Conant et al. 1990).

The Miles and Snow typology is above all, related to innovation (Song et al. 2007), which is the central theme of the present research. Song et al (2007) examined Miles and Snow typology on innovating firms across a number of industries and found support that each strategic type influences the types of capabilities the firms have. This finding lends further support for the relevance of this typology in the context of the present study.

Furthermore, Miles and Snow's strategic orientation fits the RBV theory and the innovation background of the research better than the Porter's generic strategies do. Porter's differentiation strategy is analogous to Miles and Snow's entrepreneurial dimension whereby firms meet customers' needs through innovation in products and services (Fiss 2011). Similarly, Porter's cost leadership is equivalent to Miles and Snow notion of process and efficiency. However, Porter's third strategy, scope, departs significantly from the Miles and Snow's typology. With scope, firms decide between broad strategies aiming to cover a large number of markets or targeted strategies, which focus on one or several segments (Engelland and Summey 1999). This present research examines imitative market entries in the US market at the firm level and innovation at the product level. As such, scope is not particularly relevant to the research.

In addition, using the Miles and Snow typology provides an opportunity to test the RBV theory in a new setting. The theory predicts that some types of resources and capabilities will be more closely related to superior performance than others depending on its strategic type (Song et al. 2007). Prior research predicted and found support for the hypothesis that companies invest in different resources and capabilities according to their strategic orientation (Song et al. 2007). Finally, as the Miles and Snow's typology describes the rate at which firms modify their product or market strategy in response to an environmental stimulation, the typology fits perfectly with the goal of the present research. As previously described, the premise of this present research is firms deploy their resources and capabilities to enable a timely imitative market entry, which is a move stimulated by a competitor's pioneering entry. The speed of a firm's imitative market entry and its product market strategies are argued to be closely related to each firm's strategic orientation described by Miles and Snow.

3.2.2. Analysis of Miles and Snow Typology Literature

In this section, a brief literature review on Miles and Snow's (1978) strategic orientation will be presented. Afterwards, the gap in the in the literature will be highlighted and finally, the link between strategic orientation and the thesis will be established.

After its conception in 1978, the Miles and Snow typology has enjoyed a considerable following in the marketing and management literature (e.g. Conant et al. 1990; McDaniel and Kolari 1987; Shortell and Zajac 1990; Slater and Olson 2001; Engelland and Summey 1999; Song et al. 2007; DeSarbo et al. 2006; Sabherwal and Sabherwal 2007; Kabanof and Brown 2008; Fiss 2011).

A significant number of studies on Miles and Snow's strategic type concentrated on the operationalisation and measurement of the strategy constructs. The measurement approaches adopted by previous researchers include self-report (Snow and Hrebiniak 1980; McDaniel and Kolari 1987; Segev 1987a; Zahra 1987; Segev 1987b; Smith et al. 1986; Conant et al. 1990), objective indicators (Hambrick 1983; Sabherwal and Sabherwal 2007); external assessment based on expert panel assessment (Meyer 1982); investigator inference based on interviews with company executives (Ruekert and Walker 1987) and multiple approach (combinations of investigator inference, external assessment and objective indicators) (Miles and Cameron 1982; Hambrick 1982). Realising the limitations of early operationalisations such as the limitations of using PIMS database (Hambrick 1983) and the use of single-item scales (e.g. Snow and Hrebiniak 1980; McDaniel and Kolari 1987), later researchers started incorporating multi-item scales (Conant et al. 1990; Song et al. 2007) and objective measures examining the multi-dimensional constructs of the typology (Sabherwal and Sabherwal 2007) to increase the validity of the constructs.

3.2.2.1. Miles and Snow Typology and Performance

Miles and Snow (1978) proposed that except for reactors, any of the three strategic types would perform equally well given their consistent pattern of adaptation to the environment. Despite some studies that reported conflicting findings (e.g. Hambrick 1983), in general most empirical studies confirmed Miles and Snow's proposition (e.g. Snow and Hrebiniak 1980; Smith et al. 1986). Other empirical tests of the Miles and Snow framework (e.g. Conant et al. 1990; Dyer and Song 1997) have generally supported the expectation that the three strategic types would outperform reactors. More recently, Slater et al. (2011) examined how well-matched the culture of a marketing organisation with its business strategy affects its overall firm performance, but only found partial support. Considering the scarcity of empirical work, scholars argue that more research is needed to understand the link between strategic type and performance (DeSarbo et al. 2005).

3.2.2.2. Miles and Snow Typology and Capability

Considering that the Miles and Snow's framework (1978) implies that it is the firm's strategic type that shapes its capabilities (i.e., prospectors keep on prospecting), it is not surprising that capability has emerged as an area of interest within this field. For example, Conant et al. (1990) examined the relationship between strategic types, capabilities and organisational performance. However, capabilities other than marketing related ones were not explored in their study. Subsequently, Song et al. (2007) expanded earlier research on the relationship between strategic types and capabilities by including technology, IT, market-linking and market capabilities. In addition to finding evidence of relationships between strategic types and capabilities, they also found that strategic types moderate the relationship between capabilities and performance. When strategic types were used as moderating variables, only certain capabilities had significant effects on profitability. For example, technology and information technology capabilities increase financial performance for prospector organisations, while a different set of capabilities (market-linking and marketing) are positively related to financial performance for defender organisations. As noted by DeSarbo et al. (2005), to enrich the RBV theory and configurational research stream, further studies are required to understand the relationship between capabilities and strategic types.

3.2.2.3. Miles and Snow Typology and the Environment

Scholars argue that the Miles and Snow's framework (1978) by enlarge ignores the environment-strategy link (Hambrick 1983). Similarly, Zajac and Shortell (1989) pointed out that the Miles and Snow's typology tends to assume that the various strategies perform equally well across environmental contexts and time. Although researchers have highlighted that different environmental circumstances may suit certain strategic types (e.g. Hambrick 1983), few studies have attempted to find empirical evidence to support the relationship between the environment, strategic capabilities and the Miles and Snow strategic types (DeSarbo 2005). For example, Hambrick (1983) examined the relationship between strategic choice and two environmental variables (product life cycle stage and industry innovation) using the PIMS database. Zajac and Shortell (1989) found that Prospector and Analyser hospitals outperform defender hospitals in the rapidly changing health care environment. In their investigation of the organisational effectiveness of the Miles and Snow typology, Doty et al. (1993) include configurations of organisational structure, strategy and environment in their study. More recently, DeSarbo and colleagues' (2005) framework expanded the scope of the original Miles and Snow model by including variables of capabilities, environmental uncertainty and performance together in their typology study. It is clear that there is a need for a greater consideration on the relationship between environment, capabilities and strategic type (DeSarbo et al. 2005).

3.2.3. Research Gap

Despite its large following and influence, there are some gaps in the Miles and Snow typology literature especially with regard to its link with capabilities, the environment and performance; thus, making it relevant for the current study. Furthermore, the role of strategic orientation in shaping resources and capability development or acquisition has not been investigated in the context of competition and competitive dynamics before. Lastly, by using durable consumer product firms in high technology industries as the sample firms, the present research provides an avenue to test the relationship between strategic types and performance in a new environmental context.

3.3. Capabilities: Marketing Capability & Technological Capability

Under the Resource-based View perspective, a firm is viewed as a bundle of resources and capabilities and firms are heterogeneous in their endowment of these resources and capabilities (Barney 1991; Penrose 1959; Wernerfelt 1984). The RBV scholars argue that resources and capabilities that differ in value, rarity, imitability, and sustainability can become drivers of competitive advantage (Barney 1991; Wernerfelt 1984).

As a whole, capabilities are defined as complex bundles of skills and accumulated knowledge applied through organisational processes that enable firms to coordinate activities and utilise their assets (Day 1994). Amit and Shoemaker (1993) describe capabilities as a 'firm's capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end.' Capabilities have been defined according to organisations' different functional areas. For example, a firm's R&D capability refers to its competence at converting R&D expenditure into innovations. On the other hand, marketing capability describes a firm's ability to exploit its marketing expenditure to achieve specific marketing objectives such as sales or customer satisfaction (Naramsihan et al. 2006). In the current research, the attention on capabilities is confined to marketing and R&D capabilities. Other than operational capabilities, the two capabilities have been argued to be the most valuable for firms in high technology markets (Dutta et al. 1999), which correspond to the sample firms and the industries investigated in the present research.

The present study also focuses on marketing and technological capabilities because marketing and R&D are the core organisational functions responsible in the formulation and execution of business strategies that results in sustained advantage (Krasnikov and Jayachandran 2008). For example, customer relationship and product leadership are two effective strategies that deliver superior customer value (Treacy and Wiersema 1993) and they correspond to marketing capability and R&D

capability respectively (Krasnikov and Jayachandran 2008). A firm that intends to execute an imitative entry strategy requires adequate technological and marketing capability to create an attractive product and to commercialise the product.

3.3.1. Marketing Capability & Technological Capability: Concept and Definition

3.3.1.1. Marketing Capability

Marketing resource refers to firms' knowledge and assets related to marketing mix activities such as product, price, distribution and marketing communication (Vorhies and Morgan 2005). On the other hand, marketing capability describes firm's ability to perform marketing routines through which marketing resources are combined efficiently and converted into valuable marketing outputs (Bahadir et al. 2008; Vorhies and Morgan 2005).

Marketing capability involves organisational processes that enable projection of customer needs through acquisition, management, and the use of market knowledge as well as processes facilitating sustainable relationships with customers (Day 1994). Therefore, marketing capability provides a link between firms and customers; allows firms to predict changes in customer preferences and provides a platform for sustainable relationships with customers and distribution channel partners (Day 1994; Moorman and Slotegraaf 1999). Firms' strong relationships with channel partners and distributors may create barriers to entry (Reve 1986); hence, provide a competitive advantage especially in an environment with high uncertainty (Noordewier et al. 1990).

Strength in marketing capability enables firms to identify customers' needs and the factors that influence their behaviours and purchasing decisions. Customer knowledge helps firms to achieve better targeting and positioning of its products relative to competing brands. This results in a higher level of product differentiation (Kohli and Jaworski 1990; Day 1994), which subsequently allows firms to enjoy higher margins and superior financial performance.

Heterogeneity of marketing resources (e.g., sales personnel) among firms creates differences among firms' marketing capabilities (Makadok 2001). Resources and capabilities that are not easily acquired, imitated or substituted are drivers of sustainable competitive advantage (Barney 1991). Scholars argue that marketing capability is not easily imitated as a result of its tacit and embedded nature (Brush and Artz 1999; Day 1994; Grewal and Slotegraaf 2007). Marketing capability is based on market knowledge that is usually developed and built through experiential learning and experimentation (Krasnikov and Jayachandran 2008). Market knowledge is also socially complex and difficult to codify as it is distributed across employees in the organisation (Simonin 1999). The socially complex nature of market knowledge and the prerequisite for experiential learning imply that a substantial part of marketing capability is based on knowledge that is tacitly held and difficult for rivals to imitate (Krasnikov and Jayachandran 2008).

In addition, firms' marketing capability develops cumulatively within an organisation; therefore, it is path dependent, which helps prevent imitation (Teece et al. 1997). For example, firms' ability to collect valuable customer feedback requires skills at monitoring the environment and customer relationship management (Deshpande et al. 1993). This capability is hard to imitate or acquire because it is usually firm specific and is tacit in nature (Day 1994). These factors contribute to the difficulty competitors faced when diagnosing the causal link between a firm's marketing capability and its performance outcome (Teece et al. 1997), making this capability an important source of a sustainable competitive advantage (Day 1994; Vorhies and Morgan 2005).

3.3.1.2. Technological Capability

Technological capability refers to a firm's ability to develop, produce and utilise various technologies (Afuah 2002) while product technology capability refers to a firm's technological ability to create new products and related processes (Moorman and Slotegraaf 1999). Related to technological capability, R&D capability is made up of the processes and routines firms deploy to create new technology and convert existing technology into superior products and services (Krasnikov and Jayachandran 2008).

Technology-related capabilities enable firms to respond to the rapid technological change in the environment (Wind and Mahajan 1997). In addition, technical proficiency, research and development and engineering or technical resources and skills have been found to be important to new product and process developments (Bierly and Chakrabarti 1996; Calantone and di Benedetto 1988; Nelson 1982; Roth and Jackson 1995). A meta-analysis of more than 40 studies investigating new product success reveals that technical proficiency is an important factor contributing to a new product success or failure (Montoya-Weiss and Calantone's (1994). In addition, technological capability achieved through greater R&D investments influences the speed of product development and market entry timing (Rabino and Moskowitz 1981).

R&D capability is of utmost importance in high technology markets characterised by short product life cycles, high rate of new product introductions and continuous innovations (Dutta et al. 1999). Firms equipped with superior R&D capability enjoy strong consumer loyalty (Givon et al. 1995) and are able to charge premium prices for their products. Furthermore, a firm’s superior R&D capability also leads to a competitive advantage through process innovation and a favourable cost-structure (Dutta et al. 1999).

Similar to marketing capability, technological capability is an important source of competitive advantage due to its inimitable and non-transferable nature (Dutta et al. 1999). A competitive advantage attained from technological capability has a high degree of causal ambiguity because firms lacking similar competencies have difficulties understanding how product and process improvements are created (Coombs and Bierly 2006). Firms in high technology markets often obtain technological capability through learning-by-doing, which makes it difficult for competitors to imitate or purchase the know-how in the market (Irwin and Klenow 1994). Research and development also has a high level of tacitness, which makes this capability inimitable (Dutta et al. 1999).

3.3.2. Analysis of Marketing and Technological Capability Literature

3.3.2.1. Measurement of Marketing and Technological Capability

Prior studies often measured capabilities using secondary proxy measures that captured the outward manifestations of capabilities because they are generally not explicitly visible (Krasnikov and Jayachandran 2008). For example, marketing capability has been captured using measures such as market research and advertising expenditures (e.g., Dutta et al. 1999).

Many studies employing primary measures developed scales to quantify various dimensions of marketing capability (e.g., Day 2000; Jayachandran et al. 2004). R&D capability has also been measured in a similar manner to that used in capturing marketing capability. The most frequently used measure of R&D capability is R&D intensity (e.g., Dutta et al. 1999) although rating scales have also been used to capture R&D capability in studies employing primary data (e.g., Song et al. 2005).

More recently, scholars utilising secondary data have operationalised and estimated marketing and technological capability using a sophisticated input and output econometric method referred to as the stochastic frontier estimation (Dutta et al. 1999; Dutta et al. 2005).

3.3.2.2. Marketing and Technological Capability and Performance

The relationship between capabilities and firm performance has been the subject of interest of strategy scholars ever since the conception of the RBV framework (see the literature review on the RBV in Chapter 2). In general, the predominant view and the weight of arguments in prior research support the positive association between capabilities and performance (Day 1994). Nevertheless, capabilities can also lead to core rigidities and might negatively influent some aspects of firm performance (e.g., Haas and Hansen 2005; Leonard-Barton 1992). Therefore, it is not surprising that the impact of marketing capability and technological capability as well as their interaction on firm performance have been of significant interest to RBV scholars.

The extant marketing literature provides evidence that marketing capabilities are important drivers of firm performance (Krasnikov and Jayachandran 2008). A meta-analysis of the firm capability–performance relationship indicates that in general, marketing capability has a stronger impact on firm performance than research and development and operations capabilities (Krasnikov and Jayachandran 2008).

Dutta and colleagues (1999) performed a study to examine if marketing, R&D and operations capabilities as well as their interactions are indeed determinants of firms' financial performance. They found that marketing and R&D capabilities interaction is the most important determinant of firm performance in high-technology markets. This suggests that performance relies greatly on firms' ability to come up with continuous product innovations and their ability to commercialise these innovations into products and services that fulfil consumers' current and future needs. They also found that marketing capability has its greatest impact on the innovative output for firms that have a strong technological capability. This shows that the stronger a firm's R&D competence, the more it benefits from a strong marketing capability. They also found that the interaction between marketing capability and technological capability contributes to superior financial performance in a number of ways. For example, firms with a strong base of innovative technologies enjoy favourable consumers' expectations about their product benefits. This suggests that customers use firms' past track record of consistent innovation as a signal for the innovativeness and quality of future products. Furthermore, marketing capability enhances a firm's ability to create new technologies that have various applications across many industries.

A number of prior studies investigated the impact of technological capability and competencies on firm performance (Coombs and Bierly 2006; Henderson and Cockburn 1994) with contradictory results. Similarly, De Carolis (2003) found conflicting empirical results in the study. Her finding shows that technological competence is inversely related to market-based performance measures but is positively related to accounting measures. To be precise, technological competence has a positive impact on firms' return on assets and a negative effect on their market to book value.

Song and colleagues (2005) investigated the effects of marketing capabilities, technological capabilities, and their complementarity on firms' performance and whether the levels of technological turbulence moderated those effects. Although the main effects of marketing-related and technology-related capabilities on performance were positive in both high and low level of technological turbulence, the strength of marketing-related capabilities' impact on performance was greater in the low technologically turbulent environment. On the other hand, the performance impact of deploying technology-related capabilities was the same across both levels of technological turbulence. Finally, the result indicates that the interaction effect between the two capabilities is significant only in the high turbulence environment.

Marketing scholars have also been interested in different types of marketing capabilities and their relationships with firm performance (Krasnikov and Jayachandran 2008; Vorhies and Morgan 2005; Vorhies et al. 2011). Research shows that architectural and specialised marketing capabilities and their integration mediate the relationship between firms' product-market strategy and performance (Vorhies et al. 2009). More recently, Vorhies and colleagues (2011) found a positive relationship between customer-focused marketing capabilities and firms' financial performance.

Other scholars found strong evidence that market orientation and marketing capability were complementary assets that have a positive impact on firm performance (Morgan et al. 2009). The same study found that marketing capability has a direct effect on both ROA and perceived firm performance. Similarly, Ngo and O'Cass (2012) found that marketing resources and marketing capabilities contribute to superior firm performance. The findings also show that the impact of firm performance is greater when complementarity exists between marketing resources and marketing capabilities.

At the product level, Moorman and Slotegraaf (1999) examined the influence of technology and marketing capabilities on the level and speed of product development activities. Their study indicates that firms were more likely to show quality improvements and make these improvements faster relative to competitors when endowed with high levels of both product technology and product marketing capabilities.

3.3.2.3. Technological Capability and Innovation Performance

Firms invest on technological capabilities, which are the skills and abilities to deploy and utilise various resources and know-how to enable them to produce innovations (Anderson and Tushman 1990; Song et al., 2005). As such, capability scholars have developed a stream of research investigating the relationship between technological capabilities and innovation activities and outcomes.

Huang (2011) found that different types of technological capabilities such as exploring or exploiting technological opportunities, core technology capability, and autonomy of R&D decisions contribute to firm innovation in a highly competitive environment. Confirming prediction that capabilities may turn into rigidities, the study reveals that over commitments to existing technologies may restrict a firm's innovation especially in a competitive environment. Equally, Zhou and Wu's study (2010) on the role of technological capability in product innovation indicates that technological capability accelerates exploitation, but has an inverted U-shaped relationship with exploration. In other words, their finding suggests that a high level of technological capability hinders explorative innovation.

Other scholars investigated the influence of technological capabilities and resources on firms' order of entry into new product-markets with equally conflicting results. For instance, Schoenecker and Cooper (1998) found that firms tend to enter the market earlier if their R&D efforts are more intense, while Robinson et al. (1992) found no relationship between R&D intensity and the order of market entry.

3.3.3. Research Gap

The review of literature on marketing and technological capability presents a number of opportunities to expand the extant knowledge on the subject. First, the present research attempts to reconcile conflicting findings on the impact of technology capability on performance by testing the influence of both capabilities on innovation at the product level.

Second, there is an opportunity to examine the interaction between a firm's marketing capability and its technological capabilities in facilitating imitative entry. Third, further investigation is also required on the effects of marketing capabilities, technological capabilities, and their complementarity on firms' performance in high technology and turbulent environments.

Fourth, investigating the relationship between marketing and technological capabilities and their interaction with imitative entry timing and the level of product advantage potentially extends the extant knowledge on rigidity and competency trap. Finally, the critical review of the literature highlights an opportunity to reconcile the conflicting findings regarding the importance of R&D and technological capability with market entry timing.

3.4. Absorptive Capacity

When confronted with a rival's introduction of a new innovation, firms often find themselves in a situation referred to as the 'follower's dilemma' (Semadeni and Anderson 2010). In this situation, they find it difficult to accurately recognise and predict the value of the innovation, which originates from outside the firm. This constraint stems from their embedded knowledge base, rigid capabilities, and path-dependent managerial cognition (Gavetti and Levinthal 2000; Helfat 2000; Leonard-Barton, 1992; Tripsas and Gavetti 2000) leading to their failure to identify and absorb the valuable new external knowledge presented by a new innovative product in the market. However, the 'follower's dilemma' inherent in imitation decisions as put forth by Semadeni and Anderson (2010) may not pose a challenge for firms equipped with a high level of absorptive capacity. In Cohen and Levinthal's (1994) paper, they argue that investments in absorptive capacity not only provide firms with the capability to exploit new external knowledge but also allow them to accurately identify and take advantage of emerging opportunities before their rivals do. In short, absorptive capacity eases the decision-making process of whether to imitate or not.

Absorptive capacity originated from the notion that R&D activities produce innovation as well as help firms to integrate external knowledge (Cohen and Levinthal, 1989, 1990). Cohen and Levinthal's three seminal papers (1989; 1990; 1994) describe the processes firm undertake that make up absorptive capacity: a firm's ability to identify and recognise the value of new knowledge from the environment, and then assimilate and exploit such knowledge for commercial ends. A firm develops knowledge in particular areas through research and development activities and thereon develops understanding on how those areas relate to its products and markets. This process leads to skills in identifying and evaluating external knowledge (Cohen and Levinthal 1989). A firm also develops processes, policies, and procedures to allow sharing of that knowledge internally, which then enable them to assimilate the acquired external knowledge (Cohen and Levinthal 1990). Knowledge sharing within the firm is critical to ensure assimilation and exploitation take place because the tasks of acquiring the new knowledge and applying such knowledge may be handled by different parts of the firm (Lane et al. 2006). Over time the firm learns to use that knowledge to predict technological trends and invent new products and markets, which describes its ability to commercially exploit external knowledge (Cohen and Levinthal 1990, 1994).

Absorptive capacity not only provides the ability for an organisation to imitate other firms' products or processes but also enables them to exploit non-commercially developed knowledge such as scientific research (Lane et al. 2006). Firms with high levels of absorptive capacity are more willing to absorb and exploit external know-how, overcoming the "not invented here" syndrome (Cassiman and Veuglers 2006). Absorptive capacity also facilitates the outcomes of innovation activities such as the speed, frequency and magnitude (Cohen and Levinthal 1990; Lewin et al. 2011). Scholars also argue that absorptive capacity is a driver of competitive advantage (Cohen and Levinthal 1989, 1990) and therefore, is critical to a firm's long-term survival. As external knowledge flows play an increasingly important part in product and process innovation (Cockburn and Henderson 1998; Lane et al. 2006), the important role of absorptive capacity in reconfiguring and strengthening firms' knowledge base' (Lane et al. 2006) is becoming ever more noteworthy.

Cohen and Levinthal (1989; 1990) contend that firms cannot take advantage from external knowledge flows simply by being exposed to them. Firms require adequate stock of prior knowledge to effectively monitor, evaluate, and absorb external know-how. In turn, access to external know-how may leverage the efficiency of internal R&D activities (Cassiman and Veuglers 2006). Empirically, Ethiraj and Zhu's research (2008) on the pharmaceutical industry shows that absorptive capacity resulting from investments in R&D is a necessary condition for firms wanting to engage in an imitation strategy. Despite being exposed to the spillover knowledge from the innovator's product, without absorptive capacity, prospective imitators lack the ability to generate a variant of the original drug because patents pose a strong entry barrier in the pharmaceutical industry (Ethiraj and Zhu 2008).

Other researchers also highlight that firms that are exposed to the same amount of external knowledge do not necessarily obtain equal benefits. This is because firms differ in their ability to identify and exploit such knowledge flows (Beaudry and Breschi 2003; Giuliani and Bell 2005) suggesting that absorptive capacity is a source of competitive advantage.

In summary, absorptive capacity is essentially a by-product of a firm's prior innovations and R&D efforts. A firm's absorptive capacity builds on prior investments in research and development, develops cumulatively and is path dependent (Cohen and Levinthal 1990). It also relies on organisational routines and processes enabling new external knowledge to be communicated and shared within the firm (Cohen and Levinthal 1990). In order to benefit from external know-how, firms need to develop the necessary skills and organisational routines to identify and utilise those knowledge (Cohen and Levinthal 1989; Cockburn and Henderson 1998).

3.4.1. Analysis of Absorptive Capacity Literature

The absorptive capacity construct was reported to be used in more than 900 peer-reviewed academic papers (Lane et al. 2006). To date, Cohen and Levinthal's (1990) seminal paper alone had received more than 6,700 citations.

Absorptive capacity overlaps many fields and literature stream. As such it has been incorporated in studies spanning theories of learning, innovation, managerial cognition, the knowledge-based view of the firm, dynamic capabilities, and co-evolutionary theories (Volberda 2010). For the RBV, absorptive capacity presents a distinctive capability that potentially explains the differences among firms' performance and the competitive advantages they enjoy (Lane et al. 2006).

Prior studies in absorptive capacity have covered various themes. The most prominent themes are the definition and measurement of the absorptive capacity construct. Another well-developed theme within the literature is the outcome of absorptive capacity, specifically innovation and firm performance. Another theme focuses on the characteristics or antecedents of absorptive capacity such as knowledge content, organisational structure and scope. Other themes include inter-organisational learning and organisational learning. In addition to the interest on its direct effect, absorptive capacity has also emerged as an important moderating or mediating variable in joint ventures and alliances research (e.g., Koza and Lewin 1998), ambidextrous organisations (e.g., Rorthaermel and Alexandre 2009) and balancing exploitation and exploration (e.g., Andriopoulos and Lewis 2009).

3.4.1.1. Definition and Operationalisation of Absorptive Capacity

Many prior researches defined absorptive capacity as the extent of knowledge stock or prior knowledge held in the firm (Ahuja and Katila 2001; Kim 1998; Mowery et al. 1996). Following the R&D emphasis in the seminal work of Cohen and Levinthal (1990), absorptive capacity has been operationalised using variables that are proxies for prior knowledge base such as R&D indicator (Veugelers 1997; Rocha 1999; Stock et al. 2001; Wenpin 2001; Meeus et al. 2001; Mowery et al. 1996; Tsai 2001), patents cross-citations (Ahuja and Katila 2001; Mowery et al. 1996) or the number of co-authored scientific papers (Cockburn and Henderson 1998). Proxies of knowledge stock used in prior research also include measures of a firm's human capital such as investments in scientific and technical training and the number of scientists and engineers (Mowery and Oxley 1995; Keller 1996), the number of doctorates within the R&D department (Veugelers 1997) and if a firm has a fully staffed R&D

department (Cassiman and Veugelers 2002). These indirect measures or proxies of absorptive capacity have been used as both dependent and explanatory variables in the empirical studies of high technology firms and industries (Lewin et al. 2011).

However, knowledge stock and R&D organisational process capture only one component of internal absorptive capacity development. In essence, R&D intensity, the number of scientists employed in R&D departments, patent stock and citations only indirectly represent dimensions of absorptive capacity (Lewin et al. 2011). Furthermore, they capture partial aspects of capabilities related to valuing new external information, its assimilation, and its application to commercial ends (Lewin et al. 2011). This criticism is further supported by Lane and Lubatkin's (1998) study that highlights the low explanatory power of R&D spending compared to other dimensions of absorptive capacity. As the extant empirical studies have been criticised for the lack of direct measurements of the dimensions that make up absorptive capacity, scholars highlight the need for a greater understanding of the concept (Joglekar et al. 1997; Zahra and George 2002).

Zahra and George (2002) point out that empirical studies showing significant relationships between absorptive capacity and innovation outcomes (e.g., product innovation, patents and financial performance) mainly observe and report firms' realised absorptive capacity. They observed that potential capacity aspect of the concept has received disproportionately less scrutiny in comparison to realised capacity. Subsequently, Zahra and George (2002) redefined absorptive capacity as a dynamic capability that exists as two sub-sets: potential and realised. Potential absorptive capacity comprises of external knowledge acquisition and assimilation capabilities while realised capacity concerns transformation and exploitation of such knowledge into innovative and commercialised outputs. The two subsets emphasise their distinctions as well as their complementary roles. Firms that excel solely at potential absorptive capacity may be able to renew their knowledge stock, but inability to exploit such knowledge may mean that they are unable to recover the costs of the knowledge acquisition. On the contrary, firms concentrating on the utilisation and exploitation of knowledge may enjoy short-term profits but may eventually fall into competency trap due to their inability to renew their knowledge base.

Realising the limitations of operationalising absorptive capacity as knowledge content and R&D activities, some studies have developed measures for organisational routines and processes to capture the capability view of absorptive capacity. Age (Rao and Drazin 2002; Sorenson and Stuart 2000) and size (Mowery et al., 1996) have been used as proxies of absorptive capacity. This is based on the assumption that older and bigger firms are likely to have greater levels of absorptive capacity because they are likely to have accumulated knowledge and developed routines and processes that facilitate absorptive capacity development.

The unidimensional approach of operationalising absorptive capacity as prior knowledge content and using proxies such as age and size for organisational routines and processes have yielded inconclusive findings (Lane et al. 2006). Hence, there is an increase in the number of empirical studies using survey instruments to capture attributes of absorptive capacity (e.g., Szulanski 1996; Lane and Lubatkin 1998; Lane et al. 2001). Scholars have also attempted to directly measure absorptive capacity as a capability by using measures such as compensation policies, dominant logic, knowledge-sharing routines, motivation, and competencies (Lane and Lubatkin 1998; Lane et al. 2001; Meeus et al. 2001; Szulanski 1996).

To capture the multidimensional nature of absorptive capacity, Van den Bosch and colleagues (1999) drew on two longitudinal case studies and conclude that organisational structures and combinative capabilities increase levels of firms' absorptive capacity. Other scholars operationalised a firm's absorptive capacity as a function of its R&D capability, marketing capability and operations capability measured using Stochastic Frontier Estimation and found that absorptive capacity has a significant impact on a firm's profitability (Naramsihan et al. 2006).

Absorptive capacity has also been defined as process or a capability. However, scholars have recognised that the operationalisation and empirical work on assimilation or application of external knowledge remains scarce (Lane and Lubatkin 1998; Lane et al. 2001; Lane et al. 2006). Volberda et al. (2010) point out that most empirical studies in absorptive capacity literature have neglected the process dimension of absorptive capacity. For example, although many aspects of learning processes are presented in the literature, they are not used in by empirical researchers as components of absorptive capacity (Volberda et al. 2010). Furthermore, although the literature acknowledges that prior knowledge the basis of new knowledge acquisition and creation, the processes capturing how knowledge is stored and retrieved is not addressed (Lyles and Schwenk 1992).

In order to emphasise the process perspective of Cohen and Levinthal's (1990) model of absorptive capacity, Lane and colleagues (2006) proposed adding a sequential process to the construct by redefining absorptive capacity as '…a firm's ability to utilise externally held knowledge through three sequential processes: (1) recognising and understanding potentially valuable new external knowledge through exploratory learning, (2) assimilation of new knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge through exploitative learning' (p.856).

Recognising that specific organisational routines and processes that constitute absorptive capabilities remain a black box, Lewin and colleagues (2011) broke the construct into two components: internal and external absorptive capacity capabilities. They argue that the implementation of the actual routines and the complementarities achieved between the internal and external absorptive capacity routines will be reflected in firms' innovation performance and highlight the importance of balancing the internal knowledge creating processes with the acquisition and exploitation of knowledge originating in the external environment.

Finally, the absorptive capacity literature is also criticised for its static approach to the operationalisation of absorptive capacity (Volberda et al. 2010). A call for further application of longitudinal research methods and process models has been made by scholars for the developmental, lagged and path-dependent characteristics of absorptive capacity to be properly captured (Volberda et al. 2010). However, with the exception of a few (Feinberg and Gupta 2004; Lenox and Kings 2004; Lane et al.

2001), most of the published empirical studies operationalised their studies in a very static way.

3.4.1.2. Outcomes of Absorptive Capacity

3.4.1.2.1. Absorptive Capacity and Innovation

Absorptive capacity is a source of competitive advantage (Cohen and Levinthal 1989; 1990) and therefore, has been associated with a number of outcomes pertaining to the development and sustainability of competitive advantage. For example, absorptive capacity is associated with innovation (Noteboom et al. 2007; Escribano et al. 2009; Rothaermel and Alexandre 2009) and firm performance (Tsai 2001; Lane et al. 2001; Naramsihan et al. 2006), which reflects the utilisation dimension of absorptive capacity. Generally, scholars argue that absorptive capacity increases the speed and magnitude of innovation and innovation in turn creates knowledge that makes up a firm's absorptive capacity (Lane et al. 2001).

In a study of prior related knowledge and technological acquisitions, Ahuja and Katila (2001) found that the relatedness of the acquired and acquiring knowledge bases has a nonlinear impact on the innovation output. This finding suggests that acquisition of firms with high levels of relatedness and low levels of relatedness lead to inferior innovation output in comparison to acquiring firms with moderate levels of relatedness.

In the context of technology-based firm alliances, Noteboom and colleagues (2007) found mixed effects of cumulative R&D. Although R&D may increase absorptive capacity and the level of novelty value, it also reduces the effects of cognitive distance on novelty value making it increasingly challenging for firms to find additional novelty. Bierly (2009) and colleagues examined the influence of external knowledge application process for both exploratory and exploitative innovations and found that technological relatedness is negatively associated with the application of external knowledge to explorative innovations.

Absorptive capacity was also found to moderate positively the impact of involuntary external knowledge flows on innovation performance (Escribano et al. 2009).

Similarly, Rothaermel and Alexandre (2009) found that a firm's absorptive capacity moderates the inverted U-shaped between technology sourcing mix and firm performance in a manner that the positive effect of ambidexterity in technology exploration on firm innovativeness is stronger when the firm possesses higher levels of absorptive capacity.

In sum, the findings from the innovation literature stream indicate that absorptive capacity is a by-product of R&D effort, it positively influences innovation outcomes and the interaction between R&D and absorptive capacity reconfigures and increases a firm's knowledge base leading to further innovation (Volberda 2010). Finally, empirical findings suggest that absorptive capacity comprises of various aspects other than merely R&D (Volberda 2010).

3.4.1.2.2. Absorptive Capacity and Performance

A number of empirical studies examined the impact of absorptive capacity on performance. For example, Tsai (2001) demonstrates that absorptive capacity significantly affects business units' innovation as well as their performance. Lane et al. (2001) demonstrated that absorptive capacity is positively associated with international joint venture (IJV) performance. Focusing on financial performance, Naramsihan and colleague's study (2006) show that absorptive capacity has a significant impact on profitability and that this impact is moderated by the pace of technological change. That is, the greater the pace of technological change, the greater the impact of absorptive capacity on profitability. These findings suggest that high levels of absorptive capacity provide organisations with a higher likelihood to successfully apply new knowledge toward commercial ends and benefit from more innovations and superior business performance.

Acknowledging the financial cost firms might have to incur to develop absorptive capacity, Wales and colleagues (2013) predicted and found evidence for an inverted-U shaped relationship between absorptive and financial performance. However, they argue that firms' entrepreneurial orientation (EO) moderates the inverted U-shaped relationship absorptive capacity-performance relationship. EO enhances financial gains at lower levels of absorptive capacity and mitigates the decline in financial performance at higher levels of absorptive capacity.

3.4.1.3. Interorganisational Learning and Absorptive Capacity

Interorganisational learning theme is one of the most well developed research stream within the absorptive capacity literature. However, the research under this theme mainly focuses on studies of dyadic relationships and studies of network relationships (Lane et al. 2006).

Absorptive capacity scholars argue that the relatedness of knowledge bases may provide an explanation to the heterogeneity among firms' organisational performance following mergers, acquisitions and alliances (Ahuja and Katila 2001; Empson 2001; Jones et al. 2001). Lane and Lubatkin (1998) introduced the dyadic relationship with one firm learning from another to the interorganisational learning research stream. They argue that interorganisational learning requires alliance partners to have adequate knowledge similarities and differences to facilitate learning and increase learning outcomes. Ahuja and Katila's (2001) finding confirms this conjecture by demonstrating that innovation output is maximised when knowledge similarities between alliance partners are moderate. Prior studies on knowledge similarities have found positive relationships with alliance outcomes such as innovation (e.g. Ahuja and Katila 2001; Dyer and Singh 1998; Frost 2001; Koza and Lewin 1998; Lane and Lubatkin 1998), technological capability absorption (Mowery et al. 1996), rate of learning (Schildt et al. 2012) and firm performance (Lane et al., 2001). Other than knowledge similarities, scholars have also examined other forms of likeness among partners and their relationship with absorptive capacity. They found that similarities in organisational structure, compensation practices, and national cultures contribute to relative absorptive capacity (Gupta and Govindarajan 2000; Lane and Lubatkin 1998; Lane et al. 2001). Nonetheless, knowledge similarities have also proven to constrain firms' explorative innovation outcome. Bierly (2009) shows that technological relatedness is negatively associated with the application of external knowledge to explorative innovations.

Within the network relationship stream, scholars argue that memberships in inter-organisational networks (Powell et al. 1996; Stuart 1998), geographical location (Deeds et al. 1997), and developed countries (Erramilli et al. 2002) increase absorptive capacity. According to this literature, although technological knowledge resides within the public domain, firms' ability to derive benefits from such knowledge depends on the nature of the links in terms of structure and processes that enable interfirm knowledge transfer.

In sum, absorptive capacity research in learning concludes that prior related knowledge is the most important antecedent of absorptive capacity and relative absorptive capacity is more relevant for interorganisational learning than R&D based absorptive capacity (Volberda et al. 2010).

3.4.1.4. Organisational Learning and Absorptive Capacity

This research stream mainly focuses on exploitative versus explorative learning and their relationship with absorptive capacity. For example, Ahuja and Katila (2002) found that both search depth and scope have curvilinear relationships with the number of new product introduced by a firm. Furthermore, the interaction of search depth and scope is positively related to the number of new products introduced by a firm. This suggests that existing knowledge facilitates both the absorption and further development of new knowledge resulting in the increase of product innovation.

3.4.1.5. Organisational Antecedents and Absorptive Capacity

Cohen and Levinthal (1990, p.135) postulate that distinct organisational mechanisms can influence the level of absorptive capacity. They include internal knowledge transfer mechanism, communication structure (e.g. centralisation vs. decentralisation), cross-function interfaces and many others (Van den Bosch et al. 1999).

In their review of Zahra and George's (2002) reconceptualisation of absorptive capacity, Todorova and Durisin (2007) identify important contingent factors under which absorptive capacity leads to competitive advantages including social integration, appropriability regimes, feedback loops and power relationships.

Jansen et al. (2005) demonstrate how organisational antecedents affect levels of potential and realised absorptive capacity and therefore, firms' abilities to create value from their absorptive capacity. They found that organisational mechanisms involving coordination such as cross-functional interfaces, participation in decision-making, and job rotation increase business units' potential absorptive capacity. Conversely, socialisation aspect of organisational mechanisms such as connectedness and socialisation tactics enhance realised absorptive capacity.

Other researchers have examined cross-functional team (Meeus et al. 2001), level of centralisation (Gupta and Govindrajan 2000; Lane et al. 2001), formal integration mechanisms such as transmission channels (Gupta and Govindrajan 2000; Meeus et al. 2001) and organisational flexibility (Lane et al. 2001) and the influences of these organisational variables with components of absorptive capacity. In a study that integrates firms' organisational forms and combinative capabilities as determinants of absorptive capacity, Van den Bosch and colleagues (1999) argue that scope, flexibility and efficiency of knowledge assimilation of a firm is determined by whether it has a functional, divisional or matrix organisational structure.

3.4.1.6. Process Dimension of Absorptive Capacity

Although many scholars define absorptive capacity as a process or a capability, the operationalisation and empirical work on the assimilation and application dimension of external knowledge remain scarce (Lane and Lubatkin 1998; Lane et al. 2001; Lane et al. 2006; Volberda et al. (2010). Furthermore, the processes capturing how knowledge is stored and retrieved have not been explored (Lyles and Schwenk 1992).

In order to emphasise the process perspective of Cohen and Levinthal's (1990) model of absorptive capacity, Lane et al. (2006) added a sequential process to the definition of the construct. Likewise, Lewin and colleagues (2011) broke the absorptive capacity construct into two components referred to as internal and external absorptive capacity capabilities and identify the configuration of metaroutines that make up these two components.

3.4.2. Research Gap

This critical literature review presents an opportunity to expand the field in a number of ways. First, in terms of measurement of the construct, although Zahra and George (2002) depict absorptive capacity as potential and realised, the number of empirical research operationalising the construct in such manner is small. Furthermore, accurate measurement of knowledge acquisition (potential absorptive capacity) and knowledge exploitation (realised absorptive capacity) require data to be collected at two different time periods to capture the lag effect of absorptive capacity.

Despite the prolific extant research investigating innovation outcomes of absorptive capacity, most of the empirical work in this research stream focuses on innovation at the firm level through the use of patent count or patent citation. To the best of the knowledge of the present research's author, no prior work has been done to understand the impact of absorptive capacity on innovation at the product level reflected by the level of product advantage. Furthermore, despite scholars generally agreeing that absorptive capacity enhances firms' speed of innovation (Lane et al. 2001), no prior empirical research examined swift market entry as a positive outcome of absorptive capacity.

Innovation at the product level and the speed of market entry are important considerations of absorptive capacity outcomes especially in the context imitative entry. Lewin and colleagues' (2011) absorptive capacity meta-routines framework suggests that the distinction between fast and late followers (or early adopters and imitators) lies in their absorptive capabilities. They argue that firms need to invest in absorptive capacity especially in the event of paradigmatic shifts in the existing technology. This is because absorptive capacity mediates the learning rate, which affects the dynamics of imitation (Lieberman and Asaba 2006).

Absorptive capacity has also been conceptualised as a dynamic capability (Zahra and George 2002), which is a firm's "capacity to renew competences so as to achieve congruence with the changing business environment" (Teece et. al. 1997, p.515). Absorptive capacity is an important consideration in the context of imitative market entry where firms face a change in the environment in the form of an introduction of an innovative new product by a competitor. A firm's ability to react through a timely entry and an introduction of an innovative product can be argued to be largely dependent on its absorptive capacity. Finally, the present research presents an opportunity to enrich the field's understanding on how absorptive capacity influences performance of firms adopting an imitative entry strategy.

3.5. FMA Advantages

The literature on First Mover Advantage (FMA), a distinct but related topic to imitative entry, posits that being first in the market provides a competitive advantage to firms. The concept caught the attention of management scholars in the 1980s after two U.S. Federal Trade Commission funded research projects demonstrated that first movers' in the prescription drug (Bond and Lean and 1977) and cigarette product categories (Whitten 1979) tend to perform better than later entrants.

In their seminal paper, Lieberman and Montgomery (1988) defined first-mover advantages (FMA) as a pioneer's ability to earn positive economic profits or 'profits in excess of the cost of capital' (Lieberman and Montgomery 1988, p.41). In essence, FMA is derived from the above average profits earned by pioneers from being the first to enter the market and by entering the market in a manner that inhibit others from entering the market (Finney et al. 2008).

First-mover advantage posits that order of entry is associated with superior firm performance such as market share (e.g., Urban et al. 1986). Therefore, firms were encouraged to pursue pioneering strategies to achieve first-mover advantage. The main focus of the literature on entry timing has been on the theoretical models and empirical findings that serve to either ascertain or deny the existence of first mover advantages. Consequently, for decades scholars have been examining the direct effect of first-mover-advantage (FMA) and its durability.

The second stream of research in the FMA literature is the source of FMA advantage or the isolating mechanisms that favour early entrants. This stream of literature on entry timing explores various ways the advantages can be created and sustained by early entrants. The third research stream arises from scholars' concern on the endogeneity of entry decisions, which prompted researchers to examine the firm-level resources and capabilities that influence entry timing (e.g. Robinson et al. 1992). Over the years, scholars also developed the fourth stream of the literature, which covers the contingency perspective of FMA. Under this perspective, order of entry effect is modelled as a conditional effect. This perspective advocates that the interaction of order of entry with other variables such as market strategies, resources, capabilities and marketplace conditions explains the variance in firms' performance better than entry timing alone. Lastly, the fifth stream of the FMA centres upon the influence of the environment on the effects of first mover advantages.

3.5.1. Analysis of First Mover Advantage Literature

3.5.1.1. Empirical evidence of FMA

Case studies and empirical work produced mixed results on the impact of FMA on firms' performance. A study analysing the stock market reactions to new product introductions and imitations confirmed the importance of entry timing and order of entry: the faster and earlier a firm introduces a new product, the greater its shareholder wealth effect (Lee et al. 2000). However, the study also observed that competitive imitation by later entrants dissipates the first-mover's shareholder wealth gains and therefore, impacts the durability of first-mover advantages.

Dowell and Swaminathan (2006) found that while early entry may lead to longer average lifespans for firms, early entrants also found it difficult to make the transition to the dominant design. This suggests that entering the market before the industry settles on a dominant design is more likely to limit a firm's ability to adapt to a new technology as the industry evolves.

Min and colleagues (2006) discovered that a pioneer is more likely to be the first to fail when launching a really new product into the market but not when it launches a new product consisting of incremental innovations. The result shows that the 12-year pioneer survival rate for really new products is only 23% versus 61% for incremental innovations. On the other hand, the risks faced by early followers that enter really new versus incrementally new product-markets are relatively the same at 38% and 39%, respectively. This implies that in really new product-markets, early followers benefit from pioneer's experiment.

Although some pioneering firms have been successful, the first mover strategy led to the demise of Bomar, the pioneer in electronic calculators and Osborne, the creator of portable computers (Lieberman and Montgomery 1988). Furthermore, Boulding and Moore (1987) found pioneering to be slightly unprofitable on average. Scholars also argue that market pioneers face greater survival risks than later entrants do and predict higher failure rates for pioneers (Olleros 1986, Lambkin and Day 1989; Tellis and Golder (1996). For example, Golder and Tellis (1993) show that a lifetime market pioneer survival rate observed in their study is only 53%.

Scholars highlight that uncertainties, risks, inexperience, and higher development costs are among the challenges faced by first-movers (Cho et al., 1998; Mitchell 1989). In addition to these challenges, first movers also risk disrupting their existing products and their organisational structures (Mitchell 1989).

Conversely, many studies found surviving pioneers to have enduring superior market share (Bond and Lean 1977; Whitten 1979; Urban et al. 1986; Robinson 1988; Robinson and Fornell 1985; Spital 1983; Parry and Bass 1989). In terms of survival, there is considerable evidence that indicates that first-mover advantages provide pioneers with higher survival rates (Agarwal 1997; Robinson and Min 2002). For example, Robinson and Min (2002) report a ten-year survival rate of 66% for market pioneers compared to 48% for early followers in the industrial goods businesses. The result concludes that pioneers enjoy temporary monopolies over early followers and the impact of first-mover advantages helps increase pioneers' chance of survival. As such, the benefits of pioneering offset the survival risks associated with market and technological uncertainties.

In summary, empirical studies have produced conflicting evidence regarding the existence of FMA and therefore unable to provide managers with coherent guidelines for their entry strategy (Suarez and Lanzolla 2007).

3.5.1.2. Isolating Mechanisms That Favour Early Movers

Scholars argue that the advantage of being first movers is partially derived from pioneers' lead time. Lead time provides a period of monopoly in which first movers may generate higher profits compared to when competition exists. During this period, first movers can establish a market leader position that will allow them to retain their dominant position even after competitors enter the market (von Hippel 1984).

First movers can establish market leader positions and create FMA either through economic forces or cognitive processes. The economic forces consist of entry barriers created by a leadership in product and process technology derived from economies of scale and learning curve (Spence 1981; Ghemawat 1984; Gilbert and Newbery 1982), a pre-emption of scarce assets such as input factors, geographical and product locations and retail shelf space (Prescott and Visscher 1977; Schmalansee 1978; Ghemawat 1986; Robinson and Fornell 1985), a pre-emptive positioning (Lieberman and Montgomery 1988) and a development of buyer switching costs (Carpenter and Nakamoto 1989). The other source of FMA comes from the cognitive processes of individual consumers and their greater knowledge of the pioneering brand (Carpenter and Nakamoto 1989; Kardes and Kalyanaram 1992; Lieberman and Montgomery 1988).

Pioneers may derive leadership in product and process technology through 'learning' or 'experience' curve, where costs decrease with cumulative outputs (Ghemawat 1984; Porter 1981; Shaw and Shaw 1984; Fast 1975) and through leadership in patent or research and development (Gilberts and Newbery 1982; Reinganum 1983;

Fudenberg et al. 1983). However, scholars argue that inter-firm diffusion of technology occurs rapidly in most industries (Mansfield 1985; Lieberman 1982) and therefore diminishes first-mover advantages derived from the learning curve (Ghemawat and Spence 1985; Lieberman 1987; Lieberman and Montgomery 1988). In the case of technology protection and a head-start provided by patent and R&D, despite studies demonstrating significant roles of patents in sustaining first mover advantages (Bresnahan 1985; Bright 1949) others argue that except for a few industries such as pharmaceuticals, patents generally offer weak protection, are easy to invent around or have a temporary value due to rapid technological change (Lieberman and Montgomery 1988).

Another way in which FMA can be derived is through pre-emption of scarce assets such as positioning in 'space', including geographic space, product space, shelf space, etc. and pre-emptive investments in plants and equipments (Lieberman and Montgomery 1988). Investments in enlarged capacity lead to economies of scale, which makes entrants by competitors less attractive. However, as most of the manufacturing of technological products such as smartphones and tablets are outsourced (e.g. Apple outsources its product manufacturing to China (Duhigg and Bradsher 2012), these investment tactics are no longer important in practice.

Pioneers may also derive FMA from buyers' switching costs. Switching costs include the time and resources customers have to spend as a consequent of buying a product from a new supplier such as having to learn how to use the new product (Wernerfelt 1985). Sellers can also intentionally create switching costs through mechanisms such as frequent-flyer programs (Klemperer 1986) or the 24-month contract imposed by mobile carriers in the UK and the US.

Finally, FMA can also be explained by the role of learning in consumer preference formation (Carpenter and Nakamoto 1989, 1990). When faced with uncertainty, the first product introduced in the market received disproportionate attention in the consumer's mind. Carpenter and Nakamoto (1989) found that the order-of-entry influences the formation of consumer preferences. When product attributes importance is not well developed especially in a newly created product market, first movers may be able to shape and define the ideal product attributes, hence influence consumers' preference. Furthermore, once established, customers' perception and preferences are difficult to change.

Building on this insight, researchers found that considerable first mover advantages result from consumers' cognitive processes. For example, in consumer-packaged goods, consumers learn more about a pioneer than about later entrants, which enhances FMA (Kardes and Kalyanaram 1992). Furthermore, when making a purchasing decision, consumers are more likely to recall pioneering brands; hence, choose to purchase them over products offered by later entrants (Kardes et al. 1993). Similarly, Alpert and Kamins (1995) found that consumers have a positive attitude toward pioneer brands. Pioneers that are able to achieve significant consumer trial may also define a product category as a whole (Alpert 1987; Howard 1989). This is the reason pioneers such as Coca-Cola and Kleenex have become prototypical for their product categories (Lieberman and Montgomery 1988).

3.5.1.3. Late Mover Advantages

The concept of FMA has also inspired the growth of a separate literature stream on first-mover disadvantages. Advocates of late-mover advantage posit that later entrants may benefit from the free-riding effect on pioneers' investment, the decrease of uncertainties, exploitation of technological discontinuities and by taking advantage of early entrants' tendency to refuse to adapt to technological change described as 'incumbent inertia' (Lieberman and Montgomery 1988).

Despite empirical evidence supporting the effects of FMA, other scholars revealed evidence of late-mover advantages. Studies suggest that in some cases late movers surpassed pioneers (e.g., Golder and Tellls 1993; Lieberman and Montgomery 1988; Lilien and Yoon 1990). Using French markets for industrial goods as a sample, Lilien and Yoon (1990) found that success rate is lower for first and second entrants; higher for third and fourth; and again lower for subsequent entrants. Likewise, Golder and Tellis (1993) found that not only almost half of market pioneers failed, prolonged market share leadership for pioneers is observed in only 4 of the 50 product categories they studied.

Late movers may outperform pioneers through significant advertising efforts (Urban et al. 1986; Carpenter and Nakamoto 1990), superior product positioning (Urban et al. 1986; Carpenter and Nakamoto 1989; Carpenter and Nakamoto 1990) and a differentiation strategy via exploitation of technological discontinuities (Foster 1986). Furthermore, Shamsie and colleagues (2004) found that late movers' ability to penetrate the market is strongly linked to their strategic positioning: its ability to compete with other products on attributes such as price, quality, and innovation.

Literature has also pointed out that late followers succeeded by capitalising on pioneers' mistakes (Golder and Tellis 1993; Kerin et al. 1992). In marketing field, scholars developed theoretical models suggesting innovative late movers may be more profitable than pioneers (e.g. Shankar et al. 1998) and provide some anecdotal evidence (Schnaars 1994) and empirical supports for the theory of late-mover advantages (e.g., Berndt et al. 1995, Zhang and Markman 1998). Nonetheless, studies show that late followers utilising a 'me-too' strategy tend to fail (Bond and Lean 1977; Montgomery 1975; Davidson 1976) even when they compete on low prices (Bond and Lean 1977).

3.5.1.4. Endogeneity of the Market Entry Decision

FMA conceptual and empirical work received a number of criticisms over the years. Lieberman and Montgomery (1988) highlight that scholars in this literature stream may have overlooked the endogeneity of firms' market entry decisions. Vanderwerf and Mahon's (1997) meta-analysis revealed that empirical works that omit measures of the entrants' competitive strength in their models are likely to show significant FMA findings of FMA effects. This suggests that firms with the highest probability of success tend to enter first. As such, first movership is endogenous; that is, the first movers tend to be those that are confident of their market success because they are equipped with competitive entry (e.g., best product, most advertising, etc.). Therefore, their high performance may have been attributed to their superior entry (Kalyanaram and Urban 1992; Moore et al. 1991; Vanhonacker and Day 1987; Lieberman and Montgomery 1988).

The endogeneity factor of entry decision presents an opportunity for FMA research to be positioned within the broader perspective of the resource-based view (RBV). Lieberman and Montgomery's (1998) review on FMA discusses the connection between the concept and the RBV. At the same time, a smaller literature exploring the determinants of entry timing (Klepper and Simons 2000; Mitchell 1989; Robinson et al. 1992; Schoenecker and Cooper 1998) also developed within the broader FMA and order of entry literature.

Following Lieberman and Montgomery's initial review of the FMA literature (1988), a number of scholars embarked on the investigation of the relationship between resources and capabilities with entry timing decisions. For example, Robinson and colleagues (1992) discovered that firms with greater marketing skills and shared manufacturing tend to be followers. They also found that found that strong finance skills and internal mode of entry are two factors related to pioneering. Surprisingly, substantial investments in research and development were not found to influence entry timing (Robinson and colleagues 1992). Although the study indicates that pioneers are different than later entrants, they are not intrinsically stronger as they were believed to be (Robinson and colleagues 1992).

Sullivan (1991) found that many established firms enter later than new-name brands. Moreover, they discovered that extensions of brands with large customer bases typically enter later than extensions of brands with smaller customer bases. This shows that that brand image is a key resource that later entrants use to increase its likelihood of survival. Mitchell (1989) found that possession of a direct sales force, increased rivalry and threatened core products influence incumbents' entry timing in an emerging subfield of the industry. Schoenecker and Cooper (1998) demonstrated that technological and marketing resources, commitment to a threatened market and firms' greater size were found to be associated with early entry. Shamsie and colleagues (2004) found that late entrants' resources (size and prior experience) increase the chances of their success.

Larger incumbents were found to be likely the first to enter where innovations in new product generations are incremental such as in the ready-to-eat cereal industry

(Thomas 1995; 1996). However, if the innovations in the new product generation are radical enough, researchers found a common pattern of late entry by incumbents (Henderson and Clark 1990; Henderson 1993; Christensen 1993), indicating that incumbents suffer from incumbent inertia as they are hampered by their existing capabilities and unable to adapt. Mitchell (1989) found that firms with industry specialised resources, such as distribution networks are more likely to enter earlier into a new market. He also found that Industry incumbents were more likely to enter early if their core products were threatened but their experience base retained its value in the new market.

Mitchell's (1991) proposed a dual clock approach to capture the different order entry incentives by distinguishing between those firms that possess specialized complementary assets from those that do not; i.e., one clock to capture the entry time of all entrants, and the other to capture the entry time of those entrants that possess specialised complementary assets. Mitchell (1991) discovered that the effects of entry timing on market share and survival differ substantially between industry incumbents and de novo entrants suggesting the role resources play in determining performance. In other words, the findings indicate that entry timing is influenced by firms' quality of resources and capabilities, its ability to transform existing capabilities and developing a new resource base and the degree of radicalness of the new product generation.

Naramsihan and Zhang (2000) show that pioneers that rush their entry into a market solely to avoid late movers' disadvantages despite their lack of ability to establish, exploit, and maintain pioneering advantages can become what they referred to as the 'disadvantaged pioneers'. Their finding also sheds some light on the reasons incumbent firms are slow to enter a new market. While a new entrant may have a small chance to survive as a late entrant, it is optimal for an incumbent firm that is better equipped to overcome the late-mover disadvantages to wait and let a new entrant test the market. This finding also indicate that firms' investments in areas such as distribution channels, customer and brand equity, production and marketing capabilities, process innovations and patents reduce late mover disadvantages (Naramsihan and Zhang 2000).

3.5.1.5. Contingency Perspective

The endogeneity of market entry decision also gave rise to the contingency perspective of the FMA effect. A number of studies have examined various factors and strategies that may increase late entrants' chances in penetrating the market (Cho et al., 1998; Shankar et al., 1998; Tellis and Golder 1996; Zhang and Markman, 1998). In addition, scholars also investigated the relationship between market opportunity that still exists at time of entry and later entrants' performance (Green et al., 1995; Kerin et al., 1992; Szymanski et al., 1995).

Other studies examined the conditional effect of order of entry and performance. For example, Freshtman and colleagues' (1990) finding based on a differential game model revealed that order of entry has no direct effect on market share in the long run. Its indirect effect on market share however, is observed through quality, distribution and breadth of product line. Bowman and Gatignon (1996) found that the main effects of order of entry on market share are marginal. Their finding provides support for FMA by demonstrating that order of entry is negatively related to the effectiveness of marketing mix variables. The study shows that later entry decreases customers' response to quality and promotion and reduces a competitor's price sensitivity. This suggests that in order to increase its market share, a later entrant needs to offer bigger product quality enhancement, invest more on promotion and avoid engaging in price war with earlier entrants.

More recently, Bayus and Agarwal (2007) examined the conditioning effects of prior experience and entry timing on the relationship between product strategies and survival. Adding to the contingency literature stream, Kerin and colleagues (1992) provide a conceptual framework proposing a contingency perspective of first-mover advantage. The framework suggests that the order of entry-competitive advantage relationship is moderated by other factors such as the fit consideration between environmental opportunity and organisational skills and resources.

Szymanski and colleagues' (1995) meta-analysis on the empirical studies revealed that although pioneering has a direct effect, which is significant and positive on market share, the magnitude of pioneering advantage is moderated by a number of factors. The extent of the advantage depends whether: (1) product line breadth and marketing expenditures are integrated in the model; (2) unit of analysis is SBUs or brands; and (3) order of entry is captured as actual order rather than operationalised as pioneer or non-pioneer.

The meta-analysis also supports the contingency perspective of FMA by showing that the relationship between order of entry and market share is best captured as an interaction effect rather than a direct effect. The findings show that the effect of FMA is enhanced when the pioneers also offer high quality services, adopt vertical integration and sharing of facilities, customers and marketing programmes. The meta-analysis also indicates that first mover advantage is produced through the interaction between order of entry and market growth rate. Therefore, firms considering pioneering as a strategy should also consider other appropriate market strategies (e.g. high quality service strategies, shared marketing programs, etc.) and the appropriate marketplace conditions (e.g. market growth, customer purchase frequency, technological change, etc.)

In short, the contingency perspective of FMA highlights different factors that interact with order of entry resulting in superior performance and dominance over the market.

3.5.1.6. The Role of the Environment in FMA

A number of studies have focused on the impact of the environment on FMA. For example, Porter (1985) argues that the advantages derived from entry timing are conditional on industry characteristics such as technological changes in products and processes. Likewise, Suarez and Lanzolla (2007) proposed that first mover advantages and disadvantages are subject to the pace of technological evolution and the pace of market evolution.

Giarratana and Fosfuri's (2007) research examining turbulent industry reported no evidence of first-mover advantages. Furthermore, Wang and Xie (2013) found pioneers in a low-tech industry (newspaper) to have survival advantages in both the monopoly and competitive periods, whereas the pioneer in several high-tech industries has no significant survival advantage in the monopoly period and a survival disadvantage in the competitive period.

The industrial organisation literature also posits that first mover advantages are influenced by the environmental variables such as the degree of competition (Gal-or 1985; Jensen 1982; Reinganum 1981; Farrell and Saloner 1985), market structure (Katz and Shapiro 1986; 1992), appropriability regime (Teece 1986) and network effects (Farrell and Klemperer 2007).

3.5.1.7. Criticism of FMA

3.5.1.7.1. Use of Market Share as Performance Measure

Scholars have also raised their concerns on the tendency of FMA researchers to use market share to demonstrate first-mover advantages. Lieberman and Montgomery (1988) particularly question the value and usefulness of using market-share as a measure of performance due to its ambiguous correlation with profits. Echoing Lieberman and Montgomery's (1988) concern, Kerin and colleagues (1992) argue that market share fluctuates over time and therefore, measuring first-mover advantage using market share can be misleading as the number varies depending on the point in time the number is observed.

The criticism on the use of market share is not unfounded as Vanderwerf and Mahon's (1997) meta-analysis shows that studies employing market share as a performance measure were more likely to find FMA effects than those using profitability or survival. Lieberman and Montgomery (1998) argue that they see little value from more studies demonstrating first-mover advantages based on market share. Consequently, the number of studies testing the effect of FMA using other measures of performance such as survival (e.g. Robinson and Min 2002; Min et al. 2006; Wang et al. 2010) and shareholder wealth gains and losses increased (Lee et al. 2000).

3.5.1.7.2. Sample Selection Bias, Broad definition of First-mover and Generalisability

The FMA literature has also been criticised for sample selection bias, ambiguous definition of first mover (Lieberman and Montgomery 1988, 1998; Kerin et al. 1992) and the generalisability of its findings (Kerin et al. 1992).

Most early first-mover studies have relied upon retrospective assessments of entry order (Lieberman and Montgomery 1998) as well as drawing samples from entries that are still operating in the market (Vanderwerf and Mahon 1997). These sampling methods resulted in omission of non-survivors, raising a potential methodological problem called survivor bias, which in essence augments the FMA effect (Golder and Tellis 1992; Lambkin and Day 1989; Mitchell 1991; Robinson and Fornell 1985; Urban et al. 1986). Interestingly, Vanderwerf and Mahon (1997) in their meta-analysis, found little evidence that survivor bias affects test findings.

FMA empirical studies also suffered from ambiguous and subjective elements of first mover definition (Lieberman and Montgomery 1988; 2013). In the case of the PIMS data, first mover is defined very loosely (Kerin et al. 1992). Order of entry in PIMS data is operationalised based upon self-reports which may cause a large fraction of entrants to be classified as pioneers (Lieberman and Montgomery 1988). As an alternative, researchers started employing historical analysis method using historical information in books and periodicals (e.g., Golder and Tellis 1993; Robinson and Min 2002; Min et al. 2006). Although historical analysis eliminates survivor bias (Golder and Tellis 1993), there is still a question of how broad new product categories are defined in a study (Lieberman and Montgomery 1998). Furthermore, there is still a question on how the entrants are classified; that is, whether they are categorised as pioneers, first movers, late entrants or whether they are classified by their numerical order in the sequence of entry (Lieberman and Montgomery 1988; 2013).

Kerin and colleagues (1992) also point out that the definition of business units by PIMS member companies in the database varies. In turn, this might have led to a considerable variance in the level of aggregation at which they provide information on industry structure, business strategy, and performance variables. Schoenecker and Cooper (1998) found entry timing effects differ across the two industries in their study: minicomputer and personal computer industry. This suggests that scholars should be cautious about generalising the relationship between entry timing and performance across industries. Furthermore, Vanderwerf and Mahon's (1997) meta-analysis shows that studies using samples from individually selected industries were likely to show significant FMA finding, which implies that FMA is highly likely to be industry specific. Kerin and colleagues (1992) also argue that the relationship of order of entry and market share is tempered by each study's idiosyncratic industry samples and therefore, the effect of FMA is not easily generalisable across industries. Similarly, the generalisability of findings from studies using PIMS database is also questionable. PIMS database is drawn from a heterogeneous sample covering different industries with different levels of concentration, entry and exit barriers, and other structural characteristics, which may challenge the generalisability of market share disparities observed between pioneers and late movers (Kerin et al 1992).

3.5.2. Research Gap

The critical review of the literature suggests that further empirical study is required to reconcile the conflicting evidence regarding the existence of FMA advantages. As such there is an opportunity for the present research to examine the theory of first mover advantage in a high technology market marked by uncertainty and continuous innovation.

Furthermore, by linking the RBV perspective with FMA theory, further investigation can be performed to identify which capabilities and their integration promote earlier entry and how they in turn influence performance. As late entry indicates a sign of inertia and competency trap and scholars have identified them as the downside of capabilities, imitative market entry provides an avenue for further study in this research stream of capability.

With regard to methodology, FMA literature has been criticised for sample selection bias, ambiguous definition of first mover (Lieberman and Montgomery 1988, 1998; Kerin et al. 1992) and the tendency to find evidence of FMA when performance is operationalised as market share. Hence, the present research can fill the gap left by the extant empirical study by (1) using a historical analysis from secondary data to avoid selection bias; (2) using survival as performance measure and; (3) resolving the ambiguous definition issue caused by categorical approaches by operationalising entry timing as order of entry and by measuring entry timing as the time elapsed from the first entry.

3.6. Summary

This chapter provides a critical review of research fields that are central in the study of imitative entry and performance. They have been highlighted as strategic orientation, capabilities, absorptive capacity and entry timing (first mover advantage). The chapter also highlights the unresolved issues in the literature and identifies potential research opportunities for the present study. The following chapter presents the conceptual model and research hypotheses derived from the critical review of the relevant literature discussed in the current chapter.

CHAPTER 4: CONCEPTUAL MODEL AND HYPOTHESES DEVELOPMENT

4.1. Introduction

This chapter serves to give a detailed report on the development of a conceptual model relating to antecedents of imitative market entry which include firms' strategic orientation, firm level resources and capabilities and the relationship between entry timing and product market strategy consisting of relative product advantage and relative price with product performance. The aim of chapter 4 is to synthesise extant literature on various domains forming the backbone of the conceptual model and hypotheses presented in this chapter. Chapter 4 is structured in the following way: firstly, the theoretical and empirical framework of the study is described; secondly, the conceptual model and the underlying theoretical constructs are introduced and the formal hypotheses will be presented.

4.2. Theoretical Framework

The current research on imitative market entry focuses on a few related areas: strategic orientation, resources and capabilities, entry timing, product market strategy (relative product advantage and relative price) and product performance. The contention of this research is a firm's strategic type influences its resources and capabilities development. Firms' capabilities subsequently affect its entry timing decision and product market strategy, which in turn determine product performance in the marketplace. In the following sections, these theoretical domains and their relevance to the current study are discussed.

4.2.1. Strategic Orientation

The Resource-Based View (RBV) theorises that firm performance can be explained by the manner that firms allocate and exploit their scarce resources to achieve competitive advantages (Barney and Zajac 1994; Barney 1986). A firm that possess unique resources and is able to use its capabilities to best exploit the resources will achieve a sustainable competitive advantage and improve long-term performance (Song et al. 2007). Therefore, according to the RBV, firms should allocate their scarce resources to develop capabilities that are consistent with their strategic types (Miles and Snow 1978).

Because firms’ resources, capabilities and strategic types need to be aligned, the present research argues that a firm’s strategic orientation as proposed by Miles and Snow’ typology determines its distinctive resources. The specific type and levels of resources in turn influence the levels and the areas of capabilities that the firm develop. This is because a firm tends to develop specific resources and capabilities that help implement its strategy, which suggests that the firm will continue to use the same strategy when responding to future shifts in the environment. Hambrick (1983, p. 7) highlights “…prospectors tend to want to continue prospecting; defenders tend to want to continue defending.” Strategic orientation is described by scholars as a firm’s approach towards innovation (Song et al. 2007). As such, the context of imitative entry presents an opportunity to examine the role strategic orientation plays in enabling firms to execute this strategy through its influence in shaping firms’ resources and capabilities.

4.2.2. The Value and Relevance of the Specific Characteristics of the Strategic Types and Their Persistence throughout the Period of the Study

The review of scholarly work on imitation revealed that little is known about the types, attributes or organisational configurations of companies that tend to imitate and do so successfully. In addition, empirical work on the resources and capabilities necessary for firms executing an imitative entry strategy is also scarce. Lastly, what embody effective imitative entry strategies have not been explored. Having identified the gap in the literature, the Miles and Snow’s (1978) typology is considered valuable for the present study as it helps to address the research questions and to narrow the gap currently exists in the discussion of imitation.

Strategic types are relevant in the present study for a number of reasons. First, it helps to answer the first research question regarding the characteristics of firms and their imitative entry actions. As Miles and Snow’s (1978) typology represents the rate of change firms make to their products or markets in response to the environment (Walker et al. 2003), the typology fits the goal of the present research.

According to Miles and Snow (1978), prospectors continuously try to identify and exploit new product and market opportunities and create change. Defenders seek to create a stable set of products and customers by securing a portion of the total market. Analysers, occupying an intermediate position between the two strategies, cautiously follow prospectors into a proven profitable new product-market domain while protecting its existing market. In this study, the change in the environment is represented by an introduction of a new and innovative product by a competitor in the market. As such, the speed of imitative market entry corresponds to how each strategy type responds to the change created by the new product introduction. Therefore, one can expect that strategic types shape firms' entry timing. That is, prospectors tend to be early entrants, analysers are likely to be fast followers and defenders are expected to be late entrants. Furthermore, the level of relative product advantage and relative price correspond to the product market strategy of each strategy type (see Table 4.1). Prospectors are expected to have the highest relative product advantage and price because they tend to differentiate through product innovation and being early in the market. In contrast, defenders are expected to have the lowest relative product advantage and the lowest price since they tend to compete on efficiency. Finally, analysers' product advantage and price are expected to be somewhere in between prospectors and defenders.

Second, Miles and Snow typology is also relevant in exploring the resources and capabilities necessary for firms executing an imitative entry strategy. Strategic types essentially determine how firms leverage and utilise their resources and capabilities in creating and pursuing new product markets and in exploiting existing product market domains. Incorporating Miles and Snow's typology in the present study provides an opportunity to examine prior scholars' prediction that effective relationship between strategic types and performance can only be achieved if firms possess the necessary resources and capabilities (Song et al. 2007).

Table 4.1 summarises the specific characteristics relevant to the present study according to each of the strategy types. The differences between the strategic types in terms of rate of change, resources, capabilities, product market strategy and performance are highlighted.

Table 4.1: Strategic Types and Their Specific Characteristics

Specific Characteristics	Prospector	Analyser	Defender
Rate of change	• Value being first (Miles and Snow 1978) • Value innovation (Walker et al. 2003) • Create/ lead changes (Conant et al.1990) • New product development is perceived as very important (McDaniel and Kolari 1987)	• Second-but-better strategy (Walker et al. 2003) • Calculated followers (Conant et al. 1990) • Quickly enters a proven profitable new product-market domain (Conant et al. 1990) • New product development is perceived as very important (McDaniel and Kolari 1987)	• Maintain a secure niche in a stable product market (Walker et al. 2003) • New product development is not perceived as important (McDaniel and Kolari 1987)
Resources	• Devote significant resources to product R&D, market research and marketing related activities (Hambrick, 1983; Shortell and Zajac 1990; Walker et al. 2003).	• Devote significant resources in monitoring competitors' actions (Conant et al. 1990; Dyer and Song 1997).	• Devote significant resources on efficiency, cost-cutting and product quality improvements (Hambrick 1983; Shankar 1999).
Capabilities	• Strength in technological capability, product R&D, product engineering (Walker et al. 2003) in order to create product	• View marketing capabilities (McDaniel and Kolari 1987) as more important than defenders do.	• Less dependent on product technological capability (Song et al. 2007) but rely more on efficiency such

	innovation and new market. • Strength in marketing capability through market research and market scanning (Slater et al. 2006; Conant et al. 1990; McKee et al. 1989) to identify new opportunities and customer latent needs.	• Emphasise production and technological synergies and leverage on interconnected technologies to execute fast second strategy (Langerak et al. 1999).	as process innovation
Product market strategy	• Differentiation through fast introduction of highly innovative product (Miles and Snow 1978)	• Being fast second with more cost-effective or value-oriented product or service offerings (Miles and Snow 1978)	• Price reduction or competitive differentiation (Walker et al. 2003)
Performance	• The three strategy types have equal effectiveness with respect to performance (Miles and Snow 1978)	• The three strategy types have equal effectiveness with respect to performance (Miles and Snow 1978)	• The three strategy types have equal effectiveness with respect to performance (Miles and Snow 1978)

In addition to the above discussion, a preliminary analysis was performed to examine the consistency of strategic types with the specific characteristics highlighted in Table 4.1 and to validate their relevance to the present study. Regarding the speed of entry, the patterns found are not consistent with Miles and Snow's (1978) prediction that prospectors enter the earliest, followed by analysers and defenders. This prediction was not observed in any of the product category except for in portable computers. Similarly, inconsistencies were found with respect to strategic types and their corresponding level of relative product advantage and relative price. Prospectors were expected to have the highest relative product advantage and price while defenders the lowest. Again, this pattern was not observed among firms in the sample. However, strategic types were found to be the most consistent in terms of resources and capabilities dimensions. Along the prospector-analyser-defender continuum, prospectors have the highest marketing resources, RND resources, marketing capability, technological capability, and potential absorptive capacity while defenders the lowest. It was only in realised absorptive capacity that defenders were observed to have the highest capability and prospectors the lowest. Table 4.2 highlights these patterns.

The inconsistencies of strategic types with imitative market entry strategies tested in the study (entry timing, relative product advantage and relative price) raised a question about the relationship between strategic types and firm-level performance. Miles and Snow's (1978) indeed argue that each strategy type has equal chance of performing only if they are adapted consistently. The present study seeks to examine the indirect relationship between strategic types and performance through their role in shaping resources, which in turn affects capabilities and subsequently, imitative entry strategies.

The above discussion on how strategic types shape firm's resources and capabilities in creating and pursuing new product markets and the consistency of resources and capabilities observed among firms in the sample with strategic types provide support to their value and relevance in the present study. The argument for the relationship between strategic types and resources will be further developed in Subsection 4.3.1 in this chapter.

Table 4.2: Resources and Capabilities by Strategic Type

	Resources and Capabilities by Strategic Type (Highest to lowest)		
SGA	Prospector	Analyser	Defender
RND	Prospector	Analyser	Defender
Marketing Capability	Prospector	Analyser	Defender
Technological	Prospector	Analyser	Defender

Capability			
Potential Absorptive Capacity	Prospector	Analyser	Defender
Realised Absorptive Capacity	Defender	Analyser	Prospector

4.2.3. Integration of the Competitive Dynamics and RBV Perspective

The current study seeks to explain the heterogeneity of firms' performance adopting imitative market entry by merging the RBV with the Competitive Dynamics perspective. From the Competitive Dynamics standpoint, an imitative market entry is a form of competitive reaction to a rival's move such as a new product introduction in a new product category or product improvements in an existing product category. Imitative market entry is an important consideration because advantages of being innovators or first movers are increasingly short-lived as a result of competition (D'Aveni 1994; Schumpeter 1950).

The AMC framework of Competitive Dynamics indicates that the likelihood of a firm engaging in a competitive behaviour depends on three factors (awareness, motivation and capability). The current research conjectures that a firm's ability to carry out an imitative market entry as a form of competitive reaction depends on the resources and capabilities controlled by the firm. Furthermore, a firm's resources and capabilities influence its ability to create value for customers and for itself. Hence, firms' efficiency and effectiveness in transforming resources into valuable outcomes determine its market entry strategy at the product level. As such, the present research aims to address one of the major criticisms of the RBV for not giving sufficient attention to the process of transforming valuable, rare, inimitable and non-substitutable resources into valuable outputs critical to achieving a competitive advantage (Newbert 2007; DeSarbo et al. 2006; Priem and Butler 2001).

Merging the two perspectives provides a more complete explanation to the variance among firms' performance. On the one hand, the RBV theory argues that the heterogeneity among firms can be explained by their resources and capabilities endowment. On the other hand, the Competitive Dynamics standpoint brings in competition into the backdrop of the RBV perspective. Linking the two views helps to shed some light on how heterogeneity among firms' resources and capabilities leads to a competitive advantage in an inter-firm rivalry situation.

The focus on imitative market entry provides an opportunity to integrate the role of competition and rivalry in a firm's strategy formation pertaining to entry timing, relative product advantage and relative price. Imitative market entry can be accompanied by a number of competitive responses spanning a number of dimensions such as the speed of response or the marketing mix instruments (Gatignon et al. 1997). At product level, capabilities play a major role in shaping an imitating firm's relative product advantage, its pricing strategy and its entry timing. The performance of a product relative to its competitors will depend upon a firm's capabilities (Teece et al. 1997). Prior research in the FMA literature suggests that the entry-timing decision is endogeneous to the firm (e.g. Lieberman and Montgomery 1998). The endogeneous nature of entry timing indicates that rather than simply choosing to pioneer or to be fast second, a firm gains an opportunity to enter early through its possession of certain proficiencies (Lieberman and Montgomery 1988). It is therefore conjectured that a firm's capabilities will influence its entry timing. In the same vein, a firm's capabilities also influence its product market strategy such as its relative product advantage and relative price. This is based on the rationale that firms' capabilities influence their ability to speed up their imitative market entries, offer products that are superior in terms of their uniqueness, features, functions, benefits and designs or offer products at a lower cost compared to competitors. As such, this research argues that the consequence of heterogeneity of resources and capabilities is that imitating firms vary in their ability to create value using the specific resources that they possess (Lippman and Rumelt 2003; Peteraf 1993; Conner 1991; Dierickx and Cool 1989), which explains the product performance outcome.

4.2.4. Dynamic Capability

The present research also adopts the dynamic capability perspective rather than treating resources and capabilities as 'static'. In an increasingly hypercompetitive environment, firms constantly face shifts in the environment. For example, a leader in a product category may find its product threatened by an introduction of an innovative product in a different product category. Recent examples include the worldwide drop in the sales of personal computer (PC) in 2012 as customers find convenient and cheaper ways to connect to the Internet through smartphones and tablets (Arthur 2013).

Established capabilities, complementary assets, processes and routines are path dependent. Scholars have argued that path dependency both enables and constrains firms' knowledge and capabilities (Helfat 1994; Leonard-Barton 1992; Cohen and Levinthal 1990). Other RBV scholars described firms' resource endowments as sticky for a number of reasons. First, business involves very complex processes; second, firms lack the ability to develop competences quickly because some assets are not readily tradeable; finally, even if an asset can be bought firms may achieve little from doing so (Teece et al. 1997). In sum, the trajectory or path that a firm followed in the past defines and restricts the choices of the firm's future competence development (Teece et al. 1997). Hence, scholars note that in the absence of dynamic capabilities, firms may fall into a 'trap' laid by their current competences (March 1991; Levitt and March 1988) as illustrated by the recent loss of market share by PC manufacturers to smartphones and tablets makers (IDC 2013).

Prior work on dynamic capabilities highlights the role of capabilities in enabling firms to respond to environmental changes. Dynamic capabilities have been described as "the capacity to renew competences so as to achieve congruence with the changing business environment" (Teece et. al. 1997, p.515); "the processes to integrate, reconfigure, gain and release resources—to match and even create market change" (Eisenhardt and Martin 2000 p. 1107); practices and routines allowing firms to "change the product, the production process, the scale, or the customers (markets) served" (Winter 2003 p. 992); the capacity of an organisation to purposefully reconfigure its resource base (Helfat et al. 2007); or the ability to create and capture value through sensing, seizing and transformative skills (Teece 2007). In sum, dynamic capability concerns a firm's ability to build, integrate, reconfigure and thus renew its resources and processes of transformation in order to adapt and respond to the shifts in dynamic environments.

Consistent with the dynamic perspective, the present research interprets and treats absorptive capacity in the conceptual model as a dynamic capability (Zahra and George 2002). This dynamic capability plays a vital role for the creation and utilisation of knowledge that provides the basis for imitating firms to gain competitive advantage through superior value creation for customers and speedy market entry.

Absorptive capacity is an important consideration in the context of imitative market entry for a number of reasons. Absorptive capacity refers to a firm's ability to identify and recognise the value of new knowledge from the environment, and then assimilate and exploit it for commercial end (Cohen and Levinthal 1994; 1990; 1989). The product categories chosen in the present research consist of products that survive the introductory period and remain in the market for at least ten years, which marks the point where the data collection of market entries stopped. As such, firms with high absorptive capacity would have been able to recognise the value of the new products quickly after pioneers first introduced them.

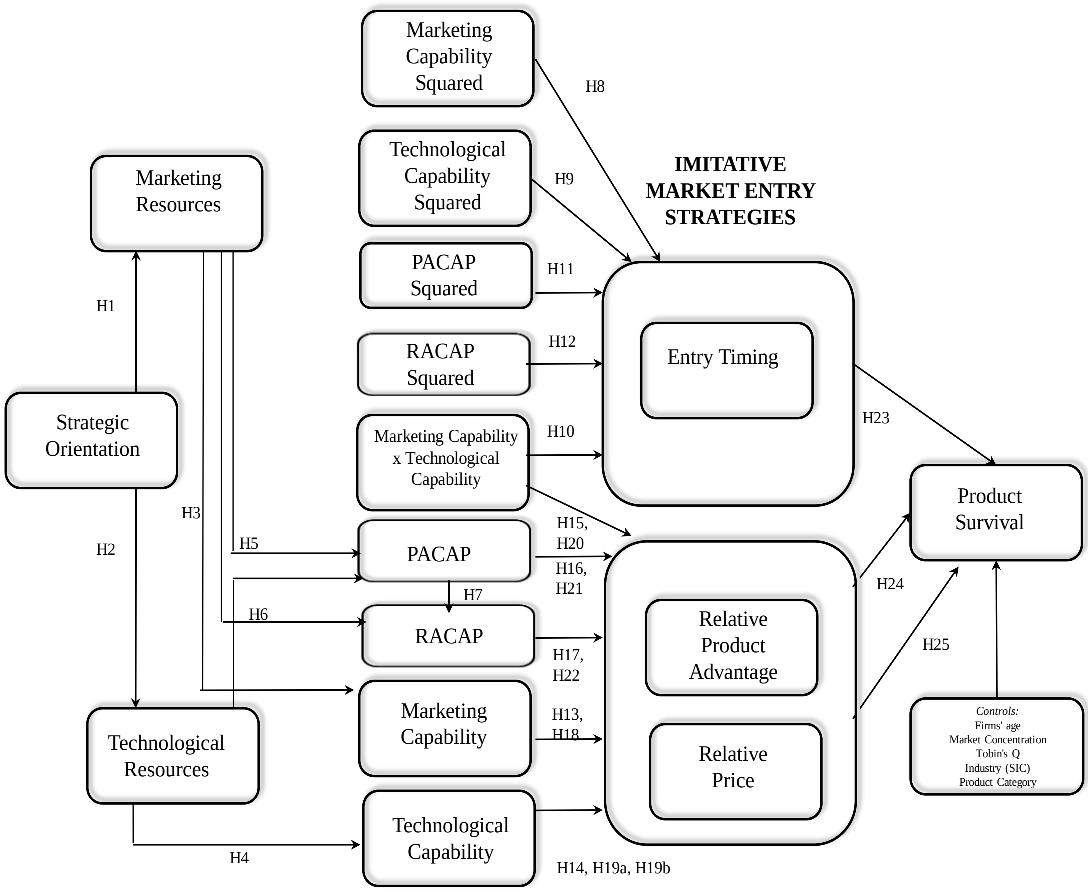
Furthermore, scholars have pointed out that a high degree of absorptive capacity not only enable firms to imitate other firms' products or processes (Lane et al. 2006) but also make firms more willing to absorb and exploit external know-how, overcoming the 'not invented here' syndrome (Cassiman and Veuglers 2006). As absorptive capacity also enhances the speed, frequency and the scale of a firm's innovation (Lewin et al. 2011; Cohen and Levinthal 1990), high absorptive capacity firms that decide to enter a new market will do so relatively quickly and will be able to provide either a superior product relative to the pioneering product or to reduce the cost of the product, hence providing better value to customers.

In sum, the present research attempts to address: (1) the role of strategic orientation in shaping resources and capabilities; (2) the usefulness of the RBV theory in enabling actions (actions being the main focus of the competitive dynamics theory) and; (3) the role of absorptive capacity as a dynamic capability in facilitating imitative market entry.

4.3. Conceptual Model and Hypotheses Development

The current section describes the development of a conceptual model that relates to firms' strategic orientation as determinants of firm level resources, which in turn shape firm level capabilities. Specific firm level capabilities then determine entry timing and product market strategy such as relative product advantage and relative pricing which subsequently influence product performance. Figure 4.1 is a graphical representation of the conceptual model introduced in the present chapter.

Figure 4.1: Conceptual Model



4.3.1. Strategic Orientation as Determinants of Resources

The RBV theory views a firm as a unique bundle of resources and firm competitive advantage is rooted in resources that are valuable an inimitable (Barney 1991; Day and Wensley 1988; Prahalad and Hamel 1990; Wernerfelt 1984; Penrose 1959). Resources include all assets, capabilities, organisational processes, firm attributes, information and so forth owned by a firm that enable them to create and execute strategies that improve their efficiency and effectiveness (Barney 1991). Miles and Snow (1978) typology describes how each type of organisation differs in its choice of product and/ or market strategy. Miles and Snow (1978) also predict that with the exception of reactor, each type of strategy should enable firms to perform well provided that they implement the strategies in a consistent manner. Since each strategic type approach its product-market domain differently, it is reasonable to assume that firms acquire and deploy different set of resources to implement their strategies effectively and efficiently. For example, Conant (1990) and Woodside et al. (1999) found that marketing competencies of prospector organisations are superior to those of analyser, defender and reactor organisations. Subsequently Song et al. (2007) hypothesised and found evidence that each of Miles and Snow strategic type's strength in four firm capabilities (technology, information technology, market-linking, and marketing capabilities) varies. DeSarbo et al. (2005) found that different groups in their study akin to the classic Miles and Snow typology perform better when they exhibit specific capabilities required by each type to execute their strategies effectively.

4.3.1.1. Strategic Orientation and Marketing Resources

Prospector's strategy is to initiate change in the market (Miles and Snow 1978). To this end they continuously look for new product and market opportunities.

Prospectors compete mainly by identifying latent customer needs, responding quickly to environmental changes and new opportunities and by introducing new products that meet those needs (Song et al. 2007). In order to identify and exploit new product and market opportunities prospectors must continually scan their external environment (Walker and Ruekert 1987; Miles and Snow 1978). Hence, prospectors have been found to devote significant resources to market research which enable them to monitor a wide range or market conditions than other strategic types (Walker et al. 2003; Shortell and Zajac 1990; Hambrick 1983). For example, Snow and Hrebiniak (1980) found that prospectors invest significantly on activities relating to monitoring changes in the market and technological trends in the environment. Similarly, McDaniel and Kolari's (1987) study of the banking industry show that prospectors and analysers perceived market research to be a more important component of their strategy than did defenders. Other research findings show that market research and market scanning are the strengths of prospector firms (Slater et al. 2006; Conant et al. 1990; McKee et al. 1989).

Prospectors have also been characterised as being market oriented (Walker et al. 2003; Maltz and Kohli 1996; Conant et al. 1990; Narver and Slater 1990) as they often engage in customer and competitor analysis (Slater and Narver 1993). Snow and Hrebiniak (1980) found that managers in prospector organisations perceived marketing and marketing-related competencies to be among their four highest-rated strengths compared to other strategy types. Woodside et al. (1999) using a multi-industry convenience sample of Finnish organisations found that prospectors have the highest marketing competencies among the four strategic types followed by analysers, defenders and reactors.

Prospectors also compete by targeting early adopters who are most likely to appreciate their innovative products, stimulating demand through advertising and providing high levels of before and after sale service to educate customers about their products (Conant et al. 1990; Miles and Snow 1978; Walker and Ruekert 1987; Hambrick 1983; Von Hippel 1986). In addition to devoting their efforts to customers, prospectors also build close network with distribution channels to execute their strategies (Song et al. 2007). Furthermore, Slater and Olson (2001) found strong support for their proposition that prospectors will achieve superior performance when they utilise an aggressive marketing strategy.

In contrast to prospector strategy, defenders' primary strategy is to create a stable set of products and customers by securing a niche or a portion of the total market

(Slater and Mohr 2006). As such, they do not typically explore outside their well-defined product-market domains for new opportunities (Shortell and Zajac 1990). As compared to prospectors' proactive market orientation, defenders display a more reactive tendency (Narver and Slater 1990) and compete primarily by continuously satisfying customers' manifest or expressed needs (Narver et al. 2004; Slater and Narver 1995). Offering a more limited range of products or services than competitors, defenders compete by focusing on resource efficiency and cost-cutting process improvements and by offering high quality, superior service, and lower prices products and services (Hambrick 1983; Shankar 1999). Walker et al. (2003) differentiate two strategies often adopted by defenders: price reduction and competitive differentiation. In terms of marketing, Miles and Snow (1978) contend that defender firms tend to ignore developments outside of its product-market domain (p.37) and therefore argue that defenders do not view marketing activities such market research and promotion as crucial to their strategy.

Occupying a middle position between the two strategies, analysers follow prospectors into a proven new product-market domain while maintaining a stable set of products and customers (Slater and Mohr 2006). Hence, they carefully monitor the actions of major competitors in areas compatible with their stable product-market base, and they frequently enter as fast second with a more cost-efficient product or service (Dyer and Song 1997; Conant et al. 1990). Although not as strongly as prospectors, previous research found that analysers view market research and promotional activities as being more important than do defenders (McDaniel and Kolari 1987). Empirical evidence also suggests that they possess greater distinctive marketing competencies than defenders but lower than prospectors (Woodside et al. 1999).

Using the rationale of the range of importance of marketing activities placed by three strategic types on their organisational strategies, the present research suggests the following hypothesis:

H1: Along the prospectors-analyser-defender continuum, prospectors devote the greatest resources to marketing and defenders the lowest.

4.3.1.2 Strategic Orientation and Technological Resources

Technological resources are especially vital for prospectors who primarily compete by identifying new product or marketplace opportunities through strengths in R&D (DeSarbo et al. 2005). Prospectors use a first-to-market strategy and typically function within a broad product-market domain that goes through periodic redefinition (Robinson et al. 1992). Prospectors also typically succeed by addressing latent customer needs through rapid development of new technologies and products (Conant et al. 1990; McDaniel an Kolari 1987). To succeed prospectors require a high level of competence in product research and development and engineering and they perform well when their expenditure on product research and development is high (Walker et al. 2003). In addition, McDaniel and Kolari (1987) observed that prospectors and analysers perceive new product development to be a more important part of their strategy than do defenders.

Unlike prospectors, analysers are rarely first to enter the market with new products (Griffin and Page 1996). However, they tend to be fast followers by quickly introducing a more cost efficient or innovative product into the market (Langerak et al. 1999). They do so by emphasising production and technological synergies by using interrelated technologies to develop new products (Langerak et al. 1999). Therefore, analysers require capabilities in accelerating new product development and technology commercialisation.

Relative to prospectors and analysers, defenders are less reliant on technological capabilities because they compete mainly by locating and maintain a secure position in a relatively stable product-market domain (McDaniel and Kolari 1987). They secure their market positions by offering high quality products or services or by offering products at lower prices (Langerak et al. 1999). They achieve this end by focusing on process efficiency and product standardisation (Langerak et al 1999). For this reason, they tend to be less inclined in developing new products and technologies.

Using this reasoning, the present research formally hypothesises:

H2: Along the prospector–analyser–defender continuum, prospectors invest the greatest in technological resources and defenders the least.

4.3.3 Resources as Determinants of Capabilities

4.3.3.1 Resources and Capabilities

Amit and Schoemaker (1993) referred to resources as stocks owned by firms, which can be converted into final products or services. In the same article, they defined capabilities as "a firm's capacity to deploy resources through combination using organisational processes, to effect a desired end" (Amit and Schoemaker (1993 p.35). In line with Amit and Schoemaker's (1993) analogy of capabilities as 'intermediate goods', Makadok (2001) argue that the objective of possessing a capability is to enhance the productivity of the resources owned by the firm. Borrowing Makadok's (2001) rationale, a firm's capabilities can only exert its productivity enhancing influence to create profit after the necessary resources are acquired. Without the necessary resources, irrespective of its excellent capability, a firm is unable to generate economic value for the firm (Makadok 2001). Therefore, the value of a capability increases in relation to the level of firms' resources on which capability affects its productivity-enhancing influence (Makadok 2001).

In essence, although the ability to transform resources into valuable outputs is heterogeneous among firms and is indeed important, this ability is always restricted by the level of resources possessed by a firm. For example, a firm's capability to convert R&D expenditures into an innovative product depends on the level of resources invested by the firm. Firms that devote a high portion of their R&D budget on training and staff compensation tend to attract highly talented engineers and scientists. As such, they are more likely to have higher technological capability than their competitors. Similarly, a firm's marketing capability or the ability to convert marketing expenditure into valuable outputs such as strong brand equity is highly reliant on the level of marketing resources possessed by the firm (Naramsihan et al. 2006). Because companies differ in terms of their marketing resources (e.g., sales personnel) or technological resources (e.g., skills and number of scientists employed) the differences in these resources create differences among firms' capabilities (Makadok 2001).

As such, the following are hypothesised:

H3: The higher the marketing resources, the greater the marketing capability.

H4: The higher the technological resources, the greater the technological capability.

4.3.3.2 Resources and Absorptive Capacity

The ability to acquire knowledge from outside the firm is crucial for firms to renew its technological know-how. This ability, also known as absorptive capacity (Cohen and Levinthal 1990) is important for firm's competitiveness because it enables a firm to offer new products and technologies by applying external knowledge into its routines and processes.

Zahra and George (2002) divide absorptive capacity into two components: potential and realised. Potential absorptive capacity encompasses knowledge acquisition and assimilation capabilities, whilst realised absorptive capacity characterises knowledge transformation and exploitation competencies (Zahra and George 2002).

The input-output RBV framework indicates that firms use and combine a set of resources available to them such as R&D and marketing expenditures in order to absorb the maximum amount of knowledge from outside the firm (Dutta et al. 1999; Naramsihan et al. 2006). It is therefore assumed that firms that have more resources should be able to absorb and assimilate more market knowledge and knowledge spillover from rivals' new patents and products.

A firm's potential absorptive capacity depends on its existing knowledge stock. Prior related know-how provides a firm with the ability to recognise the value of new knowledge, assimilate and apply it to commercial ends (Cohen and Levinthal 1990). R&D is the most fundamental resource available for firms to create knowledge. Hence, firms that conduct R&D are better able to identify externally available information (Cohen and Levinthal 1990). Based on the logic of input-output RBV framework (Dutta et al. 1999), all else being equal, firms with higher R&D resources are likely to recognise, acquire and assimilate more external knowledge.

Equally, firms that invest a lot of resources on marketing activities such as market research, data gathering and continuous interaction with customers have better knowledge on issues customers face with existing products and technologies and significant moves made by competitors (Naramsihan et al. 2006). Market orientated firms often spend a lot of their resources on activities involving acquiring information about the buyers and competitors in the target market and disseminating it throughout the organisation through inter-functional coordination (Narver and Slater 1990). Marketing resources that enhance firms' market sensing abilities (Iansiti and West 1997) resulting from firms' customers and competitors' interactions allow firms to identify new technological emergence and draw from larger technological base (Naramsihan et al. 2006). In addition, firms that devote their resources in creating routines and processes such as inter-functional coordination are better able to assimilate market knowledge obtained from external sources. This will then lead to higher potential absorptive capacity within the firms.

Hence, the following are proposed:

H5: The higher the marketing resources, the greater the potential absorptive capacity.

H6: The higher the technological resources, the greater the potential absorptive capacity.

4.3.3.3. Potential and Realised Absorptive Capacity

The present research posits that potential absorptive capacity is the antecedent of realised absorptive capacity; hence, greater potential absorptive capacity leads to higher realised absorptive capacity.

Applying the process perspective, Lane and colleagues (2006) argue that absorptive capacity is a firm's ability to utilise externally held knowledge through sequential processes that begin with the identification of valuable external knowledge, followed by the assimilation of that knowledge, which in turn leads to its utilisation. This process view of absorptive capacity is consistent with Cohen and Levinthal's (1990) contention that firms' ability to exploit (realised absorptive capacity) competitors' knowledge spillover or knowledge originates from government and university labs is a function of its prior R&D expenditure (potential absorptive capacity).

As realised absorptive capacity reflects the firm's capacity to leverage the knowledge that has been absorbed (Zahra and George 2002), the level of realised absorptive capacity is therefore assumed to increase in relation to the level of firms' potential absorptive capacity. Hence, the following is proposed:

H7: The higher the potential absorptive capacity, the greater the realised absorptive capacity.

4.3.4. Capability and Absorptive Capacity as Determinants of Entry Timing

4.3.4.1. A Non-linear Relationship between Marketing Capability and Entry Timing

The present research predicts that the relationship between marketing capability and entry timing is curvilinear (U-shaped). Marketing capability plays a major role in facilitating market entry through effective executions of marketing functions such as product development and commercialisation. Hence, it is predicted that the deficiency in marketing capability is associated with later entry.

Marketing capability spans processes and organisational routines developed by firms to generate knowledge about customer needs, forecast future needs and respond to this information by effectively linking its offerings to customers (Day 1994). The customer knowledge aspect of marketing capability is developed over time through learning and experimentation, which implies that it is tacitly held and difficult for competitors to imitate (Krasnikov and Jayachandaran 2008). In addition, marketing capability also relates to marketing mix processes such as product development, pricing, marketing communications and channel management (Vorhies and Morgan 2005).

Firms with high levels of marketing capability are therefore, able to identify the market potential of new and innovative products earlier than their competitors do through superior market sensing and customer-linking capabilities (Day 1994). In addition, their marketing capability embedded in their product development, marketing communications and channel management processes enable them to speed up market entry and become early followers. In contrast, firms lacking marketing capability need to acquire such ability, which due to its tacitness will hinder early entry.

On the other hand, after a point, increases in marketing capability will be counterproductive to expedite entry. Beyond this optimum level, firms are expected to delay their entry rather than accelerate their imitative entry. Lieberman and Montgomery (1988) predict that firms with high levels of marketing capabilities tend enter at a later stage when the uncertainties diminish. Despite the ability to enter early, firms that are highly endowed with competences crucial in overcoming late-mover advantages through investments in distribution channels, customer and brand equity prefer to delay entrance (Naramsihan and Zhang 2000). This way, they let their rivals assume the risk of testing the market, enter when uncertainties are resolved and use its strong marketing capabilities to surpass pioneers and early followers.

A number of previous researches found support for the association between marketing capabilities and later entries. For example, Robinson and colleagues (1992) found that firms with strong marketing capabilities tend to be later entrants. Similarly, Lilien and Yoon (1990) report that firms that enter the market at maturity stage possess significantly greater marketing expertise and greater marketing efficiency compared to their competitors. Robinson and colleagues' (1992) finding is consistent with prior research suggesting strong marketing skills leads to later entry. In sum, because strong marketing capabilities can be leveraged to neutralise late mover advantage, firms with high marketing capability may encourage later entry.

Another rationale supporting the U-shaped relationship is the complementary asset characteristic of marketing capability. In other words, firms possessing high marketing capability can afford to wait because marketing capability is a complementary asset. While core resources refer to the primary technical skills that a firm requires to design and create a new product (Rothaermel 2001), complementary assets are the supporting skills and investments used to commercialise a new product (Teece 1986). Mitchell (1991) conceptualised different entry order incentives for those firms that possess specialised complementary assets from those that do not, and proposed the adoption of a dual clock concept. That is, one clock to capture the entry time of all entrants, and another to capture the entry time of entrants that are equipped with specialised complementary assets. In the same vein, Levesque (2013) proposes that followers with comparatively high complementary assets can afford to wait and delay entry compared to other entrants.

Although highly endowed firms may delay entry deliberately, some firms may delay entry as a result of rigidity. Strength in marketing capability, which serves as a source of competitive advantage can turn into core rigidities, which then results in a competency trap to firms (Leonard-Barton 1992). Prior experience puts constraints on firms' learning behaviour because learning tends to revolve around local processes of search (Levitt and March 1988; Teece 1988; March and Simon 1958).

Furthermore, Danneels (2004) suggests that market facing or customer competence developed through experience with existing products or technology in particular makes it difficult for firms to evaluate the potential of a new product introduced in the market. In their studies of disruptive innovations, Christensen and Bower (1996) point out that firms that are too focused on serving the needs of their current customers often lose their industry leadership positions when faced with certain types of technological change. By listening too closely to their current customers they become less receptive to new products and technologies introduced by industry newcomers serving emerging customer segments. As a consequence of a firm's high marketing capability, particularly its knowledge of customers, firms are more likely to develop new products targeted to existing customers as opposed to new customers (Christensen 1997).   The focus on current customers may result in firms' inability to identify the potential in a new product market, which results in later entry. As such, the following is hypothesised:

H8: There is a U-shaped relationship between marketing capability and entry timing.

4.3.4.2. A Non-linear Relationship between Technological Capability and Entry Timing

Previous empirical investigations have generally provided support for the notion that technical competencies are associated with earlier entry (Schoenecker and Cooper 1998; Song et al. 2007). From the RBV perspective, technological capability achieved through greater R&D investments expedites the speed of product development and market entry timing (Rabino and Moskowitz 1981). Higher investments in R&D lead to higher levels of technological capability and greater ability to create innovation and develop a new product, which reduce entry lag. Technology-related capabilities also enable firms to respond to rapid technological changes in the environment (Wind and Mahajan 1997). As such, firms with high technological capability are likely to be able to provide a swift reaction to a competitor's introduction of an innovative product.

Furthermore, companies that excel at R&D tend to value first-movership more (Lieberman and Montgomery 1988). Schoenecker and Cooper (1998) found empirical evidence that a higher level of investment in R&D is associated with earlier entry. In the field of strategic orientation, Song and colleagues (2007) found that prospectors have greater technology capabilities than defenders do. As prospectors value being the first in new products and market areas, this implies that strengths in technological capability help firms to expedite their market entry.

On the other hand, the organisational inertia theory suggests that the increase in technological capability may lead to delays in imitative market entries. Strong technological capabilities in a particular technology domain often cause firms to overlook new knowledge that is beyond their current technology trajectories (Cohen and Levinthal 1990) resulting in organisational inertia. This is because a firm's technological capability is developed over time, accumulated through past experience and therefore, is path dependent (Zhou and Wu 2010).

Scholars argue that a high level of technological expertise in a particular field encourages more local search or exploitation in that field to improve efficiency and generate reliable organisational outcomes (Lavie and Rosenkopf 2006; Levinthal and March 1993). The more experienced and efficient a firm becomes in employing their existing knowledge, the self-reinforcing nature of learning cause the firm to embark in more exploitive activities (Benner and Tushman 2003). Zhou and Wu (2010) found empirical evidence that technological capability is positively associated with exploitative innovation but has an inverted U-shaped relationship with explorative innovation. The exploitative search leads firms to focus on the current technological trajectory, which serves to create value for their current customers.

Furthermore, firms with high technological capability often establish organisational routines to maximise their operational efficiency and reliability. However, the organisational routines that create stability in products, processes and policies among these firms can also cause inadequate adaptation and resistance to environmental changes (Nelson and Winter 1982; Hannan and Freeman 1984). Gilbert (2005) suggests that resource allocation and embedded organisational routines are the two main causes of organisational inertia. Substantial investments in existing products and technologies and the high risk associated with the choice of entering a new product market (Zhou and Whu 2010) also leads to later entries by firms with higher technological capabilities.

Thus, the following is hypothesis is proposed:

H9: There is a U-shaped relationship between technological capability and entry timing.

4.3.4.3. Marketing and Technological Capability Interaction with Entry Timing

The interaction of two distinct but interrelated resources or capabilities creates complementarity and synergy within a firm (Stieglitz and Heine 2007). The present research predicts that the interaction between marketing capability and technological capability creates synergy that leads to early market entry.

Technological capability refers to a firm's ability to create and develop new products and related processes (Moorman and Slotegraaf 1999). A firm's technological orientation is described as "the use of sophisticated technologies in new product development, the rapidity of integration of new technologies, and a proactivity in developing new technologies and creating new product ideas" Gatignon and Xuereb (1997, p. 82), which implies that technological expertise accelerates new product introduction. Other scholars argue that technological capability plays an in important role in expediting new product development because greater R&D investments have been found to have a positive association with market entry timing (Rabino and Moskowitz 1981).

Marketing capability is described as a ‘firms’ ability to combine efficiently several marketing resources and attain marketing objectives’ (Bahadir et al. 2008). Marketing capability equipped firms with the ability to predict changes in customer preferences and provide a platform for sustainable relationships with customers and distribution channel partners (Day 1994; Moorman and Slotegraaf 1999). Therefore, a highly competent marketing department is able to sense the commercial value of a newly introduced product in the market and provide feedback to the R&D department to kick-start the generation of a similar, but superior product. As such, greater marketing capability expedites product development by providing accurate knowledge on existing and potential customers.

Furthermore, possession of marketing capability, which also plays the role of a complementary asset, facilitates commercialisation of an innovation or a newly developed product. Complementary assets are the supporting assets used to commercialise a particular product; e.g., a direct sales force (Helfat and Lieberman 2002; Schoenecker and Copper 1998), distribution channels and customer base. The development of complementary assets such as sustainable relationships with channel members and retailers require a longer time then a more focused product development. Teece (1986) argue that firms with ownership of complementary assets such as competencies in marketing are often well positioned to commercialise and benefit from a new innovation introduced in the market.

In summary, technological capability enables firms to expedite new product development while marketing capability enables rapid product commercialisation. Due to their complementary nature, the following is hypothesised:

H10: The greater the interaction of marketing and technological capability, the faster the market entry.

4.3.4.4. A Non-linear Relationship between Potential Absorptive Capacity and Entry Timing

Inter-firm knowledge spillovers resulting from new product introductions or innovations by competitors are beneficial to imitators and followers. However, despite technological knowledge spillovers being available publicly or the knowledge can be obtained through licensing or reverse engineering, without potential absorptive capacity, firms are unlikely to benefit from external knowledge. This is because without potential absorptive capacity, which provides the prior knowledge (a prerequisite to new knowledge absorption), firms are not able to evaluate the potential of new external knowledge, and thus, fail to absorb it (Todorova and Durisin 2007). Prior empirical studies provide evidence of the importance of accurately identifying the value of new external knowledge in determining firms' survival in dynamic environments (Iansiti and Clark 1994; Henderson and Clark 1990).

Potential absorptive capacity encompasses knowledge acquisition and assimilation dimensions of absorptive capacity. As such, it captures the activities dedicated by firms in identifying and acquiring new external knowledge and assimilating external knowledge into the organisations (Jansen et al. 2005). Therefore, the present research argues that a firm with a high level of potential absorptive capacity will be able to detect, predict the accurate value of a new product or technology introduced by their rivals and subsequently able to capitalise on the knowledge spillover. A high level of potential absorptive capacity also facilitates firms' processes to assimilate the new knowledge into their existing knowledge stock.

The assimilation dimension of absorptive capacity describes a firm's capacity to comprehend and subsequently internalise the knowledge brought from outside the organisation. This dimension involves the ability to analyse, classify, interpret (e.g., Szulanski 1996; Cohen and Levinthal 1990) and integrate such knowledge with its previously existing internal routines, processes and knowledge (Camisón and Forés 2010). Therefore, potential absorptive capacity ensures that external knowledge is assimilated before it can be transformed and exploited to create value for the firms such as through new product commercialisation (Zahra and George 2002).

Prior studies suggest that potential absorptive enhances the speed of strategic renewal and increases a firm's responsiveness to the environmental change (Ben-Menahem et al. 2013; Liao et al. 2003). Consistent with prior studies, the present research argues that as potential absorptive capacity increases, the speed of imitative market entry increases.

Despite the predicted positive effect, the present research also anticipates a diminishing positive consequence from the increase in potential absorptive capacity on entry timing beyond an optimum point. Firms endowed with high potential absorptive capacity through knowledge acquisition and assimilation will be able to renew their knowledge stock. However, despite bearing the costs of knowledge acquisition, firms that are highly focused on external knowledge acquisition and assimilation may not able to effectively exploit and gain benefits from such knowledge (Jansen et al. 2005). As such, the imbalance between the ability to acquire external knowledge and the competency to exploit external knowledge in creating value to customers will lead to a delay in imitative market entry by these firms. Based on this rationale, the following is hypothesised:

H11: There is a U-shaped relationship between potential absorptive capacity and entry timing.

4.3.4.5. A Non-linear Relationship between Realised Absorptive Capacity and Entry Timing

Some firms may excel at acquiring and assimilating external knowledge, but are not able to transform and apply this knowledge to generate value for the firm or turning it into a competitive advantage. The ability to recognise, acquire and assimilate external knowledge enables firms to renew their knowledge base and hence, avoid a competency trap. On top of that, firms also require an adequate level of realised absorptive capacity to transform and exploit external knowledge to generate value for the firms such as creating new knowledge and commercial outputs.

Realised absorptive capacity covers the knowledge transformation and exploitation dimensions of absorptive capacity. Transformation dimension involves the capacity to transfer and combine prior knowledge with the newly acquired or assimilated knowledge. External knowledge transformation can be achieved by adding or eliminating knowledge, interpreting and combining existing knowledge in an innovative way (e.g., Todorova and Durisin 2007; Jansen et al., 2005).

Finally, the exploitation dimension of absorptive capacity encompasses a firm's ability to incorporate external knowledge into its operations and routines for the firm's application and use. The exploitation dimension leads to the creation, refinement and improvement of new products, systems, processes, routines, operations, organisational structures and capabilities (e.g., Zahra and George 2002; Lane et al. 2001).

In the context of imitative entry, a firm with high realised absorptive capacity will be able to transform and exploit the knowledge spillover from competitors' products and technologies fairly quickly to come up with their own product offerings. A firm's capacity to transform and exploit external knowledge not only enhances the degree and scale of innovation but also increases the speed of innovation process (Lane et al. 2006). Therefore, the present research argues the greater the realised absorptive capacity, the faster a firm enters the market.

Nonetheless, consistent with the hypothesised curvilinear (U-shaped) relationship between potential absorptive capacity and entry timing, a similar U-shaped relationship is predicted between realised absorptive capacity and entry timing. The present research hypothesises that there is a diminishing positive effect from the increase in realised absorptive capacity with entry timing beyond the optimum level. An extremely high level of realised absorptive capacity may indicate that a firm puts excessive focus on transformation and exploitation of knowledge activities. The disproportionate emphasis on transformation and exploitation may result in firms achieving short-term profits through exploitation but they may also fall into a competency trap. Hence, firms may be slow or even fail to identify the commercial value of a new and innovative product introduced in the market. This will then lead to a delay in market entry. Based on this rationale, the following is hypothesised:

H12: There is a U-shaped relationship between realised absorptive capacity and entry timing.

4.3.5. Capability and Absorptive Capacity as Determinants of Relative Product Advantage

4.3.5.1. Marketing Capability and Relative Product Advantage

Penrose (1959, p. 54) argues that a firm's ability to achieve rents does not rely on the fact that it has better resources, but depends on its distinctive competence in making better use of its resources. Because the creation of superior value for customers is a source of sustainable competitive advantage, one may argue that a firm that has a superior ability in utilising its resources may achieve high rents and thus, a competitive advantage.

A firm may create an additional buyer value through increasing customers' product benefits and/or reducing customers' purchase and use costs (e.g., Forbis and Mehta 1981). The resource-based view (RBV) specifies that possession of resources and capabilities provides the basis for value creation (Sirmon et al. 2007). Furthermore, Day (1994) argues that a firm possesses a distinct capability if it contributes to a firm's effort in providing superior customer value. As such, value creation occurs when a firm provides value to customers and it generates competitive advantages when it offers greater utility than its competitors do (Sirmon et al. 2007). The present research argues that firms' distinctive capabilities, specifically marketing capability and technological capability drive competitive advantages because they provide a platform for firms to develop a superior offering with product characteristics meeting customers' utility and hedonic needs.

Specific marketing capabilities such as architectural marketing capabilities enable firms to collect information from the market environment and develop marketing plans based on the information collected from the market (Morgan et al. 2003; Kohli and Jaworski 1990). Firms that have the ability to collect high-quality customer feedback through monitoring the environment and strong relationships with customers (Desphande et al. 1993) will be able to use the valuable information to develop superior products that meet customers' requirements.

Day (1994) argue that market driven firms have superior market sensing, customer linking and channel bonding capabilities. These distinctive marketing capabilities involve collecting and acting on information about customer needs and other environmental forces such as technological change and competition. In turn, these capabilities enable firms to sense market trends, and provide accurate responses to the environmental stimulus through introduction of superior products. Furthermore, market-sensing and customer-linking capabilities are sources of value creation for customers. In order to gain product leadership, firms need to utilise its market sensing capability to recognise emerging customer needs, accurately predict customer response and construct effective market entry strategy (Day 1994). Distinctive marketing capabilities allow firms to perform benchmarking and informed imitation (Day 1994). This is done through competitor intelligence, which provides firms with information on competitors' products and strategies including emerging technologies capable of satisfying current and expected customer needs (Narver and Slater 1990). This information may then be utilised by firms to create product improvements.

Proficiency in marketing not only provides the necessary information from the market to enable firms to increase their product advantage, it also allows firms to increase consumer perceptions of their products relative to competitors (Song and Parry 1997). In high technology consumer products this effect may be achieved through public relations, using early adopters or engaging experts to provide positive product reviews.

Li and Calantone (1998) described market knowledge competence as a process of generating and integrating market knowledge. Market knowledge competence comprises of (1) customer knowledge process, (2) competitor knowledge process, (3) and the marketing-research and development (R&D) interface. Customer knowledge process generates customer knowledge relating to customers' current and potential needs for new products, competitor knowledge generates knowledge about competitors' products and strategies while marketing-R&D interface enables market knowledge to be transferred to and integrated with technological knowledge (Li and Calantone 1998). Hence, each of the three processes of market knowledge competence is critical in developing product advantages for a new product. This suggests that competence in market knowledge is a capability that links a firm with the market. It also provides vital feedback for technology development to create a successful and superior product that meets customers’ needs. Therefore, the following hypothesis is proposed:

H13: The higher the marketing capability, the greater the relative product advantage.

4.3.5.2. Technological Capability and Relative Product Advantage

Technological capabilities are valuable to customers in two ways: (1) they lead to product improvements that increase the value of the product and (2) they result in process improvements that reduce the firm’s overall cost structure (Coombs and Bierly 2006). This section discusses the role technological capabilities play in creating superior products with high relative product advantage.

Each product can be viewed as bundles of physical and performance characteristics and the value assigned to the characteristics is a function of the degree to which they meet customer's utility or pleasure (Rosen 1974; Lancaster 1971). Customers choose a product over another if the product offers them superior value than other products available in the market. Each firm uses specific technological resources such as patents, skilled technological workforce, plants and licenses to create attractive product characteristics (Afuah 2002). A firm's technological capability is a firm's ability to exploit these resources to combine components, linkages, methods, processes, techniques and the underlying product concepts in order to create desirable product characteristics (Afuah 2002). In the same vein, Danneels (2002) argues that technological competence provides the ability for a firm to create and manufacture products with specific features. Technological competence consists of know-how and skills in design and engineering of products and processes, manufacturing as well as quality control (Daneels 2002). Furthermore, technological capabilities enable firms to respond quickly to rapid technological change in the environment (Wind and Mahajan 1997).

Because technological capability is heterogeneous among firms, firms with superior technological capability should be able to create products with superior characteristics that are valued by customers (Afuah 2002). Afuah's (2002) model demonstrates that technological capability allows firms to create a product advantage that is valued by customers, which is reflected in its elasticity of price. In essence, technological capability contributes to a product competitive advantage because it enables firms to raise the actual performance of the new product relative to competitors' offerings (Calantone and di Benedetto 1988). As such, technological capability can be utilised to create differentiation advantages for firms (Franco et al. 2009) by creating a product that customers see as unique (Miller 1988), which in turn leads inelasticity of price (Porter 1980).

Several prior studies on technology competence showed a positive association between a firm's technological competence and various measures of firm's innovation performance (Coombs and Bierly 2006; Ray et al. 2004; Baum and Wally 2003; Walsh and Linton 2002; Klein et al. 1998). Although prior research established a relationship between technological capability with innovation performance and not product advantage specifically, the finding implies a positive association between technological capability and product advantage. Product advantage refers to the degree to which a product offering is superior to that of competing products (Calantone et al. 2006). It is reasonable to assume that the aim of product innovation is to produce a competitive product that offers functions, features and design valued by customers. Hence, product advantage is the consequent of the innovativeness of a product. This assumption is consistent with empirical evidence showing a positive relationship between product innovativeness and product advantage (Gatignon and Xuereb 1997; Henard and Szymanski 2001; Holak and Lehmann 1990). Consequently, a positive relationship is hypothesised between technological capability and product advantage as follows:

H14: The higher the technological capability, the higher the relative product advantage.

4.3.5.3. Marketing and Technological Capability Interaction with Relative Product Advantage

Besides their individual effects, prior research in product development has recognised the complementarity between marketing and technological capability (Moorman and Slotegraaf 1999). Marketing capability facilitates the effect of technological capability as some new product or process development originates from customer requests or feedback (Moorman and Slotegraaf 1999). In the same vein, technological capability facilitates marketing capability since firms must possess prior technical knowledge to predict the value and apply external knowledge such as customer feedback or competitor analysis in the operations (Bierly and Chakrabarti 1996; Cohen and Levinthal 1990). Empirically, Moorman and Slotegraaf (1999) revealed that firms are more likely to improve their product quality and make the improvements faster when they possess high levels of both product technology and product marketing capabilities.

Dutta et al. (1999) found that marketing and R&D capability interaction is one of the most important determinants of firm performance. Companies with a strong marketing capability provide R&D departments with valuable feedback from customers which drive innovations required for product improvements (Dutta et al. 1999). For example, Procter and Gamble derived its competitive advantage from its combination of innovation and market research capability. Their market research and data gathering capabilities provide inputs for R&D departments to develop high quality, performance-driven products that are based on consumer needs (Henderson and Johnson 2012). Furthermore, Dutta and colleagues (1999) observed that marketing capability has its highest impact on the innovative outputs of firms with strengths in technological capability. This provides further support for the notion that marketing capability facilitates the creation of innovative outputs produced by technological capability. Hence, high technological and marketing capability interaction helps a firm to turn the knowledge generated by marketing into a product that offers features highly valued by customers. Similarly, a high interaction level of the two distinctive capabilities helps a firm to gather data on customers' feedback about a pioneer's product and incorporate those feedbacks into its own product development to create a superior product. Therefore, the following is hypothesised:

H15: The greater the interaction between technological capability and marketing capability, the greater the relative product advantage.

4.3.5.4. Potential Absorptive Capacity and Relative Product Advantage

The RBV explicitly acknowledges the path dependency nature of capabilities (Priem and Butler 2001; Teece et al. 1997). Path dependency can be caused by technological choices and trajectories (Schilling 1998; Ruttan 1997; Arthur 1989; Dosi 1988), product history (Helfat and Raubitschek 2000) and choices for certain customers (Danneels 2002). Recognising the limitation posed by path dependency, dynamic capabilities literature emphasises the renewal of resources and capabilities to address the changing environment (Teece et al. 1997). Subsequently, Zahra and George (2002) reconceptualised absorptive capacity, which is a firm's ability recognise, assimilate and commercialise external knowledge (Cohen and Levinthal 1990) as a dynamic capability that permits a firm to reconfigure its resources and adapt to changing market conditions in order to achieve a competitive advantage. Therefore, absorptive capacity, in particular potential absorptive capacity facilitates external learning, widens firms' perspective and prevents firms from falling into a competency trap (Levitt and March 1988), which hampers firms' innovation activities.

A firm's technological knowledge may originate from new knowledge produced through its own R&D or may be drawn externally from spillovers of competitors knowledge as well as extra-industry sources such as governments and universities (Cohen and Levinthal 1990). Absorptive capacity enables the absorption of external knowledge resulting from the spillovers between competing firms (Pacheco-de-Almeida and Zemsky 2007). Knowledge spillovers are generally seen to be good for imitators and the presence of potential absorptive capacity is required for firms to benefit from that spillover (Pacheco-de-Almeida and Zemsky 2007).

Potential absorptive capacity facilitates innovation in various ways. First, firms with high potential absorptive capacity are able to identify and assimilate the knowledge spillovers generated from competitors' products and patents. Second, potential absorptive capacity formed by internal R&D activities creates prior related knowledge, which is necessary for firms to identify the commercial value of external knowledge (Cohen ad Levinthal 1990). Third, firms' ability to create product innovation is increasingly reliant on effective acquisition of external knowledge (Bierly and Chakrabarti 1996; Rothwell and Dodgson 1991), a component of potential absorptive capacity. Fourth, the knowledge-based view literature posits that a firm's capacity to innovate depends on its effective integration of its external and internal knowledge (Spender and Grant 1996), which is also known as the assimilation dimension of potential absorptive capacity.

Knowledge is imperfectly spread within a firm (Hargadon and Sutton 1997). It is common to find that marketing department holds market knowledge while R&D department monitors knowledge spillovers from competitors' patents. Firms with high potential absorptive capacity often excel at creating channels of knowledge transfer among different units and department within the firms. As such, potential absorptive capacity contributes to firms' innovation performance by acting as tool for processing new external knowledge and providing a platform for transferring the necessary knowledge across the firm (Kostopoulos et al. 2011).

Due to the major roles potential absorptive capacity plays in facilitating innovation and relative product advantage is an outcome of a firm’s innovation activities, the following is hypothesised:

H16: The higher the potential absorptive capacity, the higher the relative product advantage.

4.3.5.5. Realised Absorptive Capacity and Relative Product Advantage

Absorptive capacity is not a goal in itself but it can generate important organisational outcomes such as innovation capability and innovation performance (Cohen and Levinthal 1990). Innovation outcomes are generally associated with realised absorptive capacity, which encompasses knowledge transformation and exploitation dimension of absorptive capacity. Transformation involves internalisation and conversion of new knowledge and it can be achieved by combining existing and newly acquired external knowledge in an innovative way (Zahra and George 2002). On the other hand, exploitation refers to a firm's ability to utilise and incorporate transformed knowledge into its operation to create value through generation of new products, systems, and processes (Zahra and George 2002).

In order for a later entrant to be able to take advantage of the information spillover from the innovator, they need the necessary realised absorptive capacity (Cohen and Levinthal 1990). The information leaked from innovator’s product or knowledge spillover from patents is not sufficient for a firm to be able to exploit it. For example, in the pharmaceutical industry, Ethiraj and Zhu (2008) observed that only those imitators that have built up a large knowledge stock in the area could generate a variant of the innovator’s technology and demonstrate the ability to differentiate by offering high quality products. Without the prerequisite realised absorptive capacity, which enabled them to transform and exploit external knowledge, the innovator’s patent posed a strong entry barrier (Ethiraj and Zhu 2008). Furthermore, reverse-engineering a competitor's product merely leads to a 'me-too' product, which is not sufficient to neutralise innovator's early advantage. In short, high realised absorptive capacity, which centres on internalisation, conversion and use of knowledge (Zahra and George 2002), allows firms to use that external knowledge to produce superior products.

In addition, a firm with strong realised absorptive capacity is better positioned to utilise and commercialise external knowledge through development of a superior product. For example, in mobile telecommunication industry, He and colleagues (2006) demonstrate how Ericsson, Nokia and Samsung caught up with Motorola in the late 1990s, the early leader through knowledge spillovers. The later entrants benefited from knowledge spillovers from Motorola by heavily citing its high impact patents. As they gradually built up their own innovation capability through R&D investment and patenting, they reduced their reliance on Motorola's knowledge and eventually overtook Motorola in the patent race as well as technological leadership in the industry. This shows that realised absorptive capacity facilitates innovation performance through effective external knowledge transformation and exploitation capacity.

Furthermore, realised absorptive capacity enhances radical innovation because radical innovation involves novel combinations of existing technologies and know-how (Van den Bosch et al. 1999; Kogut and Zander 1992). Radical innovation is best supported by the transformation dimension of absorptive capacity, which enables a combination of broad range of loosely related knowledge domains to further increase a firm's knowledge breadth (Van den Bosch et al. 1999). For example, Apple's portable music player, iPod was an outcome of a combination of existing and new knowledge in hardware and software. Apple improved on Creative Lab's (an earlier entrant) scroll wheel user interface technology and used IBM's newly-developed 1.8 inch micro drive in their first iPod (Abel 2008). The end product is an amalgam of hardware, software and content that revolutinised the way music was consumed, bought and stored by customers. The case of Apple further supports the notion that a firm that has a large knowledge base is more capable of understanding new knowledge and its applicability and therefore, is better positioned to transform the knowledge into a commercial product.

In sum, since innovation requires an integration of existing knowledge with new external knowledge, and product advantage is the outcome of a firm's innovation activities, product advantage produced by a firm in a technologically progressive environment is a function of its realised absorptive capacity. Therefore, the following is hypothesised.

H17: The higher the realised absorptive capacity, the higher the relative product advantage.

4.3.6. Capability and Absorptive Capacity as Determinants of Relative Price

4.3.6.1. Marketing Capability and Relative Price

One of the ways that enables firms to charge premium prices for their products is by choosing a differentiation strategy. The aim of a differentiation strategy is to create a product that customers see as unique (Miller 1988), which then creates customer loyalty and price inelasticity (Porter 1980). Differentiation strategies can be affected through product innovation or via intensive marketing and image management (Miller 1986). Product differentiation via advertising, prestige pricing and market segmentation requires firms to have good understanding of customer preferences and competing products (Miller 1988).

Firms adopting a differentiation strategy also need to accurately identify specific market segments that desire distinctive benefits beyond those provided by generic products (Vorhies et al. 2009). Furthermore, firms need to ensure that the size of those segments is adequate to ensure that they are profitable (Vorhies et al. 2009). To support their differentiation strategies firms require marketing capabilities that enable them to deliver the desired benefits to customers (Noble 1999) as well as to gather information about their customers' current and future needs and requirements. Therefore, the following hypothesis is proposed:

H18: The higher the marketing capability, the higher the relative price.

4.3.6.2. Technological Capability and Relative Price

Technological capability leads to two types of innovation: product and process. As the two outcomes of technological capability influence new product price-setting strategy differently, the current research offers two alternating hypotheses with regard to the relationship between technological capability and relative price.

With respect to price-setting practices of a new product, Monroe's (2003) price discretion model suggests that a firm can establish its new product price at any point between the price floor and the price ceiling. While the price floor of a new product pertains to the product costs relative to competitors' costs (Gatignon and Xuereb 1997), the price ceiling reflects customer perceptions of what the product is worth to them (Monroe 2003). As such, the price ceiling relates to the product advantage a new product offers relative to competitors' products in the market (Ingelbleek et al. 2003).

In order to charge more than competing products, a new product should offer a higher relative advantage to the customer. According to the economic theory, the prices of high-quality products are higher for two reasons (Klein and Leffler 1981; Rao and Monroe 1996). First, it covers the relatively higher costs incurred to produce a superior product. Second, higher price provides an incentive for firms to increase the quality and improve the features of their products. The ability of a firm to charge a higher relative price is therefore contingent on the relative product advantage it offers in terms of quality, features and functionalities. In other words, a higher relative price expresses or signifies the superiority of a new product relative to existing products in the market.

New product pricing literature suggests that there are two approaches a firm can adopt when setting a price for its new product: (1) market skimming and (2) penetration pricing (e.g., Noble and Gruca 1999). Price skimming describes a pricing strategy in which the price of a new product is set at an initial high price but then systematically reduced over time (Noble and Gruca 1999). This strategy allows firms to recover its investment costs and make profit quickly (Tellis 1986). Price skimming is ideal when there is a high degree of product differentiation in the market (Jain

1993) and customers are price insensitive; that is, they are willing to absorb the higher cost for a product that meets their specific requirements (Guiltinan et al. 1997; Schoell and Guiltinan 1995). Most importantly, in order to effectively execute a price skimming strategy, the new product needs to present major improvements over existing offerings in order to command a premium price (Mercer 1992).

The present research argues that the higher the technological capability a firm possesses, the higher the relative price it commands for its new product. Technological capability leads to product improvements that increase the value of the product to customers (Coombs and Bierly 2006). At the same time, technological capability also enables firms to produce a product with additional functions and features. Furthermore, technological capability may also be exploited to increase product quality. Because technological capability and competence is associated with a firm's ability to develop a superior product (Daneels 2002; Afuah 2002), the higher the technological capability, the higher the relative price that can be achieved by a firm. The price setting literature provides support for this argument in a number of ways. Firstly, technologically endowed firms are able to set their price ceiling higher because they are able to increase their customer perceptions of what the product is worth by aligning this value with the high benefits offered by its product. Secondly, they are able to adopt a price skimming strategy due its higher relative product advantage and highly differentiated product.

Afuah (2002) demonstrated that a pharmaceutical company's technological capability enables it to produce products with relatively higher product advantage, which in turn gives it a price advantage over industry average prices. Another apt example is Apple's ability to charge USD 329 entry price for its introductory product, iPad mini in a small tablet category, compared to Amazon's Kindle Fire and Google's Nexus 7 at USD200 price tag (Canada 2012). The relative high price attached to the product and customers' willingness to pay the high cost is justified by its perceived high quality and better ecosystem of products, services, and content relative to Apple's competitors (Canada 2012). Therefore, the current research presents the first of the two alternating hypotheses with regard to the relationship between technological capabilities and price as follows:

H19a: The higher the technological capability, the higher the relative price.

Recall that Monroe's (2003) pricing discretion model suggests that a firm can set the price of its product price somewhere in between its price ceiling and price floor. The price floor of a new product refers to the relative product costs, which encompasses the costs of product development, manufacturing and marketing the new product relative to competitors' costs (Ingenbleek et al. 2013).

Technological capability not only leads to product improvements, but also leads to process improvements that reduce the firm's overall cost structure (Coombs and Bierly 2006). Superior R&D and technological capability may drive the product price down through process innovation. For example, Japanese companies such as Sony and Hitachi leveraged their strong capability in process innovation in order to establish a favourable cost-structure (Dutta et al. 1999). Increased efficiency in the production process reduces product per unit costs and also allows consistent product deliveries, which prevent other extra costs from incurring (Lumpkin and Dess 1996; Day 1994).

A firm with high technological capability in process innovation may not necessarily create a product that is superior in terms of quality, features and functionality but due to its efficiency, reduce its unit costs by spreading its fixed costs over a high volume output. In other words, technological capability in process innovation or manufacturing creates greater relative costs advantage in comparison to relative product advantage. Other than skimming pricing strategy discussed earlier, the new product pricing literature also suggests that a firm can adopt penetration pricing strategy when setting a price for its new product (e.g., Noble and Gruca 1999). Penetration pricing refers to a strategy in which a firm initially set the price low in order to accelerate product adoption (e.g., Noble and Gruca 1999). Scholars argue that penetration pricing is ideal for firms that enjoy cost advantages due to economies of scale (e.g. Tellis 1986). In contrast to skim pricing, common conditions that favour penetration pricing include low product differentiation (Schoell and Guiltinan 1995), lack of product improvements from existing offerings (Mercer 1992) and elastic demand (Guiltinan et al. 1997). As such, firms with high technological capability that leads to cost advantages may favour penetration pricing strategy when introducing a new product.

It is also possible that due to its high technological capability, a firm creates a product that has high relative advantage and at the same time produces the product at relatively lower costs due to efficient production processes and economies of scale. In this case, a firm faces a situation of a wider pricing discretion resulting from a big gap between the price floor and the price ceiling (Ingenbleek et al. 2013). Price setting literature suggests that when faced with a wider pricing discretion, emphasis on competition-informed pricing contributes to a better estimation of the price ceiling based on competitors' prices. The combination of a low cost structure and competition-informed pricing facilitates a price setting that allows firms to undercut reference prices set by competitors who offer products with equally high relative product advantage (Ingenbleek et al. 2013). Furthermore, the firms are still able to enjoy higher relative margin despite undercutting competitors' due their wider pricing discretion. This will then lead to an adoption of a lower relative price when entering the market.

Therefore, the current research presents the second of two alternating hypotheses with regard to the relationship between technological capabilities and price.

H19b: The higher the technological capability, the lower the relative price.

4.3.6.3. Marketing and Technological Capability Interaction with Relative Price

A higher relative price can be achieved through product differentiation, which then leads to price inelasticity (Porter 1980). Price inelasticity can also be described as customers' insensitivity towards a high price because they are willing to pay more for a product in exchange for the benefits the product offers (Guiltinan et al. 1997; Schoell and Guiltinan 1995). Consistent with the notion that product differentiation relates to a higher price, scholars of new product pricing argue that a skimming pricing strategy, which describes the practice of setting a high initial price is ideal for firms exhibiting high product differentiation (Jain 1993; Noble and Gruca 1999).

Product differentiation can be achieved using a combination of product innovation and marketing activities (Miller 1986). Possession of both high technological capability and marketing capability enables firms to create products with superior characteristics that are valued by customers (Afuah 2002) as well as enables them communicate their products' unique advantage through their marketing efforts. Therefore, a high interaction of marketing and technological capability allows firms to affect a differentiation strategy through both product innovation and marketing activities; hence, increasing the price inelasticity for the products. Furthermore, although marketing differentiation does not require superiority in product characteristics and design to accompany the marketing activities, offering a superior product as a result of technological capability generates consistency between image created and actual product which further justifies the premium price. Therefore, the following hypothesis is proposed:

H20: The higher the marketing and technological capability interaction, the higher the relative price.

4.3.6.4. Potential Absorptive Capacity and Relative Price

Potential absorptive capacity influences a firm's ability to charge a higher relative price through its crucial role in enhancing innovation. Previous section discussing the relationship between technological capability and relative price highlights how product differentiation through quality, product features and functionalities, which are outcomes of firms' innovation activities, leads to a higher relative price. Previous empirical studies show positive associations between absorptive capacity and innovation outcomes such as patents and financial performance, which reflect firms' realised absorptive capacity (Zahra and George 2002). In addition, the innovation literature also stresses the role of absorptive capacity in increasing a firm's knowledge base through its acquisition and assimilation of external knowledge (Volberda 2010). In other words, firms focusing on acquisition and assimilation of new external knowledge are able to continuously renew their knowledge stock, crucial for the creation and sustainability of a firm's competitive advantage (Zahra and George 2002).

To develop a product differentiation strategy from innovation activities, a firm must first search, identify, and evaluate alternative knowledge from different external sources. After identifying potentially useful external knowledge, the firm must internalise and assimilate it to make it understandable to the firm. Only then the firm is able to use and transform the knowledge into a specific product innovation, which may constitute a product differentiation (Zhou and Wu 2010).

Therefore, firms that emphasise activities that encourage identification, acquisition and assimilation of external knowledge such as collecting, disseminating and acting on information about customer needs, emerging technologies, competitors and other environmental forces (e.g. Day 1994; Narver and Slater 1990) are better positioned to renew their knowledge stock. Renewed knowledge stock subsequently facilitates innovation activities essential to create product differentiation. High potential absorptive capacity enables firms to identify the potential and the commercial value of a product introduced by a competitor as well as enables them to identify existing gap in the market for potential product improvements that may satisfy existing, future or even latent needs of customers. As such, potential absorptive capacity facilitates the development of a product offering that can be differentiated from the ones that currently exist in the market.

In addition, firms with high potential absorptive capacity have established routines and processes that allow them to analyse, process, interpret, and comprehend the information originated from outside the organisation (Zahra and George 2002). For example, an empirical study by Jansen and colleagues (2005) shows that coordination capabilities, such as 'cross-functional interfaces, participation in decision-making and job rotation' (2005, p. 999) enhance a firm's potential absorptive capacity. As such, companies with coordination routines and processes are better able to facilitate the assimilation dimension of absorptive capacity through sharing and integration of external knowledge acquired by marketing and R&D team. This will then lead to effective transformation and exploitation of knowledge to generate innovation outcomes leading to product differentiation and ultimately higher relative prices. Therefore, the following is hypothesised:

H21: The higher the potential absorptive capacity, the higher the relative price.

4.3.6.5. Realised Absorptive Capacity and Relative Price

Realised absorptive capacity, encompassing knowledge transformation and exploitation refers to a firm's capacity to combine existing and newly acquired knowledge and incorporate transformed knowledge into operations to create value for the firms (Zahra and George 2002). Value creation can come in the form of new competences, routines, processes, organisational structures and new products.

Lane and colleagues (2006) argue that the literature studying the relationship between innovation and absorptive capacity essentially examined the exploitation dimension of absorptive capacity. The empirical studies in this theme suggest that absorptive capacity enhances the level of innovation (Lane et al. 2006). The aim of product differentiation is to create a product that is unique and highly valued by customers. Therefore, differentiation makes price comparison difficult and allows firms to get away with charging premium prices. One of the ways that product differentiation can be created is through product innovation, which is one of the outcomes of absorptive capacity.

Ethiraj and Zhu's study (2008) on the pharmaceutical industry shows that absorptive capacity enables later entrants to create vertical differentiation, an effective tool to overcome the advantage of the innovator. The finding is consistent with Cohen and Levinthal's (1989; 1990) argument that firms cannot benefit from external knowledge flows simply by being exposed to them. Ethiraj and Zhu (2008) show that despite the information on innovator's product leaked over time, only firms that have built up significant knowledge on the area could produce a variant of the innovator's product that is highly differentiated from existing offerings. This example indicates that external knowledge needs to be transformed internally by adding, interpreting and combining it with existing knowledge in a new way before it can be exploited effectively (Van den Bosch et al. 1999; Kogut and Zander 1992).

In short, firms with high levels of absorptive capacity are more likely to be able to sell their products at higher prices because of their competences in transforming and exploiting external knowledge to differentiate their products relative to their competitors. Therefore, the following is hypothesised:

H22: The higher the realised absorptive capacity, the higher the relative price.

4.3.7. Determinants of Product Survival

4.3.7.1. Entry Timing and Product Survival

The general proposition regarding response timing by scholars of economics, marketing and management is to respond quickly to a competitive move by a rival to limit its ability to build and sustain a competitive advantage (Boyd and Bresser 2008; Kumar and Sudarshan 1988; Porter 1985; Hauser and Shugan 1983). This view is also shared by the competitive dynamics perspective focusing on actions and responses among competing firms (Smith et al. 2001; Smith et al. 1992).

Previous studies have showed evidence of a negative linear relationship between a firm's performance and its response delay to a competitive action (Boyd and Bresser 2008). Scholars also observed an opposing positive linear relationship for the pioneer; that is, the longer a pioneer remains unchallenged, the greater its market share and profit (Smith et al. 2001; Carpenter and Nakamoto 1989; Smith et al. 1989; Glazer 1985; Hauser and Shugan 1983; Porter 1980). Longer response lags allow pioneers to establish first mover advantages through a number of isolating mechanisms that favour early movers. Pioneers can create first movers advantages by utilising isolating mechanisms such as technology leadership, leadership reputation, pre-emption of scarce assets, switching costs and buyer choice under uncertainty (Lieberman and Montgomery 1988; Golder and Tellis 1993; Day and Freeman 1990; Kerin et al. 1992).

The earlier a firm makes its imitative entry following the introduction of a new product, the less likely that the pioneer can sustain its competitive advantages created from the isolating mechanisms. In sum, by expediting its entry, not only the imitating firm is able to nullify the pioneer's early mover advantage, it also increases its own product performance.

Therefore, the following hypothesis is proposed:

H23: *The faster the entry, the higher the probability of product survival.*

4.3.7.2. Relative Product Advantage and Product Survival

A firm's innovation efforts and activities are likely to have a positive impact on its performance through their influences on its relative product advantage, which in turn affect the product's market success. Product advantage is referred to as the perceived level of a product's design, attributes, and quality relative to competition (Song and Parry 1999; Cooper and Kleinschmidt 1996; Robinson 1990; Corey 1983; Maidique and Zirger 1983). Scholars have found that a firm's relative product advantage is positively associated with its market share among start-up firms (Robinson 1990) and positively influenced business performance in established firms (Brown and Eisenhardt 1995; Cooper and Kleinschmidt 1987a).

Furthermore, Cooper (1979) and Cooper and Kleinschmidt (1987b) reported a significant and positive relationship between product competitive advantage (measured as the presence of unique features, higher relative quality, lower relative customer cost and a presence of product function that enables customers to perform a unique task) with product performance in the market. A study comparing projects from Europe and Japan reported that successful projects were more likely to involve products having a great competitive advantage (Utterback et al. 1976). Zirger and Maidique (1990) also found that technically superior product is positively related to successful outcomes. Similarly, Song and Parry (1996) show that the level of new product success is positively correlated with the level of product advantage, referred to as product's perceived superiority relative to competitive products.

Cooper and Kleinschmidt (1995) empirically provide evidence that product advantage defined as having product superiority in terms of providing unique benefits, relative product quality and good value-for-money as the number one determinant of product success. In a meta-analysis of new product performance empirical studies, Henard and Szymanski (2001) found that product advantage, defined as product superiority and/or differentiation over competitive offerings is a significant driver of product performance. In addition, Shamsie and colleagues (2004) showed that the performance of late movers (measured by survival and market share) was positively associated with relative product quality and product innovation. Equally, Day and Wensley (1988) argue that firms providing customers with either "lower relative costs" or "superior customer value" have positional advantage over their competitors. Thus, it is hypothesised that:

H24: *The greater the relative product advantage, the higher the probability of product survival*

4.3.7.3. Relative Price and Product Survival

Various studies reported that later entrants can enhance their probability of success if they are able to improve upon the positioning that was adopted by pioneers by (1) offering greater overall quality and innovative features or (2) by offering better value through lower retail price (Durand and Coeurderoy 2001; Zhang and Markman 1998; Shankar et al. 1998; Cho et al., 1998; Kalyanaram and Urban 1992; Carpenter and Nakamoto 1990; Schoonhoven et al. 1990; Romanelli 1989; Urban et al. 1986). In other words, in order to surpass pioneers, later entrants may choose to engage in either cost leadership or differentiation via product innovation (Porter 1980). Differentiation via product innovation is achieved through introduction of attractive products that are superior in quality, efficiency, design innovations, or style (Miller 1986). On the other hand, firms adopting the strategy of cost leadership obtain above-average returns achieved through cost control and efficiency.

An empirical study by Shamsie and colleagues (2004) revealed that price was negatively associated with survival and market share, indicating that later entrants that are able to bring prices down significantly may perform well in the market. A firm that is able to reduce its cost will be able to charge a lower price for its product. Despite its attractiveness, this strategy may induce retaliation by competitors who in return may lower their prices as well, leading to price competition (Costa et al. 2013). This in turn, will reduce profit and may be detrimental to product survival especially if the product offered has a lower relative product advantage compared to competitors. Furthermore, Hultink and Langerak's (2002) study of incumbents' competitive reactions to new market entries by their rivals indicates that incumbents perceived penetration pricing (a relatively low price for fast mass market penetration) adopted by new entrants as a signal of hostility. The signal of hostility represented by the relatively low price is positively associated with the strength of incumbent reactions. Hence, the cheaper the price adopted by a newcomer in the product category, the greater the magnitude of the incumbents' competitive reaction.

In contrast to a low cost strategy, differentiation creates a product or service that customers see as unique, which leads to customer loyalty and price inelasticity (Porter 1980). The higher the product differentiation, the stronger a customer's preference towards the product, which in turn makes price cutting less effective (Makadok and Ross 2013). Therefore, product differentiation allows firms to obtain premium prices and insulates them from price competition.

Customer loyalty and price inelasticity resulting from a differentiation strategy allow firms to command premium prices or sell more of their products at a given price, leading to a higher profit or market share (Porter 1985). In addition, the positive reputation generated from the perceived difference between the firm's offerings relative to their competitors' offerings enables the firm to attract new customers and withstand short-term environmental fluctuations better.

Furthermore, Miller (1988) shows that the strategy of innovative differentiation is appropriate in uncertain and dynamic environments such as in the industries captured by the present study. In contrast, the strategy of cost leadership correlates with stable and predictable environments. In dynamic environments such as the software industry where differentiation via product innovation is prevalent, products and practices change quickly (Duncan 1972). As such, firms that neglect innovation and compete solely on offering products at lower prices will fall behind. In addition, uncertain environments with continuous change present a challenge for firms trying to pursue a cost leadership strategy through economies of scale and efficiency. As such, it is reasonable to posit that firms adopting a differentiation strategy can command higher prices and perform better in a dynamic environment represented by the current study.

Because a higher relative price reflects the firm's innovation differentiation advantage and a high level of differentiation protects firms against price competition, increases customer loyalty and boosts firms' reputation, the following is hypothesised:

H25: The greater the relative price, the higher the probability of product survival.

4.4. Summary and Conclusion

This chapter has specified the research hypotheses upon which the conceptual model for the present study was built. The conceptual model has its theoretical underpinnings in the RBV, Competitive Dynamics and Dynamic Capability paradigm, thereby attempts to explain the heterogeneity of performance among firms adopting an imitative strategy by integrating formerly competing perspectives. Twenty five hypotheses were developed from the pertinent theoretical and empirical literature (see Table 4.3 for a summary of the research hypotheses). The following chapter will explain the methodology employed in empirically testing the model and hypotheses.

Table 4.3: Summary or Research Hypothesis

Number	**Hypothesis**
H1	Along the prospectors-analyser-defender continuum, prospectors devote the greatest resources to marketing and defenders the lowest.
H2	Along the prospector–analyser–defender continuum, prospectors invest the greatest in technological resources and defenders the least.
H3	The higher the marketing resources, the greater the marketing capability
H4	The higher the technological resources, the greater the technological capability
H5	The higher the marketing resources, the greater the potential

	absorptive capacity
H6	The higher the technological resources, the greater the potential absorptive capacity
H7	The higher the potential absorptive capacity the greater the realised absorptive capacity
H8	There is a U-shaped relationship between marketing capability and entry timing
H9	There is a U-shaped relationship between technological capability and entry timing
H10	The greater the interaction of marketing and technological capability, the faster the entry
H11	There is a U-shaped relationship between potential absorptive capacity and entry timing
H12	There is a U-shaped relationship between realised absorptive capacity and entry timing
H13	The higher the marketing capability, the greater the relative product advantage
H14	The higher the technological capability, the higher the relative product advantage
H15	The greater the technological and marketing capability interaction, the greater the relative product advantage
H16	The higher the potential absorptive capacity, the higher the relative product advantage
H17	The higher the realised absorptive capacity, the higher the relative product advantage
H18	The higher the marketing capability, the higher the relative price
H 19a	The higher the technological capability, the higher the relative price
H 19b	The higher the technological capability, the lower the relative price
H20	The higher the marketing and technological capability interaction, the higher the relative price
H21	The higher the potential absorptive capacity, the higher the relative

	price
H22	The higher the realised absorptive capacity, the higher the relative price
H23	The faster the entry, the higher the probability of product survival
H24	The greater the relative product advantage, the higher the probability of product survival
H25	The greater the relative price, the higher the probability of product survival

CHAPTER 5: METHODOLOGY

5.1. Introduction

The aim of the study, as specified in Chapter 1, is to develop and empirically test an integrated model of the drivers and the outcome of imitative market entry. Having developed the model and the research hypotheses, the attention shifts to a discussion on the methodology adopted for empirically testing them. The aim of this chapter is to explain the operationalisation of the constructs described in the conceptual model, which in turn enables hypothesis testing. This chapter also serves as a link between the hypotheses proposed in the previous chapter and the empirical results presented in the next two chapters.

This chapter is organised into four main sections: (1) scientific research paradigm, (2) philosophical perspectives, (3) research design identification, and (4) operationalisation of constructs. The scientific research paradigm section explains the concept of shared worldview that provides the regulative framework among the members of a particular research community. Next, the section on philosophical perspective explores how the worldview stance influences the adoption of quantitative methods for the study. The following section, research design identification discusses the research design strategy and the rationale behind it. The last section of the chapter provides a thorough review on how the constructs discussed in Chapter 4 have been operationalised to enable hypothesis testing.

5.2. Scientific Research Paradigm

The methods and techniques chosen for use in a research should be driven by, and appropriate to the research question posed (Janckowicz 1991). However, since the research process involves assumptions about what is being investigated and how it can be known (Thomas 2004), the choice of methodology should also be guided by scientific research paradigms concerning the ontology and epistemology, which then provide guidance on how knowledge can be generated, consolidated and comprehended.

The concept of paradigm in social science was coined by Kuhn (1962; 1970). He originally used the term 'paradigm' to describe the progress of scientific discoveries. According to Kuhn, a paradigm is a set of linked assumptions about the world that serve as a regulative framework of philosophical traditions shared by the members of a research community (Kuhn 1970, p.175). This set of assumptions provides a conceptual and philosophical framework for the study of a phenomenon in the world (Kuhn 1962). Hence, a paradigm is a systematic set of beliefs that dictates what researchers in a particular discipline should study, how research should be conducted and how results should be interpreted (Lincoln and Guba 1985; Bryman and Bell 2011). According to Reese (1980, p. 352) cited in Lincoln and Guba (1985, p.15) paradigms "either give us some judgment about the nature of reality, or a reason why we must be content with knowing something less than the nature of reality, along with a method for taking hold of whatever can be known." Such philosophical awareness provides a clear understanding of how a paradigm influences research design (Guba and Lincoln 1998) and helps a researcher avoid making over-ambitious claims such as having discovered the 'truth', 'the final answer' or 'absolute proof' (Thomas 2004).

5.3. Philosophical Worldview

A research paradigm represents a worldview that consists of three elements: ontological, epistemological and methodological question (Guba and Lincoln 1994). Ontology is concerned with the nature of reality and existence and what can be known about it (Guba and Lincoln 1994; Thomas 2004; Easterby-Smith et al. 2012). While ontology is about the nature of reality and existence, epistemology questions what might represent knowledge or evidence of the entities or 'reality' that one wishes to investigate (Mason 2002). Epistemology concerns the relationship between the researcher and what can be known (Guba and Lincoln 1994) and therefore provides assumptions guiding the knowledge inquiry (Easterby-Smith 2012). Finally, methodology is a combination of techniques used by the researcher in finding out what is believed can be known (Guba and Lincoln 1994). Hence, the methodology appropriate for the research is constrained by the researcher's ontological and epistemological stance. In summary, ontology is the 'reality' that a researcher wishes to investigate, epistemology is the relationship between that reality and the researcher and methodology is the means used by the researcher to investigate that reality (Healy and Perry 2000). The following section discusses the philosophical worldview adopted in the present research and the ontological and epistemological stance underlying it.

5.4. Worldview: Post-positivism

The worldview adopted in the present research is post-positivism, a scientific method of doing research commonly adopted in quantitative studies (Creswell 2009). It is called post-positivism because it represents the view after the decline of positivism influence in social science research (Creswell 2009).

The term 'positivism' was coined by the 19th century French philosopher and sociologist Auguste Comte (1798-1857) (Thomas 2004). Comte intended positivism to restrict itself to observable facts; hence, positivism become associated with knowledge of the observable (Thomas 2004).

Similar to positivism, post-positivism views the world as a set of interacting variables and therefore, inquiry is performed through the means of variable analysis (Thomas 2004). Therefore, the aim of research is to explain and enable the prediction and control of phenomena (Guba and Lincoln 1994). Furthermore, positivism and post-positivism strive to prove causality by identifying and analysing the causes that influence outcomes, such as by conducting experiments (Creswell 2009). Under these paradigms, theories are developed for the purpose of generating testable hypotheses to allow for laws to be determined (Bryman and Bell 2007). As such, hypotheses are tested, retained or rejected, leading to further development of a theory which may then be tested by further research (Saunders et al. 2007).

5.4.1 Ontology: Realism

The ontological stance of post-positivism is 'realism'. A realist stance sees both the physical and the social world as consisting of structures that exist independently of an individual's perception (Corman and Poole 2000). Essentially, realities of the physical and the social world exist separately and independently of human consciousness and cognitions (Johnson and Duberley 2000). Although the term 'realism' has a variety of different meanings, realists are united by a rejection of the view that reality is created by the minds of observers (Johnson and Duberley 2000).

Despite sharing the basic tenet of realism ontological assumption, post-positivism view has evolved to deviate from the traditional realism position held by positivism. The ontological assumption of positivism holds a stance that there exists a single truth, which can be revealed through scientific observations of the external reality (Easterby-Smith et al. 2012). Post-positivism, the worldview underpinning the present study, challenges the notion of absolute truth of knowledge held by the positivist tradition (Creswell 2009). That is, despite acknowledging that reality exists independently of individual perception, post-positivists recognise that they cannot fully apprehend that reality and the driving mechanisms in the social and physical world (Corman and Poole 2000). Because post-positivists argue that the absolute truth can never be found, knowledge is viewed as conjectural and findings from empirical research are deemed fallible. Hence, post-positivist researchers stress that they are unable to reject the hypotheses rather than claiming that hypotheses are verified as true (Creswell 2009).

Prior scholars have made a distinction between the two versions of realism adopted by the two worldviews. Positivists are said to adopt naive realism where reality is deemed real (not constructed or shaped by human perception or human interaction) and apprehendable (Guba and Lincoln 1994). In contrast, the strand of realism assumed by post-positivists is referred to as critical realism. Under critical realism, despite perceiving reality as real, it can only be imperfectly and probabilistically apprehended (Guba and Lincoln 1994).

5.4.2 Epistemology: Objectivism

The epistemological position of positivism is objectivism, which assumes that it is possible to access the external world objectively (Johnson and Duberley 2000). Objectivism presupposes that social phenomena and their meanings have an existence that is independent of social actors; hence, the position implies that the phenomena being investigated are external facts that are beyond the reach or influence of researches (Bryman and Bell 2011). Under this worldview of value-free knowledge production, it is possible and imperative that researchers conduct studies without influencing the research subject or being influenced by it (Hirschman 1986).

However, post-positivists have largely rejected the strict tenet regarding the necessary distinction between a 'researcher' and the 'researched' and the assumption of value free inquiry (Corman and Poole 2000). Most post-positivists see objectivity as a 'regulatory ideal' whereby researchers will strive to minimise potential bias that might compromise objectivity (Corman and Poole 2000). Although making no claims to value-fee inquiry validity, being objective is an essential part of post-positivist research inquiries. As such, meeting validity and reliability assumptions are important requirements under post-positivism paradigm.

5.4.3 Methodology: Quantitative

To reiterate the Kuhnian notion of paradigm, if a researcher accepts a set of linked assumptions about the world shared by his or her community, then he or she to a large extent also accepts what are considered as the appropriate 'tools' for investigating the world (Deshpande 1983). Tools refer to methodologies, instruments, and types and forms of data. Hence, the philosophical approach of post-positivism influences the methodological approach of the current research (Deshpande 1983). Under post-positivism, a researcher starts with a theory, develops a hypothesis and then seeks data that either support or disprove the theory (Creswell 2009). Hypothesis testing is primarily a quantitative research strategy (Guba and Lincoln 1998) that emphasises quantification in the collection and analysis of data (Bryman and Bell 2011).

Quantitative research is said to have a positivistic, hypothetico-deductive, particularistic, objective, outcome-oriented and natural science worldview (Reichardt and Cook 1979). In contrast, qualitative research subscribes to a phenomenological, inductive, holistic, subjective, process-oriented, and social anthropological worldview (Deshpande 1983).

Another distinction between quantitative and qualitative paradigms is on the dimension of verification versus discovery. Quantitative methods have been developed and applied to test theories while qualitative methods are mainly used in the task of discovering or generating theories (Reichardt and Cook 1979, p.17). Edmondson and McManus' (2007) framework of methodological fit delineates that the choice of three methodological approaches (qualitative, quantitative, and hybrid) corresponds to three levels of prior work in the field of interest (nascent, mature and intermediate). The topic explored in the present research encompasses mature theories, which have been studied extensively. As such, a quantitative method is deemed to be the most appropriate technique because the aim of the study is not to explore new theories but to elaborate, clarify, and challenge specific aspects of existing theories.

In summary, the connection between theory and research, epistemological considerations, and ontological considerations formed the basis of the adoption of quantitative methodology for this research.

5.5. Research Design Identification

'Research designs are master techniques…' (Kornhauser and Lazarsfeld 1955).

Social scientists Kornhauser and Laazarsfeld (1955) claimed that research designs played the role of 'master techniques', while the statistical analysis of the data collected was termed 'servant techniques' (Ghauri and Grønhaug 2002). In simple terms, a research design is the framework that guides the process of data collection and analysis for a study (Churchill and Iacobucci 2002). It is the overall plan for relating the conceptual research problem to the relevant and practical empirical research (Ghauri and Grønhaug 2002).

Research design choice should be consistent with other elements of a research project such as research question, prior work in the field and contribution to the literature (Edmondson and McManus 2007). The choice of research design should also be guided by the objective of answering the research problem in the best possible way within the given constraints of a researcher such as time, budget and skills (Ghauri and Grønhaug 2002).

This section outlines the major choices involved in selecting the appropriate research design for the current study.

5.5.1 Deductive Research Approach

The primary decision involved in formulating a research design is a choice regarding what should come first: theory or data. As such, the two research approaches available to researchers are induction and deduction (Ghauri and Grønhaug 2002). While induction involves drawing general conclusions from empirical observations, deduction involves gathering of facts to support or reject the hypotheses developed from theories (Ghauri and Grønhaug 2002). A deductive research method entails the development of a conceptual and theoretical structure prior to empirical observation and hypothesis testing (Gill and Johnson 2002).

Modern scientific inquiry owes the falsification approach of deductive research method to Karl Popper (1967; 1972). Referred to as 'Hume's problem of induction', the induction approach is problematic because even if all extant observations confirm a theory, one can never be certain whether some future observations might reveal instances that indicate otherwise (Gill and Johnson 2002). Since only one contradictory observation is required disprove a theory, Popper argues that theories can never be proved true but can only be falsified (Gill and Johnson 2002). Therefore, Popper replaced 'verificationism' by proposing the new rule of 'falsificationism'.

A deductive reasoning approach is more appropriate for this current research than an inductive approach because this research is based on mature theories. According to Edmondson and McManus (2007), mature theories consist of well-developed constructs and models that have been studied over time with an increasing accuracy and a broad agreement, resulting in a cumulative of knowledge. Therefore, research questions based on mature theories tend to focus on elaborating, clarifying, or challenging current assumptions. For example, this research draws from the literature to argue the need for a new study. Consistent with the premise of a deductive approach, specific testable hypotheses are then developed through logical arguments that build on extant studies (Edmondson and McManus 2007). The aim of the current research is to tests mature theories in a new setting, identifies and clarifies the limitations of the theories, examines a mediating mechanism and provides new evidence in support or against previous work (Edmondson and McManus 2007). Finally, the findings produced from a methodologically rigorous testing either “confirm” the theory or indicate the need for its modification. The deductive approach process undertaken in this study is depicted in the steps outlined in Figure 5.1 below.

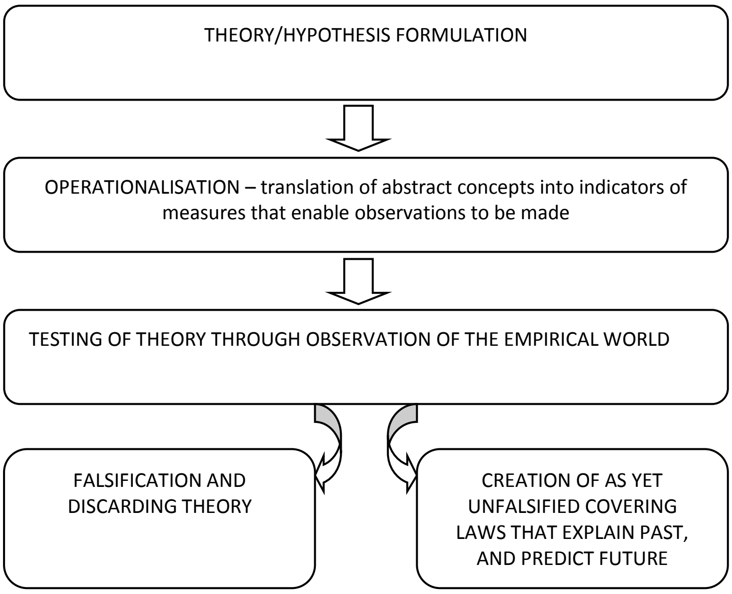


Figure 5.1: The process of deduction (Source: Adapted from Gill and Johnson 2002)

5.5.2 Longitudinal Research Design: Lagged Variables

The two most common non-experimental quantitative research designs are longitudinal and cross-sectional. Longitudinal studies rely on panel data, which consists of a fixed sample of entities from whom repeated measures are taken (Churchill and Iacobucci 2002). In contrast, cross-sectional studies entail the collection of data on more than one case from the population of interest at a single point in time (Bryman and Bell 2011). Due to the need to observe variable lagged effects in this study, the cross-sectional research design is ruled out. Although not strictly longitudinal, the present research measures variables over multiple time periods. This is necessary because a proper account of the future effects of variables such as resources, capabilities and absorptive capacity requires data over time. To capture the lagged effects of a number of variables in the research, the lagged variables of entities are measured at different point of times as opposed to the traditional longitudinal design that measures the same variables repeatedly over time. The research design incorporating lagged variables was adopted by several scholars studying the effect of acquisition on innovation (Prabhu et al. 2005), the changes in firms' technological capability (Kotha et al. 2011), efficiency of know-how how absorption (Xiong and Bharadwaj 2011) and the effects of capabilities on financial performance (Vorhies et al. 2009). The advantage of measuring lagged variables is to provide the ability to map effects of a variable on another variable over time (Kotha et al. 2011). This offers insight into the time order of variables and therefore may allow causal inferences to be made (Bryman and Bell 2011).

5.5.3 Type of Data: Secondary

'Do not bypass secondary data. Begin with secondary data, and only when the secondary data are exhausted or show diminishing returns, proceed to primary data' (Churchill 1999, p.215).

The type of data used for this present research is secondary data. Secondary data are information gathered by others for initial purposes which are different from researchers' ones. In contrast, primary data are original data collected by the researchers for the research problem at hand (Ghauri and Grønhaug 2002).

The main advantage of using secondary data is getting access to information that is readily available. Company documents such as annual financial reports and patent applications are usually available in public domain and are also likely to be of good quality since the documenting process has to follow the jurisdiction and regulation of the country they were filed (Thomas 2004).

In addition, documents and records are regarded as non-reactive, unobtrusive sources of data (Thomas 2004). The advantage of this unobtrusive measure is referred to as eavesdropping, emphasising its benefits for sensitive situations (Saunders et al. 2007). Besides, because secondary data are produced before the research commences, their content cannot have been influenced by the researcher's presence (Thomas 2004). Secondary data also allows for large samples to be obtained relatively easily. In this research, company information are available from databases, directories and news archives which means that large samples can be studied without having to secure data directly from each firm (Thomas 2004).

Secondary data is also well-suited for historical studies (Thomas 2004). As described in section 5.5.4.2.1 the present research applies historical analysis as part of the data collection method. Secondary data in the form of documentary records provides access to past events when companies cease to exist or when relevant former managers cannot easily be reached such as in the case of the present study (Thomas 2004). In this research, company histories were reconstructed from corporate and news archives.

Finally, research based on documentary sources does not require encounters with research subjects. Therefore, many of the ethical issues that may arise when dealing face to face with research participants can be avoided (Thomas 2004). Furthermore, all documents used in this research can be accessed online from databases and archives at the researcher's convenience.

There are some drawbacks in using secondary data. One of the main problems is secondary data entails information collected for a purpose that differs from the research question or objectives (Saunders et al. 2007). Consequently, the data may only be able to partially answer or address the research question. As such, in most secondary data research, including the present thesis, a number of different sources need to be consulted to fully meet the research objectives. Consequently, constructing a new database from multiple sources to meet research objectives requires significant investments of time with respect to planning and execution.

Another drawback of using secondary data is the time required by a researcher to become familiarised with each data source used. This is especially true for complex data such as when data are collected and presented at multiple level of analysis (i.e., firm level, project level, product level or employee level) (Bryman and Bell 2011). In contrast, a researcher who uses primary data is familiar with the structure and content of the data.

Finally, access to secondary data may be costly especially when they have been collected for commercial reasons (Saunders et al. 2007). For example, in the case of present research, the researcher had to apply for more research funding in order to gain access to Delphion, a commercial patent database that the university did not have access to. Subsequently, due to the high cost of subscription and limited funding, the access was limited to three months.

5.5.4. Sampling Strategy

5.5.4.1. Choice of Product Categories and Industries

Five criteria were used in the sampling strategy. First, the product categories are chosen from industries that exhibit high innovation. Two classes of products were identified to exhibit various degrees of innovation: office products and consumer durables. The two product classes have been studied in previous research on innovation diffusion and pioneering (Srinivasan et al. 2004; Chandy and Tellis 2000; Golder and Tellis 1993, 1997; Sultan et al. 1990). In addition, Thomson Reuters (2011) reports that computer hardware and software, telecommunication equipment and electrical products industries comprise the most the innovative companies in the world. This provides further support for choosing office products and consumer durables.

Four product categories were chosen specifically from office products and consumer durables product class. They are portable media players, portable computers, digital cameras and smartphones. The companies that make these products come from the SIC codes that overlap with the SIC codes of office products and consumer durables used in Hull and Covin (2010) study on innovation of high technology firms. SIC codes 3576, 3577, 3661, 3663, 3679, 3825 and 3845 were chosen by Hull and Covin in their 2010 study because they had among the 15 highest average R&D-intensity values of the larger industries identified within the COMPUSTAT database. High industry-average investment in R&D is a useful indicator of the importance of innovation to an industry, a significant consideration when studying innovation (Hull and Covin 2010; Cohen and Levinthal 1989). Table 5.1 highlights the SIC Codes and the corresponding industries represented by the firms in the sample.

Table 5.1: SIC Codes and the Corresponding Industries of Firms Incorporated in the Study

SIC Code	Industry Group	Major Group	Number of Company
3021	Rubber and Plastics Footwear	Rubber and Miscellaneous Plastic Products	1
3312	Steel Works, Blast Furnaces (Including Coke Ovens), and Rolling Mills	Primary Metal Industries	1
3570	Computer And Office Equipment	Industrial and Commercial Machinery and Computer Equipment	11
3571	Electronic Computers	Industrial and Commercial Machinery and Computer Equipment	23
3572	Computer Storage Devices	Industrial and Commercial Machinery and Computer Equipment	5
3575	Computer Terminals	Industrial and Commercial Machinery and Computer Equipment	3
3576	Computer Communications Equipment	Industrial and Commercial Machinery and Computer Equipment	2
3577	Computer Peripheral Equipment, Not Elsewhere Classified	Industrial and Commercial Machinery and Computer Equipment	8
3578	Calculating and Accounting Machines, Except Electronic Computers	Industrial and Commercial Machinery and Computer Equipment	1
3579	Office Machines, Not Elsewhere Classified	Industrial and Commercial Machinery and Computer Equipment	2
3600	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	13
3630	Household Appliances	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	2
3651	Household Audio and Video Equipment	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	14
3661	Telephone and Telegraph Apparatus	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	1
3663	Radio and Television Broadcasting and Communications Equipment	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	9
3674	Semiconductors and Related Devices	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	13
3679	Electronic Components, Not Elsewhere Classified	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	1

SIC Code	Industry Group	Major Group	Number of Company
3695	Magnetic And Optical Recording Media	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	1
3825	Instruments for Measuring and Testing of Electricity and Electrical Signals	Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks	1
3827	Optical Instruments and Lenses	Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks	1
3845	Electromedical and Electrotherapeutic Apparatus	Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks	2
3851	Ophthalmic Goods	Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks	1
3861	Photographic Equipment and Supplies	Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks	10
3942	Dolls and Stuffed Toys	Miscellaneous Manufacturing Industries	2
3944	Games, Toys, and Children's Vehicles, Except Dolls and Bicycles	Miscellaneous Manufacturing Industries	2
4813	Telephone Communications, Except Radiotelephone	Communications	2
4841	Cable and Other Pay Television Services	Communications	1
4888	Communication Services	Communications	1
4899	Communications Services, Not Elsewhere Classified	Communications	1
5045	Computers and Computer Peripheral Equipment and Software	Wholesale Trade-durable Goods	3
5051	Wholesale	Wholesale Trade-durable Goods	1
5065	Electronic Parts and Equipment, Not Elsewhere Classified	Wholesale Trade-durable Goods	2
5084	Industrial Machinery and Equipment	Wholesale Trade-durable Goods	1
5731	Radio, Television, and Consumer Electronics Stores	Home Furniture, Furnishings, And Equipment Stores	2
5734	Computer and Computer Software Stores	Home Furniture, Furnishings, And Equipment Stores	1
6794	Patent Owners and Lessors	Holding And Other Investment Offices	1
7370	Computer Programming, Data Processing, And Other Computer Related Services	Business Services	2
7372	Prepackaged Software	Business Services	2
7373	Computer Integrated Systems Design	Business Services	1

Table 5.1: SIC Codes and the Corresponding Industries of Firms Incorporated in the Study

Secondly, these product categories come from industries that not only exhibit high innovation but also high imitation. Bessen and Maskin (1999) argue that the most innovative industries of recent years including software, computers, and semiconductors have historically had weak patent protection and have experienced rapid imitation of their products. Patents in electronics industries were estimated to increase imitators' initiation costs by only 7% (Mansfield et al. 1981) or 7–15% (Levin et al. 1987), which results in rampant diffusion and imitation in these industries.

Portable media players, portable computers, digital cameras and smartphones are suitable candidates for this study because they come from fast-cycle markets. In fast cycle markets, firms' capabilities that contribute to competitive advantages are not shielded from imitation. Imitation in these markets is often rapid and inexpensive, facilitated by reverse engineering and fast rate of technology diffusion (Volberda et al. 2011). The technology often used by companies in fast-cycle industries has weaker patent protection in comparison to technology used by firms competing in slow-cycle markets. For example, patents protect only a small fraction of the parts that make up a PC. Most of the parts are readily available on the open market. Imitation of many fast-cycle products is also relatively easy, as demonstrated by Dell, HP and other PC vendors that have created their products based on the original PC design (Volberda et al. 2011).

These four product categories have also been littered with patent litigation and numerous lawsuits for patent infringements (Price Waterhouse Coopers 2012). This provides evidence of the use of imitation as a competitive strategy in these industries. Recently, smartphone companies such as Samsung and Apple have been countersuing each other for patent infringement (Albanesius 2011). Similarly, in portable music player, Quantum Research Group sued Apple, claiming that the technology used in the iPod Click Wheel infringe on patents that they hold (Cheng 2007). In 2006, Apple paid USD 100 million to Creative to settle a lawsuit over its infringement on a patent the company has for the interface in its portable music player (Apple 2006). Lucent Technologies sued Microsoft in 2007 for patent infringement in MP3 and MPEG technology (Burgender 2007). In another product category, Kodak sued Sony in 2004, claiming that Sony had infringed on its patents on digital camera technology (San Jose Mercury News 2004). Since then, Kodak and Sony have been counter suing each other for the control of 10 patents (The Toronto Star 2004). Price Waterhouse Coopers' Patent Litigation Study (2012) reports that the computer hardware/electronics, software and Internet/online services industries experienced an increase in patent litigation cases between 2006 and 2011. This provides further evidence that these industries exhibit a high level of imitation and are the most suitable candidates for sample selection in this study.

Furthermore, these industries were chosen because they were founded and developed in recent years; hence, the required data are still available. These industries are also mature enough that market entries over a significant portion of their life cycles could be tracked (Schoenecker and Cooper 1998).

Fourthly, these four product categories are relatively similar to each other. This is an important consideration in order to avoid the problems that can arise from a multiple industry bias (Kalyanaram and Urban 1992; Makadok 1998; Mascarenhas 1992; Mitchell 1991; Parry and Bass 1989; Shamsie et al. 2004).

Finally, these product categories were chosen because the categories survived. This study looks at the performance of firms undertaking an imitative entry in specific product categories over a certain period of time. Therefore product categories that did not survive such as minidisc players were not considered in the sample selection (Srinivasan et al. 2004). This criterion is consistent with the focus on the performance of entrants in product categories that proved to be viable, substantive, and managerially relevant (Srinivasan et al. 2004).

5.5.4.2 Identification of Imitative Entry in to a Product Category

Following Schmalensee (1982), Urban et al. (1986), Golder and Tellis (1993), and (Robinson and Min 2002), the current research conceptually defines a market pioneer as the first entrant in a product category that previously did not exist. Therefore, the operational definition of a market pioneer is the first entrant to serve either a regional or a national market in the United States. The US market was chosen for the present study as it has been widely adopted in innovation diffusion, pioneering and entry timing studies (e.g., Srinivasan et al. 2004; Chandy and Tellis 2000; Lee et al. 2000; Shamsie et al. 2004). The U.S. market was also chosen due to the country's reputation for innovation with 45 out of 100 organisations named the most innovative companies globally in 2013 were American companies (Thomson Reuters 2013). Although it was possible that a pioneering product was introduced elsewhere, the definition of a market pioneer and the subsequent market entries were restricted to entries into the U.S. market, which is consistent with prior empirical studies examining order of entry and entry timing (e.g. Lee et al. 2000; Robinson and Min 2002). In terms of scale of entry, the operational definition of the current research counts both nationwide entry (Urban et al. 1986) and local market entry Golder and Tellis's (1993) as entry into the market.

Using the historical analysis method (e.g., Golder and Tellis 1993; Robinson and Min 2002; Sood and Tellis 2005; Wang et al 2010), the pioneer in each of the four product categories was identified. The pioneers for portable media players, portable computers, digital cameras and smartphones product category are identified as Saehan (a Korean company), Osborne Computer, Eastman Kodak and Nokia respectively. Using the pioneer in each category as the starting point, subsequent entrants were traced forward for a maximum duration of ten years after the first entry was made using news archives, company histories, financial reports and online databases. The main online news archive database used was Nexis which provided the platform to search leading news sources such as Business Wire, PR Newswire, The New York Times, The San Francisco Chronicle, USA Today, Newsweek, among others, for product announcements containing relevant search terms. Table 5.2 summarises the search terms used to identify market entries into the four product categories.

Table 5.2: Search Terms

	Search terms
Market entry identification	'introduces', 'announces', 'unveils', 'releases', 'launches', 'arrives', 'available', 'premieres', 'presents', 'debuts'
Product identification	'portable computer', 'laptop', 'notebook', 'mp3', 'mp3 player', 'portable music player', 'portable audio player', 'digital camera',

	'smartphone', 'smart phone'.

The first article that reported an entry in the new product category created by the pioneer was classified as the initial imitative entry and the date of imitation was recorded (Lee et al. 2003). Subsequent imitative entries were identified in the same manner (Lee et al. 2003). Overall, the dataset includes 151 imitative entries in 4 product categories from 1981 to 2007. Section 5.5.4.2.1 describes historical analysis method in detail.

5.5.4.2.1. Historical Analysis

Historical analysis is defined as the process of critically examining and analysing the records and survivals of the past (Gottschalk 1969; Golder and Tellis 1993; Golder 2000). The records of the past used in this study consist of publicly available, published sources of information.

The primary advantage of historical analysis is that it provides information published at the time the new product category was emerging. The approach provides a prospective look at pioneering and product imitation because information is based on records written as the product category developed. In contrast, surveys or interviews with current survivors may be considered retrospective because the respondents report on events that occurred in the past (Golder and Tellis 1993).

Although survey research is useful for collecting current information, it can produce biased information when past events are recalled (Golder 2000). When reporting past events, respondents rely on personal recall or the oral tradition of the firm being studied (Golder and Tellis 1993). The historical approach to data collection is used for this research because it studies events from the past ranging from recent to distant past. The dataset in the present study includes companies that entered the four product categories from 1981 to 2007. Therefore, historical analysis is the most suited means to identify the accurate date of entry of each company. A number of companies in the sample have long ago ceased to exist or have since merged or have been acquired by other companies. Therefore, identifying and contacting suitable candidates for interview or survey would have proven impossible. Even if the key informants were successfully identified and located, the approach of surveying or interviewing managers would have suffered from severe memory or self-report biases (Chandy and Tellis 2000).

Historical analysis is a method that is best suited for analysing the effects of order of market entry and product imitation especially because the records of non-survivors are sparse (Golder and Tellis 1993). Previous research on first mover advantage and order of entry mainly used PIMS and ASSESSOR database (Urban et al. 1986; Golder and Tellis 1993). The limitation of using these two databases is that it posed a sampling bias from including only survivors (Day and Freeman 1990; Golder and Tellis 1993). Therefore, the use of historical analysis method solves the sampling bias issue.

Another advantage of historical analysis is the use of narratives from multiple neutral observers such as reporters, industry experts, and government body representatives. In contrast, surveys tend to rely on self-reports of one or two informants in the firms being studied. In addition to avoiding single informant bias, the historical approach is more likely to generate data that are factual rather than interpretive (Golder and Tellis 1993), which fits the post-positivist approach of this present study.

Finally, the historical approach enables accurate identification of firms' market entry and date of entry. Therefore, all entries that meet the operational definition in section 5.5.4.2 are recorded, allowing for both survivors and non-survivors to be in the sample. Historical analysis also allows the study of the effects of time and order of entry on product performance. In addition, historical analysis provides the ability to assess causality through longitudinal observation (Sood and Tellis 2005; Golder 2000; Tellis and Golder 1996). Furthermore, the reliability and objectivity nature of data (Golder and Tellis 1993) provided by historical analysis fits the worldview, objective and the design of the present research. Overall, more than 4,000 articles and periodicals in the Nexis database were consulted to gather information on firms' entry date. The information search and data collection tasks were time and effort intensive, involving a period of 14 months.

In sum, historical analysis captures the longitudinal nature of market evolution, the competitive dynamics within the product market and eliminates problems plaguing earlier studies on entry timing (e.g., survivor bias and respondent bias from self-report of entry order) (Abel 2008). Due to its many advantages over other research methods, historical analysis was adopted for the current research.

5.6. Operationalisation of Constructs

5.6.1 Dependent variable: Product Survival

Consistent with Shamsie (2004), the performance of the imitators was determined by its survival in the new product category beyond the first 4 years. The exit of each entrant was verified through archival records derived from Nexis database and Thomson One Banker, company websites, press releases and financial reports to shareholders. Survival was measured by the use of a dummy variable that took a value of 1 if the entrant had survived the 4-year period and 0 if it had dropped out of the market.

Although product performance can also be measured in terms of market share and profitability, these measures are not included in the present research. Scholars have highlighted a number of problems from using market share as a performance measure in entry timing empirical studies (Lieberman and Montgomery 1988, 2013). First, in a growing market there will be some spurious correlation between market share and entry order, which leads to a bias result favouring early entrants. Second, a relatively small market share does not mean that a firm does not perform well as some firms deliberately choose niche strategies.

Despite the availability of historical accounting data for public companies, most companies do not report their profits at the product level making secondary data collection almost impossible. Profit level incurred by firm is also largely dependent upon when the data is collected leading to inaccurate representation of product performance (Lieberman and Montgomery 2013). As companies tend incur loss during the introduction period and destructive competition tends to eliminate profits as the market matures, measuring product profitability during these periods may result in disproportionately low profitability for firms. In contrast, firms typically show higher profits when the market is growing, giving a distorted picture of firm's profitability that reflects industry life cycle rather than product performance (Lieberman and Montgomery 2013).

5.6.2. Independent variables

5.6.2.1. Strategic orientation

Sabherwal and Sabherwal (2007) identify seven attributes of Defenders, Analysers, and Prospectors. The seven attributes consist of scope, product-market dynamism, firm-level uncertainty, liquidity, asset efficiency, fixed asset intensity, and long-range financial liability. These attributes or variables are used to classify firms into the three strategies of Defenders, Analysers, and Prospectors. However, due to unavailability of data, two of the attributes, namely scope and product-market dynamism were dropped from the original seven attributes. Scope and product-market dynamism were measured by Sabherwal and Sabherwal (2007) using the number of four-digit SIC code and the mean of change in SIC codes respectively. The four-digit SIC codes identify the industries the firm participates in. The higher the number of industries a firm engages in, the bigger the scope. Similarly, the higher the mean of change in SIC codes, the higher the level of product dynamism of the firm. In their research, this historical data on SIC codes were derived from Compustat. In contrast to Sabherwal and Sabherwal's study (2007), the sample firms in the current research include international companies that entered the US market. As Compustat does not produce historical SIC data of international companies, it was not possible to measure the attributes of scope and product-market dynamism for the present study. In addition, some of the companies in the sample did not exist long enough before their entries into the market. This then restricts the opportunity to observe the change and dynamism in the scope of products for the young companies prior to their entry into the specific product category. As such, scope and product-market dynamism were excluded from the classification measurement of strategic orientation. Table 5.3 summarises the ideal levels for these five attributes, which are set at low, medium, or high for the three strategies.

Table 5.3: Characteristics of Defenders, Analysers and Prospectors

Construct	**Explanation**	**Ideal values for three strategies**			**References**
		Defenders	**Analysers**	**Prospectors**	
Firm-level uncertainty	The uncertainty encountered by the firm, due to changes in the firm's technologies, market shares, prices, and so on. It resembles "firm-specific uncertainty" (Demsetz and Lehn 1985) and "environmental turbulence" (Doty et al. 1993).	Low	Medium	High	Doty et al. 1993
Liquidity	The availability of current assets, such as cash, needed to meet the firm's short term obligations. Segev (1989) used a variable with the same name.	Low	Medium	High	Segev 1989; Smith et al. 1989
Asset efficiency	The firm's ability to utilise its assets in an efficient fashion so as to generate greater sales. It is related to previously used variables called "efficiency" (Miles and Snow 1978) and "focus on efficiency" (Doty et al.1993)	High	Medium	Low	McDaniel and Kolari 1987; Segev 1989; Langerak et al. 1999; Doty et al. 1993
Fixed-asset intensity	The extent to which the firm invests in fixed assets, such as plant and machinery rather than current assets. Hambrick (1983) used a variable with the same name. It is also similar to previously used variables called "capital intensiveness" (Beared	High	Medium	Low	Hambrick 1983; Segev 1989

	and Dess 1981), and "investment in production" (Segev 1989).				
Long-range financial liability	The firm's long-term debt relative to its equity. A high value of long-term financial liability reflects lower long-term financial strength, which refers to the firm's ability to raise financial resources for long-term investments through owner's equity or debt at a minimal price (Segev 1989)	Medium	Low	High	Segev 1989; Smith et al. 1989; Delery and Doty 1996

Table 5.3: Characteristics of defenders, analysers and prospectors (Source: Adapted from Sabherwal and Sabherwal 2007, p. 412)

As illustrated in Table 5.3, the Defender stresses on operational efficiency and economies of scale. Therefore, it has greater asset efficiency (McDaniel and Kolari 1987; Segev 1989) and fixed-asset intensity (Hambrick 1983) than that of the other firms. Among the three types, the Defender encounters least uncertainty. The Defender's long-term financial liability is more than the Prospector's but less than the Analyser's (Segev 1989). In theory, the Defender should have a lower level of liquidity compared to other firms because it does not pursue quick opportunities (Segev 1989).

In contrast to the Defender, the Prospector continually seeks innovativeness and flexibility in technology. Therefore, it has lower fixed asset intensity than that of the other firms (Hambrick 1983). The Prospector's flexible tendency means that it requires greater liquidity (Segev 1989; Smith et al. 1989), which in turn reduces its operational efficiency (McDaniel and Kolari 1987). Furthermore, the Prospector encounters the greatest uncertainty compared to others (Doty et al. 1993).

The Analyser shares some similarities with the Prospector and the Defender in terms of its characteristics. In order to address the conflicting demands of efficiency and innovation, the Analyser maintains the lowest long-term financial liability (Segev 1989), but it lies between the other two types in terms of liquidity, asset efficiency and fixed asset intensity (Hambrick 1983; Langerak et al. 1989; McDaniel and Kolari 1987).

An additional variable, research and development (R&D) intensity was used to validate the classification. The Prospector was found to have greater R&D intensity than that of the Defender (Hambrick 1983), but its difference with the Analyser in R&D intensity has not been examined (Sabherwal and Sabherwal 2007).

Data from several databases including COMPUSTAT, the Center for Research in Security Prices (CRSP), Thomson One Banker, Datastream and the firms' annual reports and 10-Ks statements were used to compute business strategy attributes and validation variables. Table 5.4 summarises these measures.

Table 5.4: Measures of Variables Used to Classify and Validate Miles and Snow's (1978) Strategic Types

Variables	Data Sources	Measures
Classification Variables		
Firm-level uncertainty	CRSP, Datastream	Variability of firm's returns, computed as the standard deviation of the daily idiosyncratic returns of the firm for the year prior to market entry. Daily idiosyncratic return was computed as residual in the OLS regression of the firm's daily return on the equally-weighted market portfolio (Demsetz and Lehn 1985; Bhushan 1989).
Liquidity	COMPUSTAT, Thomson One Banker, firm annual reports and 10-Ks	Current ratio = Current assets/current liabilities
Asset efficiency	COMPUSTAT, Thomson One Banker, firm annual reports and 10-Ks	Total asset turnover = Sales/total assets
Fixed asset intensity	COMPUSTAT,	Fixed assets / Total assets

	Thomson One Banker, firm annual reports and 10-Ks	
Long-range financial liability	COMPUSTAT, Thomson One Banker, firm annual reports and 10-Ks	Debt to equity ratio
Validation Variables		
R&D intensity	COMPUSTAT, Thomson One Banker, firm annual reports and 10-Ks	R&D expense/ net sales

Table 5.4: Measures of Variables Used to classify and Validate Business Strategy (Source: Adapted from Sabherwal and Sabherwal 2007, p. 415)

Following Sabherwal and Sabherwal (2007), the firms in the sample were categorised into the three strategic types based on the proximity of each firm's business strategy to the ideal profiles for Defenders, Prospectors, and Analysers summarised in Table 5.3 above.

In order to classify the sample firms into the appropriate strategic types proposed by Miles and Snow (1978), normalised scores of +0.5, zero, and –0.5 were assigned to the ideal profiles of strategic type attributes of high, medium, and low respectively described in Table 5.3 (Sabherwal and Chan 2001; Sabherwal and Sabherwal 2007). As such, the ideal scores of high, medium, and low on a strategic type attribute were assumed to be equal to half standard deviation larger than, the same as, and half standard deviation less than the sample mean, respectively (Sabherwal and Sabherwal 2007).

The next step involved calculating the Euclidian distance between each firm's strategic type and the three ideal strategic types (Sabherwal and Sabherwal 2003). The strategic type a firm was classified into was determined by the lowest distance to that of the type (Sabherwal and Sabherwal 2007).

In cases where two distances shared the same lowest value, the validation variable of R&D intensity summarised in Table 5.5 was then used to classify the firm into the appropriate group. However, such case was only encountered for three firms.

Table 5.5: Validation of the Classification into Defenders, Analysers and Prospectors

	Defenders	**Analysers**	**Prospectors**	**References**
R&D Intensity	Low	?	High	Hambrick 1983

Table 5.5: Validation of the Classification into Defenders, Analysers and Prospectors (Source: Adapted from Sabherwal and Sabherwal 2007, p. 415

This classification was validated using ANOVA to check for the differences in the means of five variables across the three strategic types. The result of the validation test is discussed in Section 7.5.4.3 in Chapter 7.

5.6.2.2. Resources

5.6.2.2.1. Marketing Resources

Marketing resources were measured as the ratio of the SGA (selling, general and administrative) expenses to total revenues for the company. The data was collected from Compustat, Thomson One Banker, firm annual reports and 10-Ks and were averaged for two years: the year prior to market entry t_{-1} and year of entry t_0. The two-year-average for marketing resources was used because resource allocations are likely to be more stable when viewed over a longer time frame (He et al. 2006).

SGA intensity is used as the measure for marketing resource instead of advertising intensity for a number of reasons. First, almost all companies in all industries and countries report SGA expenses, whereas advertising expenses are not consistently reported across industries and countries (Krishnan et al. 2009). Second, some companies such as Dell (Darlin 2007) and Gateway (Ogg 2007) in the PC industry employed direct selling to communicate to consumers about their products rather than using advertising. In this case, these expenses are a part of the SGA expense reported by the companies rather than reported as advertising expenses (Krishnan et al. 2009).

5.6.2.2.2. Technological Resources

Technological resources are defined as the commitment that a firm makes to research and development (Mahoney and Pandian, 1992). Therefore, technological resources were measured as the ratio of the research and development (R&D) expenses to total revenues for the company (Schoenecker and Cooper 1998). Similar to marketing resources, the data was collected from Compustat, Thomson One Banker, firm annual reports and 10-Ks and were averaged for two years: the year prior to market entry (t_{-1}) and year of entry (t_0).

5.6.2.3. Capabilities

5.6.2.3.1. Marketing Capability

Capabilities represent the firm's ability to combine efficiently a number of resources to engage in a productive activity and achieve a specific objective (Amit and Schoemaker 1993). Dutta et al. (2005) argue that capabilities can therefore be thought of as the firm's efficiency in using the inputs available to it and converts them into the outputs set as their objective. Capabilities are therefore, 'intermediate transformation ability' between resources and objectives (Dutta et al. 2005).

5.6.2.3.1.1. Stochastic Frontier Analysis

The method of estimation using observable resources to infer the superiority of the firm's transformative processes is closely tied to the notion of capabilities in the RBV tradition (Naramsihan et al. 2006). The current research adopts the Stochastic Frontier Estimation (SFE) method to measure marketing capability. This input-output approach is appropriate for this research because it recognises the linkages between resources (inputs) and objective (outputs) and the moderating role of capability (Dutta et al 1999). Given identical resources, a firm with a higher functional capability will be able to achieve a higher functional objective/output and similarly, given identical functional capability, a firm with a larger endowment of resources will be able to achieve a higher functional objective output (Dutta et al 1999). The SFE methodology provides the appropriate technique to empirically estimate the efficient frontier and hence the level of efficiency achieved by the firms in the sample in their marketing activities (Dutta et al. 1999).

Based on the above reasoning, the objective of the marketing function is to use the resources available to them to maximise revenue or sales (Dutta et al. 1999; Naramsihan et al. 2006). Sales are used as the objective because the goal of marketing at the firm level is to enhance the value of the firm's products in the minds of its existing and potential customers. This goal is reflected in increased sales through the firm's marketing activities (Dutta et al 1999). Consistent with Naramsihan et al. (2006), the resources used for marketing capability estimation in this study are the level of sales, general and administrative expenditures (SGA) and the level of its receivables. The level of receivables is used in the estimation because it reflects investments in customer relationship (input) in order to maximise sales (output). Given this set of resources, Stochastic Frontier Estimation (SFE) methodology estimated the maximum amount of sales the firm could have achieved. Firms often cannot reach the maximal level in the frontier due to random shocks and the inefficiency of a firm in transforming the resources into outputs (Xiong and Bharadwaj 2011). In reality, a firm may fail to attain optimal results because of inefficient deployment of resources (allocative inefficiency) and/or inefficient utilisation of resources (technical inefficiency) (Dutta et al. 1999). The input-output approach used in this research recognises the presence of these inefficiencies and link them to the notion of a firm's capability postulated in the RBV literature (Dutta et al. 1999). SFE estimation infers that the closer the firm's actual sales were to this estimated maximum, the higher its marketing capability (Naramsihan et al. 2006). Hence, the marketing frontier/ transformation function can be put formally as:

(M1)

$Sales =$

$f(Sales, General\ and\ Administrative\ Expenditures, Receivables, Environmental$

$Conditions + \ \varepsilon_{it} - \eta_{it})$

where

Environmental Conditions = represent market conditions and serve to ensure that external conditions are controlled for across the firms in the sample, and

$\varepsilon =$ is the random shock, and

$\eta =$ the inefficiency of transforming marketing resources into output

Because marketing capability is the efficiency of intermediate transformation ability, marketing capability is measured using the estimation of inefficiency term η_i. To determine the marketing capability or the transformation function, the natural logarithm were taken on both sides of Equation M1, for firm *i* in year *t* during the previous two years before market entry. Therefore, the transformation function can also be written out in the following econometric specification:

(M2)

$$\ln(SALES_{it}) = \alpha_0 \ + \ \alpha_1 \ln(SGA_{it}) + \ \alpha_2 \ln(RECEIVABLES_{it}) + \\ \alpha_3 \ln(ENV\_CONDS_i) + \ \varepsilon_{it} - \eta_{it}$$

where

$SALES_{it}$ = actual sales achieved by firm *i* in year *t*,

SGA_{it} = SGA expenditure of firm *i* in year *t*,

$RECEIVABLES_{it}$ = level of receivables of firm *i* in year *t*,

ENV_CONDS_i = market conditions (dummy variables based on the four-digit SIC code of firm *i*

Following Dutta and colleagues (1999), two assumptions were made regarding the distribution of the error terms ε_{it} and η_{it}. First, the random shock ε_{it} was assumed to be normally distributed with mean zero and variance σ_ε^2, i.e. $\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$. Second, the marketing capability inefficiency error component η_{it} was assumed to be distributed truncated normal (i.e. η_{it}>0) with mean μ >0 and variance σ_η^2, i.e., $\eta_i \sim N(\mu, \sigma_\eta^2)$.

To enable estimation, further assumptions were made on the error terms. The two error terms of ε_i and η_i were assumed to be independent, i.e., E[$\varepsilon_{it}\,\eta_{it}$] = 0 (Naramsihan et al. 2006). In addition, the two error components (ε_i and η_i) were also assumed to be independently distributed of the independent variables in the Equation M2, i.e., E[$X'_{it}\varepsilon_{it}$] = E[$X'_{it}\eta_{it}$] = 0 (Xiong and Bharadwaj 2011).

Given the assumptions, the maximum likelihood estimates of the parameters μ, σ_ε and σ_η (mean of η_i, variance of ε_i and η_i) were then derived following Battese and Coelli (1992). A consistent estimate of the inefficiency term η_i can then be obtained from the mean of conditional distribution f($\eta\ |\xi$)[5] (Xiong and Bharadwaj 2011) using the SFE function in STATA software.

Finally, the estimation of η_i was rescaled to be between 0 and 100 (Xiong and Bharadwaj 2011). The marketing capability of firm *i* in period *t* was measured as 100 - η_i^* (the higher the inefficiency, the lower the marketing capability).

5.6.2.3.2. Technological Capability

This research uses patent data to measure technological capability possessed by the firm. Patents have been used extensively to capture technological capabilities, innovation activities and innovation outputs in previous studies (Ahuja and Katila 2001; Argyres and Silverman 2004; Sampson 2005; He et al. 2006; Zheng et al. 2010; Kendall et al. 2010; Kotha et al. 2011). Patent data were drawn from the United States Patent and Trademark Office (USPTO) and Delphion. USPTO patent data was chosen for two reasons. First, even though the sample consists of American and international firms, they are derived from entries into the U.S. market. Thus, it is imperative that firms competing in this market obtain U.S. patents protection for all their key inventions. Second, the USPTO has the largest collection of patents in the world (He et al. 2006). As such, U.S. patent data is one of the best available measures of innovation output and technological capability, and one that is reasonably comparable across firms in the sample (He et al. 2006).

There is also another advantage of using U.S. patent data for all firms, including the foreign firms in the sample. It was necessary to maintain consistency, reliability, and comparability, as patenting systems across nations differ in their application of standards, system of granting patents, and value of protection granted (Ahuja and Katila 2001). Studies by Dosi and colleagues (1990) and Basberg (1983) show empirically that U.S. patent data provide a good measure of foreign firms' innovativeness (Ahuja and Katila 2001). Prior research using patent data has also followed this strategy of using U.S. patent data for international firms (e.g., Stuart and Podolny 1996; Patel and Pavitt 1997; Ahuja and Katila 2001).

However, patent search is not a straightforward task. Assignees obtain patents under a variety of names (their own and those of their subsidiaries), and the USPTO does not keep a unique identifier for each patenting organisation from year to year (Hall et al. 2005). In addition to firms patenting under a variety of names (sometimes for strategic purposes), the difficulties in accurate patent search is compounded by the fact that there are numerous spelling mistakes in the names and the wide use of abbreviations (Hall et al. 2005). To solve the matching of assignee and patent problem, Delphion was used in the present research as an online tool for patent search in the USPTO database. Delphion helps end the confusion caused by mergers and acquisitions and the many variations an assignee's name can be represented on a patent document. Delphion also provides the means to find patents applications filed by companies that no longer exists as legal entities and whose patents have been reassigned to new owners. Therefore, a more accurate patent search can be achieved from using Delphion rather than using USPTO database on its own.

A number of previous studies used the number of patents filed by firms as a measure of technological capability (Kotha et al. 2011; Moorman and Slotegraaf 1999) and level of invention activity (Kendall et al. 2010) and innovation performance or output (Ahuja and Katila 2001). Using patent count as a measure of technological capability is problematic and poses some challenges. For example, patents differ greatly in their value, technical and economic significance, some inventions are not patentable because not all inventions meet the patentability criteria while others are not patented (Griliches 1990; Hall et al. 2005; Cohen and Levin 1989; Trajtenberg 1990; Ahuja and Katila 2001). Patenting strategies vary significantly: some firms file for many defensive patents 'around' their primary patents to prevent competitors from competing with their new products while others decide not to file for many patents in order to keep their new innovations secret (Hall et al. 2005; Coombs and Bierly 2006).

To compensate for these problems, forward patent citation is used in this research as a proxy for technological capability (Kotha et al. 2011). Forward patent citation is the extent to which a firm's patents are cited in subsequent patents. It represents technological capability because it measures invention quality, impact and importance. It reflects the ability of a set of patents to support future inventions by stimulating subsequent patents (Makri et al. 2010; Stuart 1999; Chandy et al. 2006).

Technological capability is measured as the average number of citations, net of self-citations, received by patents filed by the firm in the year prior to market entry (t_{-1}) (citations received/count of patents) observed in five subsequent years (t_0, t_1 , t_2, t_3, t_4 respectively). Most patent citations tend to occur within a few years after the grant date, peaking at the third year. Hence, the use of a five-year window does not cause significant right-censoring bias (Hall et al., 2005; Kotha et al. 2011). This citations-per-patent ratio (Kotha et al. 2011; Makri et al. 2010), becomes the measure of a firm technological capability.

Because efficiency is used as a measure of marketing capability, one would consider the same methodology to be used in measuring technological capability. For example, Dutta and colleagues (1999) employed SFE in their estimation of both marketing and R&D capability. However, using SFE to measure a firm's efficiency in transforming its technological resources such as R&D intensity and innovation stock (citation weighted patent count) into its objective such as the number of new patent application is problematic. Note that one must take the natural logarithm of the data on both sides of the input-output equation (Xiong and Bharadwaj 2011). However, many of the firms in the sample have 0 output (i.e., new patent application) in a given year. Because it is not possible to take the natural logarithm of 0, the data has to be modified which, may affect the accuracy of the efficiency result. As such, firms' patent forward citation was chosen as a measure of technological capability.

5.6.2.3.3. Absorptive Capacity

In agreement with Cohen and Levinthal's (1990) definition that absorptive capacity is multidimensional, encompasses a firm's ability to value, assimilate, and apply knowledge, Zahra and George (2002) argue that absorptive capacity are comprised of two subsets: potential and realised (PACAP and RACAP). To address the multidimensional nature of absorptive capacity construct and the specific capabilities that absorptive capacity comprises, the absorptive capacity was measured by the operationalisation of its two subsets: PACAP and RACAP.

5.6.2.3.3.1 Potential Absorptive Capacity

Potential absorptive capacity comprises knowledge acquisition and assimilation capabilities. As such, potential absorptive capacity is measured in the present research by the number of cross-firm patent citations (Cockburn and Henderson 1998; Zahra and George 2002) made by the firm during the year prior to market entry (t_{-1}) to capture for external knowledge acquisition and assimilation.

The analysis of backward citations (citations made to other patents by the focal patent) has been used to map knowledge flows. By citing prior art, the firm provides evidence that the knowledge contained in those past patents is now a part of the firm's current knowledge set (Ahuja and Katila 2001). If firm A cites a patent granted to firm B, this suggests firm A builds its patent upon the knowledge possessed by firm B (He et al. 2006).

Patent backward citation not only conveys information about the innovation spillover across location and institutions (Hall et al. 2005), it has also been used to measure the novelty of an idea (Hall et al. 2005; Chandy et al. 2006). Higher backward citations imply lower novelty (Chandy et al. 2006). This indicates that a higher cross-firm backward citation implies not only lower novelty but also that the knowledge or idea comes from an external patent. Based on this reasoning, potential absorptive capacity is measured as the average number of backward citations, net of self-citations, cited in patents filed by the firm in year t_{-1} (year prior to entry).

5.6.2.3.3.1 Realised Absorptive Capacity

Realised absorptive capacity is a function of the knowledge transformation and exploitation capabilities; therefore, it reflects the firm's ability to leverage the knowledge that has been absorbed (Zahra and George 2002). To measure this transformation and exploitation capacity, intermediate outputs, specifically the number patents filed is used. Because realised absorptive capacity in the form of innovative outputs is likely to lag behind potential absorptive capacity activities, it is measured as the number of new patents applied by firms in the subsequent year (t_0).

5.6.2.4. Imitative Market Entry Strategy

5.6.2.4.1. Entry Timing

Entry timing is operationalised in two ways. The first method is defined as move timing, which is the number of months elapsed between the date of the introduction of the pioneering product and the entry date of each imitative entry (Schoenecker and Cooper 1998; Lee et al. 2000). Measuring entry timing in months has the advantage of more likely reflecting strategic decisions about the time period when a firm decided to enter the industry (Schoenecker and Cooper 1998).

The second operationalisation was order of entry. The pioneer that first entered the market is labelled as order 1, the second entry is labelled as order 2, and subsequent entries are labelled in the same manner (Lee et al. 2000). Order of entry provides information about the number of competitors that had already entered the industry when the firm entered the market (Schoenecker and Cooper 1998).

5.6.2.4.2. Relative Product Advantage

When deciding an imitative entry strategy a firm may decide to enter a market with a "me-too" product or improve upon existing product by adding new features and functionalities (Schnaars 1994; Shankar et al. 1998).

The measure of relative product advantage used in the current study was similar to those used by Shamsie et al. (2004) and Green et al. (1995) in their study of entry timing. The degree of relative product advantage for each subsequent product entry was measured by a count of new product features listed under product reviews found in news archives. Multiple sources were consulted to ensure accuracy and consistency of product features. They include articles from US national and local newspapers and magazines from Nexis database, Consumer Product Magazine, PC Magazine, CNET reviews and company press releases. The relative measure was then derived by dividing the number of new product features for each product entry by the existing number of product features that were listed for previous entrants.

5.6.2.4.3. Relative Price

The measure of relative price was obtained using a methodology that was developed by Willard and Cooper (1985) and adopted by Shamsie et al. (2004). Relative price for each product entry was reported as a percentage of the average price calculated from the products of all significant competitors that entered the U.S. market in the same year and during the second half of the previous year. Similar to relative product innovation, data on price was derived from news archive, such as nationwide and local newspapers, Consumer Reports, PC Magazine and product review websites such as PC World, CNET, Engadget.com and many more.

5.6.2.5. Controls

5.6.2.5.1. Industry

Although the companies in the four product categories are similar, the sample firms come from different industry groupings. Therefore, it was important to control for possible differences between these industries groupings. Dummy variables were used to separate the SIC groups.

5.6.2.5.2. Product Category

It is possible that there are variances in terms product survival, relative product advantage and entry timing among the four product categories. Hence, the effects of product categories were controlled for by assigning dummy variables to the product categories.

5.6.2.5.3. Firm's Age

A measure of age was included to control for its influence on product performance. Furthermore, firm's age would tend to be closely tied to its accumulated resources as reflected by its overall size (Shamsie 2004). Age was measured by subtracting the year in which the firm was founded from the year that it made its entry into the product market.

5.6.2.5.4. Tobin's Q

Firm value was control by including the measure of Tobin's q ratio. The current research used the widely accepted operationalisation of Tobin's Q as the market value of assets divided by the book value of assets (Brown and Caylor 2006; Bebchuk and Cohen 2005; Gompers et al. 2003; Kaplan and Zingales 1997; Uotila et al. 2009). The data required to calculate the Tobin's q ratio was obtained from COMPUSTAT and Thomson One Banker.

5.6.2.5.5 Four-firm Market Concentration Ratio

The research also controlled for industry concentration. Industry concentration is measured by the share of industry sales produced by the four leading firms during the market entry year of each firm (Lee et al. 2000). The data were derived from the US Census Bureau report for each entry year.

5.7. Summary

Chapter five explained how the scientific research paradigm and philosophical stance influenced the decisions made with regards to the research design and methods chosen for this research. This chapter also provides a detailed description of the methods employed in the current study. Finally, this chapter has provided a thorough overview of measures and operationalisation of constructs that made hypothesis testing possible. The next two chapters highlight the main findings of this research.

CHAPTER 6: DATA PREPARATION & DESCRIPTIVE ANALYSIS

6.1. Introduction

There are three aims for this chapter. The first is to address the initial steps in the data analysis process: data preparation and screening procedures. Data preparation and screening procedures performed include the detection and treatment of missing values and outliers and testing for any deviations from the normality assumptions. Second, the descriptive statistics analysis of the variables is discussed. Third, the correlation matrix is presented and the correlations among variables are deliberated.

6.2. Data Preparation and Screening

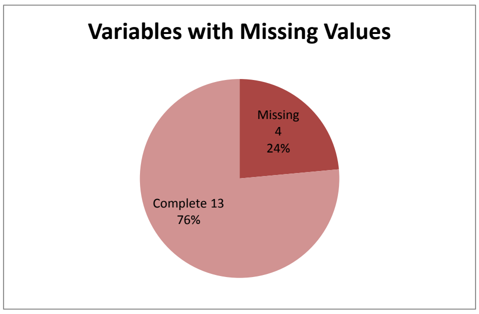
6.2.1. Treatment of Missing Values

Missing data describes the situation faced by a researcher when valid values on one or more variables are not available for analysis (Hair et al. 2010). Missing data may arise from respondents providing incomplete answers in a questionnaire to varying degrees (Malhotra 1987) or incomplete data obtained from other sources such as time series (e.g., Rao and Bass 1985) or data collected from a variety of secondary sources (e.g., Robinson and Fornell 1985). In the case of present research, missing data occur as a result of data being collected from various secondary sources.

Failure to address the issue raised by missing data may affect the generalisability and the internal validity of the findings (Hair et al. 2010). When faced with missing data, a researcher needs to first find out how much data is missing (Hair et al. 1995). Second, the researcher needs to ascertain if the missing data is scattered randomly or if it follows a pattern (Hair et al. 1995). It is important to determine the extent of missing data because if treatments of missing data are not applied, any observation with missing data on any of the variables needs to be dropped from the analysis. This in turn would result in a reduction of the sample size available for analysis (Hair 2010). In general, missing data under 10 percent for a particular variable can be ignored (Cohen and Cohen 1983) except when the missing data occur in a specific non-random pattern (Hair 2010).

The first step taken by the researcher in dealing with missing data is to assess the extent of missing data. The motivation behind this step is to determine whether the amount of missing data is large enough to potentially affect the results (Hair 2010).

The sample data consists of 148 companies and 17 variables. Figure 6.1, 6.2 and 6.3 show the overall summary of the missing values in the sample by variables, cases and data points. Out of 17 variables, 4 variables (24%) have missing data in them. The second pie chart indicates that 114 (77%) cases are complete while 34 cases (23%) have missing data. Finally only 44 or 2% of data points in the dataset are incomplete.



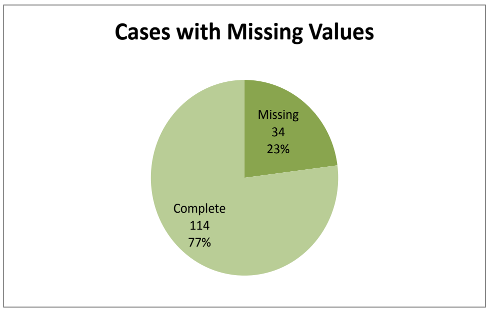


Figure 6.1: Missing Values by Variables **Figure 6.2: Missing Values by Cases**

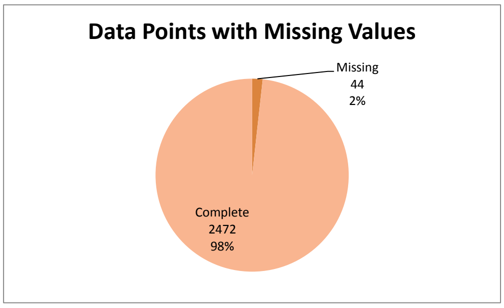


Figure 6.3: Missing Values by Data Points

Table 6.1 presents a summary statistics of missing data. The variable with the highest percentage of missing data is R&D intensity (19.6%), followed by SGA intensity (4.7%), and marketing capability (4.7%). Data for R&D intensity, SGA intensity and marketing capability were collected from companies' annual financial report.

Table 6.1: Summary Statistics of Missing Data

			Missing Data	
No.	**Construct**	**Variable**	**Number**	**Percent (%)**
1.	Strategic orientation	Analyser, defender, prospector	0	0
2.	Marketing resource	SGA intensity	7	4.7
3.	Technological resource	R&D intensity	29	19.6
4.	Marketing capability	Efficiency term (derived from SFE analysis of marketing input and output)	7	4.7
5.	Technological capability	Forward citation	0	0
6.	Potential absorptive capacity	Backward citation t_{-1}	0	0
7.	Realised Absorptive Capacity	Number of patents t_0	0	0
8.	Imitative market entry strategies	Order of entry	0	0
		Entry lag in months	0	0
		Relative product advantage	0	0
		Relative price	0	0
9.	Product performance	Product survival	0	0
10.	Controls	Age	0	0
		Market concentration	0	0
		Tobin’s Q	1	0.7
		Product category	0	0
		SIC code	0	0

Missing data are caused by relevant information not reported by the companies for that particular year. The most common imputation method and the easiest to apply in dealing with missing quantitative information is to only include companies with complete information and drop companies that do not have complete data on the variables of interest (in this case R&D intensity, SGA intensity and marketing capability) from the data set (Pigott 2001).

However it is imperative for a researcher to identify the extent of missing data and to identify the patterns and relationships underlying the missing data in order to keep as close as possible the original distribution of values when applying a remedy (Hair 2010). Companies with missing data on R&D intensity constitute 19.5% of the sample size. Therefore, deleting the companies with missing data will significantly reduce the sample size and hence lower the statistical power of any analysis (Hair 2010).

Having established that the extent of missing data is substantial enough to warrant action, the next step is to determine the degree of randomness present in the missing data (Hair et al. 2010). This will then determine the appropriate remedy. MCAR (missing completely at random) test was performed to diagnose the levels of randomness in the missing data. This test determines if the observed values of Y are truly a random sample of all Y values, with no underlying process that lends bias to the observed data. The missing data is categorised as MCAR if the missingness does not depend on the observed or missing values of *y* (Rubin 1976) or if the missingness does not depend on the values of the variables in the data set (Little 1988). In other words, the cases with missing data are indistinguishable from cases with complete data (Hair et al. 2010).

The Little's MCAR test compares the pattern of missing data on all variables and with the pattern expected for a random missing data process (Hair 2010). The missing data can be classified as MCAR if no significant differences are found ($p>0.05$), which suggests that the observed pattern does not differ from the expected random pattern. Table 6.2 below illustrates the result of Little's MCAR test performed in SPSS. Table 6.2 shows that Little's MCAR test indicates a significant level of 0.582 suggesting that the missing data is missing completely at random. By dropping the cases with missing data, an analysis for this MCAR data still provides results that are generalisable to the target population (Pigott 2001). However, because the amount of missing data is significant, the estimates will be less precise than initially planned since a smaller number of cases are used for estimation. The insignificant result implies that any imputation method maybe used (Hair 2010). Nonetheless, the expectation-maximisation algorithm, better known as EM imputation method was adopted in the present study.

Table 6.2: Little's MCAR Test

Variable	Exepectation-Maximisation Means
Strategic Orientation	2. 14
Marketing Resource	0.43
Technological Resource	0.12
Marketing Capability	0.78
Technological Capability	4.35
Potential Absorptive Capacity	9.14
Realised Absorpive Capacity	497.85
Order of entry	44.69
Entry lag in months	60.95
Relative product advantage	0.24
Relative price	0.88
Product survival	0.57
Age	47.38
Market concentration	44.66
Tobin's Q	2.85
Little's MCAR test:	Chi-Square = 75.202, DF = 94, Sig. = 0.923

The present research adopted the EM approach in SPSS which is an iterative two-stage method involving the E and M stages. This method assumes a distribution for the partially missing data and bases inferences on the likelihood under that distribution. The E-stages estimates the missing data and the M-stage then makes an estimation of the parameters (means, standard deviations, or correlations) assuming the missing data were replaced. The process cycles back and forth going through the two stages until the change in the estimated values is negligible and the missing data is replaced (Hair et al. 1998; Pigott 2001).

6.2.2. Outliers

Outliers are observations identified as distinctly different from the other observations. An outlier typically takes form of either unusually high or low value on a variable or a unique combination of values across several variables making the observation stand out from the others (Hair et al. 2010). The decision to either retain or eliminate an outlier should be evaluated by the type of information the outlier may provide. For example, a beneficial outlier may stand out from the majority, but may still be indicative of characteristics of the population and therefore, should be retained (Hair et al. 2010). A problematic outlier is not representative of the population and if retained, can distort statistical tests (Hair et al. 2010). Such problematic outliers may be the result of mistakes in data entry or coding.

One of the methods to detect outliers in a single variable is to use boxplot. Boxplot summarises the data by showing the median, quartiles and the whiskers. Points that lie beyond the whiskers in the boxplot represent outliers (Miles and Shevlin 2001). Figure 6.4 to 6.14 represent the boxplots for the variables in the data. The univariate boxplots indicate that except for firms' age, all the other variables have potential outliers in them.

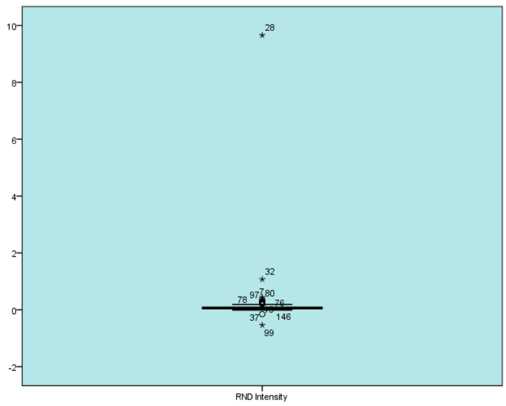


Figure 6.4: R&D Intensity

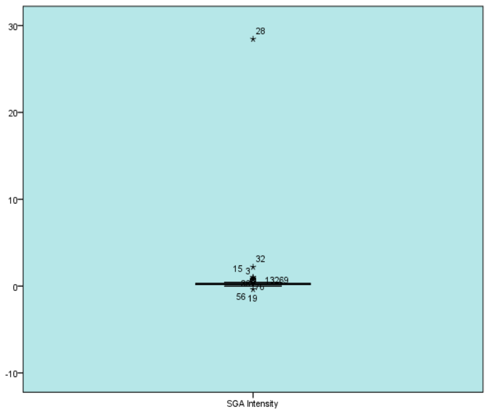


Figure 6.5: SGA Intensity

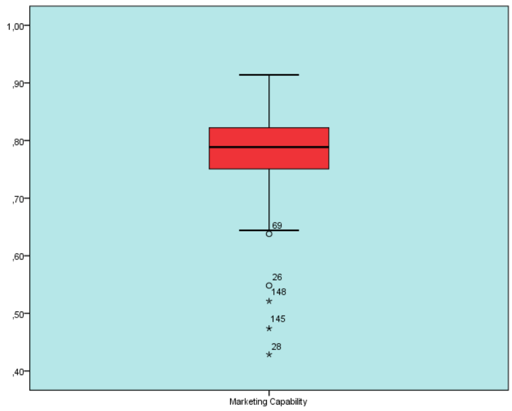


Figure 6.6: Marketing Capability

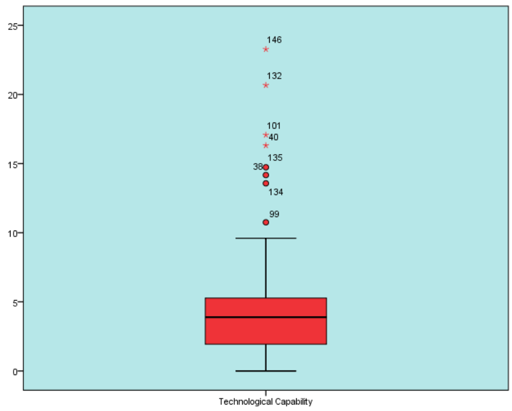


Figure 6.7: Technological Capability

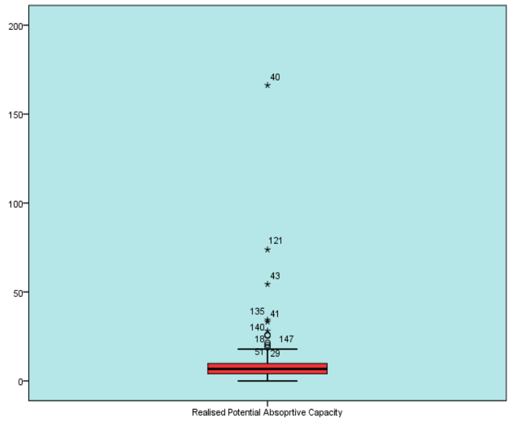


Figure 6.8: Potential Absorptive Capacity

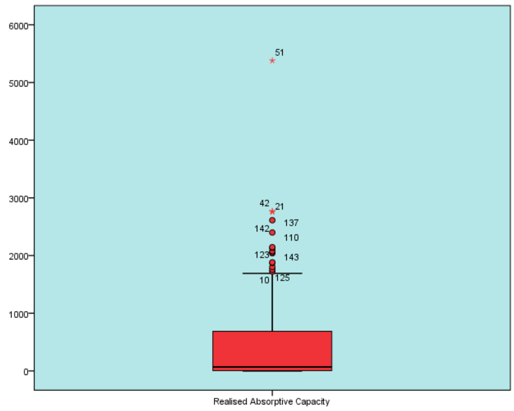


Figure 6.9: Realised Absorptive Capacity

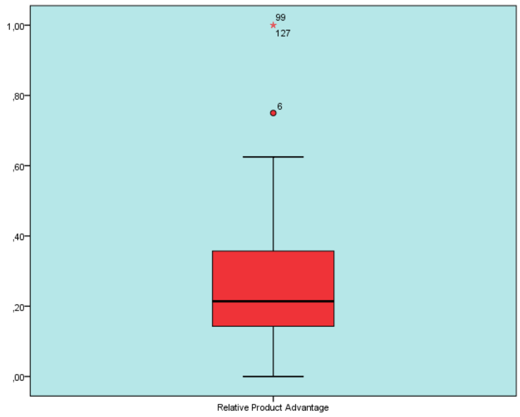


Figure 6.10: Relative Product Advantage

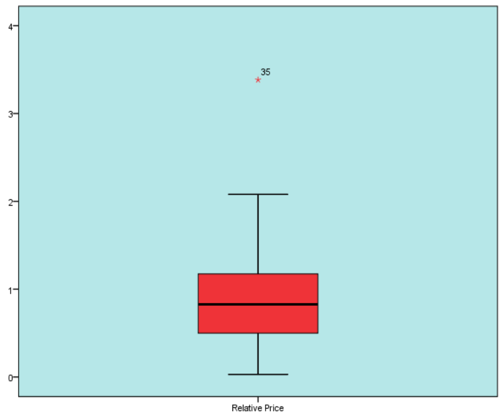


Figure 6.11: Relative Price

Controls

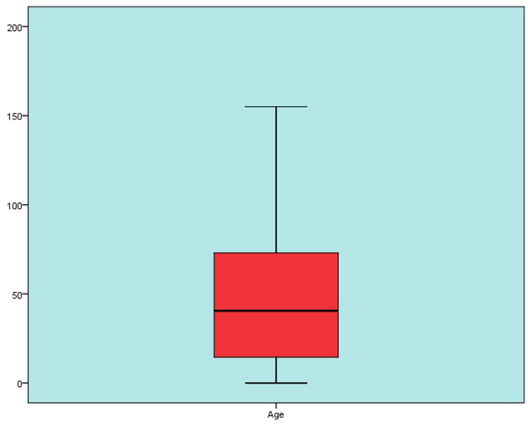


Figure 6.12: Firms' age

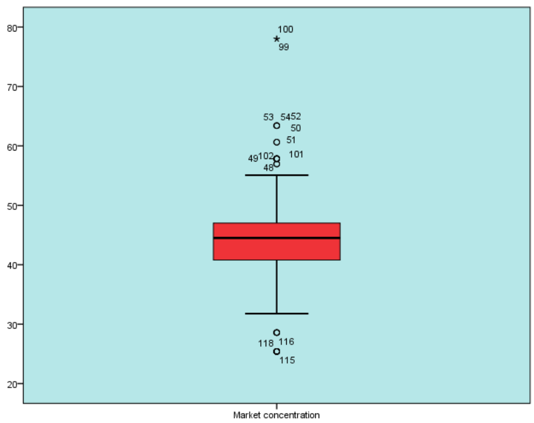


Figure 6.13: Market Concentration

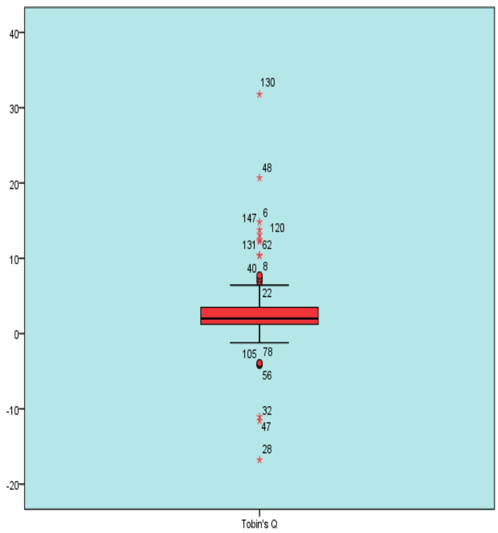


Figure 6.14: Tobin's Q

Other than using a graphical approach, outliers can also be identified using assessments from a univariate, bivariate, or multivariate perspectives based on the number of variables considered (Hair et al. 2010). As researchers are advised to utilise as many of these perspectives to identify outliers, the present research applied a univariate and a multivariate approach to identify outliers.

The univariate identification of outliers examines the distribution of observations for each variable in the analysis (Hair 2010). The present reseach converts the data value to standard scores using SPSS which have a mean of 0 and a standard deviation of 1. Cases falling at the outer ranges (high or low) of the distribution are identified as outliers. Table 6.3 highlights identify potential outliers for each variable. Outliers identified are consistent with boxplots presented in figure 6.4 to 6.14.

Table 6.3: Univariate Assessment of Outliers

Variable	Company	Case Number	Z-score	Total Outliers
SGA	Fonix	28	12.02	
	E.Digital	32	0.74	
	LG	19	-0.36	
				3
R&D	Fonix	28	11.92	
	E.Digital	32	1.15	
	Logitech	99	-0.87	
	LG	146	-0.38	4
Marketing				4

Capability				
	Fonix	28	-4.78	
	UT Starcom	145	-4.17	
	Pantech	148	-3.52	
	Memorex	26	-3.16	
Technological Capability				4
	LG	146	4.83	
	Handspring	132	4.17	
	Apple	101	3.25	
	Lexar	40	3.06	
Potential Absorptive Capacity				5
	Lexar	40	9.9	
	Nintendo	121	4.08	
	Oakley	43	2.85	
	RIM	135	1.59	
	SanDisk	41	1.52	
Realised Absorptive Capacity				5
	Microsoft	51	6.04	
	Seiko Epson	42	2.81	
	Panasonic	21	2.79	
	Hitachi	142	2.62	
	Toshiba	137	2.35	
Relative Product Advantage				2
	Logitech	99	4.24	
	Nokia	127	4.24	
Relative Price	Bang & Olufsen	35	5.00	1
Age				0
Market Concentration				2
	Logitech	99	3.86	
	Fujifilms	100	3.86	
Tobin's Q				5
	Fonix	28	-4.22	
	E.Digital	32	-3.10	
	Dish Network	47	-2.98	
	Walt Disney	48	3.86	
	Qualcomm	130	6.26	

The final method utilised in the present research to identify outliers is Mahalanobis D^2: a multivariate assessment of each observation across a set of variables. This method measures each observation's distance in multidimensional space from the mean center of all observations, providing a single value for each observation regardless of how many variables are considered (Hair et al. 2010). It also measures the multidimensional centrality and has statistical properties that allow for significance testing (Hair et al. 1998). Higher D^2 values represent observations farther removed from the general distribution of observations in this multidimensional space. It is suggested that a conservative level of significance at 0.001 be used as a the threshold value for designation as an outlier (Hair et al. 1998). However, this method has a drawback of only providing an overall assessment. It does not provide any insight as to which particular variables might lead to a high D^2 value (Hair et al. 2010). In the present research, Mahalanobis distance was measured using the linear regression function in the Analyse menu of SPSS. The probability of D^2 was computed using CDF.CHISQ command in SPSS, which calculates the probability of a variable following a chi-square distribution such as Mahalanobis D^2.

Table 6.4 shows that in this dataset, 7 cases have a Mahalanobis D^2 with a probability less than 0.001.

Table 6.4: Mahalanobis D^2 Result

Case	Company	D^2	Probability
28	Fonix	143.74	0.000
40	Lexar	102.27	0.000
51	Microsoft	53.41	0.000
130	Qualcomm	50.68	0.000
99	Logitech	48.24	0.000
146	LG	37.86	0.000

Outliers should be retained unless there is evidence that indicates that they are truly unusual and not representative of any observations in the population (Hair et al. 2010). Although deleting an outlier improves the multivariate analysis, it also limits the generalisability of the research (Hair et al. 2010).

After the outliers were detected, the profiles of each outlier observations were generated and the variables responsible for its being an outlier were inspected. The researcher then checked if the outlier occurred because of an error while entering the data into the computer. As no error in data entry was detected, the outliers were then checked against the theoretical constructs and checked if they were representative of certain segments of the observations in the population. Table 6.5 highlights the outliers deleted from the dataset:

Table 6.5: Outliers Deleted From Dataset

Case	Company	Variable	z-score
28	Fonix	R&D Intensity	11.92
		SGA Intensity	12.02
		Marketing Capability	-4.78
		Tobin's Q	-4.22
32	E.Digital	R&D Intensity	1.15
		SGA Intensity	0.74
		Tobin's Q	-3.10
130	Qualcomm	Tobin's Q	6.26
47	Dish Network	Tobin's Q	-2.98
48	Walt Disney	Tobin's Q	3.86

Five companies were deleted from the sample for showing extreme points in a number of variables. Both Mahalanobis D^2 test and univariate identification of outliers using z-scores were used to identify the extreme outliers. Case 28 (Fonix) demonstrates extreme values in four variables. For a company to spend close to 10 times its sales on R&D and 28 times its sales on SGA is very unusual. To have -16 Tobin's Q value is even more unusual. Therefore, Fonix is deleted from the sample. Case 47 (Dish Network) was deleted because it proved to be an extreme outlier for Tobin's Q variable with a z-score of -2.98. Case 32 (E.Digital) is an outlier in three variables, R&D Intensity, SGA Intensity and Tobin's Q. Its z-score for R&D Intensity, SGA Intensity and Tobin's Q is 1.15, 0.74 and -3.10, respectively. Walt Disney (case 48) was also deleted as it proved to be an extreme outlier for Tobin's Q variable with a z-score of 3.86. Finally, case 130 (Qualcomm) was deleted for having a z-score of 6.26 for Tobin's Q as well as having Mahalanobis D^2 value with a probability of less than 0.001 (significant). Other outliers are retained because they are in line with the theoretical constructs and they do potray a representative element or a segment of the population.

6.2.3. Normality (skewness and kurtosis)

One of the most fundamental assumptions in multivariate analysis is normality. This assumption refers to the shape of data distribution for an individual metric variable and its correspondence to the normal distribution. If the variation from the normal distribution is sufficiently large, all resulting statistical tests are invalid because normality is required to use the F and t statistics (Hair et al. 2010). According to Miles and Shevlin (2001), the distribution can deviate in two ways. First, the distribution can be non-symmetrical or skewed which means that one tail of the distribution is longer than the other tail. Second, the distribution of the data can be too flat or too peaked, that is the tails are too short or too long. This is an indication that the distribution is being kurtosed.

The skewness and kurtosis of a variable that is normally distributed will both have the value 0 while values above or below zero indicates a departure from normality (Hair et al. 2010; Miles and Shevlin 2001). Negative kurtosis values indicate a platykurtic (flatter) distribution, whereas positive values denote a leptokurtic (peaked) distribution. Similarly, positive skewness values indicate the distribution shifted to the left, and the negative values denote a rightward shift (Hair et al. 2010). Scholars argue that a skewness statistic greater than 2.0 is definitely a concern as it might have an effect on the parameter estimates. Although skewness statistic greater than 1.0 but less than 2.0 might also have an effect on the parameter estimates, it should not be a major concern (Miles and Shevlin 2001).

The standard error of the skew and kurtosis can also be used to help to determine whether the skew and kurtosis differ significantly from what might reasonably be expected in a normally distributed population. If the absolute value of skew or kurtosis (ignoring any minus sign) is greater than twice the standard error, then the distribution significantly differs from normal distribution (Miles and Shevlin 2001).

Table 6.6 denotes that the standard error of skewness and kurtosis is 0.2 and 0.4 respectively. All variables have skewness statistics greater than twice the value of standard error. Likewise, Age is the only variable with kurtosis statistics smaller than the value of the standard error.

The table also shows that the skewness value of R&D Intensity, SGA Intensity, Potential Absorptive Capacity and Realised Absorptive Capacity have skewness statistics that are both significant and high enough as they are greater than 2.

Marketing Capability, Technological Capability, Relative Price, Relative Product Advantage and Tobin's Q are moderately skewed with skewness statistics value of above 1 but below 2. Despite the moderate level of skewness, these variables are more peaked (taller) than the normal distribution as shown by the statistic values of kurtosis.

Age and Market Concentration have skewness statistics value below 1. However, the skewness statistics value of Age and Market Concentration are greater than twice their standard error. Furthermore, the kurtosis of Market Concentration is too high (greater than twice the standard error). As such, Age and Market Concentration still warrant concern.

Table 6.6: Skewness and Kurtosis Statistics

		RND Intensity	SGA Intensity	Mktg Cap	Tech Cap	Potential Absorptive Capacity	Realised Absorptive Capacity	Entry Lag	Rel Price	Relative Product Advantage	Age	Market Con	TobinQ
N	Valid	143	143	143	143	143	143	143	143	143	143	143	143
	Missing	0	0	0	0	0	0	0	0	0	0	0	0
Skewness		3.566	3.462	-1.332	1.972	7.297	2.417	0.493	1.121	1.492	0.729	0.588	1.774
Std. Error of Skewness		0.203	0.203	0.203	0.203	0.203	0.203	0.203	0.203	0.203	0.203	0.203	0.203
Kurtosis		20.352	21.398	3.936	5.952	66.025	8.469	-0.768	3.696	3.371	-0.175	3.013	5.279
Std. Error of Kurtosis		0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403

Departures from normality of distribution can also be detected using visual check such as histogram and probability plot. Histogram is a visual check of normality that compares the observed data values with a distribution approximating the normal distribution (Hair et al. 2010). It is a plot that shows the values along the x-axis (the horizontal axis) and the number of values that obtained score on y-axis (the vertical exis) (Miles and Shevlin 2001). However, relying on histogram alone can be problematic because for smaller samples, the number of categories or the width of the categories can distort the visual portrayal and render the analysis unreliable (Hair et al. 2010).

As such, scholars argue that a more reliable visual approach for detecting non-normality is the normal probability plot, which compares the cumulative distribution of actual data values with the cumulative distribution of a normal distribution (Hair et al. 2010). The normal distribution forms a straight diagonal line (Hair et al. 2010). If the plotted data values match the diagonal line fairly well, it can be concluded that the data are normally distributed. If the distribution differs form normality, then the points will lie further from the diagonal line (Miles and Shevlin 2001). Figure 6.15 to 6.38 represent the normal probability plots and corresponding histograms of each metric variable.

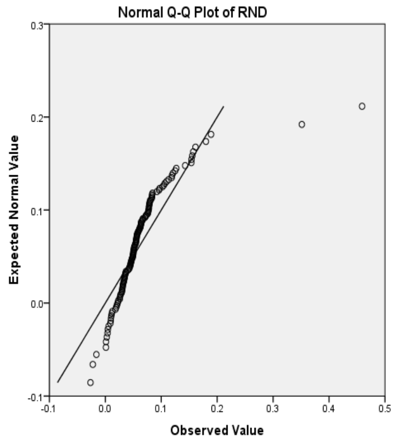


Figure 6.15: Q-Q Plot of R&D

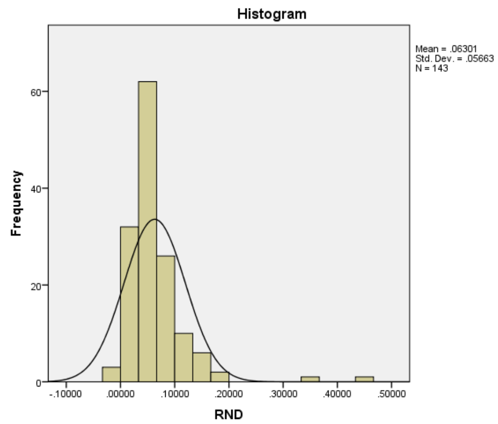


Figure 6.16: Histogram of R&D

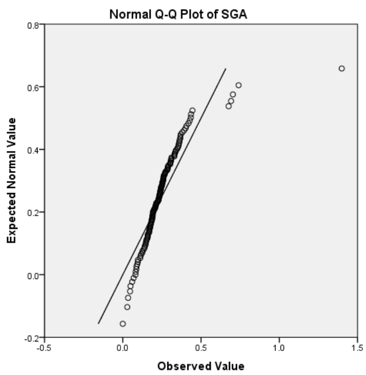


Figure 6.17: Q-Q Plot of SGA

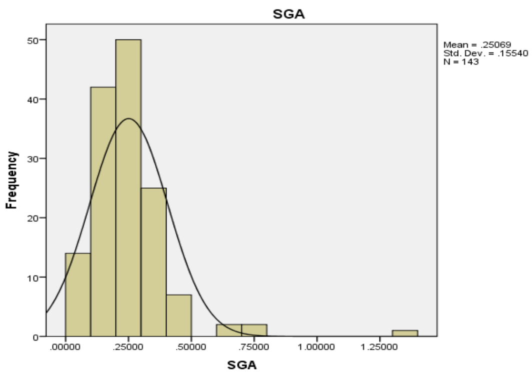
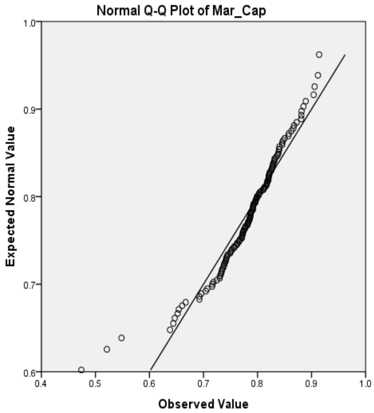


Figure 6.18: Histogram of SGA



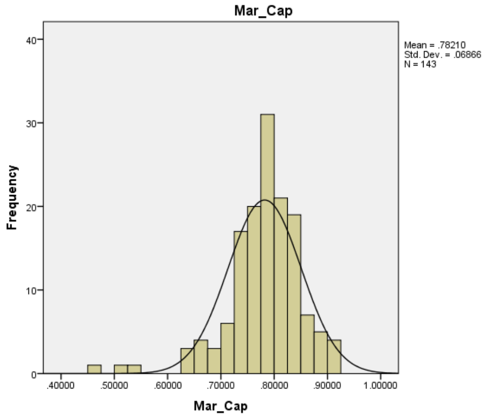
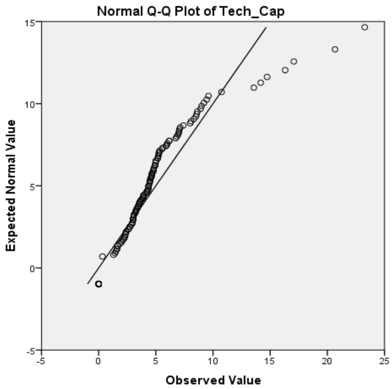


Figure 6.19: Q-Q Plot of Marketing Capability **Figure 6.20: Histogram of Marketing Capability**



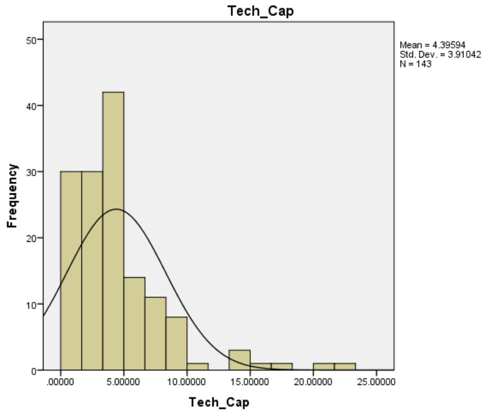
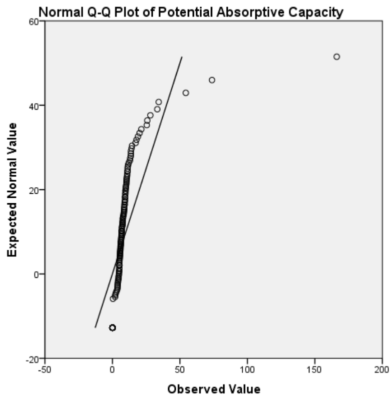


Figure 6.21: Q-Q Plot of Technological Capability **Figure 6.22: Histogram of Technological Capability**



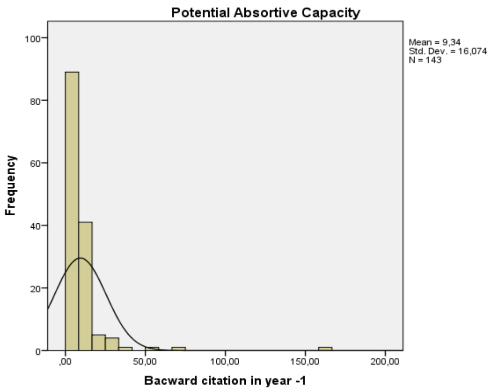
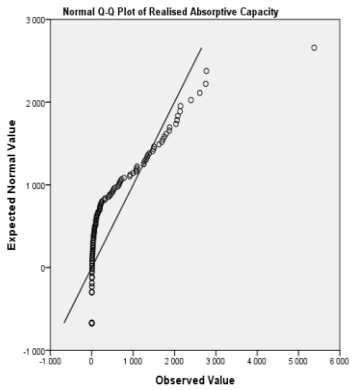


Figure 6.23: Q-Q Plot of Potential Abs Capacity **Figure 6.24: Histogram of Potential Abs Capacity**



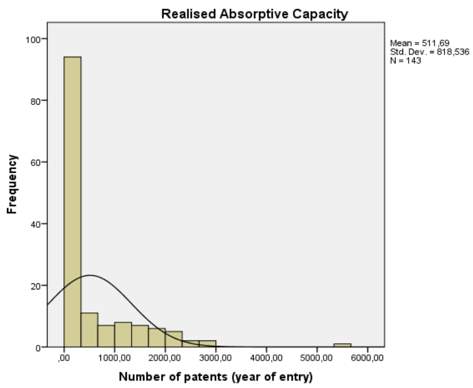
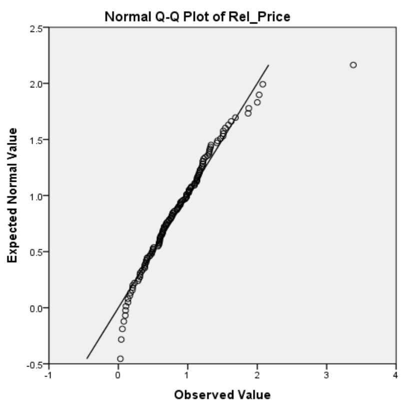


Figure 6.25: Q-Q Plot of Realised Abs Capacity

Figure 6.26: Histogram of Realised Abs Capacity



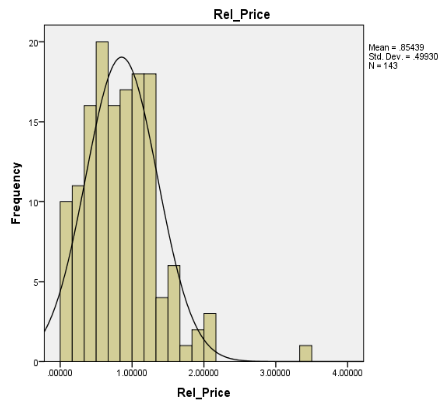
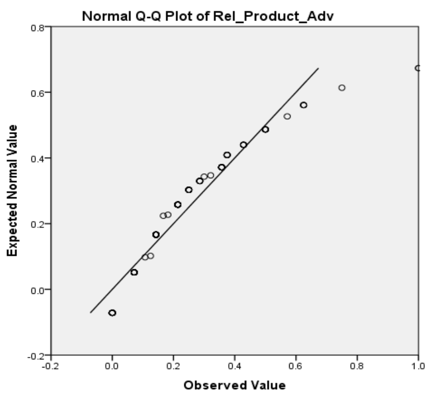


Figure 6.27: Q-Q Plot of Relative Price

Figure 6.28: Histogram of Relative Price



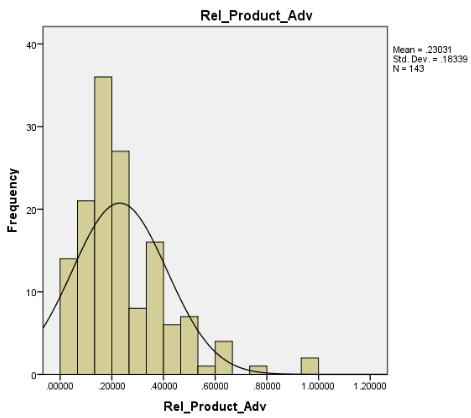
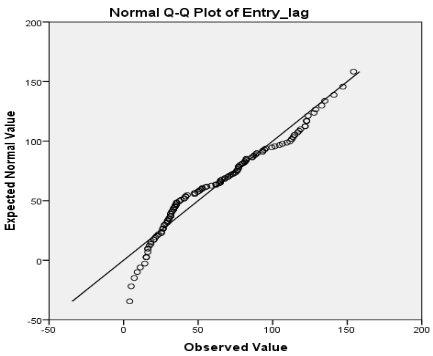


Figure 6.29: Q-Q Plot of Rel. Product Advantage

Figure 6.30: Histogram of Rel. Product Advantage



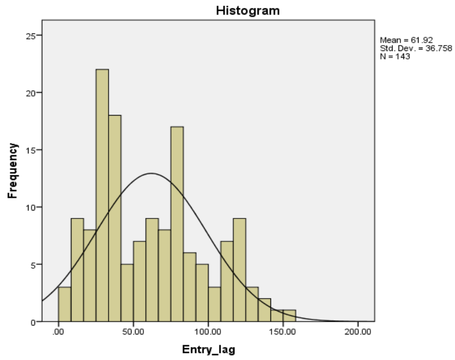


Figure 6.31: Q-Q Plot of Entry Lag

Figure 6.32: Histogram of Entry Lag

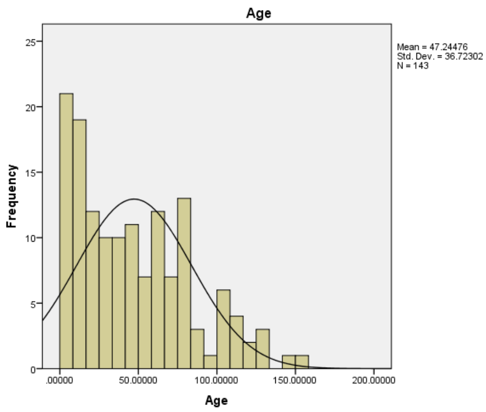
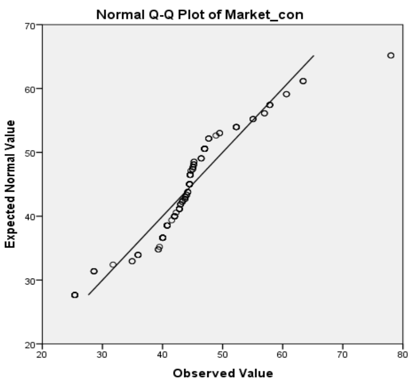


Figure 6.33: Q-Q Plot of Age

Figure 6.34:Histogram of Age



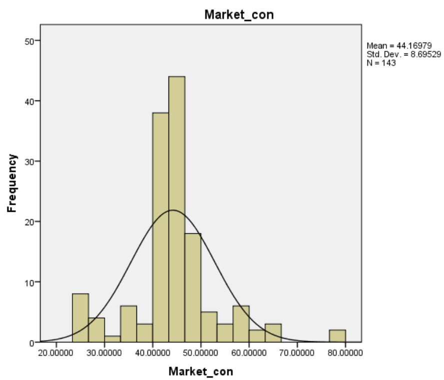
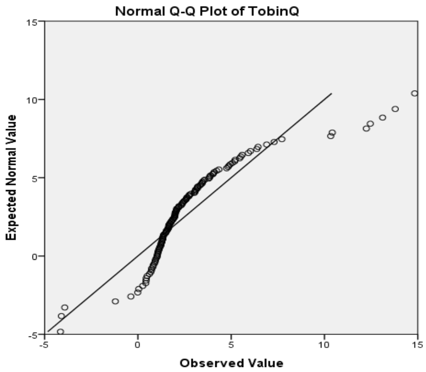


Figure 6.35: Q-Q Plot of Market Concentration

Figure 6.36: Histogram of Market Concentration



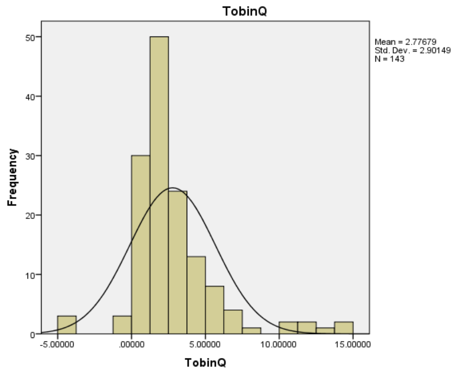


Figure 6.37: Q-Q Plot of Tobin's Q

Figure 6.38: Histogram of Tobin's Q

Deviation from the normality assumption can also be tested using statistical tests. The two most common specific statistical tests for normality are the Shapiro-Wilks test and a modification of the Kolmogorov-Smirnof test. Each test calculates the level of significance for the differences from a normal distribution. The tests of significance are less useful in small samples (fewer than 30) and quite sensitive in large samples (exceeding 1000 observations). Thus it is necessary for a researcher to use both the graphical plots and statistical tests to assess the actual degree of departure from normality (Hair et al. 2010). Table 6.7 shows the result of the test of normality of metric data of the dataset. The result of Kolmogorov-Smirnof test shows that except for relative price variable, all of the variables deviate from a normal distribution. On the other hand, as all of the estimates are significant, Shapiro-Wilks test suggests that all of the variables deviate from a normal distribution.

Table 6.7: Statistical Test of Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RND	0.192	143	0.000	0.718	143	0.000
SGA	0.139	143	0.000	0.747	143	0.000
Mar_Cap	0.105	143	0.001	0.918	143	0.000
Tech_Cap	0.168	143	0.000	0.828	143	0.000
Potential Abs Caps	0.295	143	0.000	0.395	143	0.000
Realised Abs Caps	0.269	143	0.000	0.675	143	0.000
Entry_lag	0.129	143	0.000	0.946	143	0.000
Rel_Price	0.059	143	0.200*	0.939	143	0.000
Rel_Product_Adv	0.166	143	0.000	0.878	143	0.000
Age	0.121	143	0.000	0.929	143	0.000
Market_con	0.184	143	0.000	0.895	143	0.000
TobinQ	0.162	143	0.000	0.810	143	0.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

6.2.4. Data Transformation

After examining the skewness, kurtosis, histogram, probability plot and performing statistical tests of normality for each variable, a number of actions were taken to achieve a more normal distribution. For non-normal distributions, the two most common patterns are flat distributions (denoted by negative kurtosis) and skewed distributions (Hair et al. 2010). For the flat distribution, the most common transformation is the inverse (e.g.1/Y or 1/X). Skewed distributions can be transformed by taking the square root, logarithms, squared, or cubed terms or even the inverse of the variable. Usually negatively skewed distributions are best transformed by employing squared or cube cubed transformation, whereas the logarithm or square root typically works best on positive skewness (Hair et al. 2010). Table 6.8 summarises the remedies applied and the improvement of skewness and kurtosis after data transformation. The statistics of skewness and kurtosis of all variables have improved as a result of data transformation.

Table 6.8: Description of Skewness and Kurtosis, Remedies Applied and Improvement After Data Transformation

Variable	**Skewness Before Transformation**	**Skewness After Transformation**	**Kurtosis Before Transformation**	**Kurtosis After Transformation**	**Description of Distribution**	**Remedies Applied**
R&D Intensity	3.57	2.949	20.35	15.085	Peaked with substantially positive skew	Natural logarithm NEW X= LN(X)
SGA Intensity	3.46	2.064	21.399	9.723	Peaked with substantially positive skew	Natural logarithm NEW X= LN(X)
Marketing Capability (Mean Centered)	-1.33	.996	3.94	2.723	Peaked with moderately negative skew	Natural Logarithm NEW X = LN(K-X) K= a constant from which each score is subtracted so that smallest score is 1.

Technological Capability (Mean Centered)	1.97	-.564	5.95	-.151	Peaked with moderately positive skew	Natural logarithm NEW X= LN(X)
Potential Absorptive Capacity	7.297	-0.444	66.025	0.587	Peaked with positive skew	Natural logarithm NEW X= LN(X)
Realised Absorptive Capacity	2.417	0.207	8.469	-1.429	Peaked with moderately positive skew	Natural logarithm NEW X= LN(X)
Relative Price	1.121	.040	3.7	.122	Peaked with moderately positive skew	Natural logarithm NEW X= LN(X)
Relative Product Advantage	1.49	.961	3.37	1.254	Peaked with moderately positive skew	Natural logarithm NEW X= LN(X)
Entry Lag	0.49	NA	-0.768	NA	Slightly flat with slight positive skew	None
Age	0.73	NA	-0.18	NA	Peaked with slight positive skew	None
Market Concentratio	0.59	-0.607	3.01	2.045	Peaked with slight	Natural logarithm

n					positive skew	NEW X= LN(X)
Tobin's Q	1.77	.390	5.28	4.413	Peaked with moderately positive skew	Natural logarithm NEW X= LN(X)

6.2.5. Linearity

Another assumption of a linear model considered in the present research is linearity which assumes that the dependent variable *y* is a linear function on the *x*'s plus a random disturbance U (Allison 1999). Because regression represents only the linear association between variables, nonlinear effects will not be represented in the estimation value. This omission of the non-linear effects results in an underestimation of the actual strength of the relationship (Hair et al. 2010).

Linearity of any bivariate relationship can be examined through residual plots. If a consistent curvilinear pattern is observed in the residuals, it indicates that relationship between the two variables is non linear (Hair et al. 2010). To determine any non-linearity in multiple regression with more than one independent variable such as in the present research, partial regression plots were used. Partial regression plots show the relationship of a single independent variable to the dependent variable, controlling for the effects of all other independent variables (Hair et al. 2010). Any consistent curvilinear pattern indicates a nonlinear relationship between a specific independent variable and the dependent variable (Hair et al. 2010). One of the possible corrective actions to achieve linearity is similar with dealing non-normal distribution, which is through transforming the data values (e.g. logarithm, square root, etc.) of one or more independent variables to achieve linearity (Hair et al. 2010). However, the partial regression plots in Appendix 1 do not reveal any consistent curvilinear pattern to warrant a corrective action.

6.2.6. Homoscedasticity

One of the most important assumptions of linear regression is variance independence or homoscedasticity. Homoscedasticity refers to the assumption that the dispersion (variance) of the dependent variable values must be relatively equal across the range of predictor variable(s) (Allison 1999). In other words, the level of random noise is constant regardless of the values of the *x* variables (Allison 1999). The relationship is referred to as heterocedastic if the variance of the residuals is unequal across values of the independent variable (Allison 1999).

The presence of heteroscedasticity may result in unbiased but inefficient least square estimators (Maddala 1992). Efficient estimation methods have minimum standard errors but when heteroscedasticity exists, least squares estimates no longer have the smallest possible standard errors. Ordinary least squares is not optimal when there is heteroscedasticity because it is gives equal weight to all observations despite observations with larger disturbance variance containing less information than observations with smaller disturbance variance (Allison 1999).

In addition to inefficient estimation, using the least square estimator to estimate the unknown coefficients of a linear regression model with heteroscedasticity may result in biased and inaccurate standard errors (Maddala 1992). The biased estimation of standard errors leads to bias in test statistics and confidence intervals (Allison 1999). As such, confidence intervals and hypothesis tests that use these standard errors may be misleading because any calculations of significance will be incorrect to some extent (Miles and Shevlin 2001).

The diagnosis of heteroscedasticity was performed using statistical tests. To achieve this, the Breusch-Pagan Test and White's General Test for heteroscedasticity were conducted in Stata. The Breusch-Pagan Test for heteroscedasticity checks the null assumption that the variance of error terms is constant (Breusch and Pagan 1979). The alternative assumption hypothesised that the error variances increase or decrease as the predicted values of Y increase or decrease. However, Breusch-Pagan Test requires the errors to be normally distributed, which means that this test is problematic for the non-linear forms of heteroscedasticity (Breusch and Pagan 1979).

Because of the normality assumption of errors in Breusch-Pagan Test, White's General Test for heteroscedasticity was also employed to diagnose for heteroscedasticity. The White's (1980) general test for heteroscedasticity relaxes the normal distribution of error assumption by regressing the squared residuals on all distinct regressors, cross-products and squares of regressors (Greene 2000, pp. 507-511).

Table 6.9: Breusch-Pagan Test and White's General Test for Detecting Heteroscedasticity

Equation	Breusch-Pagan test		White's general test	
	Chi-squared	Prob > chi-square	Chi-squared	Prob > chi-square
Marketing Resources	3.47	0.063	24.94	1.000
Technological Resources	14.90	0.000	26.66	0.999
Marketing Capability	23.72	0.000	96.55	0.008
Technological Capability	4.00	0.046	103.65	0.002
Potential Absorptive Capacity	0.48	0.489	125.00	0.001
Realised Absorptive Capacity	3.12	0.078	98.12	0.071
Order of Entry	23.21	0.000	143.00	0.461
Entry Lag	0.00	0.995	143.00	0.461
Relative Product Advantage	9.88	0.002	143.00	0.461
Relative Price	0.05	0.825	143.00	0.461

The Breusch-Pagan test and White's general test are based on the null hypothesis that the variance is constant. Therefore, when the probability of chi-squared is significant, the null hypothesis of constant variance is rejected. At 0.05 level of significant, the Breusch-Pagan test result indicates that heteroscedasticity is present in technological resources equation, marketing capability equation, technological capability equation, order of entry equation and relative product advantage equation. In contrast, White's general test suggests heteroscedasticity is present in marketing capability equation, technological capability equation and potential absorptive capacity equation. As each of these diagnosis methods has its own limitation, the present research also used graphical plots of residual to detect heteroscedasticity.

Residual plots are presented in Appendix 2. The standardised residuals were plotted against the standardised predicted values (Allison 1999; Hair et al. 2010). The scatterplot was then compared to the null plot. If the assumption of homoscedasticity is satisfied, the residuals should vary randomly around zero and the spread of the residuals should be equal throughout the plot showing no systematic patterns (Allison 1999). However, if the variance is not constant indicating the presence of heteroscedasticity, the plot shows a consistent pattern (Hair et al. 2010). Some of the common pattern includes a triangle-shaped pattern in either direction where more variation is exhibited at the tails and a diamond-shaped pattern where variation is more evident in the midrange of the plot rather than at the tails (Hair et al. 2010, p.185). Homoscedasticity assumption may also be violated if the points in the plot lie on a curve around zero, rather than fluctuating randomly and if a few points in the plot lie far off from the rest of the points (Allison 1999). The result of statistical tests and graphical plots of residual indicate that heteroscedasticity is present in the dataset and may result in inefficient least square estimations.

There are a number of ways to correct the problem of inefficient estimation and biased standard errors due to violation homoscedasticity assumption. First, if the violation can be attributed to a single independent variable, the procedure of weighted least squares can be employed (Hair et al. 2010). Under this procedure, greater weight is put on the observations with smaller disturbance variance (Gujarati 1995). However, using weighted least squares (WLS) to calculate efficient estimators is conditional on knowing the variance structure, which in practice is seldom known and must be estimated.

A much simpler and a more common solution than weighted least squares method is to use robust standard error, which requires fewer assumptions. Using robust standard does not solve the inefficiency problem but produces unbiased least squares coefficient estimators. As such, the test statistics produces reasonably accurate *p* value (Allison 1999, p.127-128). Due to the advantage of using robust standard error, this approach was used in the additional analyses to ensure that the findings are robust. Hence, in addition to SUR, the data was also analysed using

Seemingly Unrelated Estimation (SUEST). SUEST command in STATA allows for the equations in the system to be estimated simultaneously using robust standard error. Employing robust standard error produces unbiased least squares coefficient estimators hence provides accurate p values (Allison 1999, p.127-128). The findings of these two procedures were compared to ensure robustness of findings and increase confidence in reporting the results.

6.2.7. Multicollinearity

Collinearity refers to the degree of correlations among the independent variables in a regression estimation (Miles and Shevlin 2001). Multicollinearity does not violate any of the assumptions of linear regression (Allison 1999). However, multicollinearity leads to large standard errors and creates shared variance between variables making it difficult for regression calculation to isolate the separate effects of each of the explanatory variable on the predicted variable (Maddala 1992). Therefore, the most troublesome impact of multicollinearity is the likelihood of concluding that two or more correlated variables have no predictive power over the dependent variable, when actually one of them has a strong effect (Allison 1999).

To detect the presence of multicollinearity and to diagnose the seriousness of the problem, variance inflation factors (VIF) were calculated. VIF is calculated as 1/tolerance, where tolerance is calculated as 1- R^2(Miles and Shevlin 2001). VIF calculation is useful in the diagnosis of multicollinearity because it indicates how much standard error has increased as a result of collinearity (Miles and Shevlin 2001). The square root of VIF is equal to the increase in standard error in comparison to what it would be with no multicollinearity). A VIF value of 10 is the common cut-off of to determine when collinearity is becoming serious as it corresponds to standard errors being increased more than three times the VIF (10 = 3.16 increase in standard error) (Hair et al. 2010). Table 6.10 presents the variance inflation factor (VIF) analysis performed on each equation. Little impact from potential multicolinearity was observed as the highest VIF value for each equation was found to be below the cut-off value of 10.

Table 6.10: Variance Inflation Factor (VIF) Analysis

Equation	Highest VIF
Marketing Resources	7.32
Technological Resources	7.32
Marketing Capability	7.37
Technological Capability	7.43
Potential Absorptive Capacity	7.74
Realised Absorptive Capacity	7.74
Order of Entry	9.03
Entry Lag	9.03
Relative Product Advantage	9.25
Relative Price	8.94
Survival	9.64

6.3. Descriptive statistics

This section presents the descriptive statistics of variables employed in the regression estimation. The means, standard deviation, minimum and maximum number for each variable are reported. The aim of descriptive analysis presented in this section is to summarise the large data collected and to identify distinct patterns, characteristics and tendencies of the variables under study.

6.3.1. Product Performance

The model's dependent variable is represented by product performance, which was determined by its survival in the new product category beyond the first 4 years. As shown in Table 6.11, the dependent variable equals 1 if the business survived and 0 otherwise. Out of 143 entries, 44.1% of the products failed within the first four years of its introduction. In contrast, 55.9% of the products survived beyond the 4th year of their introduction.

Table 6.11: Product Performance (Survival) Summary

0 = Failed, 1 = Survived	Frequency (N=143)	%	Cumulative %
0	63	44.1	44.1
1	80	55.9	100.0
Total	143	100.0	

6.3.2. Product Category

As shown in Table 6.12, the sample of the present study is derived from four product categories: portable audio player, portable computer, digital camera and smart phone. Fifty companies or 35% of the sample come from portable audio player product category. Portable computer constitutes 30.8% of the sample, while digital camera and smart phone represents 19.8% and 15.4% of the sample respectively. To control for possible differences between these product categories, dummy variables were created to represent each product category and portable audio player was used as the baseline.

Table 6.12: Product Category Summary

Product Category	**Frequency (N=143)**	**%**	**Cumulative %**
Portable Audio Player	50	35.0	35.0
Portable Computer	44	30.8	65.7
Digital Camera	27	18.9	84.6
Smart Phone	22	15.4	100.0
Total	143	100.0	

6.3.3. Industry (SIC Code)

Recall from Chapter 4 that although the companies that entered the four product categories are similar, the sample firms come from different industry groupings referred to as SIC codes. To control for possible differences between the industry groupings, dummy variables were created to separate each industry group. Table 6.13 summarises the industry groups and the correspondent SIC codes that make up the groups. Table 6.13 indicates that the highest percentage of the companies in the sample comes from computer and computer related equipment at 51%. Audio, video and telecommunication equipment makes up the second highest industry group in the sample at 44%. Both photographic equipment and wholesale and stores represent 10% of the sample while toys and personal goods constitutes 6% of the sample. Toys and personal goods industry group was used as the baseline.

Table 6.13 Industry Groupings Summary

Industry Groupings	SIC Code	Frequency (N=143)	%	Cumulative %
Computer and Computer Related Equipment: Computer Peripheral Equipment, Computer Manufacturing, Computer Systems Design Services, Computer Storage Device Manufacturing, Office Machines, Magnetic and Optical Recording Media, Computer Terminals, Calculating & Accounting Equipment	3577, 3570, 3600, 3576, 3571, 3572, 3579, 3695, 3575, 3578,	73	51.0	51
Audio, video and Telecommunication Equipment: Household Audio and Video Equipment, Telecommunications, Semiconductors and Related Devices	3651, 3663, 3674	44	30.8	81.8
Photographic Equipment: Photographic Equipment & Supplies, Optical Instruments and Lenses	3861, 3827	10	7.0	88.8
Wholesale and Stores: Computer, Peripherals & Software, Electronic Parts & Equipments, Metals Service Centres & Offices, Industrial Machinery & Equipment, Radio, TV & Electronic Stores, Computer & Software Stores	5045, 5065, 5731,5051, 5734, 5084	10	7.0	95.8
Toys and Personal Goods: Games, Toys, and Children's Vehicles, Dolls and Stuffed Toys, Rubber and Plastics Footwear, Ophthalmic Goods	3944, 3942, 3021, 3851	6	4.2	100
Total		143	100	

6.3.4. Strategic Orientation

The descriptive statistics for Miles and Snow's typology of firms' strategic orientation are provided in Table 6.14. With 60 firms from the group, analyser represents the highest percentage of firms in the sample (41.96%). At 34.27%, defender constitutes the second highest group represented in the sample while prospector makes up the smallest group in the sample.

Table 6.14: Strategic Orientation Summary

Strategic Orientation	**Frequency (N=143)**	%	**Cumulative %**
Defender	49	34.27	34.27
Analyser	60	41.96	76.22
Prospector	34	23.78	100.00
	143	100.00	

6.3.5. Resources

Marketing Resource is measured by the natural logarithm of SGA Intensity while Technological Resources is measured by the natural logarithm of R&D Intensity. The descriptive statistics for marketing and technological variable are provided in Table 6.15. Table 6.15 shows that firms' SGA Intensity in the sample ranges from 0.00 to 0.88 with a mean of 0.22. In contrast, technological capability ranges from 0.00 to 0.40 with a mean of 0.09. The descriptive analysis also demonstrates that marketing resource data is more spread out over a large range of values than technological resource as indicated by the standard deviation and variance. The standard deviation and variance of marketing resource are 0.11 and 0.01 respectively while the standard deviation for technological resource and variance are 0.05 and 0.00 respectively.

Table 6.15: Marketing Resource and Technological Resource Summary

Variable	**Definition**	**Mean**	**Standard Deviation**	**Variance**	**Min**	**Max**
Marketing Resource	The natural logarithm of SGA Intensity	0.22	0.11	0.01	0.00	0.88
Technological Resource	The natural logarithm of R&D Intensity	0.09	0.05	0.00	0.00	0.40

6.3.6. Capabilities

Table 6.16 summarises the descriptive statistics of capabilities variables in the present study. Marketing capability exhibits a range of 0.37 and a mean of 0.12. A standard deviation of 0.06 and a variance of 0.00 suggest a moderate dispersion from the mean. Technological capability ranges from 0 to 3.19 with a mean of 1.43. In contrast to marketing capability, technological capability has a higher variation from the mean with a standard deviation of 0.78 and a variance of 0.61.

Descriptive results for potential absorptive capacity show a minimum of 0.00 and a maximum of 5.12 with a mean of 1.86. A standard deviation of 1.01 and a variance of 1.01 indicate a high variation of data from the mean. Similar observation of high dispersion of data was found for realised absorptive capacity. Realised absorptive capacity exhibits a range of 6.29 and a mean of 4.73. The analysis shows that this variable has a standard deviation of 1.96 and a variance of 3.82.

The interaction between marketing capability and technological capability ranges from 0.00 to 1.26 with a mean of 0.51. The data is moderately dispersed from each other and the mean as indicated by a standard deviation of 0.15 and a variance of 0.02.

Finally, marketing capability squared exhibits a minimum of 0.00 and a maximum of 0.10 with a mean of 0.01. A standard deviation of 0.01 suggests suggest a moderate dispersion from the mean. In contrast, the descriptive result shows that technological capability has a minimum of 0.00, a maximum of 356.23 and a mean of 15.18. The data on technological capability shows a high dispersion from the mean and each other as indicated by a standard deviation of 42.30 and a variance of 1788.87.

Table 6.16: Capabilities Summary

Variable	Definition	Mean	Standard Deviation	Variance	Min	Max
Marketing Capability	*The natural logarithm of efficiency estimation (100 - η_i^*)	0.12	0.06	0.00	0.00	0.37

Technological Capability	*The natural logarithm of average number of citations, net of self-citations	1.43	0.78	0.61	0.00	3.19
Potential Absorptive Capacity	The natural logarithm of Potential Absorptive Capacity	1.86	1.01	1.01	0.00	5.12
Realised Absorptive Capacity	The natural logarithm of Realised Absorptive Capacity	4.73	1.96	3.82	2.30	8.59
Marketing Capability x Technological Capability	* The natural logarithm of marketing capability x technological capability	0.511	0.15	0.02	0.00	1.26
Marketing capability squared	*Marketing capability squared	0.01	0.01	0.00	0.000	0.10
Technological Capability Squared	*Technological Capability Squared	15.18	42.30	1788.87	0.00	356.23

*The variables were mean centred to reduce potential problems with multicollinearity

6.3.7. Entry timing

The descriptive statistics for entry timing measured by order of entry and entry lag in months are provided in Table 6.17. Order of entry ranges from 2 to 179 with a mean of 44.97 while entry lag ranges from 4.10 to 152.43 with a mean of 61.92 months. Both measure of entry timing exhibit a high variation from the mean with a standard deviation of 38.61 and 36.76 respectively.

Table 6.17: Entry Timing Summary

Variable	Definition	Mean	Standard Deviation	Variance	Min	Max
Order of entry	Order of entry	44.97	38.61	1490.43	2.00	179.00
Entry lag	Entry lag in months	61.92	36.76	1351.15	4.10	154.23

6.3.8. Product Market Entry Strategy

Table 6.18 displays the product market entry strategy adopted by each firm at market entry represented by price and product advantage relative to existing players. The relative price ranges from 0 to 1.47 and a mean of 0.57. A standard deviation of 0.27 and a variance of 0.07 suggest a moderate variation from the mean.

Descriptive results for relative product advantage show a range 0.69 and a mean of 0.20. A low standard deviation of 0.14 and a variance of 0.02 suggest relatively little variation from the mean.

Table 6.18: Product Market Entry Summary

Variable	Definition	Mean	Standard Deviation	Variance	Min	Max
Relative Price	The natural logarithm of relative price	0.57	0.27	0.07	0.00	1.47
Relative Product Advantage	The natural logarithm of relative product advantage	0.20	0.14	0.02	0.00	0.69

6.3.9. Controls

Table 6.19 displays the descriptive summary of control variables. The firms' age in the sample ranges from 0 to 155 years with a mean of 47.24. The sample distribution exhibited a standard deviation of 36.72 and a variance of 1348.58. The high standard deviation and variance suggest that the distribution of firms' age differ greatly from the mean.

Descriptive analysis of Tobin's Q in Table 6.19 indicates that firms' size ranges from 1 to 4.47 with a mean of 2.77. A standard deviation of 0.50 and a variance of 0.25 suggest that there is a relatively moderate variation from the mean.

Finally, the four-firm market concentration ratio at each firm's entry ranges from 25.40 to 78.00 The sample distribution shows a standard deviation of 8.70, which indicates a small variation from the mean of 44.17.

Table 6.19: Controls Summary

Variable	Definition	Mean	Standard Deviation	Variance	Min	Max
Age	Year entry minus year founded	47.24	36.72	1348.58	0	155
Tobin's Q	The square root of Tobin's Q	2.77	0.50	0.25	1.00	4.47
Market Concentration	Natural log of market concentration	44.17	8.70	75.61	25.40	78.00

6.4. Corrrelation Matrix

Bivariate product moment correlations are provided in Table 6.20. A correlation captures the degree to which two variables are linearly related (Miles and Shevlin 2001). To achieve this objective, correlation analysis was performed in SPSS. Cohen (1988) defines a small correlation as having an absolute value of approximately 0.1, a medium correlation as 0.3 and a large correlation as 0.5 or greater (Miles and Shevlin 2001). Based on Cohen's (1988) categorisation, the present research classifies a correlation value of 0.5 and greater as strong, 0.3 to 0.4 as medium and below 0.3 as low. A brief discussion on the highly correlated explanatory variables is presented next.

6.4.1. Strong and significant correlation

There is a high negative correlation of –0.50 between portable computer product category (dummy 3) and relative price. This is expected because products categories may contribute to the variances of relative price among market entries. A high positive correlation of 0.63 was also observed between R&D Intensity and SGA Intensity. Although the two variables measure two different constructs, it is common to find firms that invest greatly in R&D also allocate equivalently high level of resources into marketing and sales; hence, the high correlation.

The analysis also indicates that technological capability is positively correlated with potential absorptive capacity and realised absorptive with a correlation value of 0.80 and 0.51 respectively. Firms that dedicate their effort into renewing their knowledge stock through potential absorptive absorptive capacity and exploit those knowledge through realised absorptive capacity tend to have high technological capability as a result of those efforts, which may explain the high correlation.

A high positive correlation of 0.61 was also observed between realised potential absorptive capacity and age, which is one of the control variables. Finally, order of entry and entry lag were found to be positively correlated with a correlation value of 0.76. This positive association is expected as they are both measures of entry timing. Since they measure the same construct and are highly correlated, they were used in two separate systems of equations in the hypothesis testing to avoid multicollinearity.

It is also worth highlighting the unexpected negative medium correlation (-0.34) between SGA intensity and marketing capability. One explanation for this negative association is the possible inefficiency of firms endowed with greater maketing resources in turning those resources into valuable outputs due to wastefulness.

6.5. Summary

This chapter provides a summary of the procedures undertaken in the evaluation and remedy of missing data, identification and treatment of outliers and tests of the assumptions underlying the regression techniques and multicollinearity. Additionally, this chapter also provides descriptive analyses and a correlation analysis of the variables examined in this study. After going through all these processes, the data was ready for testing the hypotheses as postulated in this study. The testing of hypotheses using the Seemingly Unrelated Regression is described in the next chapter.

	Variable	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23
X1	Survival	1.00																						
X2	Portable Audio Player	-0.15	1.00																					
X3	Portable Computer	-0.05	-0.49**	1.00																				
X4	Digital Camera	0.18*	-0.35**	-0.32**	1.00																			
X5	Smart Phone	0.07	-0.31**	-0.28**	-0.21*	1.00																		
X6	SGA Intensity	-0.07	-0.01	0.09	0.01	-0.11	1.00																	
X7	RND Intensity	-0.08	-0.09	0.09	-0.06	0.07	0.63**	1.00																
X8	Marketing Capability	0.02	0.18*	-0.08	-0.06	-0.07	-0.34**	-0.08	1.00															
X9	Technological Capability	0.12	-0.11	-0.29**	0.22*	0.28**	0.05	0.07	0.13	1.00														
X10	Potential Absorptive Capacity	0.09	0.07	-0.37**	0.18*	0.17*	-0.01	-0.07	0.19*	0.80**	1.00													
X11	Realised Absorptive Capacity	0.24**	-0.09	-0.21*	0.20*	0.17*	0.02	0.02	0.04	0.51**	0.45**	1.00												
X12	Marketing & Technological Capability Interaction	0.00	0.03	-0.06	-0.07	0.11	0.16	0.10	-0.29**	0.09	0.04	-0.02	1.00											
X13	Marketing Capability Squared	-0.05	-0.04	-0.05	-0.10	0.22**	-0.03	-0.08	-0.50**	-0.18*	-0.25**	-0.19*	0.21*	1.00										
X14	Technological Capability Squared	-0.07	-0.05	-0.10	-0.05	0.25**	0.12	0.21*	0.11	0.31**	0.08	-0.07	0.40*	0.01	1.00									
X15	Potential Absorptive Capacity Squared	-0.01	-0.01	0.18*	-0.03	-0.19*	0.00	0.00	0.08	-0.26**	-0.20*	-0.32**	0.20*	-0.01	0.08	1.00								
X16	Realised Absorptive Capacity Squared	-0.04	0.00	-0.14	-0.01	0.19*	-0.06	0.05	0.05	0.02	0.03	0.10	0.06	-0.01	0.11	0.07	1.00							
X17	Order of Entry	-0.16	0.02	0.43**	-0.23**	-0.32**	-0.10	-0.11	0.17*	-0.16	-0.10	-0.08	-0.31**	0.02	-0.06	0.03	-0.02	1.00						
X18	Entry Lag	-0.06	-0.31**	0.20*	0.06	0.09	-0.16	-0.08	0.09	0.05	0.06	0.05	-0.17*	0.18*	0.09	-0.02	0.12	0.76**	1.00					
X19	Relative Product Advantage	0.21*	-0.24**	-0.10	0.04	0.39**	0.00	0.16	-0.06	0.21*	0.11	0.10	0.06	-0.05	0.13	-0.15	-0.02	-0.31**	-0.10	1.00				
X20	Relative Price	0.05	0.28**	-0.01	-0.50**	0.19*	0.09	0.12	0.04	-0.07	0.03	0.10	0.13	-0.06	-0.03	-0.09	-0.03	0.00	-0.12	0.20*	1.00			
X21	Age	0.15	-0.15	-0.11	0.197*	0.12	-0.02	-0.07	0.02	0.24**	0.31**	0.61**	-0.09	-0.19*	-0.20*	-0.38**	-0.04	-0.10	-0.01	0.06	0.10	1.00		
X22	Tobin's Q	0.02	0.17*	-0.17*	-0.10	0.09	-0.10	-0.09	0.17*	0.13	0.16*	0.12	-0.07	-0.11	0.05	0.05	0.08	-0.01	-0.03	0.06	0.07	-0.05	1.00	
X23	Market Concentration	-0.14	0.43**	-0.09	-0.48**	0.06	0.00	0.01	0.15	-0.04	-0.05	-0.10	-0.08	0.04	0.13	-0.02	-0.03	0.21*	-0.05	0.01	0.25**	-0.22**	0.07	1.00

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

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

Table 6.20: Correlation Analysis

CHAPTER 7: HYPOTHESIS TESTING, ADDITIONAL ANALYSES AND ROBUSTNESS TEST RESULTS

7.1. Introduction

Having presented the data preparation procedures and findings of descriptive and correlation analysis in the previous chapter, this chapter highlights the results of the hypothesised relationships discussed in the conceptual framework in Chapter 4. The hypotheses were tested using seemingly unrelated regression (SUR) to simultaneously model the focal relationships. In addition, logistic regression was used to estimate the likelihood that a product survives beyond four years after introduction. To ensure robustness, the hypotheses were also tested using seemingly unrelated estimation (SUEST) and probit regression whereby robust standard error was utilised to deal with potential heteroscedasticity discussed in Chapter 6. Each individual relationship was examined for significance and direction. In addition, a review of the general fit of the model is also presented.

This chapter is organised into five parts. The first part discusses the seemingly unrelated regression technique, logistic regression and their assumptions. The second part discusses the conceptual framework model represented by the two systems of regressions equations estimated. This chapter also discusses the justification of adding additional variables consisting of interaction terms between categorical and continuous variables. This part of the chapter provides an overview of the procedures taken to ensure the validity and usefulness of adding the interaction terms into the equations. The third part of Chapter 7 reports the results obtained from the system of equations and discusses the respective hypotheses.

The fourth part of the chapter discusses the result of robust test using seemingly unrelated estimation (SUEST) and probit regression. Finally, the chapter provides a brief review and discussion on additional tests regarding issues such as model specification error and validation of strategic orientation measure.

7.2. Hypothesis Testing Method

7.2.1. Seemingly Unrelated Regression (SUR)

The hypotheses were tested using seemingly unrelated regression (SUR) to simultaneously model the focal relationships. This modelling approach was employed for a number of reasons. First, it allows the data to be modelled in a way that reflects the process by which strategic orientation is hypothesised to impact the level of resources, which in turn impacts capabilities, which subsequently influence market entry timing and product market strategy.

Secondly, estimating a full system of equation through SUR produces an efficiency gain relative to single-equation least-squares estimators (Zellner 1962; Davidson and MacKinnon 2004). In SUR, regression coefficients in all equations are estimated simultaneously by applying generalized least-squares to the whole system of equations (Zellner 1962). A system of equations produces better estimates when the error terms are correlated across the equations of the system (Vorhies et al. 2011; Davidson and MacKinnon 2004). The Breusch and Pagan (1980) $\chi 2$ statistic is typically applied to test the null hypothesis of uncorrelated errors across the equations of the system. If the null hypothesis is rejected, as is the case in the models of the present research, SUR is a superior method compared to equation-by-equation regression estimation using OLS due to the efficiency gain from SUR (Heij et al. 2004). The present research applied the 'sureg' command in STATA to run the seemingly unrelated regression model. The 'sureg' command in STATA uses the asymptotically efficient, feasible, generalised least-squares algorithm described in Greene (2012, pp.292–304).

Although Structural Equation Modelling (SEM) also allows for a series of relationships to be examined simultaneously and is useful in testing theories that contain multiple equations involving dependence relationships (Hair et al. 2010), it was ruled out for a number of reasons. First of all, SEM is a large sample technique in which N > 200 (e.g., Kline 2005, pp. 111, 178). In addition, SEM technique cannot typically model multiple categorical data making it inappropriate for testing the hypotheses developed in the present research (Vorhies et al. 2009).

SEM can be thought of as a combination of confirmatory factor analysis and multiple regression analysis, made up by simultaneous equation models (Hair et al. 2010; Allison 1999). Factor analysis reduces sets of variables that are highly interrelated into factors which represent dimensions within the data (Hair et al. 2010). The basic idea of SEM is that the observed variables depend on latent, unobserved variables and those latent variables may have causal relationships among them (Allison 1999). However, factor analysis is not necessary for the present research because the present research does not employ questionnaire as a method. Questionnaires ask several questions representing indicators that need to correlate. In contrast, secondary data was used in the present research to operationalise measures and each construct is measured and represented by one indicator (see section 5.6 on operationalisation of constructs in Chapter 5). For this reason, SEM is considered unsuitable as a method of analysis for the present study.

7.2.2. Logistic Regression

Recall that product performance was measured as whether the product survives beyond four years after its launch. Therefore, the dependent variable is dichotomous: the dependent variable in the survival equation equals 1 if the product survived and 0 otherwise. In other words, the present research tries to estimate a probability that a product survives given the explanatory variables discussed earlier.

Using linear regression when the dependent variable is dichotomous has several disadvantages. Firstly, because the dependent variable y can take only the value 0 and 1, it puts a restriction on the parameters β (Heij et al. 2004). The linear regression estimation cannot guarantee that the predicted values will remain within the range of 0 and 1 (Hair et al. 2010). When the estimation produces a value smaller than zero or larger than one, it is not a real estimation of probabilities.

Secondly, the binary nature of the dependent variable (0 or 1) has properties that violate the assumptions of multiple regressions. The error term of the dichotomous dependent variable follows the binomial distribution instead of the normal distribution (Hair et al. 2010). The violation of normality of disturbance assumption leads to unreliable parameter estimates, standard errors and significance tests (Allison 1999; Miles and Shevlin 2001).

In addition, the variance of a dichotomous variable is not constant indicating the presence of heteroscedasticity (Hair et al. 2010). This implies that although OLS may be an unbiased procedure (provided that the regressors are exogenous, it is not an efficient estimator of β (Heij et al. 2004).

Besides the linear probability model, another option is to use discriminant analysis. However, discriminant analysis relies on strictly meeting the assumptions of multivariate normality and equal variance-covariance matrices across groups (Hair et al. 2010). In practice, these assumptions are difficult to meet.

Accordingly, logistic regression was used to estimate the probability of survival for the 143 products. Logistic regression is an appropriate method because it is specifically designed to predict the probability of an event occurring (i.e., the probability of an observation being in the group coded 1) (Hair et al. 2010). It also deals with issues such as binomial distribution of error term and heteroscedasticity that are problematic for linear regression (Hair et al. 2010). The following equation provides a brief explanation of logistic regression.

If p is the probability that a product survives, the logistic model predicts p as follows:

$$\text{Log}\left({}^{p}/_{1-p}\right) = A + B_1x_1 + B_2x_2$$

The left-hand side of this equation is called the logit of *p*, which converts a variable that is bounded by 0 and 1 into a variable that has no upper and lower bounds (Allison 1999). The logit model is estimated using maximum likelihood estimator, which works iteratively (Allison 1999; Miles and Shevlin 2001). Maximum likelihood estimator attempts to maximise the likelihood of obtaining the observed values of the dependent variable, given the independent variables (Miles and Shevlin 2001).

Furthermore, many researchers prefer logistic regression due to its similarity to multiple regression (Hair et al. 2010). Logistic regression has also been used by previous scholars to analyse the relationship between order of entry and survival (e.g., Robinson and Min 2002). Logistic regression has a straightforward statistical test as well as having similar approaches to incorporating metric and nonmetric variables and nonlinear effects to multiple regression (Hair et al 2010). Furthermore, it has a wide range of diagnostics namely the goodness of fit (LR-test and R^2), the predictive quality (classification table and hit rate) and analysis of the residuals (in particular an LM-test for heteroskedasticity) (Heij et al. 2004).

In summary, logistic regression is an appropriate method for two-group (binary) dependent variables due to its robustness, ease of interpretation, and diagnostics available (Hair et al. 2010).

7.3. Adding Interaction Terms and Polynomial Terms

7.3.1. Interaction Terms between Technological Capability and Product Categories

In addition to the variables specified in the hypotheses and conceptual framework, additional variables in the form of interaction terms between technological capability and product categories (represented by dummies) were considered as additional predictors of relative product advantage. First of all, a simple regression analysis shows that technological capability is a significant predictor of relative product advantage. However, the significant effect was nullified when product categories were controlled for. In contrast, marketing capability, potential absorptive capacity and realised absorptive capacity were not significant predictors of relative product advantage whether or not product categories were added as controls. The same dynamic between technological capability and product categories was not observed when they were entered into entry timing and relative price equation.

To further explore the possible interaction effects, the equality of variance test was performed. One-way ANOVA test reveals that the means of natural log of product advantage variable are not equal among the four product categories. Furthermore, the Welch and Brown-Forsythe test also indicate that technological capability varies in significant amounts in three out of four product categories. This suggests that the impact of technological capability on relative product advantage may vary across product categories. Hence, the possible interaction effect between technological capability and product categories continued to be examined using the hierarchical regression procedure. This procedure is described in the next section.

7.3.2. Hierarchical Regression Procedure

Adding interaction effects can lead to the problem of multicollinearity. Multicollinearity can create problems in assessing the statistical significance of the individual coefficients (Hair et al. 2010). Therefore, the interaction terms were added hierarchically to the original models to examine the improvement in R-squared. By doing this, it could be determined whether the new model is an improvement of the original (Miles and Shevlin 2001). If the change in R-squared is found to be significant, the interaction terms would be included in the system of equation.

The interaction terms between technological capability and product categories produces an R-squared value change of 0.05, which is significant ($p > 0.08$) at 10% level when added into relative product advantage equation. This interaction effect involves an interaction between a categorical independent variable (product category), represented by dummies with a continuous variable (technological capability). Therefore, the interaction variable was treated just like a normal dummy variable. In the hypothesis testing, the interaction between dummy variable portable media player and technological capability was used as the reference group; therefore, excluded from the equation.

7.4. Model Specification

After the procedures in section 7.3 were performed, the hypotheses proposed in Chapter 4 are formally specified as a system of regressions equations estimated simultaneously as specified below.

$\mathrm{LN\ SGA}\ i$ = β_0 + β_1(Analyser) + β_2(Prospector) + β_3(SIC Computer) + β_4(SIC Audio, Video & Telecommunication) + β_5(SIC Photographic Equipment) + β_6(SIC Wholesale & Stores) + β_7(Category Portable Computer) + β_8(Category Digital Camera) + β_9(Category Smart Phone) + β_{10}(Age) + β_{11}(SqrtTobinQ) + $\varepsilon_{\mathrm{LN\ SGA}\ i}$

$\mathrm{LN\ RND}_i$ = β_0 + β_1(Analyser) + β_2(Prospector) + β_3(SIC Computer) + β_4(SIC Audio, Video & Telecommunication) + β_5(SIC Photographic Equipment) + β_6(SIC Wholesale & Stores) + β_7(Category Portable Computer) + β_8(Category Digital Camera) + β_9(Category Smart Phone) + β_{10}(Age) + β_{11}(SqrtTobinQ) + $\varepsilon_{\mathrm{LN\ RND}\ i}$

$\text{LN MARKETING CAPABILITY}_i$ = β_0 + β_1(Ln SGA) + β_2(Analyser) + β_3(Prospector) + β_4(SIC Computer) + β_5(SIC Audio, Video & Telecommunication) + β_6(SIC Photographic Equipment) + β_7(SIC Wholesale & Stores) + β_8(Category Portable Computer) + β_9(Category Digital Camera) + β_{10}(Category Smart Phone) + β_{11}(Age) + β_{12}(SqrtTobinQ) + $\varepsilon_{\text{LN MARKETING CAPABILITY}\ i}$

$\text{LN TECHNOLOGICAL CAPABILITY}_i$ = β_0 + β_1(Ln RND) + β_2(Analyser) + β_3(Prospector) + β_4(SIC Computer) + β_5(SIC Audio, Video & Telecommunication) + β_6(SIC Photographic Equipment) + β_7(SIC Wholesale & Stores) + β_8(Category Portable Computer) + β_9(Category Digital Camera) + β_{10}(Category Smart Phone) + β_{11}(Age) + β_{12}(SqrtTobinQ) + $\varepsilon_{\text{LN TECHNOLOGICAL CAPABILITY}\ i}$

$\text{LN POTENTIAL ABSORPTIVE CAPACITY}_i$ = β_0 + β_1(Ln SGA) + β_2(Ln RND) + β_3(Analyser) + β_4(Prospector) + β_5(SIC Computer) + β_6(SIC Audio, Video & Telecommunication) + β_7(SIC Photographic Equipment) + β_8(SIC Wholesale & Stores) + β_9(Category Portable Computer) + β_{10}(Category Digital Camera) + β_{11}(Category Smart Phone) + β_{12}(Age) + β_{13}(SqrtTobinQ) + $\varepsilon_{\text{LN POTENTIAL ABSORPTIVE CAPACITY}\ i}$

$\text{LN REALISED ABSORPTIVE CAPACITY}_i$ = β_0 + β_1(Ln Potential Absorptive Capacity) + β_2(Analyser) + β_3(Prospector) + β_4(SIC Computer) + β_5(SIC Audio, Video & Telecommunication) + β_6(SIC Photographic Equipment) + β_7(SIC Wholesale & Stores) + β_8(Category Portable Computer) + β_9(Category Digital Camera) + β_{10}(Category Smart Phone) + β_{11}(Age) + β_{12}(SqrtTobinQ) + $\varepsilon_{\text{LN REALISED ABSORPTIVE CAPACITY}\ i}$

ORDER OF ENTRY $_i$ = β_0 + β_1(Ln Marketing Capability) + β_2(Ln Technological Capability) + β_3(Ln Marketing & Technological Capability Interaction) + β_4(Ln Potential Absorptive Capacity) + β_5(Ln Realised Absorptive Capacity) + $\beta_6(Technological\ Capability^2)$ + $\beta_7(Marketing\ Capability^2)$ + $\beta_8(Potential\ Absorptive\ Capacity^2)$ + $\beta_9(Realised\ Absorptive\ Capacity^2)$ + β_{10}(Ln SGA) + β_{11}(Ln RND) + β_{12}(Analyser) + β_{13}(Prospector) + β_{14}(SIC Computer) + β_{15}(SIC Audio, Video & Telecommunication) + β_{16}(SIC Photographic Equipment) + β_{17}(SIC Wholesale & Stores) + β_{18}(Category Portable Computer) + β_{19}(Category Digital Camera) + β_{20}(Category Smart Phone) + β_{21}(Age) + β_{22}(SqrtTobinQ) + $\varepsilon_{\text{ORDER OF ENTRY}\ i}$

Section 5.6.2.4.1 explains that entry timing were operationalised as order of entry as well as entry lag (the number of months elapses between the date of the new product introduction and the date of each subsequent entry). As such, order of entry was replaced with entry lag as an alternative measure of entry timing in the second system of equations. The entry lag equation is specified below:

ENTRY LAG $_i$ = β_0 + β_1(Ln Marketing Capability) + β_2(Ln Technological Capability) + β_3(Ln Marketing & Technological Capability Interaction) + β_4(Ln Potential Absorptive Capacity) + β_5(Ln Realised Absorptive Capacity) + $\beta_6(Technological\ Capability^2)$ + $\beta_7(Marketing\ Capability^2)$ + $\beta_8(Potential\ Absorptive\ Capacity^2)$ + $\beta_9(Realised\ Absorptive\ Capacity^2)$ β_{10}(Ln SGA) + β_{11}(Ln RND) + β_{12}(Analyser) + β_{13}(Prospector) + β_{14}(SIC Computer) + β_{15}(SIC Audio, Video & Telecommunication) + β_{16}(SIC Photographic Equipment) + β_{17}(SIC Wholesale & Stores) + β_{18}(Category

Portable Computer) + β_{19}(Category Digital Camera) + β_{20}(Category Smart Phone) + β_{21}(Age) + β_{22}(SqrtTobinQ) + + $\varepsilon_{\text{ENTRY LAG } i}$

$\text{RELATIVE PRODUCT ADVANTAGE}_{i}$ = β_0 + β_1(Ln Marketing Capability) + β_2(Ln Technological Capability) + β_3(Ln Marketing & Technological Capability Interaction) +β_4(Ln Technological Capability x Category Portable Computer) + β_5(Ln Technological Capability x Category Digital Camera) + β_6(Ln Technological Capability x Category Smart Phone) + β_7(Ln Potential Absorptive Capacity)+ β_8(Ln Realised Absorptive Capacity) + β_9(Ln SGA) + β_{10}(Ln RND) + β_{11}(Analyser) + β_{12}(Prospector) + β_{13}(SIC Computer) + β_{14}(SIC Audio, Video & Telecommunication) + β_{15}(SIC Photographic Equipment) + β_{16}(SIC Wholesale & Stores) + β_{17}(Category Portable Computer) + β_{18}(Category Digital Camera) + β_{19}(Category Smart Phone) + β_{20}(Age) + β_{21}(SqrtTobinQ) + $\varepsilon_{\text{RELATIVE PRODUCT ADVANTAGE } i}$

$\text{RELATIVE PRICE}_{i}$ = β_0 + β_1(Ln Marketing Capability) + β_2(Ln Technological Capability) + β_3(Ln Marketing & Technological Capability Interaction) + β_4(Ln Potential Absorptive Capacity)+ β_5(Ln Realised Absorptive Capacity)+ β_6(Ln SGA) + β_7(Ln RND) + β_8(Analyser) + β_9(Prospector) + β_{10}(SIC Computer) + β_{11}(SIC Audio, Video & Telecommunication) + β_{12}(SIC Photographic Equipment) + β_{13}(SIC Wholesale & Stores) + β_{14}(Category Portable Computer) + β_{15}(Category Digital Camera) + β_{16}(Category Smart Phone) + β_{17}(Age) + β_{18}(SqrtTobinQ) + $\varepsilon_{\text{RELATIVE PRICE } i}$

The logistic equation to estimate product likelihood of survival is specified as:

SURVIVAL_i = β_0 + β_1(Order of Entry) + β_2(Ln Relative Product Advantage) + β_3(Ln Relative Price) + β_4(Ln Marketing & Technological Capability Interaction) + β_5(Ln Marketing Capability) + β_6(Ln Technological Capability) +β_7(Ln Technological Capability x Category Portable Computer) + β_8(Ln Technological Capability x Category Digital Camera) + β_9(Ln Technological Capability x Category Smart Phone) + β_{10}($Technological\ Capability^2$) + β_{11}($Marketing\ Capability^2$) + β_{12}(Potential Absorptive Capacity) + β_{13}(Realised Absorptive Capacity) + β_{14}($Potential\ Absorptive\ Capacity^2$) + β_{15}($Realised\ Absorptive\ Capacity^2$) + β_{16}(Ln SGA) + β_{17}(Ln RND) + β_{18}(Analyser) + β_{19}(Prospector) + β_{20}(SIC Computer) + β_{21}(SIC Audio, Video & Telecommunication) + β_{22}(SIC Photographic Equipment) + β_{23}(SIC Wholesale & Stores) + β_{24}(Category Portable Computer) + β_{25}(Category Digital Camera) + β_{26}(Category Smart Phone) + β_{27}(Age) + β_{28}(SqrtTobinQ) + β_{29}(Ln Market Concentration)+ $\varepsilon_{\text{SURVIVAL}_i}$

Recall that in the second system of equations, order of entry is replaced with entry lag as an alternative measure of entry timing. Hence, entry lag also replaced order of entry as a predictor of product survival in the second system of equation. Data was then analysed using SUR and logistic regression to test the relationships specified in the above equations.

7.5. Hypothesis Testing Results

7.5.1. Standardised Data

Data for all the variables were standardised except for the dummies. The simultaneous systems of equations were modelled using standardised data to reduce the effects of the units of measurement that varied across the constructs in the model (Vorhies et al. 2009). Standardisation of data was performed using 'egen' command in STATA, which creates standardised data for each variable. Standardisation procedure involves subtracting the mean from the value for each case and dividing by the standard deviation (Haighton et al. 2003). The process of standardising variable x with mean μ and standard deviation σ to produce variable z is summarised by the following:

$z = (x-\mu)/\sigma$

7.5.2. System Equation 1 with Order of Entry as a Measure of Entry Timing

7.5.2.1. Model Fit

Table 7.1 summarises the results of regressions equations estimated simultaneously for System Equation 1 and 2 as well as the results from the logistic regressions. It shows the standardised estimates, t-values and significant levels for the hypotheses.

SUR procedure on the system of equation produced R^2 values ranging from 0.15 to 0.58, which suggest that the independent variables account for significant variance in the dependent variables for the firms in the sample. Furthermore, the result of Breusch-Pagan Test of independence (1980) produced a significant finding at 0.001 level suggesting that the errors across the equations are correlated. Hence, SUR procedure proved to have resulted in an efficiency gain in the estimation (Heij et al. 2004).

The pseudo R^2 value for the logistic regression estimating survival rates is 0.23, which suggests that the independent variables explain the model relatively well. The logistic regression produces a Wald chi-squared value of 44.49 and $p<0.05$, which suggests that the overall model is significant and performs well at predicting the probability of product survival. Hosmer and Lemeshow's test performed on the logistic regression yielded a χ^2 value of 6.48 with a p-value of 0.59. The insignificant result indicates that the model fits the data well.

7.5.2.2. Hypothesis Testing Results

Hypothesis 1 predicted that along the prospectors-analyser-defender continuum, prospectors devote the greatest resources on marketing and defenders the lowest. The results support the hypothesis. This is presented by $\beta = 0.54$ ($t = 2.59$) for analyser and $\beta = 0.71$ ($t = 3.02$) for prospector at 1% level of significance.

Testing Hypothesis 2 demonstrated support for the predicted relationship that along the prospectors-analyser-defender continuum, prospectors devote the greatest resources on technology and defenders the lowest. This estimation yields $\beta = 0.50$ ($t = 2.41$) for analyser and $\beta = 0.51$ ($t = 2.15$) for prospector at 5% level of significance.

Hypothesis 3 predicted the higher the marketing resources, the greater the marketing capability. The results in Table 7.1 show a significant finding at 1% level of significance for Hypothesis 3 ($\beta = -0.35$, $t = -4.65$), but the sign is not in the hypothesised direction. In contrast, testing of hypothesis 4, which predicted a positive relationship between technological resources and technological capability yielded no significant finding ($\beta = 0.01$, $t = 0.11$).

Hypothesis 5 predicted a positive relationship between marketing resources and potential absorptive capacity. The estimate has the opposite of the expected sign (β= -0.00, t= -0.09), and is not statistically significant. Hypothesis 6 forecasted that technological resources have a positive relationship with potential absorptive capacity. Similar to the result for Hypothesis 5, the estimate has the opposite of the expected sign, indicating that no support was found for Hypothesis 6. The estimation produces a standardised coefficient of -0.11 and a t-value of -1.37. Hypothesis 7 predicted a positive relationship between potential absorptive capacity and realised absorptive capacity. Table 7.1 shows a significant finding at 1% level of significance for Hypothesis 7 (β = 0.23, t = 3.58).

Hypothesis 8 predicted that there is a U-shaped relationship between marketing capability and entry timing. The hypothesis was supported at 1% level of significance (β=0.24, t=3.08). Similarly, the analysis found support for Hypothesis 9 predicting a U-shaped relationship between technological capability and entry timing (β=0.23, t=2.88). Technological capability squared was found to be a significant predictor of order of entry at 1% level of significance.

Hypothesis 10 predicted that the greater the interaction between technological capability and marketing capability, the faster the entry. This hypothesis received strong support as the coefficient of marketing and technological capability interaction is negative and significant at 1% level (β=-0.34, t=-4.53).

Testing Hypothesis 11 demonstrated a non-significant finding for the predicted U-shaped relationship between potential absorptive capacity and entry timing (β=-0.10, t=-1.39, p< 0.164). Similarly, testing Hypothesis 12 which predicted a U-shaped relationship between realised absorptive capacity and entry timing yielded a non-significant finding (β=0.03, t=0.49, p< 0.626).

Hypothesis 13 to 15 predicted that marketing capability, technological capability as well as their interaction positively influenced relative product advantage. Testing for these hypotheses again produced no support. The coefficient of -0.07, -0.23, 0.01 and t-statistics of –0.80, -1.23 and 0.18 for marketing capability, technological capability and the interaction respectively are not significant.

Hypothesis 16 argues that the higher a firm's potential absorptive capacity, the higher the relative product advantage. This finding shows that the hypothesis cannot be supported (β=0.13, t=0.87, p<0.386). Similarly, no support was found for Hypothesis 17, which predicted that realised absorptive capacity is positively associated with relative product advantage (β=-0.13, t=-1.10, p<0.272).

No support was found for Hypothesis 18, which predicted for a positive relationship between marketing capability and price (β=0.00, t=0.01, p<0.995). Hypothesis 19 predicted that as the technological capability increased, relative price could either increase (19a) or decrease (19b). No support was found for Hypothesis 19a, but a strong support was found for Hypothesis 19b. The estimation produces a standardised coefficient value of -0.31 that is significant at 5% level and a t-value of -2.43. No support was found for Hypothesis 20, which predicted a positive interaction effect between the two capabilities and relative product price (β=0.11, t=1.64, p<0.101).

Hypothesis 21 predicted that potential absorptive capacity has a positive relationship with relative price. This hypothesis is weakly supported at 10% level of significance (β=0.25, t=1.95, p<0.052). Finally, no support was found for Hypothesis

22, which predicted that the higher the realised absorptive capacity, the higher the relative price (β=0.07, t=0.70, p<0.484).

Hypothesis 23 argued that increasing order of entry would reduce the probability of product surviving beyond four years of entry. Using logistic regression to test the hypothesis, marginal support at 10% level of significance was found (β=-0.53, t=-1.75, p< 0.081). Testing Hypothesis 24 showed a marginally significant relationship between relative product advantage and product survival at 10% level of significance (β = 0.44, t= 1.66, p< 0.096). Similarly, weak support was found for Hypothesis 25 which predicted probability of product surviving beyond four years increased as relative price increased (β = 0.52, t= 1.66, p< 0.097).

7.5.2.3. Interaction Terms between Technological Capability and Product Category

The interaction between portable computer product category and technological capability was found to be significant at 10% level when entered into the relative product advantage equation (β=0.30, t=1.72). Similarly, the interaction between digital camera product category and technological capability was found to be significant at 1% level (β=1.00, t=3.03). Finally, the interaction between smart phone product category and technological capability was also found to be a significant predictor of relative product advantage at 10% level (β=0.57, t=1.91).

The significance of the interaction terms in predicting relative product advantage suggests the effect of technological capability on relative product advantage differs according to product categories. Using portable audio player as the reference category, the estimation of the interaction term (β = 0.30, β =1.00, β = 0.57) yields a plot as illustrated in Figure 7.1 below.

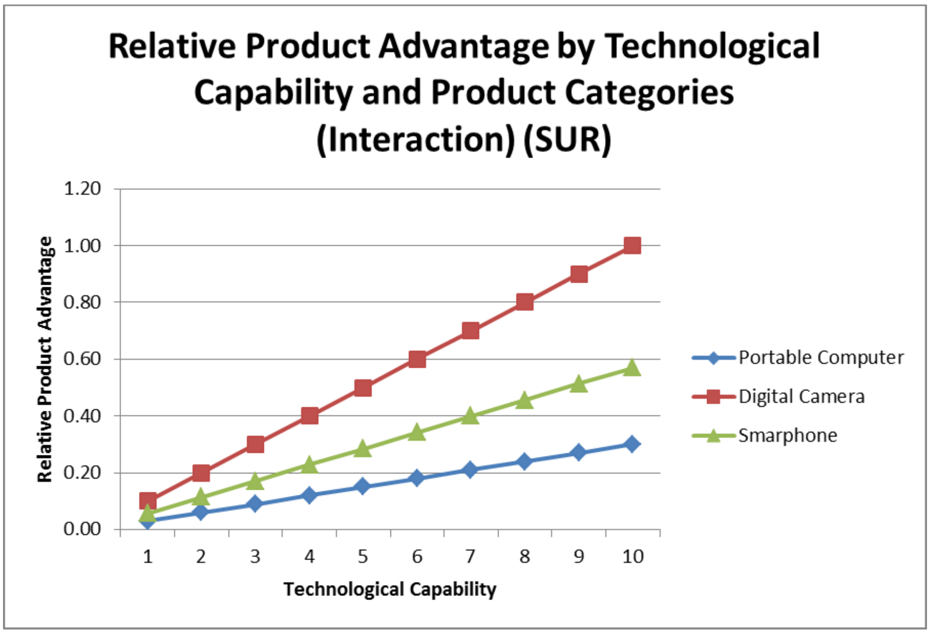


Figure 7.1: Relative Product Advantage by Technological Capability and Product Category (Interaction)

7.5.3. System Equation 2 with Entry Lag as a Measure of Entry Timing

Recall that entry timing was measured using order of entry as well as entry lag. Table 6.20 in Chapter 6 shows that the two measures are highly correlated with a correlation value of 0.76 ($p<0.001$). Due to potential multicollinearity caused by the high correlation between these two variables, they were applied separately in two different systems of equations. The findings from the estimation of simultaneous system of equations using entry lag is presented in Table 7.1 and the results are discussed below.

SUR estimation produced R-squared values of 0.48 and 0.36 for order of entry and entry lag respectively suggesting that the independent variables explain order of entry better than they do entry lag. The logistic model predicting the likelihood of product survival using entry lag as a measure of entry timing produced a pseudo R-squared of 0.23, similar to the pseudo R-squared estimated when order of entry is used. Furthermore, the logistic model using entry lag produces a Wald chi-squared value of 44.56 and $p<0.03$, suggesting that the model is significant in predicting firms' likelihood of survival beyond four years. Subsequently, a Hosmer and Lemeshow's test was performed, which yielded a χ^2 value of 5.61 and a p-value of 0.69. The insignificant result indicates that the model fits the data well. The results of hypothesis testing using entry lag as a measure of entry timing are discussed below.

SUR produced the same results for Hypothesis 1 to 7 and Hypothesis 13 to 22 because entry timing is not one of the variables in the equations. Replacing order of entry with entry lag affects Hypothesis 8 to 12 and Hypothesis 23.

Hypothesis 8 predicted that there is a U-shaped relationship between marketing capability and entry timing. Consistent with the result for order of entry, the hypothesis was also supported at 1% level of significance when entry timing was operationalised as entry lag ($\beta=0.36$, $t=4.17$). Similarly, the analysis found support for Hypothesis 9 predicting a U-shaped relationship between technological capability and entry timing ($\beta=0.25$, $t=2.70$). Technological capability squared was found to be a significant predictor of order of entry at 1% level of significance.

Hypothesis 10 predicted that the greater the interaction between technological capability and marketing capability, the faster the entry. This hypothesis received strong support as the coefficient of marketing and technological capability interaction is negative and significant at 1% level (β=-0.24, t=-2.83).

Consistent with the result found for order of entry, testing Hypothesis 11 demonstrated a non-significant finding for the predicted U-shaped relationship between potential absorptive capacity and entry timing (β=-0.09, t=-1.09, p< 0.277). Similarly, testing Hypothesis 12 which predicted a U-shaped relationship between realised absorptive capacity and entry timing yielded a non-significant finding (β=0.08, t=1.10, p< 0.270).

Finally, Hypothesis 23 argued that increasing entry lag would reduce the probability of product surviving beyond four years of entry. Using logistic regression to test the hypothesis, marginal support at 10% level of significance was found (β=-0.49, t=-1.76, p< 0.079).

7.5.4. Robust Test

7.5.4.1 Diagnostic of Specification Error in Logistic Regression

A variety of robustness test to establish confidence in the results were performed. The first test was performed to enable detection of any specification error in the logistic models. In order to ensure that survival equation was properly specified, logistic model regression was indeed the correct function, relevant variables have been included and that no irrelevant variables have been included in the model, STATA command 'linktest' was used. Table 7.2 presents the findings.

Table 7.2: Test of Specification Error in Logistic Regression

System Equation	_Hat t-value	P>|z|	_Hatsq t-value	P>|z|
1 with order of entry	5.28	0.000	-0.12	0.904
2 with entry lag	5.29	0.000	-0.28	0.777

Linktest uses the linear predicted values (_hat) and linear predicted value squared (_hatsq) as predictors to rebuild the model. If the model is specified correctly, the variable '_hat' should be statistically significant. Linktest is significant If '_hatsq' is significant suggesting that relevant variables have been omitted from the model. Table 7.2 shows that '_hat' estimations are significant in all equations. In contrast, 'Hatsq' is insignificant indicating that the models are well specified. The findings from the test indicate that the logistic regressions do not suffer from specification error; thus adding confidence and credibility to the findings.

7.5.4.2. SUEST and Probit Regression: System of Equation 1 & 2

To ensure robustness of findings, System Equation 1 and 2 were also tested using Seemingly Unrelated Estimation (SUEST). SUEST allows for multiple equations to be estimated simultaneously using robust standard error, which deals with heteroscedasticity problems in some of the equations (see section on test of heteroscedasticity in Chapter 6).

In addition to logistic regression, product survival equation was also estimated using probit regression with robust standard error. The probit and and logit models differ in the specification of the distribution of the error term u (Maddala 1992). The model which cumulative distribution of u follows the standard normal distribution is called the probit model, and the model which cumulative distribution of u follows logistic distribution is called the logit model (Maddala 1992; Heij et al. 2004).

The decision to choose between the logit and probit model is often a personal preference because generally, the differences between the two models are small (Heij et al. 2004). A number of studies studying firms' performance such as survival (e.g., Shamsie et al. 2004) and probability of an imitating firm beating an innovator firm in terms of sales (e.g. Ethiraj and Zhu 2008) used probit models to assess the effects independent and control variables have on firms' likelihood of being in group labelled 1 (i.e., 1 representing the group that survived or beat the innovator). Table 7.3 summarises the findings of SUEST and probit estimation.

As shown in Table 7.1 and Table 7.3, SUR and SUEST yielded relatively similar findings for System of Equation 1 and 2 with regards to t-value and level of significance. Table 7.4 highlights the three differences produced by the two estimations.

Table 7.4: Difference in the Estimation Produced by SUR and SUEST

		SUR		SUEST	
Independent Variable	**Dependent Variable**	**Standardised Coefficient**	**t-value**	**Standardised Coefficient**	**t-value**
Portable computer x Technological Capability	Relative Product Advantage	0.30	1.72*	0.19	0.98
Digital Camera x Technological Capability	Relative Product Advantage	1.00	3.03***	0.94	2.24**
Smart Phone x Technological Capability	Relative Product Advantage	0.57	1.91*	0.60	2.01 **

SUR and SUEST procedure yielded different results for testing of relationship between the interaction of portable computer category and technological capability with relative product advantage. While SUR produced a significant result (β=0.30, t=1.72, p< 0.09), SUEST yielded a non-significant finding (β=0.19, t=0.98, p<0.33).

A slight difference was yielded by the two estimation procedures when testing the relationship between the digital camera product category and technological capability interaction term with relative product advantage. SUR estimation produced a stronger relationship (β=1.00, t=3.03, p< 0.002), compared to SUEST estimation (β=0.94, t=2.24, p<0.03).

The two estimations also produced different results for testing of relationship between the interaction of smart phone category and technological capability with relative product advantage. While SUEST estimation provided a coefficient estimation of 0.60, significant at 5% level (t=2.01, p< 0.05), SUR produced a coefficient estimation of 0.57, significant at 10% level (t=1.91, p<0.06).

Logistic regression and probit regression yielded similar findings for survival estimation except for the impact of relative product advantage in determining product survival. The difference is highlighted in Table 7.5. While logit estimation indicates that relative product advantage is significant at 10% level in predicting survival (β=0.44, t=1.66), probit estimation shows that it is not a significant predictor of survival (β=0.25, t=1.59).

Table 7.5: Difference in the Estimation Produced by Logistic and Probit Model

		LOGIT		PROBIT	
Independent Variable	**Dependent Variable**	**Standardised Coefficient**	**t-value**	**Standardised Coefficient**	**t-value**
Relative Product Advantage	Survival	0.44	1.66*	0.25	1.59

7.5.4.3. Validation of Strategic Orientation Categorisation

Following Sabherwal and Sabherwal (2007), strategic orientation classification was further validated using the analysis of variance to check for the differences in the means of five variables (firm level uncertainty, liquidity, asset efficiency, fixed asset intensity and long range financial liability) across the three strategic types.

One of the assumptions of ANOVA is constant variance of the error term (Hair et al. 2010). Therefore, Lavene's test for homogeneity of variance was used to measure the equality of variances. If Lavene's test produced a significant finding, it implies that the assumption of homogeneity of variances has been violated. When the assumption of homogeneity of variances is violated, Welch and Brown-Forsythe test were used to test for the equality of group means.

Table 7.6 below indicates that ANOVA, Welch and Brown-Forsythe test are statistically significant. This shows that the means of the five classification variables vary in significant amounts. This finding provides further validation of the measure used in the present research to classify the firms in the sample into the three strategic orientations.

Table 7.6: Strategic Orientation - Test for the Equality of Group Means

Variable	Lavene	ANOVA	Welch (Sig)	Brown-Forsythe (Sig)
Firm level uncertainty	0.000	NA	0.000	0.000
Liquidity	0.000	NA	0.000	0.000
Asset efficiency	0. 002	NA	0.000	0.002
Fixed Asset Intensity	0.025	NA	0.000	0.000
Long range financial liability	0.957	0.006	NA	NA

One-way ANOVA, Welch and Brown-Forsythe test indicate that the total set of group differences (i.e., Prospector vs. Analyser, Prospector vs. Defender, etc.) is large enough to be statistically significant). However, a significant main effect does not suggest that every one of the group differences is also significant (Hair et al. 2010). To find out which groups are significantly different (e.g., Prospector vs. Defender etc.), a post hoc procedure was applied. The post hoc procedure tests for all the group differences before identifying those differences that are statistically significant (Hair et al. 2010). Although there are a number of post hoc comparison methods available (e.g., Tukey HSD, Scheffe, LSD, etc.), Tamhane's T2 multiple comparison test was used in this case because it is an appropriate test to use when equal variances are not assumed.

Table 7.7 contains Tamhane's T2 post hoc comparison applied to five validation variables across the three strategic orientation groups. In the table, 1 represents Defender, 2 represents Analyser and 3 represents Prospector. With respect to firm level uncertainty, the groups are significantly different except for Analyser and Prospector. In terms of liquidity and fixed asset intensity, the groups are all significantly different from each other. Table 7.7 also shows that in terms of asset efficiency, the groups are significantly different except for Defender and Analyser. Finally, with respect to long range financial liability, only Analyser and Defender are significantly different from each other.

Table 7.7: Strategic Orientation – Post Hoc Test

Multiple Comparisons

Tamhane

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Firm Level Uncertainty	1	2	-1.13*	.17	.00	-1.55	-.71
		3	-1.41*	.17	.00	-1.81	-1.00
	2	1	1.13*	.17	.00	.71	1.55
		3	-.27	.13	.11	-.59	.04
	3	1	1.41*	.17	.00	1.00	1.81
		2	.27	.13	.11	-.04	.59
Liquidity	1	2	-.44*	.08	.00	-.63	-.26
		3	-1.20*	.27	.00	-1.86	-.53
	2	1	.44*	.08	.00	.26	.63
		3	-.75*	.27	.03	-1.43	-.08
	3	1	1.20*	.27	.00	.53	1.86
		2	.75*	.27	.03	.08	1.43
Asset Efficiency	1	2	.16	.21	.83	-.35	.67
		3	.71*	.21	.00	.20	1.22
	2	1	-.16	.21	.83	-.67	.35
		3	.55*	.14	.00	.20	.89
	3	1	-.71*	.21	.00	-1.22	-.20
		2	-.55*	.14	.00	-.89	-.20
Fixed Asset Intensity	1	2	.65*	.18	.00	.21	1.09
		3	1.36*	.17	.00	.95	1.78
	2	1	-.65*	.18	.00	-1.09	-.21
		3	.72*	.14	.00	.36	1.07
	3	1	-1.36*	.17	.00	-1.78	-.95
		2	-.72*	.14	.00	-1.07	-.36
Long Range Financial Liability	1	2	.58*	.19	.01	.13	1.03
		3	.16	.17	.73	-.25	.56
	2	1	-.58*	.19	.01	-1.03	-.13
		3	-.43	.20	.11	-.91	.06
	3	1	-.16	.17	.73	-.56	.25
		2	.43	.20	.11	-.06	.91

*. The mean difference is significant at the 0.05 level.

The analysis of variance shows that the means of all five variables used to validate the strategic orientation classification are statistically different across the groups. Subsequently, the post hoc procedure shows that the groups are mostly significantly different across the 5 variables when the groups are compared in pairs. Thus, the validation tests generally support the empirical classification.

7.6. Summary

This chapter provided an overview of the analysis method used for hypothesis testing. Additionally, it also provided a detailed account of the procedures taken to extend the conceptual model with the addition of quadratic and interaction terms. In order to ensure that the findings can be reported with confidence, the data was subjected to additional analyses. Furthermore, diagnostics of potential issues commonly faced by quantitative researchers such as model specification errors were also discussed. Finally, the chapter also discussed the findings of analysis of variance performed to test and validate the reliability and validity of the strategic orientation classification. Table 7.8 summarise the findings discussed in the present chapter.

Drawing upon the results generated here, the following chapter will summarise the main conclusions, delineate the importance of the currents study and highlight its contribution to existing knowledge. The empirical applications for academics and practitioners will be discussed and the limitations of the study will be considered. Lastly, several recommendations for future research directions will be proposed.

Table 7.8: Summary of Hypothesis Testing Results from System of Equation 1 and 2

Number	**Hypothesis**	**Result**
H1	Along the prospectors-analyser-defender continuum, prospectors devote the greatest resources to marketing and defenders the lowest.	Supported
H2	Along the prospector–analyser–defender continuum, prospectors invest the greatest in technological resources and defenders the least.	Supported
H3	The higher the marketing resources, the greater the marketing capability	Not Supported
H4	The higher the technological resources, the greater the technological capability	Not Supported
H5	The higher the marketing resources, the greater the potential absorptive capacity	Not Supported

H6	The higher the technological resources, the greater the potential absorptive capacity	Not Supported
H7	The higher the potential absorptive capacity the greater the realised absorptive capacity	Supported
H8	There is a U-shaped relationship between marketing capability and entry timing	Supported
H9	There is a U-shaped relationship between technological capability and entry timing	Supported
H10	The greater the interaction of marketing and technological capability, the faster the entry	Supported
H11	There is a U-shaped relationship between potential absorptive capacity and entry timing	Not Supported
H12	There is a U-shaped relationship between realised absorptive capacity and entry timing	Not Supported
H13	The higher the marketing capability, the greater the relative product advantage	Not Supported
H14	The higher the technological capability, the higher the relative product advantage	Not Supported
H15	The greater the interaction level between technological capability and marketing capability, the greater the relative product advantage	Not Supported
H16	The higher the potential absorptive capacity, the higher the product advantage	Not Supported

H17	The higher the realised absorptive capacity, the higher the product advantage	Not Supported
H18	The higher the marketing capability, the higher the relative price	Not Supported
H19a	The higher the technological capability, the higher the relative price	Not Supported
H19b	The higher the technological capability, the lower the relative price	Supported
H20	The higher the marketing and technological capability interaction, the higher the relative price	Not Supported
H21	The higher the potential absorptive capacity, the higher the relative price	Weakly Supported
H22	The higher the realised absorptive capacity, the higher the relative price	Not Supported
H23	The faster the entry, the higher the probability of product survival	Weakly Supported
H24	The greater the relative product advantage, the higher the probability of product survival	Weakly Supported
H25	The greater the relative price, the higher the probability of product survival	Weakly Supported

Table 7.1: Hypothesis Testing Results (SUR and Logit Estimation)

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7(a)	Equation 7(b)	Equation 8	Equation 9	Equation 10 (a)	Equation 10 (b)
	Marketing Resource	Technological Resource	Marketing Capability	Technological Capability	Potential Absorptive Capacity	Realised Absorptive Capacity	Order of Entry	Entry Lag	Relative Product Advantage	Relative Price	Survival (Logit)	Survival (Logit)
	Coefficient (t-value)	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*
Independent variables												
Strategic Orientation (Dummy)												
Analyser	0.54 (2.59)***	0.50 (2.41)**	-0.20 (-1.02)	0.01 (0.06)*	0.18 (0.96)	-0.18 (-1.24)	-0.03 (-0.16)	0.01 (0.06)	0.41 (2.00) **	-0.13 (-0.75)	0.19 (0.31)	0.20 (0.34)
Prospector	0.71 (3.02)***	0.51 (2.15)**	-0.58 (-2.58)**	0.17 (0.80)	0.32 (1.54)	-0.45 (-2.67)***	0.15 (0.72)	0.15 (0.67)	0.05 (0.22)	-0.45 (-2.08)**	0.83 (1.13)	0.81 (1.11)
Ln SGA Intensity			-0.35 (-4.65)***		-0.00 (-0.09)		-0.06 (-0.66)	-0.09 (-0.87)	-0.14 (-1.31)	0.13 (1.34)	0.06 (0.18)	0.07 (0.19)
Ln R&D Intensity				0.01 (0.11)	-0.11 (-1.37)		-0.03 (-0.36)	0.01 (0.14)	0.15 (1.52)	0.05 (0.51)	-0.40 (-1.13)	-0.38 (-1.07)
Ln Marketing Capability							0.16 (1.82)*	0.22 (2.21)**	-0.07 (-0.80)	0.00 (0.01)	0.31 (1.03)	0.34 (1.11)
Ln Technological Capability							-0.19 (-1.44)	-0.31 (-2.11)**	-0.23 (-1.23)	-0.31 (-2.43)**	-0.54 (-0.90)	-0.54 (-0.91)
Ln Potential Absorptive Capacity						0.23 (3.58)***	0.25 (2.01)**	0.40 (2.85)***	0.13 (0.87)	0.25 (1.95)*	-0.07 (-0.15)	-0.04 (-0.08)
Ln realised Absorptive Capacity							0.24 (2.43)**	0.26 (2.39)**	-0.13 (-1.10)	0.07 (0.70)	0.92 (2.46)**	0.91 (2.46)**
Ln Marketing Capability x Technological Capability							-0.34 (-4.53)***	-0.24 (-2.83)***	0.01 (0.18)	0.11 (1.64)	-0.10 (-0.36)	-0.06 (-0.24)
Marketing Capability Squared							0.24 (3.08)***	0.36 (4.17)***			0.03 (0.13)	0.09 (0.31)
Tecnological Capability Squared							0.23 (2.88)***	0.25 (2.70)***			0.18 (0.42)	0.23 (0.54)
Potential Absorptive Capacity Squared							-0.10 (-1.39)	-0.09 (-1.09)			0.36 (1.31)	0.38 (1.38)
Realised Absorptive Capacity Squared							0.03 (0.49)	0.08 (1.10)			-0.13 (-0.61)	-0.11 (-0.52)
Ln Technological Capability x Category Portable Computer									0.30 (1.72)*		1.48 (2.59)**	1.48 (2.60)***
Ln Technological Capability x Category Digital Camera									1.00 (3.03)***		-2.02 (-1.57)	-2.09 (-1.60)
Ln Technological Capability x Category Smart Phone									0.57 (1.91)*		-0.36 (-0.28)	-0.56 (-0.43)
Order of Entry											-0.53 (-1.75)*	
Ln Entry Lag												-0.49 (-1.76)*
Ln Relative Product Advantage											0.44 (1.66)*	0.47 (1.75)*
Ln Relative Price											0.52 (1.66)*	0.52 (1.67)*
Controls												
Industry Grouping **(Dummy)**												
Computer & Computer Related Equipment	-0.43 (-1.03)	0.61 (1.47)	-0.31 (-0.80)	0.44 (1.17)	-0.40 (-1.08)	1.02 (3.46)***	-0.57 (-1.55)	-0.57 (-1.41)	0.47 (1.10)	0.59 (1.56)	2.09 (1.41)	2.13 (1.44)
Audio, video &Telecommunication Equipment	-0.40 (-0.94)	0.60 (1.41)	-0.31 (-0.77)	0.40 (1.05)	-0.52 (-1.39)	0.80 (2.67) ***	-0.65 (-1.76)*	-0.61 (-1.47)	0.23 (0.54)	0.76 (1.98)**	2.07 (1.37)	2.16 (1.43)
Photographic Equipment	-0.31 (-0.63)	0.41 (0.82)	-0.01 (-0.01)	0.18 (0.40)	-0.28 (-0.65)	0.55(1.55)	-0.73 (-1.81)*	-0.81 (-1.81)*	0.26 (0.53)	0.83 (1.97)**	-0.01 -0.01)	0.09 (0.05)
Wholesale and Stores	-1.13 (-2.23)**	-0.39 (-0.78)	-1.27 (-2.67)**	-0.73 (-1.61)	-1.66 (-3.74)**	0.20 (0.54)	-0.13 (-0.31)	-0.06 (-0.12)	0.14 (0.27)	0.30 (0.66)	2.98 (1.76)*	3.07 (1.82)*
Product Categories **(Dummy)**												
Portable Computer	0.16 (0.77)	0.21 (1.04)	-0.17 (-0.90)	-0.27 (-1.48)	-0.56 (-3.12)***	-0.10 (-0.68)	0.85 (4.91)***	1.06 (5.48)***	0.27 (1.32)	-0.29 (-1.61)	1.31 (1.71)*	1.31 (1.71)*
Digital Camera	-0.12 (-0.49)	-0.05 (-0.23)	-0.41 (-1.87)*	0.52 (2.43)**	0.02 (0.10)	0.27 (1.57)	-0.44 (-2.19)**	0.76 (3.33)***	0.08 (0.27)	-1.41 (-6.66)***	3.68 (2.61)***	4.18 (2.77)***
Smart Phone	-0.17 (-0.70)	0.31 (1.27)	-0.44 (-1.93)**	0.70 (3.20)***	0.29 (1.36)	0.14 (0.80)	-0.95 (-4.42)***	0.42 (1.74)*	0.94 (3.24)***	0.09 (0.40)	0.47 (0.49)	1.18 (1.16)
Age	0.11 (1.18)	0.02 (0.21)	-0.07 (-0.76)	0.15 (1.80)*	0.28 (3.46)***	0.45 (6.64)***	-0.11 (-1.19)	-0.15 (-1.39)	0.14 (1.29)	0.06 (0.69)	-0.26 (-0.78)	-0.27 (-0.81)
Square root Tobin's Q	-0.10 (-1.27)	-0.05 (-0.65)	0.15 (1.87)*	0.12 (1.61)	0.10 (1.41)	0.17 (2.79)***	-0.07 (-1.02)	-0.07 (-0.89)	0.12 (1.43)	0.06 (0.80)	-0.05 (-0.19)	-0.04 (-0.18)
Ln Market Concentration											0.11 (0.34)	0.03 (0.11)
Individual equation R-squared & Pseudo R-Squared	0.15	0.15	0.26	0.31	0.35	0.58	0.48	0.36	0.29	0.42	0.23	0.23

*p < .10
**p < .05
***p < .01

Table 7.3: Hypothesis Testing Results (SUEST and Probit Estimation)

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7(a)	Equation 7(b)	Equation 8	Equation 9	Equation 10 (a)	Equation 10 (b)
	Marketing Resource	Technological Resource	Marketing Capability	Technological Capability	Potential Absorptive Capacity	Realised Absorptive Capacity	Order of Entry	Entry Lag	Relative Product Advantage	Relative Price	Survival (Probit)	Survival (Probit)
	Coefficient (t-value)	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*	*Coefficient (t-value)*
Independent variables												
Strategic Orientation (Dummy)												
Analyser	0.54 (3.47)***	0.50 (3.72)***	-0.20 (-1.04)	0.01 (0.06)	0.18 (1.16)	-0.19 (-0.97)	-0.02 (-0.11)	0.02 (0.07)	0.43**	-0.13 (-0.64)	0.08 (0.23)	0.10 (0.28)
Prospector	0.71 (3.61) ***	0.51 (2.59)**	-0.58 (-2.06)**	0.17 (0.74)	0.32 (1.38)	-0.45 (-2.44) **	0.15 (0.64)	0.15 (0.58)	0.07	-0.45 (-1.81)*	0.48 (1.19)	0.48 (1.20)
Ln SGA Intensity			-0.35 (-3.20)***		-0.01 (-0.04)		-0.06 (-0.72)	-0.09 (-1.02)	-0.14 (-1.32)	0.13 (1.64)	0.05 (0.25)	0.05 (0.25)
Ln R&D Intensity				0.01 (0.07)	-0.11 (-1.01)		-0.03 (-0.44)	0.01 (0.15)	0.14 (1.70)*	0.05 (0.60)	-0.23 (-1.16)	-0.23 (-1.10)
Ln Marketing Capability							0.16 (1.58)	0.21 (1.98)**	-0.08 (-0.93)	0.00 (0.01)	0.20 (1.18)	0.22 (1.26)
Ln Technological Capability							-0.18 (-1.19)	-0.30 (-1.74)*	-0.18 (-0.97)	-0.31 (-2.50)**	-0.33 (-1.05)	-0.34 (-1.07)
Ln Potential Absorptive Capacity						0.23 (3.24)***	0.25 (2.17)**	0.39 (3.00)***	0.12 (0.84)	0.25 (1.71) *	-0.03 (-0.11)	-0.01 (-0.02)
Ln realised Absorptive Capacity							0.24 (1.98)**	0.26 (1.90)*	-0.12 (-0.90)	0.07 (0.57)	0.55 (2.70) ***	0.56 (2.72)***
Ln Marketing Capability x Technological Capability							-0.35 (-4.99)***	-0.24 (-3.40)***	0.00 (0.00)	0.11 (1.63)	-0.07 (-0.43)	-0.04 (-0.29)
Marketing Capability Squared							0.25 (3.65)***	0.37 (5.03)***			0.04 (0.25)	0.07 (0.43)
Tecnological Capability Squared							0.23 (3.16)***	0.24 (2.63)**			0.10 (0.56)	0.13 (0.71)
Potential Absorptive Capacity Squared							-0.08 (-1.23)	-0.07 (-0.98)			0.22 (1.56)	0.23 (1.64)
Realised Absorptive Capacity Squared							0.05 (0.74)	0.09 (1.31)			-0.08 (-0.62)	-0.06 (-0.51)
Ln Technological Capability x Category Portable Computer									0.19 (0.98)		0.86 (2.65)***	0.87 (2.66)***
Ln Technological Capability x Category Digital Camera									0.94 (2.24)**		-1.20 (-2.05)**	-1.26 (-2.15)**
Ln Technological Capability x Category Smart Phone									0.60 (2.01)**		-0.21 (-0.32)	-0.32 (-0.50)
Order of Entry											-0.31 (-1.70) *	
Ln Entry Lag												-0.29 (-1.79)*
Ln Relative Product Advantage											0.25 (1.59)	0.27 (1.69)*
Ln Relative Price											0.31 (1.76) *	0.31 (1.76)*
Controls												
Industry Grouping **(Dummy)**												
Computer & Computer Related Equipment	-0.43 (-1.30)	0.61(1.83) *	-0.31 (-1.27)	0.44 (1.06)	-0.40 (-0.68)	1.02 (3.47)***	-0.55 (-1.56)	-0.56 (-1.40)	0.47 (1.12)	0.59 (1.42)	1.27 (1.50)	1.29 (1.51)
Audio, video &Telecommunication Equipment	-0.40 (-1.15)	0.59 (1.91)*	-0.31 (-1.19)	0.40 (0.96)	-0.52 (-0.88)	0.80 (2.62)**	-0.62 (-1.75)*	-0.58 (-1.92)	0.23 (0.59)	0.76 (1.74)*	1.24 (1.46)	1.30 (1.51)
Photographic Equipment	-0.31 (-0.79)	0.41 (1.27)	-0.01 (-0.02)	0.18 (0.32)	-0.28 (-0.40)	0.55 (1.13)	-0.70 (-2.10)**	-0.79 (-0.11)*	0.25 (0.45)	0.83 (1.58)	0.00 (0.00)	0.04 (0.04)
Wholesale and Stores	-1.13 (-2.85)***	-0.39 (-0.87)	-1.27 (-2.03)**	-0.73 (-1.41)	-1.66 (-2.48)**	0.20 (0.65)	-0.13 (-0.27)	-0.05 (-1.37)	0.15 (0.27)	0.30 (0.60)	1.65 (1.70)*	1.71 (1.75)*
Product Categories **(Dummy)**												
Portable Computer	0.16 (0.72)	0.21 (0.92)	-0.17 (-0.85)	-0.27 (-1.41)	-0.56 (-3.17)***	-0.10 (-0.76)	0.85 (3.84)***	1.06 (4.81)***	0.23 (1.14)	-0.29 (-1.65)	0.80 (1.96)**	0.81 (1.96)**
Digital Camera	-0.12 (-0.62)	-0.05 (-0.29)	-0.41 (-2.32)**	0.52 (2.83)**	0.02 (0.12)	0.27 (1.45)	-0.45 (-2.68)***	0.745 (3.40)***	0.07 (0.24)	-1.41 (-5.75)***	2.23 (3.19)***	2.54 (3.48)***
Smart Phone	-0.17 (-0.63)	0.31 (1.20)	-0.44 (-1.38)	0.70 (3.20)**	0.29 (1.21)	0.14 (0.74)	-0.96 (-5.77)***	0.41 (1.65)	0.88 (3.06)***	0.09 (0.39)	0.32(0.59)	0.74 (1.31)
Age	0.11 (1.21)	0.02 (0.22)	-0.07 (-0.74)	0.15 (1.59)	0.28 (3.61)***	0.45(4.57)***	-0.10 (-0.92)	-0.14 (-1.23)	0.15 (1.22)	0.06 (0.77)	-0.17 (-0.86)	-0.18 (-0.91)
Square root Tobin's Q	-0.11 (-1.03)	-0.05 (-0.39)	0.15 (1.60)	0.12 (1.50)	0.10 (1.24)	0.17 (2.61)**	-0.07 (-1.05)	-0.07 (-0.93)	0.12 (1.07)	0.06 (0.71)	-0.05 (-0.35)	-0.05 (-0.36)
Ln Market Concentration											0.07 (0.40)	0.03 (0.16)
Individual equation R-squared & Pseudo R-Squared	0.15	0.15	0.26	0.31	0.35	0.58	0.48	0.36	0.30	0.42	0.23	0.23

*p < .10
**p < .05
***p < .01

CHAPTER EIGHT: DISCUSSION AND CONCLUSION

8.1. Introduction

The previous chapter, Chapter 7 presented the results of the hypotheses tests as well as the results of robustness tests. Following on from these results, Chapter 8 aims to conclude the present research by providing a discussion on the findings. The chapter also discusses the contribution of main findings to both theory and practice. Finally, the chapter reflects on the limitations of the present research and outlines some avenues for future research, which may extend the knowledge in the fields.

8.2. Discussion of Findings

8.2.1. Relationship between Firms' Strategic Orientation and Resources

Miles and Snow typology (1978) put forward the proposition that firms align their product-market innovation strategies with environmental shifts (Song et al. 2007). Namely, firms decide to pioneer a new product or market (prospector) or to protect an existing position within their niches (defender), or assume an intermediate position between these two strategies (analyser). In order to support its chosen strategy, a firm needs to allocate its scarce resources to develop capabilities that are more in line with the strategic types (Song et al. 2007). Hypothesis 1 and 2 were therefore tested and support was found for both hypotheses.

The hypotheses proposed that along the prospectors-analyser-defender continuum, prospectors devote the greatest resources on marketing and technology while defenders the lowest. The results are consistent with previous finding that in terms of their relative degree of marketing-related competencies, Miles and Snow's strategic types can be ordinally arranged as: prospector > analyser > defender > reactor (Conant et al. 1990). The finding of the present research is also in line with Langerak and colleagues' study (1999) on firms' R&D departments' strategic types and their associated R&D capabilities. Similar to Conant and colleague's finding, the capabilities of R&D departments can be ordinally arrayed as prospector > analyser > defender > reactor (Langerak et al. 1999).

This study contributes to the investigation of relationship between RBV studies of resources and capabilities with strategic type. That is, the present study confirms findings from previous empirical studies examining the alignment between organisations' resources and capabilities with their strategic type or product-market innovation decisions (e.g. Song et al. 2007; Conant et al 1990).

Furthermore, the present study enriches the fields' understanding on the relationship between strategic type and performance. Previous studies generally supported Miles and Snow's (1978) proposition that the three strategic types would perform equally well (e.g. Dyer and Song 1997; Conant et al. 1990). However, DeSarbo and colleague's called (2005) for more research to be done to enrich the understanding on the link between strategic type and performance. Accepting the call, the present research links strategic type and performance by unfolding the role of strategic type in shaping firms' resources and capabilities development, which facilitate firms' imitative market entry.

8.2.2. Relationship between Firms' Resources and Capabilities

Hypothesis 3 proposed that the higher the marketing resources, the greater the marketing capability. Similarly, hypothesis 4 posited that the higher the technological resources, the greater the technological capability. Despite the theoretical foundation, both hypotheses were not supported in the analysis. Specifically, marketing resources were found to be negatively associated with marketing capability while technological resources were found to have no significant relationship with technological capability.

Hypothesis 5 predicted that the higher the marketing resources, the greater the potential absorptive capacity. Likewise, Hypothesis 6 posited that the higher the technological resources, the greater the potential absorptive capacity. The present study argues that a firm's level of resources determines its level of potential absorptive capacity, which represents a firm's dynamic capability to value, acquire and assimilate external knowledge (Zahra and George 2002). However, the hypothesis testing procedure described in Chapter 7 indicates that no support was found for these hypotheses.

These are certainly surprising findings within the context of the present study. Given that resource levels are heterogeneous among firms, the differences in these resources in turn create differences among firms' capabilities (Makadok 2001). That is, a firm's ability to develop a particular capability relies highly on the level of resources invested by a firm to develop that capability. For example, it is reasonable to assume that a firm's technological capability development is determined by R&D budget allocated into the department, level of training received by staff and alliances with external research institutions such as universities.

Despite the unexpected result, these findings provide further credence to Penrose's proposition (1959, p.25) that the value generated by resources is a function of the way in which they are exploited. Penrose argues that a firm may achieve rents not because it has better resources, but rather the firm's distinctive competence enable better use of its resources (1959, p.54). The significant negative relationship between marketing resources and marketing capability implies that despite possessing smaller resources, some firms are better and more efficient at deploying resources using organisational processes, to attain its objective (Amit and Schoemaker 1993). Furthermore, the same resources when used in different manners and in combination with different types or amounts of other resources may generate different values to firms (Penrose 1959, p.25).

Penrose's emphasis on resource exploitation rather than possession is also shared by other scholars. For example, Mahoney and Pandian (1992) suggest that firms may benefit from their resources by utilising them in a manner that their productivity and financial outcome are maximised. Similarly, other scholars argue that to attain a competitive advantage a firm must properly leveraged (Peteraf 1993) or managed (Henderson and Cockburn 1994) its valuable resources.

These findings also provide further explanation as to why there is a lack of support for resources as predictors of competitive advantage and performance. Nonetheless, confirming that resources do not lead to capabilities, which is fundamental for value creation and the development of competitive advantages (Barney and Arikan 2001; Priem and Butler 2001) means that the processes through which particular resources provide competitive advantage remains in a black box (Priem and Butler 2001).

The lack of support for the hypotheses predicting a positive relationship between resources and capabilities could be explained by the possibility that capability development may take time to materialise (Kotha et al. 2011). This might indicate a potential lag in the effects resources have on capabilities and potential absorptive. As such, the effects might have not been captured by the data. This assumption may be tested by allowing for a longer gap between the dates the marketing and technological resources data are captured and the dates that potential absorptive capacity and marketing and technological capability are observed. To demonstrate, in the present research, marketing and technological capability were captured during the year of entry (t_0) suggesting that resources should be observed at least during t_{-3} (three years prior to entry) to allow for the lag effect to be observed. However, several of the companies were young and did not become public long before their market entry, which is common high technology industry. Hence, this present research is limited by the unavailability of data to allow for this possible lagged effect to be captured. The inability to observe the lagged effect of resources on capabilities potential absorptive capacity over a longer period of time is recognised as a limitation of the current research. Hence, investigating the possibility that capability development may require time and may be observed using longitudinal research method is a potential avenue for future research.

8.2.3 Relationship between Potential Absorptive Capacity and Realised Absorptive Capacity

The present study found support for the hypothesis that the greater the potential absorptive capacity, the greater the realised absorptive capacity. The finding is first of all consistent with Cohen and Levinthal's process perspective paper on absorptive capacity (1990). Secondly, it also consistent with the process model absorptive capacity proposed by Lane and colleagues (2006). The process model of absorptive capacity suggests that a firm's ability to utilise external knowledge is represented by three sequential learning processes of (1) recognising and understanding potentially valuable new external knowledge (2) assimilating the identified new knowledge and (3) exploiting the assimilated knowledge to create new knowledge and commercial outputs. Potential absorptive capacity corresponds with learning process (1) and (2), while realised absorptive capacity corresponds with exploitation of external knowledge represented in learning process (3). The finding that potential absorptive capacity is positively associated with realised absorptive capacity is consistent with the model's indication that identification, understanding and assimilation of external knowledge is an antecedent of the exploitation of that external knowledge.

8.2.4. Capabilities, Capability Interaction and Absorptive Capacity as Determinants of Entry Timing

8.2.4.1 Marketing Capability and Entry Timing

The present research hypothesised that there is a U-shaped relationship between: (1) marketing capability with entry timing and, (2) technological capability with entry timing. These hypotheses were supported, indicating that the earliest and the latest entries were made by firms with the highest marketing and technological capability. These findings further strengthen the theory of organisational inertia and competency trap proposed by strategy scholars (Chandy and Tellis 1998; Christensen 1997; Cohen and Levinthal 1990).

One the most important implication of this finding is for managers to find the equilibrium level of technological and marketing capabilities. The finding of the present research suggests that capabilities are a double-edged-sword. On one hand, they help firms to recognise, assimilate, improve and commercialise external information embedded in a product pioneered by a rival firm; hence expediting their entries into the market. On the other hand, they may become so entrenched in existing technological trajectories and engrossed in serving the needs of their current customers that they might overlook the opportunities presented by the emerging technologies and products introduced by their rivals. The unwillingness to enter the new territories leads to late entries which can be costly for these firms.

In summary, the findings concerning the relationship between capabilities and entry timing enrich the extant theory of the RBV by showing that although strong technological and marketing capabilities facilitate firms' swift entry into the market for some firms, for others they may cause them to be trapped in existing product and technological trajectories, lock them in with existing customers and prevent them from being receptive to new opportunities in the environment. For example, Polaroid, a former leader in instant and film and cameras was declared bankrupt in 2001 because they missed the introduction of digital photography and entered the digital camera market too late (Zhou and Wu 2010).

8.2.4.2. Marketing and Technological Capability Interaction and Entry Timing

The present research also investigated the relationship between the interaction of marketing and technological capability with entry timing. The hypothesis that the higher the interaction between the two capabilities, the faster the firm enters the market was supported.

The finding that marketing and technological capability interaction facilitates faster entry into the market can be explained by the complementary assets view. Teece (1986) argue that the ownership of complementary assets necessary for the commercialisation of an innovation, determines which firms will benefit from an innovation. Firms that do not have the complementary capabilities need to either build them or acquire them. Therefore, firms that possess both technological and marketing capability can deploy their resources efficiently to enter the market quicker than firms that require time to develop the capability or source the expertise externally.

The finding is also consistent with the view of the RBV and dynamic capability theory that different organisational capabilities may be complementary assets (Helfat et al. 2007). The presence of marketing capability enhances the returns of technological capability and vice versa as their interaction increases a firm's efficiency in the development and commercialisation of the product.

In addition, this finding provides further credence for extant literature on the marketing-R&D interface. This literature stream proposes that interactions between marketing and R&D capabilities can enhance firm's performance beyond their individual effects (e.g., Song et al. 2005; Moorman and Slotegraaf 1999; Dutta et al. 1999). Scholars argue that capability integration provides firms with the most advantageous deployment of firm resources (Dutta et al. 1999; Vorhies et al. 2009).

8.2.4.3. U-shaped Relationship between Potential and Realised Absorptive Capacity with Entry Timing

Pertaining to the hypothesised non-linear (U-shaped) relationship between potential and realised absorptive capacity with entry timing, the findings indicate no support for the propositions. In fact, the analysis yielded a significant positive and linear relationship between potential absorptive capacity and order of entry as well as with entry lag. The analysis produced a coefficient estimation of 0.25 and a t-value of 2.01, significant at 5% level for potential absorptive capacity-order of entry relationship. Testing for potential absorptive capacity and entry lag relationship produced a coefficient estimation of 0.40 and a t-value of 2.85, significant at 10% level. Similar positive and linear effects were observed for the relationship between realised absorptive capacity with order of entry and entry lag. The coefficient estimation and t-value are 0.24 and 2.43 respectively for realised absorptive capacity-order of entry relationship while the coefficient estimation and t-value for realised absorptive capacity-entry lag relationship are 0.26 and 2.39 respectively. The realised absorptive capacity-order of entry relationship and realised absorptive capacity-entry lag relationship are both significant at 5% level.

These findings suggest that rather than facilitating quicker imitative entry, greater levels of potential and realised absorptive capacity delay entry. This finding is despite the theoretical argument that firms with high absorptive capacity are able 'to recognise the value of new, external knowledge, assimilate it, and apply it to commercial ends' (Cohen and Levinthal 1990, p.128).

One possible explanation as to why absorptive capacity does not expedite entry timing is the path dependent nature of absorptive capacity. Absorptive capacity is a capability that tends to develop cumulatively and therefore has a strong path dependency on the prior R&D investment and knowledge base of a firm (Cohen and Levinthal 1990). Therefore, despite its high level of absorptive capacity, a firm may find it difficult to recognise the value of external knowledge that spills over from a pioneering product if it departs from a firm's knowledge base. Absorptive capacity scholars have reported empirical evidence that the relatedness of knowledge bases explains the heterogeneity among firms' performance following mergers, acquisitions and alliances (Ahuja and Katila 2001; Empson 2001; Jones et al. 2000). The previous empirical evidence highlighting the need for adequate knowledge similarities as a prerequisite for inter-organisational learning (Lane and Lubatkin 1998) provides potential explanation for the lack of support for the two hypotheses.

In another line of reasoning, the surprising finding is perhaps due to the evolutionary nature of absorptive capacity, which dimensions of learning and utilisation of knowledge occur over time. The impact of absorptive capacity on new product development such as a firm's ability to cut new product development and commercialisation time may require time to materialised. Even though the present research used three time periods to capture three variables: potential absorptive capacity, realised absorptive capacity and entry timing, the time period covered in the present research might have not been long enough to capture the developmental and lagged characteristic of absorptive capacity.

8.2.5. Capabilities, Capability Interaction and Absorptive Capacity as Determinants of Relative Product Advantage

8.2.5.1. Technological Capability and Marketing Capability with Relative Product Advantage

Another unexpected finding revealed by the present research is the lack of statistically significant finding of the hypothesised relationship between technological and marketing capability with relative product advantage. The hypothesis posited that firms with high technological capability are able to use their technological skills in improving the products through innovation. Similarly, firms with high marketing capability are hypothesised to be able to gather and exploit customer and competitor knowledge to create value to potential and existing customers by creating superior products. Scholars even argue that firms with high marketing capability are able increase consumer perceptions of a product's advantages relative to competitors (Song and Parry 1997). There are a number of potential explanations for the lack of support for this finding.

The new-product development literature pointed out a trade-off between entry timing and product performance (Griffin and Hauser 1996; Lilien and Yoon 1990). This literature emphasises the need for a balance between minimizing time to market and maximizing technological performance (Hatch and Macher 2002; Bayus 1997; Cohen et al. 1996). One of the important findings of the present research is the U-shaped relationship observed between entry timing and capabilities, which suggests that firms with the highest capabilities were the earliest and the latest ones to enter the new product market. Therefore, it is possible that despite their high technological and marketing capabilities, firms that expedited their market entries had to forgo the opportunity to make a better product in exchange of capturing the advantages associated with earlier entries. Hence, this also explains why the marketing and technological capability interaction has no significant association with relative product advantage.

This finding can also be linked to the industry life-cycle theory (Fosfuri et al. 2013) and the theory of a 'dominant design' (Abernathy and Utterback 1978). Whilst the decision to enter early may have required firms with high technological and marketing capability to compromise the opportunity for offering a higher relative product advantage, later entry makes introducing a product with a major advantage more difficult. Once a dominant design emerges, subsequent technological advancements revolve around incremental changes that elaborate the basic design until the industry life cycle reaches the discontinuity stage (Abernathy and Utterback 1978). Therefore, despite a firm's high capabilities, once the dominant design has emerged, relative product advantage is limited to incremental improvements (Tegarden et al. 1999), which may have explained the lack of positive association between technological capability and relative product advantage. The finding is consistent with Robinson's report (1990) that only 9% of the later entrants offered a product with a major product advantage versus 33% of the market pioneers.

The finding that there is no positive association between technological capability and relative product advantage is also consistent with a distant but related study by Benner and Tripsas (2012) on product feature entry choices among digital camera makers. The study revealed that technical capability did not have a significant effect on firms' choices of which product features to introduce in their digital cameras. In contrast, heterogeneity in product feature entry choices is shaped by prior industry experience and their tendency to imitate the behaviours of firms from the same prior industry. In other words, a firm's decision to include certain product features which may translate into a product relative advantage compared to existing product offerings is determined by other factors rather than its technological ability to develop the product feature itself.

Another possible explanation for the lack of significant and positive association between technological and marketing capability with relative product advantage is customers' inability to assess relative product advantage when all firms are simultaneously competing on functional performance dimensions (Friar 1995). Despite firms believing that their products are superior in terms of performance in comparison to existing product, Friar (1995) argues that in an industry where most firms compete by improving product advantage, customers struggle to distinguish product performance because these improvements did not create meaningful differences for them. As the relative improvements in product performance created through firms' technological capability and innovation process might not have been meaningful, they might have not been mentioned in product reviews. Recall that the degree of product advantage for each subsequent product entry was measured by a count of new product features listed under product reviews found in news archives. Hence, the insignificant relationship between capabilities and relative product advantage might have been the result of lack of meaningfulness of the relative product advantage to customers.

8.2.5.2. Technological Capability and Product Category Interaction with Relative Product Advantage

Section 7.5.2.3 in Chapter 7 highlights the significance of the interaction terms between technological capability and product category in predicting relative product advantage. As such, the effect of technological capability on relative product advantage differs according to product categories. For example, relative to portable audio player (the reference group), the impact of technological capability on relative product advantage is the highest for digital camera, followed by smartphone and portable computer. This finding is consistent with the assumption that each product category is governed by its own idiosyncrasies and unique characteristics regarding level of innovation, complexity of technologies involved and speed of industry life cycle. For example, in portable computer and portable audio player, most firms that entered the market used standard technology and offer standard product features, which required less innovation and technological competence on their parts.

In portable computer and personal computer (PC) industry, it was common for industry players to act as assemblers of outside vendors' parts. PC makers often purchased components of their machines such as the microprocessor, from other firms (Schoenecker and Cooper 1998). This reliance on outside vendors made it easier for firms to make imitative market entries without having to rely on their internal technological capabilities. Furthermore, PC makers often published specifications of their products to facilitate software development by independent firms, which again made imitative market entries easy (Asbrand and Bozeman 1992). These examples explain why technological capability plays a less important role in creating product advantage among portable computer firms.

Portable audio player was introduced following the release of MP3 compression software in 1993 (Abel 2008). As is the case with portable computer, many portable audio player manufacturers used standard technology from flash memory and hard drive memory which can be sourced from outside suppliers and offer standard product features. This in turn facilitates imitative market entry without much requirement for high technological capability.

8.2.5.3. Absorptive Capacity and Relative Product Advantage

Despite absorptive capacity advocates suggesting that absorptive capacity enhances innovation performance (Volberda 2010), no support was found for the hypothesised relationship between potential and realised absorptive capacity with relative product advantage. Similar to the discussion on the possible explanation for non-positive association between absorptive capacity and entry timing, the insignificant effect of potential and realised absorptive capacity on relative product advantage may be attributed to the path dependent nature and the developmental and lagged characteristics of absorptive capacity.

Absorptive capacity constitutes a firm's ability to absorb and exploit external knowledge, which is a critical component of its innovative capabilities (Cohen and Levinthal 1990). However, absorptive capacity is also highly path dependent because it develops cumulatively through relevant prior knowledge (Cohen and Levinthal 1990). Scholars investigating the relationship between absorptive capacity and performance outcome emphasise the importance of knowledge similarities in facilitating innovation (e.g., Ahuja and Katila 2001; Lane and Lubatkin 1998). For this reason, firms that find their knowledge base unconnected or too distant to the knowledge embedded in the pioneering products might have difficulty improving the product through innovation.

In addition, the insignificant finding may also be explained by the possible lagged outcome of absorptive capacity. Previous studies have associated innovation as an outcome of absorptive capacity (e.g., (Noteboom et al. 2007; Escribano et al. 2009; Rothaermel and Alexandre 2009) while empirical studies have provide evidence of a positive relationship between product innovativeness and product advantage (Gatignon and Xuereb 1997; Henard and Szymanski 2001; Holak and Lehmann 1990). Perhaps due to the evolutionary, cumulative and lagged nature of absorptive capacity, the positive effect it has on innovation and product advantage requires time to materialise, explaining the lack of support of such relationship in this study.

8.2.6. Capabilities and Absorptive Capacity as Determinants of Relative Price

8.2.6.1. Marketing Capability and Relative Price

The result of the analysis indicates no significant relationship between marketing capability and relative price. Marketing capability refers to a firms' ability to combine marketing resources efficiently in order to engage in productive activity and attain marketing objectives (Bahadir et al. 2008). Vorhies and Morgan (2005) describe marketing capability as a firm's ability to convert marketing resources into valuable outputs through marketing routines.

Implicit in the definitions of marketing capability, the insignificant finding may be explained by the possibility that two firms with equally high marketing capabilities may have different marketing objectives, which explains the lack of relationship between marketing capability and relative price. For example, despite similar levels of marketing capabilities, two firms may choose two different product-market strategies. Customer knowledge helps a firm in its targeting and positioning activities. Using its strength in customer knowledge and its brand equity a firm may choose product or brand differentiation. On the other hand, a firm with strong relationships with channel partners and distributors as well as efficient supply-chain system may choose a low-cost strategy.

8.2.6.2. Technological Capability and Relative Price

In contrast to the lack of association between marketing capability and relative price, technological capability is found to have a negative and significant relationship at 5% level with relative price. This finding is consistent with the logic that technological capabilities create values to customers by either enabling product improvements allowing firms to charge premium prices or process improvements, which results in cheaper products (Coombs and Bierly 2006). The finding is also in line with new product pricing literature suggesting that firms with cost advantages may compete with existing players by adopting a penetration pricing strategy (e.g., Noble and Gruca 1999). Furthermore, firms with high technological capability that enables them to reduce unit cost as well as offer a product with high relative product advantage are able to undercut competitors' prices but still enjoy higher relative margin due their wider pricing discretion.

8.2.6.3. Absorptive Capacity and Relative Price

The present research also tested for the hypothesis that potential absorptive capacity and realised absorptive capacity are positively related to relative price. Marginal support was found for the hypothesised relationship between potential absorptive capacity and relative price. Firms focusing on acquisition and assimilation of new external knowledge are able to continuously renew their knowledge stock, (Zahra and George 2002), which encourages innovation activities essential to create product differentiation.

On the other hand, realised absorptive capacity was not found to have a significant relationship with relative price. Although realised absorptive capacity enhances innovation, the resultant products may rapidly converge to industry standards (Eisenhardt & Martin, 2000; Zahra & George, 2002) and become obsolete relative to current environmental demands (Sorensen and Stuart 2000) and competitors' products. Hence, firms are not always able to benefit from charging premium prices despite the high realised absorptive capacity. Another potential explanation can be firms' decision to adopt penetration strategy because their realised absorptive capacity leads to high process innovation. Alternatively, firms with high realised absorptive capacity can afford to lower their prices to match or undercut competitors due their wider gap between price floor and price ceiling.

8.2.7. Relationship between Entry Timing, Relative Product Advantage and Relative Price with Product Survival

8.2.7.1 Entry Timing and Product Survival

One of the most important contributions of the present research is the finding that earlier entry as opposed to delaying entry is associated with product survival. Advocates of First-Mover-Advantages (FMA) have long attributed the positive association between early entries and performance to the 'isolating mechanisms' resulted from entering the market early. The finding of the present research is consistent with Lieberman and Montgomery's argument (1988) that isolating mechanisms which include technology leadership, pre-emption of scarce assets, switching costs and buyers' decision making behaviour under uncertainty drive the advantages of early entry. Boulding and Christen (2008) found empirical evidence that experience-curve effects, pre-emption of input factors, and pre-emption of ideal market space are associated with the advantages of early entry. More recently, Gomez and Maıcas (2011), using data from the telecommunications industry in several European countries, provide empirical evidence that switching costs mediates the relationship between market-entry order and performance.

The finding indicating the positive association between earlier entry and product survival can also be explained by the industry-life cycle theory. Teece (1986) highlighted that the emergence of a "dominant design" (Abernathy and Utterback 1978), an important milestone in the industry determines the success of a firm's market entry. Furthermore, Christensen and colleagues (1998) provided empirical evidence that firms entering a market during the 'window of learning period', referred to as the three-year period right before the emergence of the dominant design have higher survival rates. The further a firm's entry from the 'window of learning period', the lower its probability of success. This logic offers an explanation as to why the rate of product survival decreases with order of entry and entry lag.

8.2.7.2. Relative Product Advantage and Product Survival

Marginal support was found for the hypothesis predicting a positive relationship between relative product advantage and survival. The finding is in line with prior studies, which argue that adding new features leads to a positive differentiation by giving a product perceived advantages over competitive products (Carpenter et al 1994) as well as adding desired functionality (Thompson et al. 2005). The finding is also consistent with previous empirical research that found product competitive advantage, technically superior product and level of product advantage to be positively correlated with successful outcomes (e.g., Cooper and Kleinschmidt 1987b; Zirger and Maidique 1990; Cooper and Kleinschmidt 1995).

Furthermore, the support for the hypothesised relationship between relative product advantage and product survival implies validity of imitative entry as a valid strategy. The result suggests that despite not being first, by adding new product advantage, a firm can increase its probability of product success.

8.2.7.3. Relative Price and Product Survival

Support was found for the hypothesis predicting a positive relationship between relative price and product survival. The goal of differentiation strategy is to create a product that customers see as unique (Porter 1980) through product innovation and/or intensive marketing and image management (Miller 1986), which in turn creates customer loyalty and price inelasticity. In the present study, firms that offer a product at a higher relative price can be assumed to adopt a differentiation strategy in order to justify the high price. Perhaps it should also be noted that correlation analysis indicates that relative price and relative product advantage are correlated at 5% level of significant. This suggests that firms in the sample introduce new features, enhance quality or improve product design to differentiate their products. This finding can be attributed to a number of factors.

The positive association between relative price and product performance may be due to the high level of consumers' involvement in making the purchasing decisions of the particular products in the present research. High level of involvement is linked to the purchase of high-value goods, the purchase of products that are purchased infrequently and the purchase of products with high perceived risk (Hughes and Fill 2008). A purchase of a portable media player, a portable computer, a digital camera and smartphones does not only involve large financial commitment for consumers, but is also a highly emotive decision that has significant performance, social and ego risks attached to it (Hughes and Fill 2008).

Consumers might associate a cheaper product with higher risk of not performing well or breaking easily. Therefore, buying a cheaper product might be perceived as increasing a customer's financial risk. Furthermore, as these products are used in public, consumers might also weigh the social risk when making their purchasing decisions, as they would be likely to want their friends, family or colleagues to be pleased or impressed by their purchase. Finally, consumers might also emphasise the need for feeling good after purchasing the product.

The nature of consumer-decision-making process associated with high involvement and high-perceived risk of the products in the sample, may have contributed to the positive relationship between relative price and product survival. Furthermore, scholars argue that because customers develop perceptions based on products initial low price, entering these four product markets with a relative low price strategy might harm the product's immediate profit potential as well as negatively affects its long-term potential (Lowe and Alpert 2010). Introducing a product with lower relative price may also encourage competitors to reduce their price, leading to increase in price competition (Costa et al. 2013). This will reduce profit and may be detrimental to product survival especially if competitors offer superior products and have higher brand equity than the new entrant.

8.3. Theoretical Implications

8.3.1. Integration of the RBV and Competitive Dynamics Theory

The present research main contribution is the reconciliation of the previously two competing theory: RBV and competitive dynamics in determining firms' performance. The present research integrates the two theories by examining how firms' specific capabilities as well as their interaction determine timing of their entry, relative product advantage and relative product price when they enter the four product categories. Several researchers have called for conceptual integrations of the RBV and competitive dynamics theory (e.g., Grimm et al. 2006; Sirmon et al. 2007; Ndofor et al. 2011). The present research therefore represents some efforts into bringing to fruition the calls by these scholars for the integration of these two influential theories. The present research argues that understanding the complete picture of how firms can achieve superior performance and sustainable competitive advantage can only be accomplished through the integration of RBV and competitive dynamics perspective. Understanding the linkages between resources, capabilities and actions greatly enhance the understanding of why two firms both choosing imitative market entry experience different level of product performance.

This research offers contributions to the RBV and competitive dynamics research streams, both of which continue to offer important insights in improving the understanding on performance heterogeneity among firms. RBV scholars have long been criticised for their lack of attention on the process of the resource deployment or leveraging actions (Priem and Butler, 2001) as well as their relative silence on the role of competition (Ndofor 2011). The present research addresses these concerns by directly considering how specific types of firm resources and capabilities enable a specific competitive action (imitative market entry) and influence product market strategies, specifically entry timing and product market strategy reflected in their relative product advantages and relative prices.

For competitive dynamics, a clearer understanding of the role of resources and capabilities in enabling competitive actions is important for further advances. The results of this research extend and validate the competitive dynamic's model of 'awareness-motivation-capability' framework. The findings suggest that without the requisite capabilities and their complementarities, firms will be constrained in terms of the choices accompanying their competitive action strategies. In addition, the present research also examined specific capabilities relevant for effective execution of a competitive action in the context of imitative entries. The present research demonstrates that if firms do not engage in such competitive actions, the potential of their resources outlined by the RBV theory will not be realised.

8.3.2. Strategic Orientation

Miles and Snow's Defenders, Prospectors and Analysers typology of business strategy is a well-established one and the present research contributes to this field by providing further insights regarding the relationship between firms' strategic orientation and specific resource types. According to Miles and Snow (1978), firms adopt certain strategies in response to environmental change. These strategies are reflected in their consistent patterns of product-market innovation behaviour in response to environmental shifts (Song et al. 2007).

In order to help implement its strategy, firms need to develop relevant resources and capabilities that enable them to execute the strategies effectively. The results revealed that relative to other organizations, prospectors invest the highest amount of technological and marketing resources so that they may pursue first-to-market initiatives. Prospectors are followed by analysers who invest more resources in technological and marketing resources than do defenders. These findings enrich both the RBV and strategic orientation field as they are consistent with Hambrick's (1983) contention that prospectors want to keep prospecting and consequently, develop the capabilities necessary for prospecting more than do other firms.

Finally, the present research contributes by operationalising the three Miles and Snow's typology of business strategies in terms of attributes that can be measured using secondary data. Thus, following Sabherwal and Sabherwal (2007), the present research utilises secondary data to evaluate the three strategies based on theoretically and empirically supported variables.

8.3.3. Resources and Capabilities

According to the RBV perspective, the possession of resources and capabilities by a firm does not by itself increase performance. It is the possession of the capability and its correct deployment that leads to sustainable competitive advantage (Song et al. 2007). The process in which resources is deployed to achieve superior performance leading to a sustainable competitive advantage has often been referred to as the 'black box' because not much is understood about it (Priem and Butler 2001). The empirical results of the present research help to shed some light on the relationship between resources, capabilities and performance by showing that possession of capabilities and their integration enable firms to enter the market early and allow them sell their products at a higher price than their competitors which lead to higher probability of product survival.

When viewed in the context of imitative entry, the current findings indicate that capabilities' effect on determining product performance is not a direct one. Potential absorptive capacity is positively associated with relative price and higher relative price increases the probability of product survival. Similarly, marketing and technological capability interaction is significantly related to earlier entry, and earlier entry is found to be significantly related to product survival. Therefore, it seems that in order to reap any performance gains from its resources and capabilities, a firm needs to exploit these valuable, rare resources and capabilities in combinations to effectively reduce entry lag and increase relative price. By doing so, firms not only exploit market opportunities but also neutralise competitive threats leading to a more sustainable competitive advantage. The finding that marketing and technological capability interaction contributes to product performance by allowing firms to expedite entry is consistent with Song and colleague's finding (2005). They found that the effect of complementarity (interaction) of marketing and technological capability on firm's performance is significant in high-turbulence environment, which industries overlapped with the industries covered in the present study.

What is most notable from the present research is the non-significant finding of the hypothesised relationship between resources and capabilities. These findings provide significant insights to the RBV field by providing further explanation to the lack of support for resources as predictors of competitive advantage and performance. Newbert's (2007) assessment of RBV-grounded empirical articles indicate that of the 232 studies examining the relationship between a resource and either competitive advantage or performance, empirical support is found for only 85 (37%). In contrast, of the 161 studies testing the relationship between a capability and either competitive advantage or performance, empirical support is found for 114 (71%) and of the 24 tests examining relationship between a core competence and performance is empirical support is found for 16 (67%).

The lack of relationship between a firm's resources and its capability, which is ' ... a firm's capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end' (Amit and Schoemaker 1993) indicates that possessing resources alone does guarantee superior performance or sustainable competitive advantages. The analysis also found no direct relationship between technological and marketing resources with entry timing, relative product and relative price as well as product survival, which further confirms the suspicion scholars have regarding resources alone contributes to superior performance and a competitive advantage.

These findings are consistent with the view that resource possession does not necessarily lead to resource exploitation as firms' ability to achieve rent relies on firm's distinctive competence in making better use of its resource. Superior performance outcome can therefore be predicted only for firms that are skilled at allocating their resources in such a way that their productivity is maximized (Mahoney and Pandian 1992 p. 365) reflected by their capabilities.

RBV scholars argue that in order for firms to exploit the full potential of their resources and to attain a competitive advantage, resources need to be properly organised (Barney 1997, p. 160; Barney and Wright 1998) leveraged (Peteraf 1993) or managed (Henderson and Cockburn 1994), which describes the capability dimension of RBV.

An important contribution of the present research is the finding that technological capability and marketing capability has a U-shaped relationship with entry timing: a high level of technological and marketing capability relates to the earliest as well as the latest entry. The finding indicates that high level of capabilities increases speed of entry for some firms but leads to long entry lag for others. The reluctance to enter early associated with high technological and marketing capabilities may be a result of organisational inertia. As a firm accumulates technological know-how, they are likely to become more efficient in evaluating, assimilating, and applying existing knowledge to extensions and improvements of existing products (Zhou and Wu 2010). Similarly, firms with high marketing capability may become too focus on meeting their current consumers' needs (Christensen 1997). As such, these firms may become so entrenched in existing technology and customer trajectories that they might overlook emerging products from new territories and become unwilling or unable to enter the new markets with new technological platform or serving an emerging market segment. Organisational inertia discourages radical departures from the status quo, which makes firms unwilling to explore opportunities originated externally from the environment. This is because exploring such opportunity would mean firms require a different set of rules and processes, compromising their efficiency.

These findings enrich extant literature by demonstrating the possible liabilities of capabilities: a strong technological capability may foster myopic learning and incremental innovations, but inhibit experimentation with new alternatives in emerging domains. Similarly, market facing or customer competence developed through experience with existing products or technology makes it difficult for firms to evaluate the potential of a new product introduced by a competitor (Danneels 2004). These findings reconcile the conflicting views about the relationship between capability and innovation (e.g., Levinthal and March 1993; Rosenkopf and Nerkar 2001) as well as enriching existing literature on rigidity of capabilities and competency trap (Leonard-Barton 1992; Christensen 1997, 2006).

8.3.4. Absorptive Capacity

The present research also enriches absorptive capacity literature through its attempt to operationalise the multiple dimensions of absorptive capacity. Although absorptive capacity has three dimensions covering acquisition of external knowledge, assimilation external knowledge and utilisation of external knowledge, Lane and colleagues (2006) detailed analysis of 289 absorptive capacity papers shows that the number of studies that discuss all three dimensions of absorptive capacity is scarce. The tendency to focus on the knowledge recognition and acquisition dimension but ignoring the assimilation and exploitation dimensions leads to a largely uni-dimensional operationalisation of absorptive capacity in the empirical research (Volberda et al. 2010).

The present research represents an attempt to the resolve the criticism directed against absorptive capacity by measuring the two components of absorptive capacity: potential and realised (Zahra and George 2002). Hence this study attempts to break away from the tendency of empirical researchers to ignore the multidimensional nature of absorptive capacity and better reflect the richness of the construct.

Furthermore, the present research contributes to absorptive capacity literature by testing the relationship of absorptive capacity encompassing three dimensions with outcomes such as a firm’s ability to speed up imitative entry, its ability to innovate reflected by its relative product advantage and its ability to differentiate its product reflected by its relative product price. By doing so, the present research also indirectly tested the influence absorptive capacity has on product performance. Although previous researches have focused on discussing absorptive capacity outcome variables such as innovation (Noteboom et al. 2007; Escribano et al. 2009; Rothaermel and Alexandre 2009) and firm performance (Tsai 2001; Lane et al. 2001; Naramsihan et al. 2006), many of the researches testing these relationships ignore the multidimensional nature underlying absorptive capacity (Volberda et al. 2010). In addition to the multidimensional operationalisation of absorptive capacity, the present research also answers the call made by Volberda and colleagues (2010) for more work to be done in realised absorptive capacity.

In addition, the present study also contributes significantly to inter-organisational learning theme of absorptive capacity. Although this theme is one of the most well developed research stream within absorptive capacity literature (Lane et al. 2006), researchers have mainly concentrated on studies of dyadic relationships among alliance partners (e.g., Ahuja and Katila 2001; Dyer and Singh 1998) and studies of network relationships such as memberships in inter-organizational networks (Powell et al., 1996; Stuart 1998), geographical location (Deeds et al.1997) and developed countries (Erramilli et al.2002). Imitative market entry provides an opportunity to enhance the understanding on inter-organisational learning outside the context of learning through partnership and networking focused by extant absorptive capacity literature. Specifically, the number of cross-firm patent backward citations used as a measure of potential absorptive capacity carries information about the innovation spill over across location and institutions (Hall et al. 2005) suggesting that inter-organisational learning occurs among firms that are not necessarily connected through alliances or networks.

Cohen and Levinthal’s definition of absorptive capacity indicates that it is developmental, lagged, and path-dependent (Cohen and Levinthal 1990). However, few researchers in absorptive capacity have fully captured these characteristics in their empirical work (Volberda et al. 2010). The present research adds to the research stream by attempting to capture at least some portions of these characteristics by using two time periods: the first period to capture potential absorptive capacity and second period to capture the lagged realised absorptive capacity.

8.3.5. Entry Timing

The discussion on entry timing has been dominated by a debate on the relationship between timing of entry and firm performance (e.g., Durand and Coeurderoy 2001; Min et al. 2006; Suarez and Lanzolla 2007), and a debate on the determinants of timing of entry (e.g., Fuentelsaz et al. 2002; Garcia-Villaverde et al., 2012; Lee 2008). The present research enriches the field of entry timing by contributing to both literature streams.

The finding that order of entry and shorter entry lag increase the likelihood of product survival lends reconciliation to the conflicting and mixed empirical findings in the FMA and the entry timing literature. As the present research observed imitative market entries during a ten year period from the first product introduction, the finding suggests that firms may enjoy product success without having to be the pioneer of the market. However, the rate of product success decreases the later the firm decides to enter the market. This finding reiterates the importance for firms to develop relevant capabilities that enable their swift imitative market entry.

The present research extended entry timing and FMA literature by studying the effects of absorptive capacity, marketing capability, technological capability and marketing and technological capability interaction on firms' order of entry and entry lag. Literature on the determinants of entry timing have mainly focused on R&D investment, marketing skills, finance skills and shared manufacturing (Robinson et al. 1992), possession of a direct sales force (Mitchell 1989), technological and marketing resources (Schoenecker and Cooper 1998), size and prior experience (Shamsie and colleagues 2004) as determinants of entry timing. To the best of the knowledge of the researcher of current study, no empirical study has been performed to test the relationship between capabilities and absorptive capacity with entry timing.

Furthermore, FMA literature has also been criticised for not having a standard and clear manner for defining “first-mover(s)” and “followers” (Lieberman and Montgomery 2013). In an attempt resolve the issues caused by categorical approaches, on top operationalising entry timing as order of entry, the present research also view entry timing as a continuum, by measuring entry timing as the time elapsed from first entry.

8.3.6. The Relationship between Entry Timing, Relative Product Advantage and Relative Price with Survival

Most of the literature on timing of entry has focused on comparing the performance of pioneers, early followers and later movers. The contingency perspective of FMA literature focusing on the role of the environment on FMA has emerged only relatively recently. The present research presents significant contributions to both of these literature streams by examining the influence of firms’ product strategic positioning and market concentration on increasing or decreasing the rate of product survival.

The study found that market concentration is not a significant predictor of product survival, which indicates there was little effect of competition on the early success of the imitating firms in the sample. In addition to positive association between early entry and product success, the results also indicate that the product market strategy, namely its relative product advantage and relative price is strongly tied to its ability to survive through the first 4 years. This result suggests that firms carrying out an imitative entry need to be able to compete with all other products on attributes such as price, quality, product features and performance. The significant correlation between relative product advantage and relative price suggests that firms need to have competitive products in order to justify the relatively high price. These findings are consistent with previous studies investigating factors that can increase the chances for late movers to outperform pioneers (Carpenter and Nakamoto 1990; Kalyanaram and Urban 1992; Lilien and Yoon 1990; Shankar et al. 1998; Urban et al. 1986; Zhang and Markman 1998; Shamsie et al. 2004).

8.3.7. Distinctive Contribution to the Dynamic Capabilities and Competitive Dynamics Literature

The aim of the present section is to provide a discussion on the distinctive contributions of the study to the dynamic capabilities and competitive dynamics literature. Dynamic capability and competitive dynamics perspective share the notion that competitive advantages are temporary and short-lived (D'Aveni 1994; Ferrier 2001; Teece et al. 1997). The competitive dynamics perspective emphasises the interplay of actions and reactions firms use to create competitive advantages for them and to undermine the competitive advantages of others (Chen 1996; D'Aveni 1994; Ferrier et al.1999; Ferrier 2001; Rindova et al. 2010). On the other hand, dynamic capability refers to a firm's ability to 'integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece et al. 1997, p. 516). In short, the two perspectives emphasises the need for firms to adapt and to respond to the continuously changing environments through capabilities and actions.

The present study's contributions to the competitive dynamics literature are twofold. First, it examines the effectiveness of three possible competitive reactions firms can choose when faced with an introduction of an innovative product in the market. Scholars suggest that competitive responses may include speedy reaction and utilisation or combination of any marketing mix instrument such as price, advertising and a new product introduction (Gatignon et al. 1997). The present study specifically examines the effect of speed of entry, relative product advantage and relative price on product survival. The result shows that responding to a rival's action quickly with a product that has a higher relative product advantage and a higher price contributes to a greater likelihood of product survival. These findings enrich existing literature with respect to types of competitive reactions firm may employ to improve their current status when challenged by a rival's action.

A careful review of the Competitive Dynamics literature shows that the capability dimension of the AMC framework (Awareness-Motivation-Capability) is largely unexplored. The AMC framework of competitive dynamics suggests that a firm's competitive reaction or a counter move will be determined by their awareness of a rival's competitive action, their motivation to react due to the reward gained from reacting and lastly, their capability to act (Chen 1996). Acknowledging the scarcity of empirical work surrounding the capability aspect of the AMC framework, the present study focuses on understanding the capabilities crucial in enabling firms to respond to a rival's competitive action. This represents the second contribution of the present study to the competitive dynamics literature. This research examined firms' ability to act upon an introduction of an innovative product through their speed of entry, relative product advantage and relative price. The results show that the greater the interaction of marketing and technological capability, the faster the entry. The result also indicates that the higher the technological capability, the lower the relative price. Consistent with the competitive dynamics perspective that firms need to have the right capabilities to enable them to execute a competitive reaction, the results suggests that firms thinking of responding to their rival's action through a speedy new product introduction need to possess both high marketing and technological capability. In addition, although the present study does not find evidence that offering a lower price product leads to a higher likelihood of survival, scholars have identified a low price strategy as a valid competitive reaction (e.g., Gatignon et al. 1997). The results of the present study then suggest that firms which competitive reaction strategy is to offer a lower price need to equip themselves with technological capability.

Dynamic capability enables a firm to consistently renew their resources so that it can continue to 'hit a moving target'; thus, achieve sustainable advantages through a continuous sequence of temporary advantages (Ambrosini and Bowman 2009). Dynamic capability explains how some successful firms demonstrated timely responsiveness to changes in the environment while others do not (Teece and Pisano 1994). Following Zahra and George (2002), the present research treats absorptive capacity in the conceptual model as a dynamic capability. Absorptive capacity enables firms to absorb, assimilate and exploit external knowledge as well as create new know-how, which gives them the advantage to compete in dynamic markets (Cohen and Levinthal 1990).

The results of the present study indicate that absorptive capacity is not significant in predicting competitive actions, namely speed of product introduction, relative product advantage and relative price, which in turn, contribute to product survival. There are a number of contributions of these counter-intuitive findings. First, they provide further support to the path dependency nature of dynamic capability (Eisenhardt and Martin 2000). Managers must be able to accurately sense changes in their competitive environment such as potential shifts in technology, competition, customers, and regulation and they must be able respond to these challenges by reconfiguring their resources (Harreld et al. 2007). However, as the findings suggest, firms are constrained by their existing knowledge, their resource base and their understanding of the external environment (Ambrosini and Bowman 2009). The path dependency nature of dynamic capability may lead managers to misperceive the direction of the changes in the environment which then trigger inappropriate set of dynamic capabilities (Ambrosini and Bowman 2009). Therefore, dynamic capability can result in creating and deploying resource stock that is irrelevant to the market.

Second, the lack of support for the hypotheses regarding the relationship between absorptive capacity and competitive actions also provides a validation to scholars' concerns about the non-effect or the negative impact of dynamic capability on firm performance (Helfat et al. 2007; Zahra et al. 2006). Dynamic capability may not necessarily create resources and capabilities that meet the VRIN attributes (valuable, rare, inimitable, and non-substitutable) (Eisenhardt and Martin 2000). As such, the new resource base and capability do not guarantee firms to outperform rivals. The new set of resources or capabilities may merely provide a competitive parity by enabling the firm to continue operating in the industry or worse, they may be irrelevant to the market. This in turn, results in either no relationship or a negative relationship observed between dynamic capability and performance. In short, the finding does not imply that firms' which products do not survive lack dynamic capability or the ones whose products thrived had dynamic capabilities. Rather, as discussed above, the findings do not provide evidence that dynamic capabilities lead to competitive actions that result in performance.

8.4. Managerial Implications

These findings also provide some important managerial implications. In order to support its chosen strategy (prospector/analyser/defender), a firm needs to allocate its scarce resources to develop capabilities that are more in line with the strategic types (Song et al. 2007). Superior firm performance can only be achieved through an alignment of organisations' resources and capabilities with their strategic type or product-market innovation decisions (e.g. Conant et al 1990; Song et al. 2007).

From a practitioner standpoint, the finding that superior product performance of imitative entry strategy stems from the combination of technological and marketing capabilities may inform the way in which managers make decisions regarding their resources and capability acquisition and development. The present research demonstrates that in addition to simply possessing valuable, rare, inimitable resources, a firm also needs to enhance their capabilities which are crucial if they want exploit the full potential of those resources and to attain a competitive advantage (Barney 1997, p. 160; Barney and Wright 1998). The present findings suggest that although the resource may indeed be highly valuable, it must simply be accompanied by necessary capability. Thus, before investing in high level of a given resource such as R&D and marketing, managers may wish to first assess their existing capabilities which may need improvement or may be combined to increase their potential in creating values and in turn, generate superior performance. Proper resource exploitation may be achieved by using organisational components such as structure, control systems, and compensation policies (Barney 1997; Barney and Mackey 2005). Furthermore, as illustrated by the present research, firm-level orientation and strategy need to be aligned with utilisation of its resources.

The results reporting the lack of relationship between level of resources and capabilities, but showing a positive association between combined capabilities and entry timing, which in turn increases product survival rate suggests that managers need not necessarily seek out greater level of resources but rather develop novel ways in which to combine the capabilities they possess.

Firms must also be aware of the limitations of their existing capabilities. For example, firms with a strong technological capability should understand that although their technological know-how greatly enhances their product extension and refinement, it may trap them in existing technological trajectories, lock them in with existing customers, and prevent them from exploring new options. The result demonstrates that high interaction between marketing capability and technological capability expedites market entry, which in turn leads to superior product performance. This finding is consistent with market orientation perspective that suggests that market-oriented firms are more sensitive to environmental cues, which puts them in a better position than their non-market-oriented competitors to uncover and overcome potential internal competence deficiencies (Barney and Zajac 1994; Day 1994).

Therefore, to overcome the challenge of organisational inertia, technology-capable firms should simultaneously build strong marketing capability. RBV theory has long raised the possibility of synergy through capability complementarities (e.g., Dutta et al. 1999). Empirically, scholars have provided evidence that integration of marketing and R&D capabilities can enhance firm’s performance beyond their individual effects (e.g., Moorman and Slotegraaf 1999; Song et al. 2005). The present research demonstrates that the presence of both marketing and technology capability, due to their complementary nature allows firms to expedite their imitative market entry.

The finding that earlier imitative entry in terms of shorter entry lag and smaller number of entry order leads to product survival provides a highly meaningful and relevant managerial implication. Given the mixed empirical findings in entry timing research, managers who may recognise entry opportunities may delay entry thinking that late entries lead to higher product performance. The finding provides empirical evidence that may help managers to make an important strategic decision when it comes to choosing the timing of their entry.

The results showing that earlier imitative entry leads to product survival also indicate that companies should take planned actions to improve competitive vigilance and to enhance the perceived urgency to react to competitive moves (Debruyne et al.

2010). Competitive action literature has pointed out planning and execution of competitive actions such as imitative entry can be assisted by paying attention toward competitors' actions (Debruyne et al. 2010). Hence, firms need to focus on collecting, disseminating and analysing this information within their organisations. For example firms should encourage employees to engage in information acquisition activities such as visiting trade shows, investigating competitors' websites and public filings, and going to industry meetings. The urgency to respond to a new product introduction can be improved when competitor intelligence is explicitly part of a firm's decision-making processes.

The insignificant relationship between absorptive capacity with relative product advantage and the significant effect of absorptive capacity in delaying entry timing provides an important managerial implication especially to practitioners operating in a dynamic market. These findings highlight the impact of path dependency nature of absorptive capacity on firms' ability to quicken entry and add further improvements to existing offerings. The findings show that firms with knowledge base that is unconnected or too distant to the knowledge embedded in the pioneering products might have difficulty in recognising the potential value of a competitor's product and when they finally do, they find improving the product equally tough. Hence, firms need to emphasise exploratory learning for absorptive capacity development namely in identifying and understanding potentially valuable new external knowledge. Levinthal and March (1993) have long argued that firms need to find a balance between exploratory and exploitative learning. The use of exploratory learning in the identification and understanding of new external knowledge increases a firm's ability to venture from its existing knowledge base (Lane et al. 2006); hence increasing a firm's ability expedite its imitative entry and boosts its ability to improve upon a pioneer's product.

8.5. Limitations, Future Research Directions and Alternative Operationalisation Approaches

8.5.1 Limitations and Future Research Directions

The present study, like all other empirical studies, is not without its limitations. First, the findings may be limited because the present research focuses on publicly listed firms. Restricting the sample to publicly held companies that existed prior to their entry into the new product category left out many entrants and restricted our sample size. Replicating this study using a different method such as questionnaires may alleviate this problem. However, as market entries dated back to 1982, some of the companies and the managers may no longer available to fill in the questionnaires. Furthermore, using questionnaire may raise other issues inherent in survey-based research such as common method bias.

This present research is not strictly cross sectional as the variables were measured at different times to capture the lagged effect some variables have on another. For example, this research attempts to capture the developmental, lagged, and path-dependent nature of absorptive capacity by measuring potential absorptive capacity and realised absorptive capacity in two time periods. Similar approach was taken to capture the potential lagged effect between resources and capabilities considering capabilities may require time to develop.

Despite this effort, the study still suffers from a relatively short-term focus. Furthermore, the lack of significant findings on the hypothesised relationships between absorptive capacity and its outcome such as entry timing and relative product advantage may suggest that the developmental, lagged, and path-dependent nature of absorptive capacity may take longer to take shape than expected. Hypothesised relationships between resources also lacked support indicating the possibility that the impact resources have on capabilities development may also take time to manifest.

As such, future research could complement these findings by utilising longitudinal research designs that incorporate empirical estimations of the effect of absorptive capacity and its outcome including product performance at different points in time. Future longitudinal research is necessary to investigate how absorptive capacity is developed and how it impacts outcomes such as innovation, product advantage and entry timing overtime. Similar approach may also be taken to explore the relationship between resources and capabilities.

The present research use patent-derived measures for technological capabilities. Specifically, technological capability operationalised in the present study captures the extent to which a firm's patents are cited in subsequent patents by other firms. It reflects the quality aspect of a patent through a firm's patent ability to influent and to stimulate subsequent patents. The use of patent-based measures is appropriate for this study and captures an important, albeit partial, aspect of a technological capability (Kotha et al. 2011). An extension of this study might consider additional measures such as the publication data of engineers in the R&D department and the capital investments in developing products, among others (Kotha et al. 2011).

Similar to technological capability, absorptive capacity in the present research was also operationalised using patent data. Adding to the present study, future researchers might use additional measures of absorptive capacity dimensions. For example, to capture knowledge acquisition researchers may use 'years of experience of the R&D department' or 'R&D investment' as measures of knowledge acquisition (Zahra and George 2002). Transformation dimension may be operationalised as 'the number of new product ideas' or 'new research projects initiated' (Leonard-Barton 1995). Finally, exploitation may be measured using outputs such as the number 'new product announcements' or 'length of product development cycle' (Zahra and George 2002). These measures can be complemented with a longitudinal research method to capture developmental and lagged nature of absorptive capacity as well as its impact over time, as previously discussed.

Future research may also conceptualise absorptive capacity along multiple dimensions such speed of external knowledge absorption versus breadth of external knowledge absorption and examine how firms' choices along this absorptive capacity dimension influence various consequences such as product innovativeness and entry timing. For example, some firms are better than others at absorbing know-how quickly over a very narrow area, while other firms may absorb more slowly over a broader area (Naramsihan et al. 2006).

Following Zahra and George (2002), future research may want to examine the relationship between potential and realised absorptive capacity efficiency ratio with performance. Future research may also want to explore the alternative view such as what kind of balance between potential and realized absorptive capacity leads to superior performance (Jansen et al. 2005). In addition, future research may also want to examine the moderating effects of environmental dynamism (i.e., high-turbulence environment vs. low technologically turbulent environment) on the balance between potential and realised absorptive capacity relating to superior performance.

It is important to emphasise that the present study focuses on the early success of firms entering markets that have already been developed by pioneering firms. Such a focus on the early performance of firms shortly after their entry is similar to previous studies on entry timing (e.g., Shamsie et al. 2004). This measure of performance is therefore confined to four years, which is a reasonably short period of time after their entry. Consequently, this study cannot make any claims about the performance of firms in the context of imitative entry over a longer term. The present study acknowledges that the probability of survival for firms in the sample during subsequent years would also be affected to a considerable degree by other factors that were not measured in this study. For example evolving market conditions, subsequent moves made by existing and new players and the reactions of the other competitors to these moves contribute to firms' probability of survival.

Another limitation of the present study is product performance was only measured using product survival. Section 5.6.1 in Chapter 5 highlights why product performance was not measured in terms of market share and profitability. Future research may explore the impact of firms' imitation strategy on firms' financial performance such as return on assets, return on equity, return on sales, market value, market value added, and economic value added. Similarly, future research can also extend the present research by investigating the impact of imitative entries by competitors on existing market players' firm performance. This impact can be studied at product level such as the impact on market share and product survival as well as firm level such as financial and market performance.

The present research examines four product categories that come from two industries that are relatively similar to each other: office products and consumer durables. Choosing a single industry or limiting the study to two industries that resemble each other ensures internal validity because the measures of the variables tested in the present study may differ across industries (Prabhu et al. 2005). As highlighted in Chapter 4, the four product categories from these two industries are especially suited for the study of imitative entries because they exhibit high degrees of innovation as well as imitation. However, choosing specific industry(s) also raises the issue of generalisability. For example, industries may vary in the nature and magnitude of the advantages available to early entries and higher relative price. Despite the distinctiveness of office products and consumer durables industry, it is possible to apply the findings and make some cautious generalisations to other high-tech industries as the present study is not alone in choosing these specific industries. Previous scholars in the field of product innovation, new product introduction and entry timing have also chosen to study these industries (Srinivasan et al. 2004; Chandy and Tellis 2000; Golder and Tellis 1993, 1997; Sultan et al. 1990). One may also argue that the generalisability of these findings may be limited to industries where patents are meaningful indicators of technology and innovation. However, the number of such industries has been growing in recent years, which include pharmaceuticals, chemical, and electrical products and automotive industries (Thompson Reuters 2013)

Another limitation is that the current research only measured absorptive capacity, marketing capability, technological capability and marketing and technological capability interaction as determinants of entry timing, relative product advantage and relative price in the context of imitative market entry. Perhaps there are other types of capabilities not examined in the study that play a role in enabling effective imitative entry strategy that may be explored in future research. Other important organisational capabilities such as financial management and human resource management capabilities may play a role in the imitation strategy and performance relationship. For example, Dutta and colleagues (1999) suggest that operations capability along with marketing, R&D and marketing and R&D interaction are important determinants of financial performance in high technology industries.

Finally, the imitation literature may benefit from additional research on firms' prior industry affiliation with their imitation strategies and decisions. The present research demonstrates that innovation and imitation strategies are not strictly exclusive. That is, when developing a product, firms copy certain features, design and attributes of existing products in the market while at the same focusing on innovation of other characteristics of the product. Therefore, it will be interesting to explore the role of prior industry experience in influencing firms' decision whether to innovate or imitate specific product features. This is an interesting avenue to explore as prior industry experience reflects the path dependent nature of capabilities and absorptive capacity of firms.

8.5.2. Alternative Operationalization Approaches

As there are various ways to conduct a research, this section provides a discussion on alternative operationalisation approaches to this study. First, an alternative research design is presented. Second, an alternative data collection method will be discussed. Finally, alternative operationalisations of the constructs tested in the present study will deliberated.

Data collection method and the operationalisation of constructs follow a research design decision which objective is to answer the research problem in the best possible way (Edmondson and McManus 2007; Ghauri and Grønhaug 2002). The research questions of the present study are: (1) to examine the role of capabilities in enabling firms to engage in successful imitative market entries, (2) to understand the relationship between strategic types and resources as well as the relationship between resources and capabilities, and (3) to investigate the effectiveness of imitative market entry strategies; namely speed of entry, relative product advantage and relative price in determining product survival.

As an alternative to the quantitative and deductive approach adopted in the present study, a qualitative and inductive approach could have been adopted. Prior studies on imitation have used this alternative approach to examine the variants that contribute to the success and failure of imitating firms (Schnaars 1994; Shenkar 2010). Specifically, these scholars have used case studies to identify specific capabilities that enable firms to perform imitation strategies effectively. Using inductive and qualitative approaches, scholarly work on imitation strategies have offered a framework on key decisions such as where, what, who, when and how to imitate (Shenkar 2010).

Inductive and qualitative research approaches were appropriate for early studies on imitation because the field was relatively new, undeveloped and in need of further exploration (Hair et al. 2011). Due to the lack of knowledge in this area, inductive research was employed to identify patterns from data for theory building (Hair et al. 2011). However, currently a number of exploratory studies in the form of case studies have been published resulting in an accumulation of knowledge in this area (Schnaars 1994; Shenkar 2010).

While qualitative research emphasises hypotheses development, quantitative research focuses on hypotheses testing (Dul and Hak 2008). As the knowledge in the field accumulates, research questions of the present study were developed based on mature theories. Rather than aiming to develop a theory, the goal of the current research is to test existing theories in the setting of imitative market entry and to identify the limitations and boundaries of those theories (Edmondson and McManus 2007). Therefore, a deductive reasoning approach and a quantitative research method are more appropriate for this current study. Furthermore, as qualitative research has been adopted previously (e.g., Schnaars 1994 and Shenkar 2011), adopting the same approach will add little value to current knowledge. A quantitative approach is also more appropriate compared to qualitative because the 'context' of the research is not important in the present study. It is also difficult to generalise findings from qualitative research derived from a small number of cases to a larger population (Dul and Hak 2008).

Next, a discussion on alternative operationalisation through a different data collection method is presented. An alternative approach to the use of secondary data is the use of questionnaire. Although the use of questionnaire is common in the field of marketing and strategy, this data collection approach poses some limitations to the present study. The need to choose an appropriate industry and the need to avoid sampling bias deem the use of questionnaire unsuitable. One of the most important concerns in this research is to choose industries with available data; that is, the industries have to be initiated recently enough that the required data are still available (Schoenecker and Cooper 1998). At the same time the industries have to exist long enough so that market entry over a significant portion of their life cycles could be traced (Schoenecker and Cooper 1998). Due to the need to choose industries that are established enough, it is possible that some of the companies in the sample have exited the market. Sending questionnaires to managers of only the surviving companies while excluding non-survivors leads to sampling issues called survivor bias. The exclusion of firms that have failed may amplify the advantage of imitative entry strategies. On the contrary, the use of secondary data enables the performance and the characteristics of both failed and surviving firms to be examined; hence, avoiding survivor bias.

Another limitation of survey data corresponds to the time lapse between market entries with the time the questionnaires are filled in. Respondents such as newer employees may not have accurate information about the timing of the firm's market entry, especially of older products (Golder and Tellis 1993). Furthermore, self-perception bias commonly observed in self-reported data increases the number of entrants claiming market pioneer status (Golder and Tellis 1993). As the study concerns imitative entry, pioneers will have to be excluded, which then reduces the sample size and weakens the empirical results (Golder and Tellis 1993). In addition, there is still ambiguity about how to accurately classify firms as fast followers and late entrants. Thus far, there is no consensus about the period of time covering the window in which firms should be categorised as fast followers following an introduction of a pioneering product (e.g., one month later or one year later) (Lieberman and Montgomery 2013). Similarly, there is no agreement on when the next window starts for firms to be considered late entrants.

Lastly, Table 8.1 presents in detail the alternative operationalisations of each construct tested. In addition, the limitations of the alternatives are also highlighted. For comparison purposes, the operationalisations employed are also included in the table.

Table 8.1: Alternative Operationalisations of Constructs

Construct	Employed in Present Study	Alternatives	Limitations of Alternatives
Dependent variable: Performance	Product Survival	**Financial measures:** • Profit (Lieberman and Montgomery 1988) • ROA, ROE, ROI (Cho and Pucik 2005; De Carolis 2003) • MVA (Deeds 2001) • Cash flow (Hambrick 1983; Vorhies et al. 2009) **Market performance measure:** • Market-to-book ratio (De Carolis 2003) • Tobins's Q ratio (Cho and Pucik 2005; Uotila et al. 2009)	**Limitations of using Profit:** • Difficult to obtain data as most companies do not report their profits at the product level (Lieberman and Montgomery 2013) • Profit level varies according to when data is collected. That is, firms show higher profits during growth period. Profit tends to be lower as the market matures due to intense competition (Lieberman and Montgomery 2013) **Limitations of Financial and market performance and market performance:** • They are

			measured at firm level rather than at product level.
		Product performance: • Market share (Shamsie et al. 2004; Mitchell 1991)	**Limitations of using market share:** • There is a correlation between market share and entry order, which leads to a bias result favouring early entrants Lieberman and Montgomery 1988, 2013)
		Subjective Performance: • Self-report	**Limitations of using self-report:** • Response bias (Golder and Tellis 1993)
Strategic Orientation	The strategic types were categorised using seven attributes of defenders, analysers, and prospectors (Sabherwal and Sabherwal 2007). The seven attributes consist of scope, product-market dynamism, firm-level uncertainty, liquidity, asset efficiency, fixed asset intensity, and long-range	Self-report/ self-typing (Snow and Hrebiniak 1980; McDaniel and Kolari 1987; Conant et al. 1990)	Response bias (Golder and Tellis 1993)

	financial liability.		
		Objective indicators: • Percentage of sales derived from new products (Hambrick 1983)	A unidimensional conceptualisation of a multi-dimensional construct (Conant et al. 1990) leading to an incomplete measure
		External assessment: • Expert panel assessment and typing (Meyer 1982)	• Time consuming (Conant et al. 1990) • Difficult to identify experts and to secure their involvement (Conant et al. 1990) • The classification decisions must be developed and agreed with experts at the beginning of data collection process (Conant et al. 1990).
Marketing Resources	The ratio of the SGA (selling, general and administrative) expenses to total revenues for the company.	Self-report/ self-typing	Response bias (Golder and Tellis 1993)
		Use other proxies based on secondary data: • Possession of direct sales force (1-firm possesses a direct sales force; 0 firm does not) (Schoenecker and Cooper 1998) • Brand capital: operationalised as	**Limitations of using other proxies based on secondary data:** • Not all firms have direct sales forces • As the empirical setting of this

		the total number cereal brands sold by a firm (Thomas 1996) • Advertising/ sales (De Carolis 2003) • Brand equity measure using financial markets information (Simon and Sullivan 1993)	study involves technological firms, the number of brands used by each company is limited compared to the FMCG industry. • Many companies do not report advertising expenditure • Difficulty to obtain data especially for younger companies.
Marketing Capability	Secondary data: Input-output approach Stochastic Frontier Estimation (SFE) method to measure marketing capability.	Self-report/ self-typing: Use existing scales or develop new scales to quantify various dimensions of marketing capability (e.g., Day 2000; Jayachandran et al. 2004)	Response bias (Golder and Tellis 1993)
Technological Resources	Technological resources were measured as the ratio of the research and development (R&D) expenses to total revenues for the company (Schoenecker and Cooper 1998)	Self-report/ self-typing	Response bias (Golder and Tellis 1993)
Technological capability	Forward patent citation (Kotha et al. 2011).	Self-report/ self-typing: Adopt existing scales have also been used to capture R&D capability in studies employing primary data (e.g., Song et al. 2005).	Response bias (Golder and Tellis 1993)
Absorptive Capacity	Operationalised as potential and realised using	**Other indirect measures or proxies of absorptive capacity:**	**Limitations of using other indirect measures or proxies of**

	patent data	Proxies for prior knowledge base: • R&D Intensity (Cohen and Levinthal 1990) • The number of co-authored scientific papers (Cockburn and Henderson 1998). Proxies for knowledge stock: • Measures of a firm's human capital such as investments in scientific and technical training and the number of scientists and engineers (Mowery and Oxley 1995; Keller 1996) • The number of doctorates within the R&D department (Veugelers 1997) and if a firm has a fully staffed R&D department (Cassiman and Veugelers 2002). **Use survey instruments to capture attributes of absorptive capacity** • Operationalise absorptive capacity as a capability by developing scales that capture compensation policies, dominant logic, knowledge-sharing routines,	**absorptive capacity:** • Knowledge stock and knowledge base only represent one of the many dimensions of absorptive capacity (Lewin et al. 2011). • The process dimension of absorptive capacity is not captured (Volberda et al. 2010) • The use of proxies does not capture the developmental, lagged and path-dependent characteristics of absorptive capacity (Volberda et al. 2010) **Limitations of using survey instruments:** • The use of survey instruments does not capture the developmental, lagged and path-dependent

		motivation, and competencies (Lane and Lubatkin 1998; Lane et al. 2001; Meeus et al. 2001; Szulanski 1996)	characteristics of absorptive capacity (Volberda et al. 2010).
Entry timing	• The number of months elapsed between the date of the introduction of the pioneering product and the entry date of each imitative entry (Schoenecker and Cooper 1998; Lee et al. 2000) • Order of entry: The pioneer that first entered the market is labelled as order 1, the second entry is labelled as order 2, and subsequent entries are labelled in the same	• Self-report: Retrospective assessments of entry order (Lieberman and Montgomery 1998).	• Ambiguous classification of pioneers, first movers, and late entrants (Lieberman and Montgomery 1988; 2013) • Order of entry that is operationalised based on self-reports causes a large fraction of entrants to be classified as pioneers (Lieberman and Montgomery 1988).

	manner (Lee et al. 2000)		
Relative product advantage	The number of new product features of a new product divided by the existing number of product features that were listed for previous entrants.	**Self-report:** • Use a scale that captures elements of product advantage such as product superiority, unique benefits, relative product quality and good value-for-money (Cooper 1979; Maidique and Zirger 1983; Cooper and Kleinschmidt 1995). **Product Review Rating** • Obtain ratings from product surveys published by product review magazines or websites such as Consumer Reports, 'Which?co.uk', PC Magazines (Shamsie et al. 2004; Green et al. 1995) **Objective Rating** • Use experts' ratings	**Limitations of self-report** Response bias: Self-reports may increase the likelihood of managers reporting products as having high relative product advantage. **Limitations of Product Review Rating** • Ratings from product surveys were not available as products in the sample did not exist in the market at the same time and were not rated relative to each other **Limitations of Using Experts' Ratings** • Experts must be identified and their willingness to get involved is secured (Conant et al. 1990)
Relative price	Percentage of the average price calculated from	Self-report: Managers to rate the expensiveness of their	• Inaccurate response • Response bias

	the products of all significant competitors that entered the U.S. market in the same year and during the second half of the previous year.	products relative their competitors' offerings	

8.6. Conclusions

To conclude, the study of firms' imitative entry has enriched strategic orientation, capability, absorptive capacity, entry timing and product-market strategy literature. The study attempted to accomplish four main tasks. First, the study investigated the relationship between Miles and Snow's typology of strategic orientation with resources. Second, the study explored the association between specific resources with associated capabilities and absorptive capacity. Third, the study examined how capabilities, their interaction and absorptive capacity determine firms' ability to expedite their entries, improve relative product advantage and relative price. Finally, the present study links capabilities with performance through capabilities role in enabling faster entries and effective differentiation via perceived superior product and premium price.

The results of the present study revealed a number of important findings. First, along the prospectors-analyser-defender continuum, prospectors devote the greatest resources on marketing and technology while defenders the lowest. Second, higher potential absorptive capacity is associated with greater realised absorptive capacity. Third, there is a U-shaped relationship between marketing capability and entry timing as well as between technological capability and entry timing. Hence, firms that made the earliest and the latest entry were the ones with the highest capabilities. Fourth, high marketing and technological capability interaction facilitates faster entry. Fifth, greater technological capability enables firms to provide value for their customers by reducing relative price. Finally, the present study found marginal support indicating that entry timing, relative product advantage and relative price increase the likelihood of product survival.

The findings offer intriguing insights for both researchers and practitioners; therefore, it is hoped that the present research is successful at inducing future efforts to explore this research directions further.

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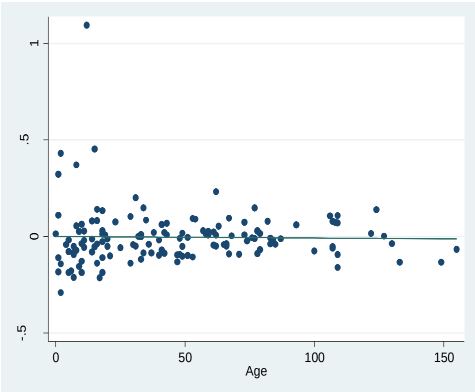
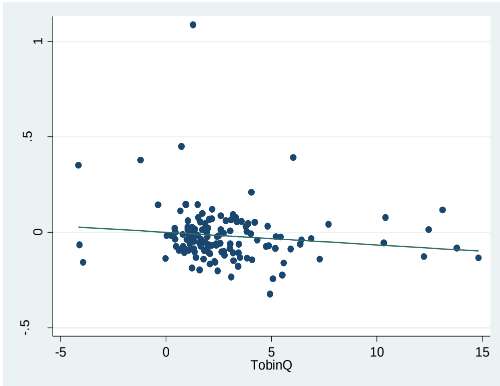
APPENDIX 1: PARTIAL REGRESSION PLOTS

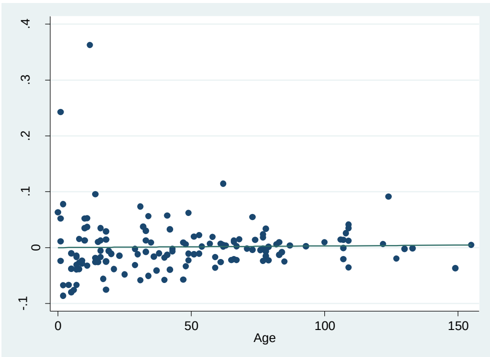
Linear Relationships between Dependent and Independent Variables (Dummies Excluded)

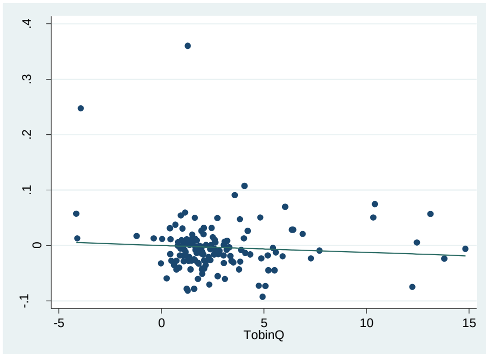
Equation 1: SGA Intensity



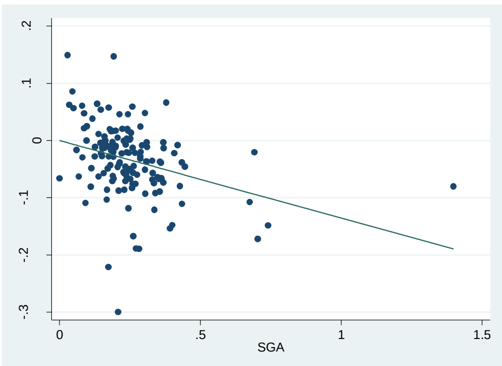


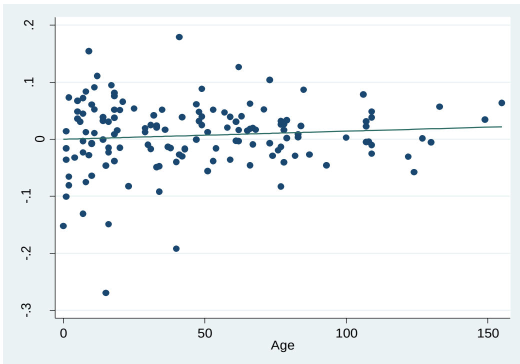
Equation 2: RND Intensity

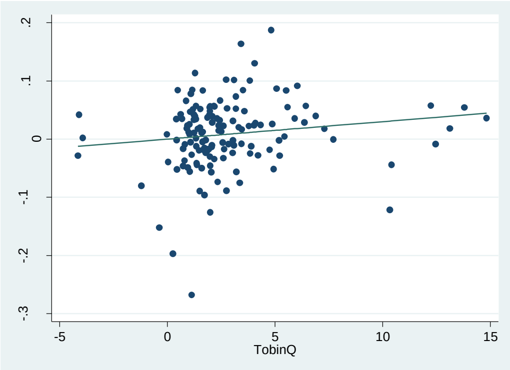




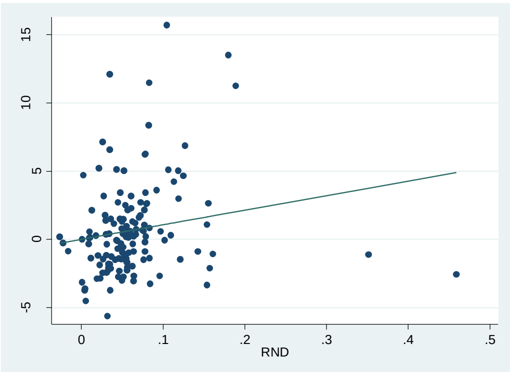
Equation 3: Marketing Capability

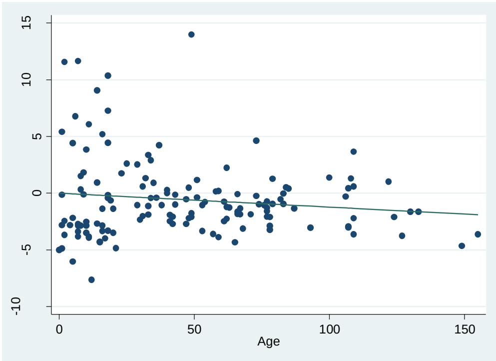


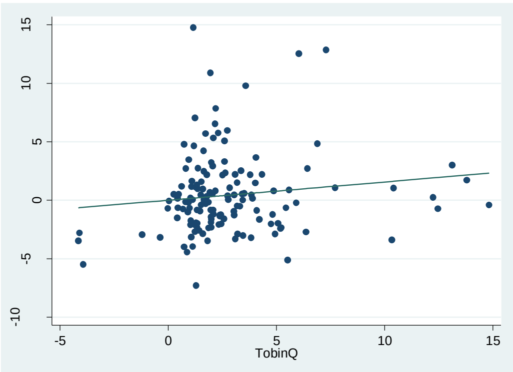




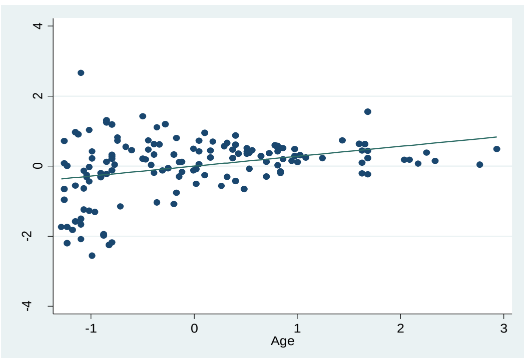
Equation 4: Technological Capability

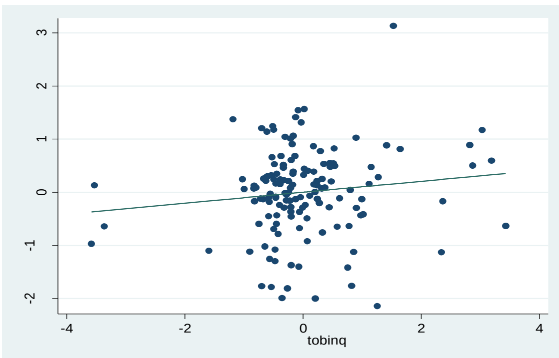


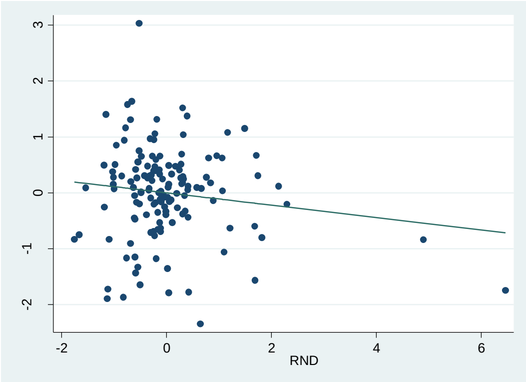


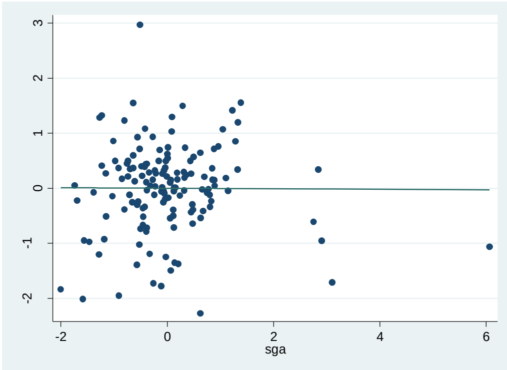


Equation 5: Potential Absorptive Capacity

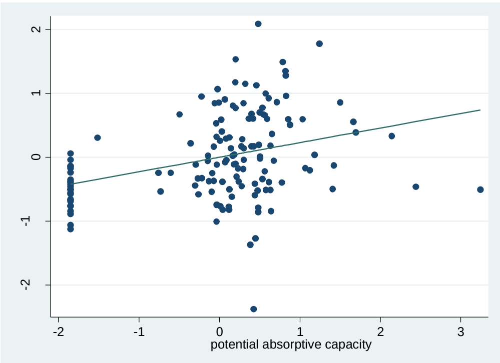


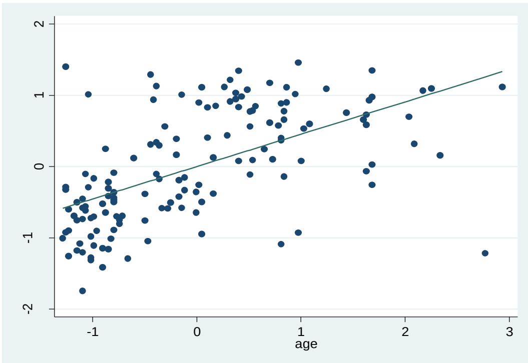


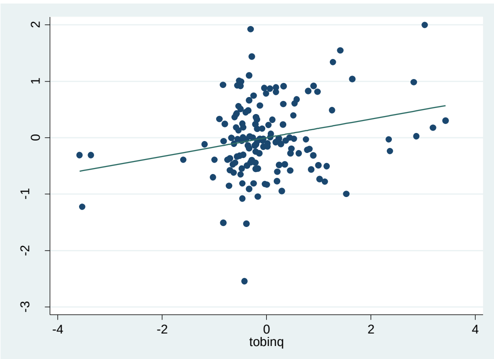




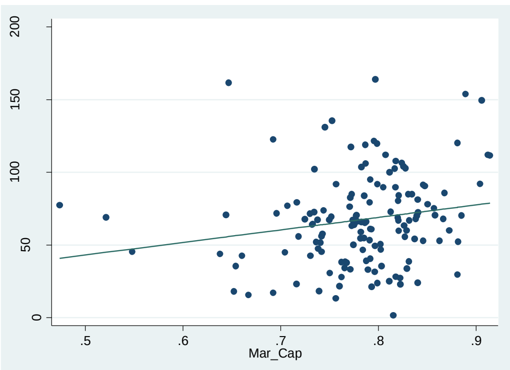
Equation 6: Realised Absorptive Capacity

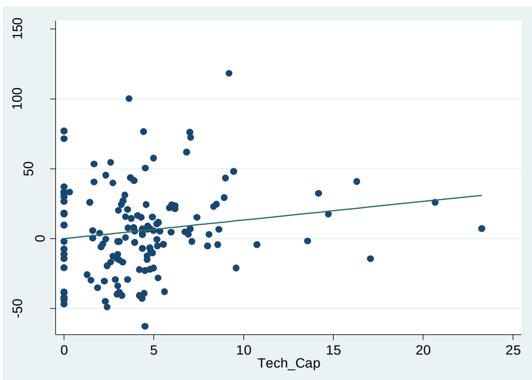


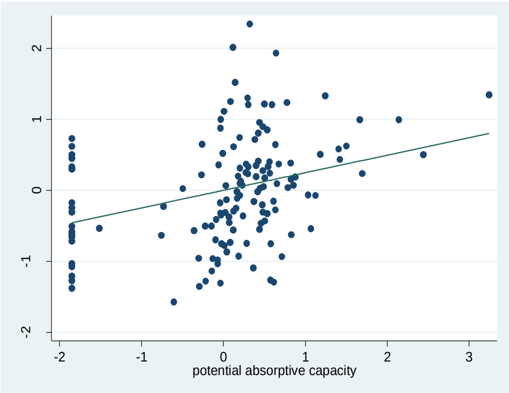


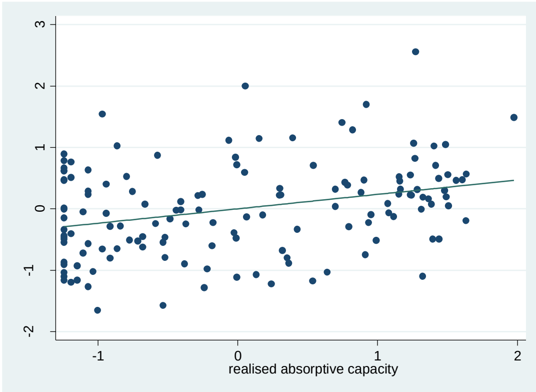


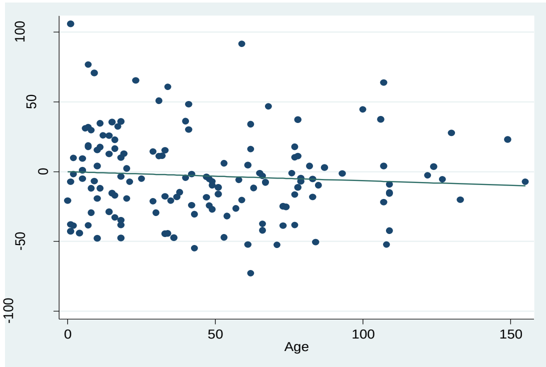
Equation 6a: Order of Entry

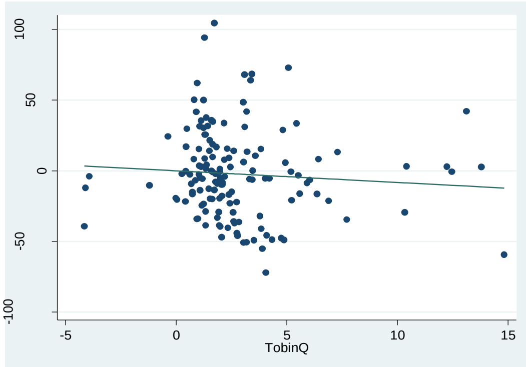




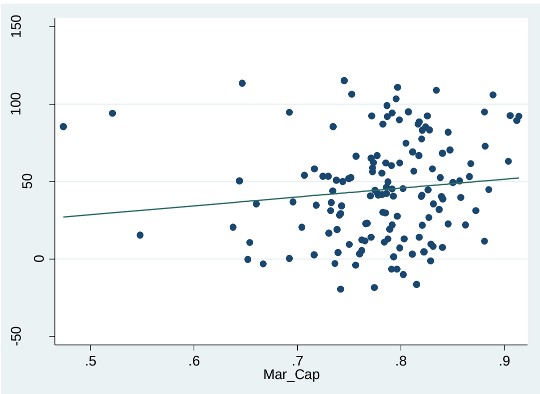


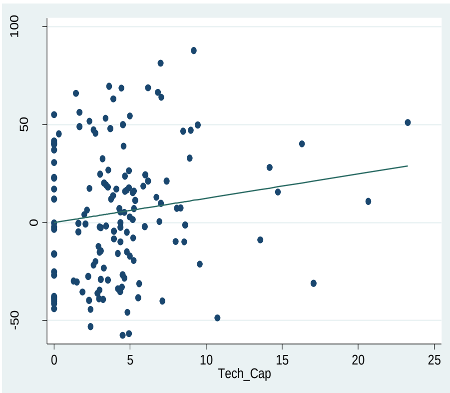


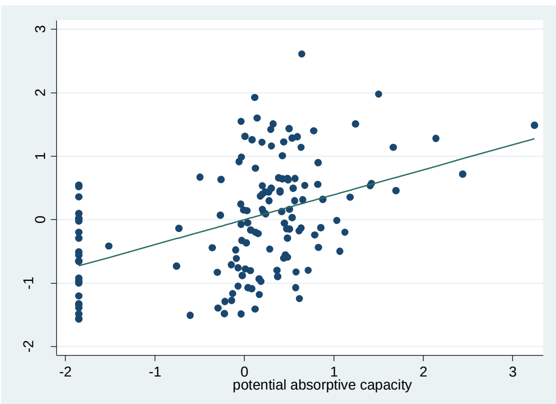


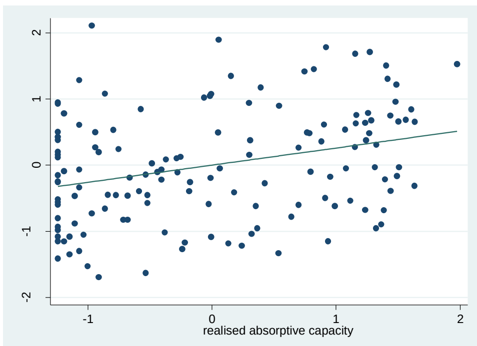


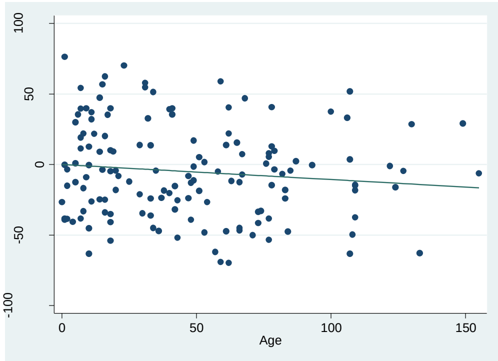
Equation 6b: Entry Lag

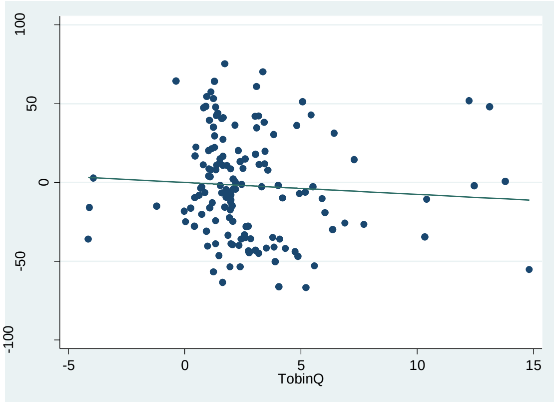




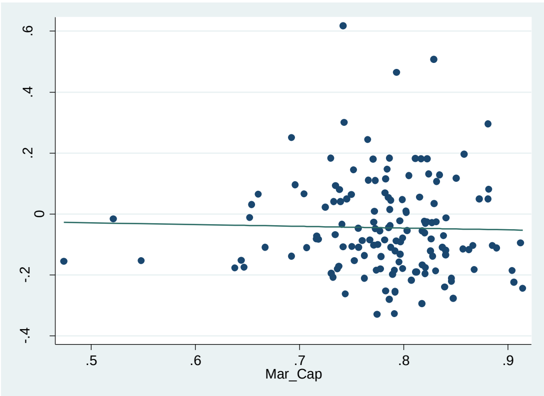


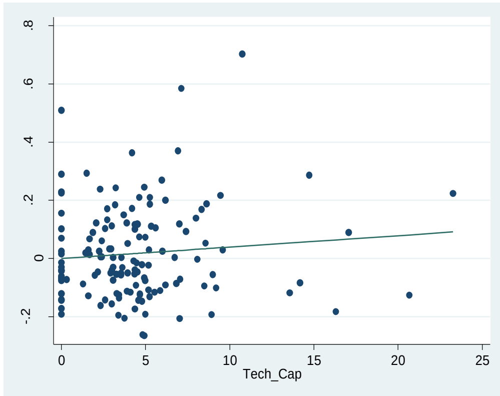


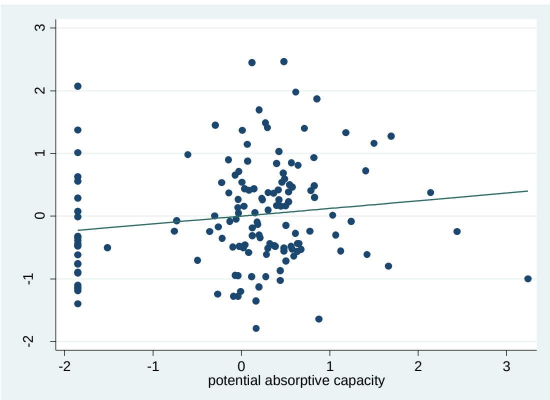


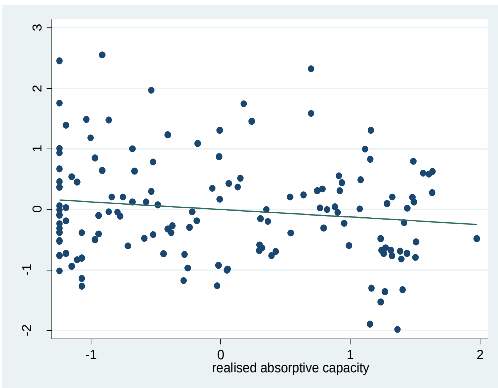


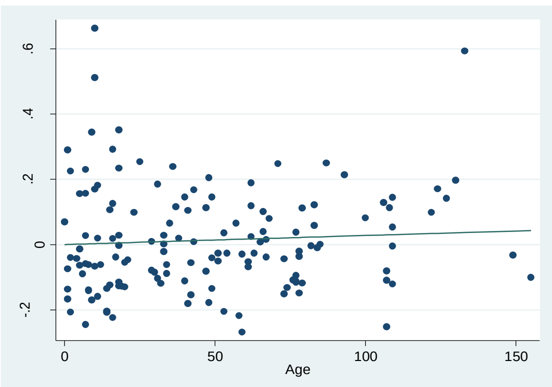
Equation 7: Relative Product Advantage

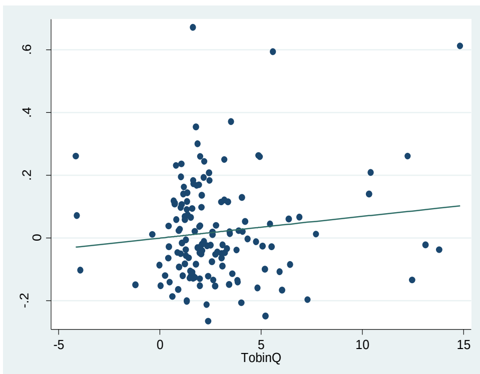




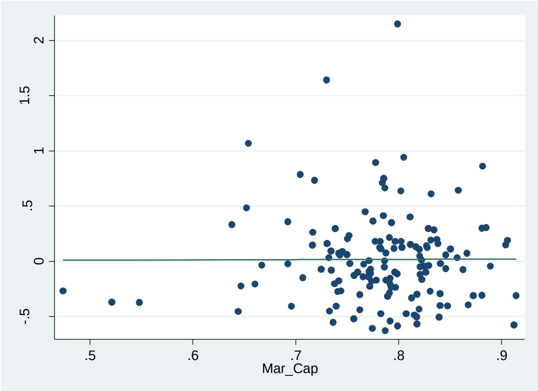


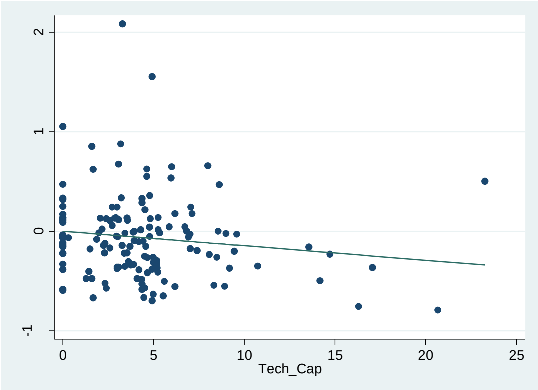


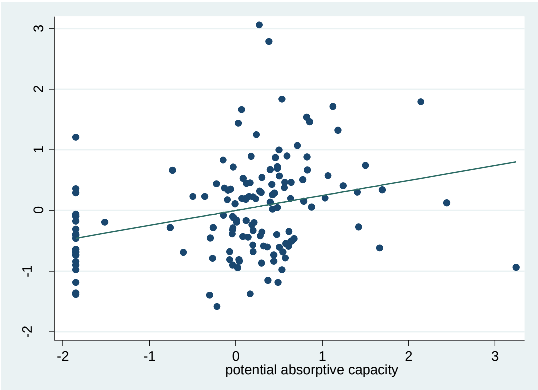


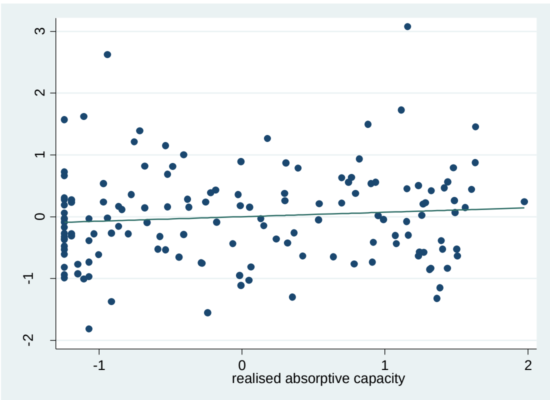


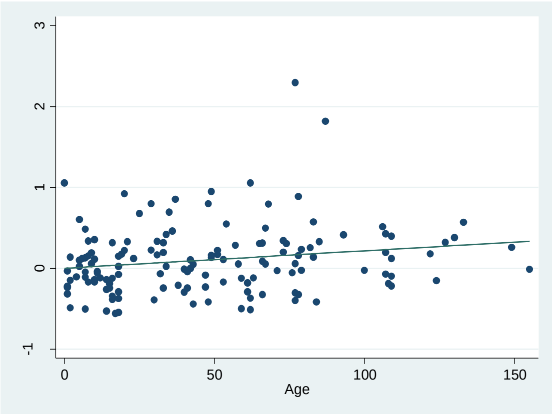
Equation 8: Relative Price



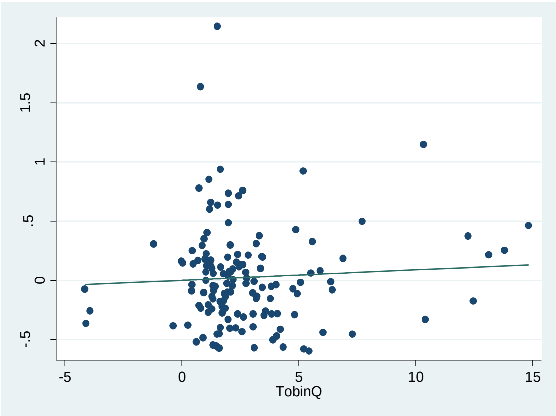








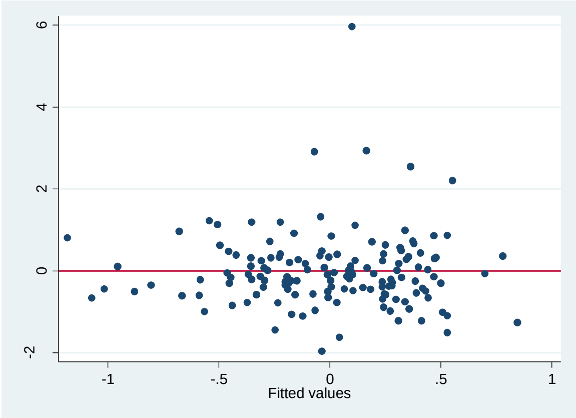
-1
0
1
2
3
0
50
100
150
Age



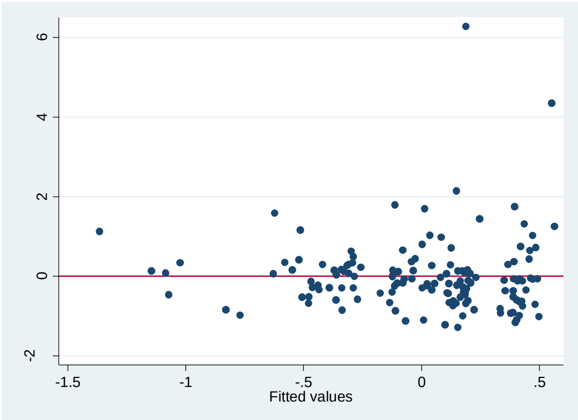
-.5
0
.5
1
1.5
2
-5
0
5
10
15
TobinQ

APPENDIX 2: RESIDUAL PLOTS

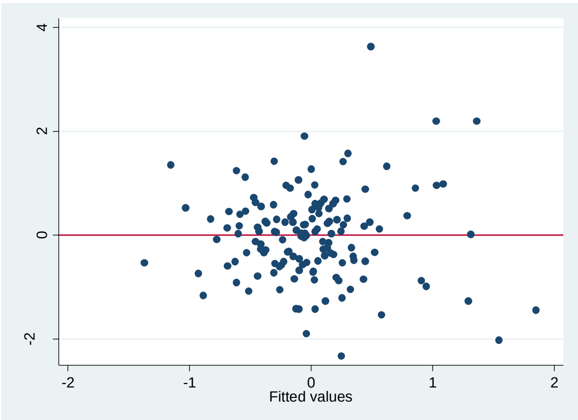
Equation 1: SGA Intensity



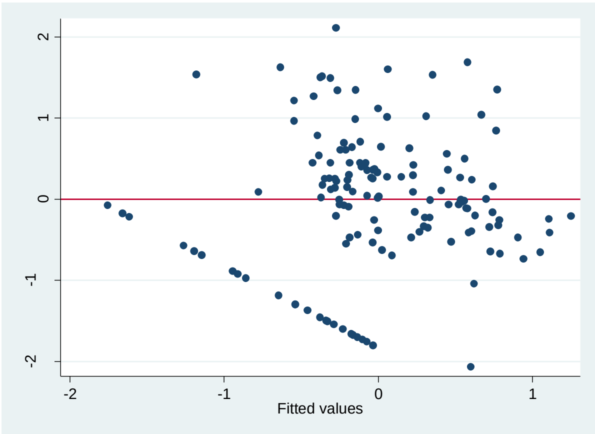
Equation 2: RND Intensity



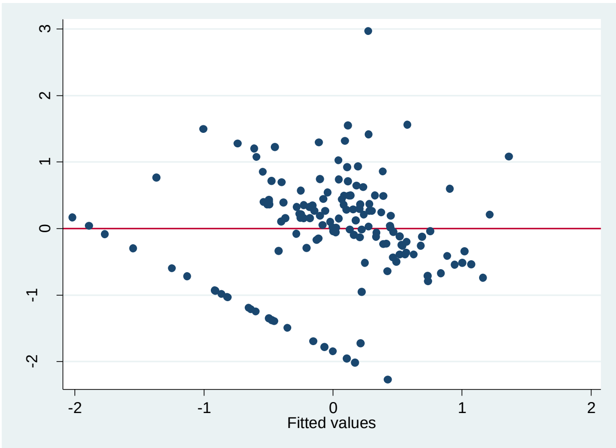
Equation 3: Marketing Capability



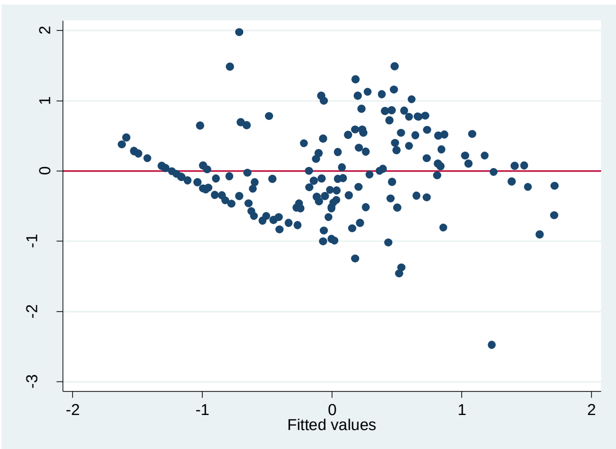
Equation 4: Technological Capability



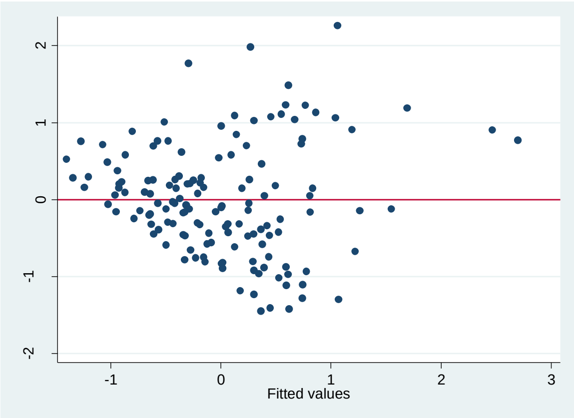
Equation 5: Potential Absorptive Capacity



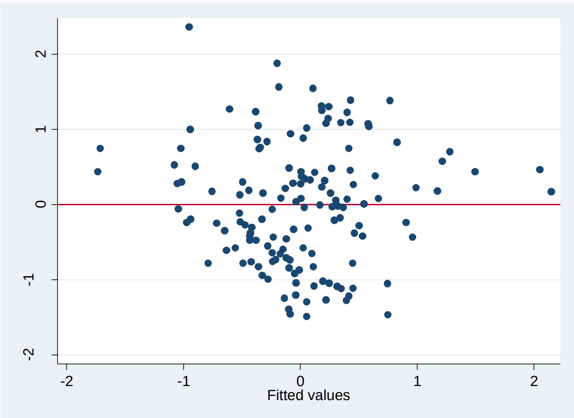
Equation 6: Realised Absorptive Capacity



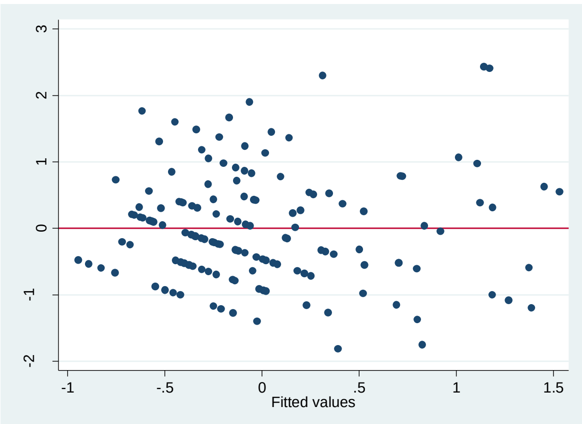
Equation 7a: Order of Entry



Equation 7b: Entry Lag



Equation 8: Relative Product Advantage



Equation 9: Relative Price