EXPLORING THE ROLE OF ORGANISATIONAL AMBIDEXTERITY IN PROMOTING FIRM SURVIVAL AND PERFORMANCE THROUGH THE GLOBAL FINANCIAL CRISIS

By

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ABSTRACT

Companies constantly hit rough patches. Unfortunately, not all firms manage to survive decade after decade. Some companies morph throughout the years and bear little resemblance to their original setup (Krakovsky, 2013). Johnson & Johnson began in the late 1880s by manufacturing commercial sterile surgical dressings, while Nokia was kicked off in 1865 as a riverside paper mill. The explanation for this longevity: organisational ambidexterity. The engagement in organisational ambidexterity has grown substantially over the past ten years as studies have found it promotes superior performance. This thesis examines the role of ambidexterity in promoting firm survival and performance through the 2008-2009 financial crisis. 11,290 U.S. firms, listed on the stock markets from 2006 through 2014, are used to form a longitudinal study. The first empirical chapter explores the research question, *Did actually Corporate America experience a crisis in 2008 and 2009?* The findings confirm that Corporate America did go through a crisis, based on the high bankruptcy rate, which underlines the importance of crisis survival knowledge and the value of this research. Then, the thesis identifies the influence of ambidexterity on the probability of firm survival during the Global Financial Crisis, through the research question, *Why and how did some firms survive, while others did not? The* results demonstrate a positive relationship between ambidexterity, exploitation and firm survival, while exploration reduced the likelihood of crisis survival. The third empirical chapter focuses on the forms of ambidexterity that promote firm performance. The ambidexterity constructs were found to be negatively correlated to financial firm performance, which is mainly attributed to the initial investment in the activities.

This thesis distinguishes the role of ambidexterity in relation to firm survival and performance. Survival and performance are not purely dependent on luck or the possession of slack resources. Hence, the knowledge and the ability to exploit and explore resources are essential for long-term survival and prosperity.

DEDICATION

I dedicate my dissertation work to my family and my husband.

A special feeling of gratitude to my loving Mum and my Uncle, whose words of encouragement and inspiration throughout my life. Thank you for providing me a 'writing space' and nurturing me through the journey of PhD.

I dedicate this dissertation to my siblings, Tze Lin, Hui Yong and Boon Hwee who have never left my side.

To my mother-in-law, father-in-law and Ani who have supported me throughout the process.

I also dedicate this work to my dear husband, Dimitar who remains willing to engage with the struggle, and ensuing discomfort, of having a partner who has devoted most of her time in her research. A very special thank you for your practical and emotional support.

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CHAPTER 1: Introduction

Understanding the thesis

In ancient Roman religion and myth, Janus, the god of transitions, is portrayed as having two faces – one focusing on the past and the other on what lay ahead. The concepts of dualism, mastering change and adaptation, bridging the old and the new are deeply rooted in our history. Once veiled in symbolism, nowadays clenching their proficiency often epitomises the ultimate mantra for prosperity. Contemporary business practitioners constantly analyse and refer to past performance, while pushing the boundaries in their strides to dominate the future. They tirelessly seek the ultimate balance between extracting the optimum value out of existing capabilities and successfully navigating the uncertainty of innovation, which is often elusive in our dynamic business environment.

Being ambidextrous can indeed be one of the toughest managerial challenges (O'Reilly and Tushman, 2004). It requires practitioners to work diligently in exploiting existing capabilities and plunge bravely into exploring new opportunities. Successful companies - such as Hewlett-Packard (HP) which transformed itself from electronic instruments to minicomputers to printers manufacturer (House and Price, 2009); the International Business Machines Corporation (IBM) switched from hardware manufacturing to software to services provider (O'Reilly and Tushman, 2013; Tushman et al., 2013); or Fuji that used to manufacture photographic film and converted to a specialist in fine chemicals (O'Reilly and Tushman, 2013) - suggest that the fundamental, long-term survival requires sufficient amounts of exploitation to ensure current viability and exploration to enhance future success.

The argument about the importance of balancing exploitation and exploration to achieve optimal performance is widely recognised in the literature (Benner and Tushman, 2002; Benner and Tushman, 2003; He and Wong, 2004; Gupta et al., 2006; Lubatkin et., 2006; Uotila et al., 2009; Zimmermann et al., 2015). Overemphasis on exploitation reduces learning opportunities

and gives way to potential captivity in outdated knowledge, while overemphasis on exploration may expose a firm to risky investments with unpredictable returns.

Empirical studies about the association of exploitation and exploration activities with performance have relied on various research designs, including questionnaire surveys, interviews and case studies (He and Wong, 2004; Jansen et al., 2006; Lubatkin et al., 2006). Most papers model exploitation and exploration as orthogonal activities with positive interaction (Uotila et al., 2009). Ambidexterity has been shown to be positively associated with firm performance (Gibson and Birkinshaw, 2004; Lubatkin et al., 2006; Cao et al., 2009; O'Reilly and Tushman, 2013), sales growth (Lee et al., 2003; He and Wong, 2004; Auh and Menguc, 2005; Venkatraman et al., 2007), firm survival (Hill and Birkinshaw, 2010; Laplume and Dass, 2012) and innovation (Katila and Ahuja, 2002; Burgers et al., 2009; Tushman et al., 2010).

However, the relationship between ambidexterity and firm performance during crisis has remained untested. Moreover, prior research has failed to employ broad measures for operationalising the concept, with almost inexistent longitudinal research designs, which are essential to control for unobserved heterogeneity and endogeneity in analysing the linkage between ambidexterity and firm performance. First, this weakness may restrain the development of the concept since scholars may have applied their own sets of measures and definitions of the concept. Second, it limits the ability to document the effects of the concept over time.

This thesis contributes to the literature by developing a new firm-level analysis using business performance ratios to operationalise the ambidexterity, exploitation and exploration constructs. It derives an explanation of the relationship between the constructs, the probability of survival and performance using statistical methods, which are comparable, more convincing and

objective in a large-scale, longitudinal research design. The latter plays a defining role, because it explains the effects of strategic choices on survival and performance.

Using binary regression analysis to test the hypotheses and employing longitudinal data covering 2006 to 2014 for 11290 firms in the Nasdaq Composite, New York Stock Exchange Composite and Dead U.S. list, this thesis found that ambidexterity and exploitation orientation are more likely to increase the probability of firm survival during environmental turbulence, while an exploration orientation may reduce the probability of crisis survival.

This thesis further contributes to the literature by examining the effects of ambidexterity constructs on firm financial performance after the crisis. The result reveals that the accounting-based financial performance measures have negative relationship to ambidexterity, exploitation and exploration, while market-based financial performance measures have positive relationship to exploration. Undeniably, the findings contradict the existing literature. The difference may be attributed to the types of financial performance measures used in this thesis and the fact that ambidexterity activities do require initial investment which reflects on the balance sheet. However, looking at the fact that this study is the only one that operationalises ambidexterity with financial ratios, the result may be portraying the truth nature of ambidexterity. Nevertheless, being ambidextrous does require resources to realise, which may create negative implications for the financial firm performance. Still, this thesis reveals that the relationship between ambidexterity and firm survival and firm performance can be different. It appears that performance may not guarantee survival, while survival may not guarantee performance.

In addition, this thesis shares valuable evidence on the influence of ambidexterity on firm survival and performance that can be useful for business practitioners, who encounter similar situations. The evidence that higher ambidexterity increases the likelihood of firm survival reflects the importance to incorporate both learnings into an organisation. The result confirms

the existing literature and at the same time, strengthens the argument by using statistical methods with robust findings. Thus, it increases the validity and potency of such strategy.

Finally, the negative relationship between ambidexterity activities and financial firm performance reflect the reality of most business strategies – they require sizeable upfront investment, which might cost firms their financial performance. For practitioners, who are aiming to improve performance via ambidexterity, it is crucial to identify the breakeven point in order to realise the benefits. Moreover, the findings suggest that this strategy requires efforts and appropriate planning to deliver concrete outcomes on the commitments made.

The rest of this thesis proceeds as follows. Chapter two presents an overview of the literature on crisis survival. Chapter three discusses the literature on organisational ambidexterity as well as the development of the research questions. Chapter four is the methodology chapter, which shows the empirical setting and the operationalisation of the constructs. Chapter five is the first empirical chapter, which questions the existence of the Global Financial Crisis among U.S. firms. This chapter serves as the preliminary chapter that highlights the impacts of the Crisis and the value of a crisis survival study. Then, chapter six discusses the influence of ambidexterity on organisational survival. A binary regression is used to identify the relationship of the ambidexterity constructs with crisis survival. Chapter seven focuses on the role of ambidexterity in firm performance. Both accounting-based and market-based performance measures are employed in this thesis. Finally, the conclusion discusses managerial implications and summarises the study in chapter eight.

CHAPTER 2: Literature Review

Prepare for and Survive through Ever Changing Environmental Conditions: A Review of the Strategic Literature

In a turbulent business environment, it can be challenging for an established firm to choose new market directions. However, by rethinking the past and present and reimagining the future, business practitioners can construct strategic narratives that enable innovation and enable firm to achieve sustainability (Kaplan and Orlikowski, 2014).

2.0   Introduction

The recurrence of economic shocks has raised questions about firms' adaptability to unexpected changes in their external environment (Chakrabarti, 2015). An economic shock offers threats and opportunities (Calvo, 1998; Pangarkar and Lie, 2004; Wan and Yiu, 2009) and firms reconfigure their asset base (Tybout and Bark, 1988), review existing strategy to improve their competitive position or introduce retrenchment to improve internal efficiency (Anand and Singh, 1997) in response to the changes.

The concept of crisis survival is intuitive and modest in its interpretation, yet complex when employed and examined in strategic research, because of its multiple definitions, conceptualisation and operationalisation. As stated in the introduction chapter, this thesis aims to identify the role of ambidexterity in promoting organisational survival during environmental jolts. This chapter provides an overview of the empirical studies in the strategic literature pertaining to the survival of firms during environmental jolts. This chapter begins with a discussion of the concept of punctuated events and the various types of crisis, which highlight the importance of crisis survival knowledge. Then, it focuses on the empirical evidence of the ambidexterity concept and models, concluding with implications for the research agenda and recommendations for future research direction.

2.1 Ever-Changing Environmental Conditions

2.1.1 Punctuated Event

There are longstanding studies that refer to events and crises as key sources of change in fields and conceptualise them as "jolts" (Meyer, 1982), "discontinuities" (Langfield-Smith, 1997) or "shock" (Fligstein, 1990; Carrière-Swallow and Céspedes, 2013). All these terms are related to the punctuated equilibrium theory, which emphasises spark or uncertainty in a turbulent business environment.

The punctuated equilibrium was initially developed in the field of biology. It has since been applied to the study of organisational change, focusing on how firms respond to sudden changes in their internal composition as well as their external environment (Gersick, 1991; Tushman and O'Reilly, 1996; Fox-Wolftramm and Boal, 1998; Haveman et al., 2001; Chang et al., 2003; Silva and Hirschheim, 2007; Dansereau and Yammarina, 2011; Moerschell and Lao, 2012). The theory of organisational change has been incorporated into the punctuated equilibrium model, because organisational stability tends to be interrupted by major changes and transformation (Drazin et al., 2004). The punctuated equilibrium theory suggests that organisational activity tends to be static. The theory advocates that it is common for a firm to encounter short bursts of change, triggered by environmental shifts and events that overwhelm inertia (Gersick, 1991; Romanelli and Tushman, 1994; Tilcsik and Marquis, 2013). A punctuated equilibrium event is a sudden and radical or gradual and incremental process that arises over a long period (Moerschell, 2009; Moerschell and Lao, 2012).

The punctuated equilibrium models explain organisational change in two major settings. First, the model of change advocates that change occurs gradually and the organisational system can absorb almost any change of this type. The model suggests that most firms can manage this type of change, because it is nonthreatening, thus political and emotional reactions are diffused

over time. Second, it states that change occurs when there is a threat to system maintenance imposed by shifts outside of the system (Drazin et al., 2004).

Romanelli and Tushman (1994) argue that a major change is likely to occur in response to three antecedents: major environmental changes that modify the external environment, short term decline in performance and the installation of a new CEO. Fiksel et al. (2014) summarise six major vulnerability factors that cause punctuated events, which are typically inherent to the business and difficult to avoid. Table 1 shows the summary of vulnerability factors.

Table 1   **Vulnerability Factors that Cause Punctuated Events**

No.	Vulnerability Factor	Definition	Examples
1.	Sensitivity	Carefully controlled conditions for business operational integrity.	Supply purity, fragility of handling, complexity of procedures, restricted materials, safety hazards, stringency of manufacturing.
2.	Deliberate threats	Intentional attacks focused on disrupting operations and causing human or financial harm.	Product liability, terrorism and sabotage, labour disputes, special interest groups, piracy and theft, industrial espionage.
3.	Resource restrictions	Limited availability of the factors of productions.	Natural resources, raw material, utilities availability, human resources.
4.	Connectivity	Degree of interdependence on external entities.	The extent of supply network, export/import channels, outsourcing, reliance on information flow, reliance on specialty sources.
5.	External pressures	Influences that create constraints or barriers.	Government regulation, price pressures, corporate responsibility, competitive innovation, environmental, health and safety concern, social or cultural issues.
6.	Turbulence	Frequent changes in external factors beyond the company's control.	Unpredictability of demand, fluctuations in currencies and prices, political disruptions, natural disasters, technology failures, epidemics.

Adapted from: Fiksel et al., 2014

Punctuated equilibrium has introduced the "concept of crisis" into the model of change (Drazin et al., 2004, p.176), which involves a modification in the firm's deep structure (Gersick, 1991).

For instance, crisis occurs due to major technological and environmental shifts, which usually lead to performance decline and stress of managerial progression. Crisis is differentiated from 'change', because the former threatens the organisation's well-being. Unlike the models of change, crisis stemming from a firm's internal operations or externally generated shocks has the potential to disrupt stability, fundamental organisational logic, situational logic and order (Navis and Glynn, 2010; Goldstein et al., 2010).

Overall, the depth, severity, degree of pervasiveness, duration and novelty differentiate punctuated events from organisational change and crisis. As a result, firms are required to respond with different strategy when confronted with these different incidents. The selection of strategy depends on the inherent capabilities of the firm. The following section will explore the characteristics of crises.

2.1.2   Definition of the Crisis Concept

The notion of a crisis is a simple idea with intuitive appeal. It is defined as a sudden and unexpected event that negatively affects and threatens a firm (Pearson and Mitroff, 1993; Coombs, 2007a, 2007b; Park, 2013), while an organisational crisis threatens high-level goals giving business practitioners little time to respond (Hermann, 1963; Rosenthal, 2003; Herbane, 2013). They are low-probability, high-impact situations, which are formed by ambiguity of cause, effect and means of resolution, requiring speedy decision making (Pearson and Clair, 1998). Table 2 summarises the characteristics of a crisis.

The literature classifies crises into seven categories: physical crises, personnel crises, criminal crises, information crises, natural disasters, economic crises, and reputational crises (Mitroff and Alpaslan, 2003). A crisis is a severe threat to the survival of firms regardless of whether the causes are mundane or exotic (Pearson and Sommer, 2011). Table 3 shows the types of crises.

Table 2   The Characteristics of Crisis

Characteristics	Explanations
1. Low-probability events	• Increased difficulty for planning; • Lower motivation for business practitioners to plan for the possible scenarios (Spillan and Crandall, 2002).
2. High-damage effects	• Ability to cause firm closure regardless of the firm's size.
3. Ambiguous causes and effects, especially in the initial stage	• The causes are often attributable to negligence.
4. The solution is always debatable	• The ambiguity of a crisis means that the results of the potential solutions are always debatable; • However, it also shows that various methods could be used to diminish a crisis.
5. The implementation stage is crucial	• Managing a crisis is challenging; • Very often, the failure to act definitively during the acute stage can intensify the difficulty.

Source: Personal collection of author

Table 3   Types of Crises

Normal Accidents	Abnormal Accidents	Natural Accidents
Economic Crises • Recessions • Stock market crashes • Hostile takeovers	**Criminal Crises** • Product tampering • Kidnapping or hostage situations • Acts of terrorism	**Natural Disasters** • Earthquake • Flood • Fire
Physical Crises • Industrial accidents • Supply breakdowns • Product failures	**Information Crises** • Theft of proprietary information • Tampering with company records • Cyberattacks	
Personal Crises • Strikes • Exodus of key employees • Workplace violence or vandalism	**Reputation Crises** • Rumour-mongering or slander • Logo tampering	

Source: Mitroff and Alpaslan, 2003

The KOF Globalization Index (KOF Swiss Economic Institute, 2017) and the OECD Economic Globalisation Indicators (Organisation for Economic Co-operation and Development, 2017) measure globalisation from three main dimensions: economic, social and political. They show that there has been a progressive upward trend in actual economic flows and information flows,

between countries for the past twenty years, except for a notable interruption after the year 2000, around the time of the bursting of the dot.com bubble and the tragic 9/11 terrorist attacks (KOF Swiss Economic Institute, 2017).

Globalisation creates a borderless business environment and promotes greater free trade, movement of labour, increase in capital flow and improved communication and transportation. At the same time, globalisation has increasingly exposed more economies to external shocks that might initiate economic recessions and in turn lead many businesses to bankruptcy and liquidation. Most firms cannot escape the economic cycle of growth and contraction caused by internal or external influences. Thus, there is hardly any immunity to crisis in the age of globalisation.

Nowadays, it is no longer a question whether a business will face a crisis; instead, it is merely a matter of when the crisis will hit and how prepared the firm is. The business practitioners must to be ready to face an unexpected incident (Mitroff et al., 1996; Ponis and Koronis, 2012). A crisis can arise from various types of sources: environmental, systemic and endogenous. It arises everywhere, with mass media serving as a magnifying lens revealing a mishandled crisis to the public and corporate shareholders (Ponis and Koronis, 2012). Such an organisational crisis can intensify exponentially, affecting people, assets, and image, reducing prosperity and a firm's viability. Therefore, it begs the question how a firm can protect itself and mitigate the undesired impacts. Crisis survival is the subject of the next several sections.

2.1.3   Crisis Survival

Crisis can result in significant losses to a firm and its stakeholders, a market, an economy and even a country. Thus, 'crisis response strategies' are critical resources in the crisis survival process to help alleviate these loses and increase the chances of enduring the environmental turbulence. Numerous studies have been conducted in response to the large number of frequent

crises, which occurred around the world over the past 20 years, ranging from the Asian Financial Crisis to the Global Financial Crisis. The main lines of the crisis survival studies cover crisis communication (Allen and Caillouet, 1994; Benoit, 1995; Hearit, 2001; Coombs and Holladay, 2002; Coombs, 2004), financial flexibility (Wan and Yiu, 2009; Bradley et al., 2011a; Bradley et al., 2011b; Zona, 2012; Gracia-Appendini and Montoriol-Garriga, 2013; Maier et al., 2013), strategic flexibility (Pangarkar, 2007; Lim et al., 2009; Lee and Makhija, 2009; Nadkarni and Herrmann, 2010; Lekmat and Chellah, 2011; Armstrong, 2013; Zagelmeyer and Heckmann, 2013), and dynamic capabilities (Makkonen et al., 2014).

The organisational crisis survival construct is easy to understand, but challenging to implement due to deep underlying complexities. The literature conceptualises and operationalises crisis survival in multiple ways across studies. These complications have arisen especially in the past decade, because of the increase in attention paid to the subject of crisis survival, particularly after the most recent Global Financial Crisis.

In the next section, the existing crisis survival studies are explored to understand the current development of firm survival literature, which later shapes the theoretical framework of the thesis.

2.2   The Empirical Evidence of Crisis Survival

The various types of crises have different impacts on firm resources and operations. Literature shows that appropriate business continuity planning at the pre-disaster stage (to resume key business operations to minimum acceptable pre-defined level) and disaster recovery planning at the post-disaster stage facilitate the full restoration of interrupted operations to normal state (Sahebjamnia et al., 2015). This section reviews 24 strategic management articles to identify how firms survived during turbulences. Table 4 summarises each article and includes the

information these studies are based on, such as industry and variable types, as well as their conclusions.

A review of the crisis survival strategies begins with a unidimensional description of each of these operationalisations and the identification of articles in which they are employed, followed by the multidimensional view of crisis survival. In this study, the crisis survival strategies are differentiated into three groups: Individual, Organisational and Institutional.

2.2.1 Individual

Managing declining firm performance during a crisis is challenging for most firms. Interestingly, some firms are more adversely affected during a crisis, while others experience better turnaround performance (Pearce and Michael, 2006; Carreira and Silva, 2010; Patel and Cooper, 2014). Empirical studies show that these differences in firm performance during a crisis are related to the role Chief Executive Officers (CEOs) play (Nadkarni and Herrmann, 2010; Withers et al., 2012; Patel et al., 2014), stakeholders (Pajunen, 2006) and networking.

Strategic management literature shows the direct relationship between the CEO and firm performance (Al-bahussin and El-garaihy, 2013). During periods of recession, the CEO plays an important role in determining the values, beliefs and work systems, encouraging both knowledge creation and knowledge sharing and forming organisational culture (Al-bahussin and El-garaihy, 2013). Prior research shows that organisational culture is the most effective path to effective knowledge management and organisational innovation (Alavi and Leidner, 2001; Gold et al., 2001; Shili, 2008; Al-bahussin and El-garaihy, 2013). Organisational culture consists of a complicated collection of values, standards and leading attitudes (Rousseau, 1990), which are closely related to the CEO's experiences, standards, values and philosophies (Schein, 1984). Thus, the CEO plays a vital role during crisis as the positive organisational culture can

stimulate changes and organisational innovation, which later enhance the firm's survival chances.

Furthermore, the empirical evidence suggests a direct relationship between a CEO's personality and their firm's strategic decision-making process and strategic actions by claiming that a firm's strategies may actually represent the characteristics of its CEOs (Miller and Toulouse, 1986; Carpenter et al., 2001; Peterson et al., 2003; Nadkarni and Narayanan, 2007; Nadkarni and Herrmann, 2010; Dowell et al., 2011). CEOs play a vital role in the development of strategic flexibility, driving the strategic changes of firms and serving as chief cognisors and decision makers (Nadkarni and Herrmann, 2010). Studies show that CEO's emotional stability, agreeableness, extraversion and openness to experience impact firm performance by fostering flexibility, whereas CEO's conscientiousness may undermine firm performance by inhibiting flexibility (Nadkarni and Herrmann, 2010). During a recession, it is crucial for firms to respond continuously to unanticipated changes and adjust to the unexpected consequences of predictable changes (Lei et al., 1996). Hence, a CEO's personality is vital in order to identify, communicate, and implement a strategy plan effectively (Table 4).

In addition, empirical studies suggest that different types of leadership styles have different impacts on firm performance and survival. According to Patel et al. (2014), executive narcissism tends to lead to a greater decline in performance at the onset of a crisis. The agency model of narcissism defines narcissists as approach-oriented people, who actively search for reward opportunities in the external environment and focus less on negative outcomes (Finkel et al., 2006; Foster et al., 2009; Patel et al., 2014). This leadership style is characterised by high acceptance of a wide variety of possible business scenarios. However, there are some drawbacks of this high-motivation and low-avoidance approach as narcissists tend to make riskier managerial decisions (Campbell et al., 2004). The literature shows that narcissists

experienced greater losses during the stock market crash in 2008, because they made riskier choices than their business rivals (Foster et al., 2009).

Besides, the research confirms that retrenchment strategies such as strategy repositioning, cost cutting, investing in innovation and marketing provide firms with a higher chance of survival during an economic recession (Latham and Braun, 2011). However, narcissistic leaders with primary focus on their own personal image (Kets de Vries and Miller, 1985) are likely to avoid both retrenchment and repositioning strategies during trauma. As a result, less narcissistic CEOs and executives, who aim to reduce outcome variance, are preferable during crises.

Finally, the existence and longevity of a firm also depend on its relationship with its stakeholders (Pajunen, 2006). Stakeholders' influence on organisational survival consists of both direct resource-dependence and structure-based forms of power (Table 4). Clarkson (1995) identifies two groups of stakeholders: a primary stakeholder group is the one without whose continuing participation the corporation cannot survive as a going concern, while secondary stakeholders are those who influence or are influenced by the firm but not essential to its survival. The literature shows that during an existence-threatening crisis, frequent and open communication between managers and stakeholders enable continuous support from stakeholders and thus, increase the probability of crisis survival. As a result, a firm must be able to recognise its stakeholder influence with respect to whether it is direct resource-dependence-based power or network-position-based power, primary stakeholder group or secondary stakeholder group, and exploit the benefits inherent to the relationship.

In conclusion, the strategic management literature has generally proved the idea that the executives, CEOs and stakeholders are related to organisational survival during crises (Carpenter et al., 2004; Certo et al., 2006; Patel and Cooper, 2014). However, the relationship

between CEOs and stakeholders in organisational survival during environmental turbulence is still an emerging research field and there is a lack of evidence to support this relationship.

2.2.2 Organisational

Organisational strategy portrays how an organisation evolves over time to meet its objectives based on a detailed assessment of what needs to be done. The development of organisational strategy involves analysing the differences between the present state and desired state, followed by identification of the changes to achieve the target. Revising the organisational strategy is essential for firms, because it promotes sustainability, especially during a period of financial crisis.

Unstable and unpredictable business conditions result in adopting temporal strategies (Eisenhardt, 2002; Matthyssens et al., 2005). The changes in the external environment require a greater measure of adaptability and versatility on the part of a firm's management. Empirical studies show that various organisational strategies, such as financial flexibility (Wan and Yiu, 2009; Bradley et al., 2011a; Bradley et al., 2011b; Zona, 2012; Gracia-Appendini and Montoriol-Garriga, 2013; Maier et al., 2013), strategic preferences (Pangarkar, 2007; Lim et al., 2009; Lee and Makhija, 2009; Nadkarni and Herrmann, 2010; Lekmat and Chellah, 2011; Armstrong, 2013; Zagelmeyer and Heckmann, 2013), sales internationalisation (Lee et al., 2012), firm structure simplification (Bock et al., 2012), innovation (Naidoo, 2010; Lee et al., 2012; McKinley et al., 2014), and dynamic capabilities (Makkonen et al., 2014), can improve the likelihood of firm survival during environmental jolts (Table 4).

Hitt et al. (1998) suggest that survival in highly uncertain business environments is dependent on the creation of flexibility and the ability to balance stable and fluid states. However, in reality, organisational and market routines hamper the necessary adaptation, because competitive rules and markets are changed and reconceived frequently. Being strategically flexible is vital to

endure in a competitive position and realise financial performance. Therefore, flexibility is essential for a firm to survive during a crisis.

The concept of strategic preferences has received broad attention from scholars and business practitioners as a solution for crisis survival (Pangarkar, 2007; Lim et al., 2009; Lee and Makhija, 2009; Nadkarni and Herrmann, 2010; Lekmat and Chellah, 2011; Armstrong, 2013; Zagelmeyer and Heckmann, 2013). In particular, research shows that a firm with flexibility will be better off than a firm locked into a single course of action, because the former can respond advantageously to unanticipated adverse changes in their environment (March, 1991; Lee and Makhija, 2009).

According to Lee and Makhija (2009), international investments, such as foreign direct investment and export-related international investment, can deliver valuable flexibility for firms during an economic crisis. For instance, established exporting infrastructure enables firms to respond rapidly to unanticipated downward changes in demand by shifting sales from less beneficial markets to profitable markets in both domestic and international trade (Roberts and Tybout, 1997). This concept is reinforced by Lee at al. (2012) who suggest that firms engaged in sales internationalisation, such as export, overseas distribution, alliances or the establishment of international sales subsidiaries, perform well during crisis. In addition, research identifies that unrelated diversification is positively related to dynamic environments (Lim et al., 2009). Thus, flexibility can undoubtedly provide firms with an alternative approach in confronting uncertainty.

Literature shows that financial slack provides a buffering capacity and flexibility for experimentation in dynamic environments (Bradley et al., 2011a; Bradley et al., 2011b). Maier et al. (2013) suggest that high pre-crisis levels of cash do not imply firm value during a financial crisis, but that high levels of debt have a negative impact on firm value during a crisis. Holding

substantial cash reserves or keeping the debt level below borrowing capacity enables a firm to invest in potential new projects without the need to raise funds from external sources. Therefore, the advantages of accumulating financial flexibility become prominent during a recession, when there are constraints in accessing external financing sources.

In addition, literature demonstrates that slack resources can provide flexible means for developing strategy options and thus, improve company performance (Greenley and Oktemgil, 1998). The amount of slack that a firm maintains is a strategic decision (Bourgeois, 1981). There are two contradictory views on the relationship between organisational slack and firm performance. Some studies argue that slack is necessary for organisational adaptation and renewal (Singh, 1986; Cyert and March, 1992), while others advocate that slack is negatively related to performance, as it is a form of inefficiency (Leibenstein, 1969; Nohria and Gulati, 1996). Empirical studies demonstrate a positive relation between slack resources and corporate investment in innovation during an economic downturn (Wan and Yiu, 2009; Bradley et al., 2011a; Bradley et al., 2011b; Zona, 2012; Garcia-Appendini and Montoriol-Garriga, 2013; Maier et al., 2013). Furthermore, slack resources have also positively moderated the relationship between the setting of difficult targets and corporate investment in innovation during crisis. Therefore, it can be concluded that slack resources can help to improve firm performance in low-discretion environments, when they are managed and utilised appropriately.

Innovation is another important element that determine firm persistence. Literature defines innovation as the creation of modern thoughts or practices (Roger, 1995; Freeman and Soete, 1997) that can be classified into four categories: product innovation, process innovation, market innovation and organisational innovation (Avermaete et al., 2003). For instance, in the manufacturing industry innovation means the improvement of production and operation or the introduction of new products to the market. Innovation strengthens corporate performance, increases profitability and sales growth (Hsueh and Tu, 2004). Several studies highlight that

organisational innovation is positively related to firm performance and suggest that innovation can improve the chances of survival during a financial crisis (Naidoo, 2010; Lee et al., 2012; McKinley et al., 2014). Naidoo (2010) proposes that marketing innovation, or an improvement in the marketing mix, allows firms to develop a sustainable competitive advantage based on differentiation and cost leadership strategies. A separate, empirical study also shows that research and development alliances are positively associated with firm survival (Lee at al., 2012). Indeed, this finding encourages firms to be innovative during environmental jolts.

Corporate social responsibility and corporate governance have also been addressed in the literature targeting survival of environmental jolts. Corporate social responsibility (CSR) allows a firm to build strong corporate image and reputation, which effectively improve performance and increase the chances of weathering a crisis (Sun and Cui, 2014). Prior research confirms that CSR reduces the risk of falling into default. This relationship is stronger in highly dynamic environments than in low-dynamism environments.

Default risk has been frequently discussed in the strategic management literature. The default risk is an important indicator of firm health (Foster et al., 1998; Moulton et al., 1996; Rego et al., 2009). This risk is defined as the inability to repay the principal and interest of a debt obligation as required (Vassalou and Xing, 2004; Bakshi et al., 2006; Sun and Cui, 2014). Factors such as operational efficiency (Rendleman, 1978), size (Reuer and Leiblein, 2000), production efficiency (Becchetti and Sierra, 2003), customer satisfaction (Anderson and Mansi, 2008), customer-based brand equity (Rego et al., 2009), and cash flow uncertainty (Chava and Purnanandam, 2010) are associated with default risk, cash position and firm value. Literature shows that CSR is an effective tool in linking firms to various stakeholders (Kotler and Lee, 2004; Lichtenstein et al., 2004; Sun and Cui, 2014). For instance, positive customer satisfaction can increase cash flow, while strong firm value is related to customer-based brand equity. Successful CSR practices are likely to lead to favourable debt assessment and greater chances

in obtaining external financing (Sun and Cui, 2014). As a result, CSR is likely to reduce the default risk due to its direct or indirect relationship with cash flow, its ability to reduce income volatility and produce insurance-like assets that protect firms from default.

Iwasaki (2014) highlight the importance of the governance mechanism by stating that the independence of governance bodies from top management, their human resource abundance, and influence over corporate management are key determinants of firm survival. In particular, the board of directors and the audit committee are likely to play a significant role in reducing the potential exit risk. This finding is parallel to these of Dowell et al. (2011), who argue that the more independent the board is, the lower the probability of failure during a crisis. The latter changes the relative costs and benefits of governance mechanisms, increasing the value of smaller and more independent boards in distressed firms. In certain circumstances, nimble decision making could also be achieved by powerful CEOs. Concentrated power allows making rapid decisions without the need to build consensus.

Lastly, Clarke et al. (2012) emphasise the importance of networking and claim that pre-existing relationships with financial institutions are more likely to attract external funding to compensate for decreased internal funding from sales caused by a crisis. Similarly, Chung et al. (2008) also highlight that a subsidiary network has a strong positive effect on firm performance during crisis periods.

Overall, the strategic management literature demonstrates the importance of organisational strategies and networking in crisis survival. However, it must be highlighted that, unlike other types of survival strategies, building a strong and good networking system requires longer period and thorough preparation. It is a long-term investment that usually has to be started before the crisis.

In addition, most of the strategies proposed in these empirical studies require firms to maintain a certain level of flexibility in their operations and decision-making processes. As a result, revising organisational strategy frequently and preparing extensively before the crisis may be some of the options to endure during the jolt.

2.2.3 Institutional

Oxford University Press (2015) defines institution as an organisation founded for a religious, educational, professional or social purpose; an established law or practices and the action of instituting something. Institutions, such as governments and central banks, are vital during environmental jolts. Suitable economic policy and regulatory framework tend to generate stable financial system and economic conditions. Conversely, a crisis is the reflection of ineffective regulatory governance and failure to learn from history (Aikins, 2009).

Nowadays, most economic policy debates focus on the downturn and solutions in the immediate aftermath of the 2008 financial crisis, the followed global recession (Krugman, 2014) and the resulted crisis in Greece. Regardless of the pivot of such policies, they all aim to minimise the impact of the crisis and bring the economy back to the desired status. Government intervention was undoubtedly necessary to turn the global economy around, given the enormity of the Global Financial Crisis (Aikins, 2009).

Central banks around the world played an active role during the recession by reducing interest rates to unprecedentedly low levels to create some economic incentive for borrowing money (Vaitillingam, 2009). This then translated into investment, jobs, income, and spending. For instance, Bank of England reduced the base rates from five per cent to 0.5 per cent between October 2008 and March 2009. It was the lowest base rate since the central bank was founded in 1694. The "quantitative easing" programme for buying government bonds also helped boost money supply and corporate borrowing.

Although reducing interest rates is a commonly employed measure to increase money supply in the market, its effectiveness is dubious as the private sector and households might not react in line with expectations by increasing their expenditure during difficult times. Even if people and businesses are entitled to borrow, there is no certainty that borrowers' and consumer spending would follow, especially during a recession. For example, there is no real incentive to build more properties no matter how low mortgage rates become, if there is an excess of unsold properties available on the market during a recession. Therefore, reducing interest rates and 'quantitative easing' programmes may be common measures in the arsenal of central banks battling environmental jolts, but their results are not guaranteed and there is always a possibility for market failure (Martin and Martin, 2011).

Governments also have their own means to counteract the negative crisis effects. They can apply an 'automatic stabiliser', which naturally reduces tax revenue and increases the total spending on benefits, health and pensions. The main purpose of this type of policy is to promote economic recovery by encouraging the private sector to spend. For instance, the 'discretionary fiscal policy' of the UK government aimed to reduce the rate of value added tax (VAT) from 17.5 per cent to 15 per cent with effect from 1 December 2008 to 31 December 2009 (Vaitillingam, 2009). Crossley et al. (2009) suggested that the cut would boost consumer spending by 1.25 per cent. However, this policy can be risky as it requires the government to produce credible plan and set aside sufficient resource to repay the additional public debt or it may otherwise jeopardise the stability of public finances.

A third type of government policy is the bailout. It constitutes a capital injection directly into particular banks or firms to prevent their default and contagion throughout the economy. Studies show that past failure to restore market confidence has pushed governments to adopt a more proactive and broad-ranging approach. For instance, the UK government announced a comprehensive rescue plan that included capital injections, debt and deposit guarantees, and

even asset insurance later as response to the recent financial crisis (King, 2014). However, bailouts are inherently controversial, because they redistribute public money between recipients in an arbitrary way (Aikins, 2009).

The interventionist government efforts to stabilise their economies have inspired wide-ranging reviews and opposing arguments about the wisdom of government intervention. According to the theories of laissez faire and market failure, a crisis occurs due to failure to learn from history and ineffective regulatory governance. Therefore, governments need to implement proactive regulatory framework to guard against regulatory capture, arbitrage and forbearance in tackling financial market excesses (Aikins, 2009). Despite the ongoing deep debate on government stimulus and fiscal austerity, studies are yet to focus on the importance of mutual coexistence of both market and government and effective regulatory governance for the overall economic stability and firm survival. Table 4 shows the review of the empirical studies, which are discussed in section 2.2.

In the next section, the discussion will focus on crisis survival management. The resource-based view theory will be discussed first, followed by strategic management concepts that explain crisis survival and last, the diverse operationalisations of the construct that are found in the management literature.

Table 4   Summary of the Review

Dimension of Crisis Survival Emphasised	Articles	Research Purpose	Target Industry	Estimator	Independent Variables and estimation	Conclusion
1. Individual	Pajunen (2006)	Examines stakeholders' influence in an existence threatening crisis of an organisation	Pulp and paper industry in Finland	Historical analysis	• Resource-dependence based influence • Network-position based influence • Stakeholders' influence on organisational survival	• Resource dependencies and stakeholders' network positions contributes positively to decision-making in both crisis and stable environments.
	Nadkarni and Herrmann (2010)	Examines relationship between CEO personality, strategic flexibility and firm performance	195 small and medium-sized firms from the business process outsourcing industry	Questionnaire and financial performance data	• Strategic flexibility: questionnaire • Firm performance: return on assets (ROA), return on sales (ROS), and return on investment (ROI)	• CEO personality trait may enhance or inhibit strategic flexibility. • CEO extraversion, emotional stability and openness to experience enhance firm performance by fostering strategic flexibility.
	Bock et al. (2012)	Discusses CEO perceptions of the drivers of strategic flexibility during business model innovation	107 multinational firms	Archival data	• Creative culture • Internal structure changes. • Partner reliance • Business model innovation effort	• Culture supporting creativity is associated with strategic flexibility, while dispelling the notion that flexibility can be attained by relying on partners.
	Patel et al. (2014)	Examines the role of external economic conditions in how executive narcissism affects performance	392 manufacturing firms	Annual report	• Prominence of the CEO photograph in the annual report • Prominence of the CEO in press releases • Use of the first-person pronoun in CEO interviews • Ratio of CEO cash compensation to the second highest paid executive in the firm • Ratio of CEO bonus compensation to the second highest paid executive in the firm	• Firms under narcissistic CEOs experience performance declines (at the onset of the crisis period) and performance gains (in the post crisis period) that differ significantly from these under less narcissistic CEOs.
2. Organisational	Pangarkar (2007)	Examines the impact of some key alliance characteristics on alliance survival	20 listed Singapore firms	Annual report and news archives	• Shock and alliance categorisations • Alliance involving a Western partner	• Onset of a crisis does not necessarily impact the survival of alliances negatively.

Chung et al. (2008)	Compares the performance of subsidiaries during times of economic crisis versus stable periods to determine the environments in which intra- and inter-firm organisational linkages matter most	Japanese subsidiaries operating in Indonesia, Thailand, South Korea, Malaysia, and the Philippine	Toyo Keizai, Inc database Cox proportional hazard regression model to analyse subsidiary survival	• Number of countries in which a firm had overseas subsidiaries in each year • Number of a firm's overseas subsidiaries in each year	• Stronger positive effect from subsidiary networks in crisis periods compared to stable periods. • Profitability is more likely to benefit from a tightly linked intra-firm network (subsidiary network) than from a distant inter-firm network (keiretsu affiliation).
Lee and Makhija (2009)	Investigates how strategic flexibility impacts firm survival during an economic crisis.	Korean firms except from the financial industry	Firms' exports and intrafirm trade data	• Export investments • Foreign direct investments • Export and foreign direct investments	• Export investments (positive relationship) • Foreign direct investments (positive relationship) However, the two independent variables only contribute during crisis, but not during a stable period.
Lim et al. (2009)	Predicts the influence of related and unrelated product diversification on a firm's level of debt financing by using agency theory during the Asian Financial Crisis	370 public listed firms in Singapore from various industries	Financial data	Diversification	• Emphasises the importance of examining diversification and financing decisions concurrently to enhance the understanding of the complex relationship between corporate strategy and capital structure.
Wan and Yiu (2009)	Incorporates the external environment into acquisition by examining the performance result of acquisition during crisis	78 firms from various industries	Financial data	• Firm performance: return on assets, return on equity • Effect of corporate acquisition: number and size of acquisition • Unabsorbed slack: equity to debt ratio, cash flow divided by sales	• Acquisition vs. performance show positive relationship during crisis. • Acquisition vs. slack show positive relationship during crisis.
Naidoo (2010)	Investigates whether marketing innovation (improvement in the marketing mix) helps firms survive during a recession	Consumer manufacturing firms and industrial manufacturing firms	Questionnaire survey	• Market orientation • Marketing innovation • Competitive advantage • (Differentiation, cost leadership and focus.)	• Marketing innovation capabilities improved when the examined firms were competitor oriented and had good inter-functional capabilities.
Bradley et al. (2011a)	Examines differences between independent and subsidiary organisations at founding and during environmental change, while addressing the role	7166 firms in the manufacturing and technology industry	Annual report	• Organisational failure e.g. bankruptcies, liquidations, closures based on company request	• The effect of organisational independence on survival rates was contingent on the nature of the environmental conditions, with subsidiaries doing better than independents prior to the jolt, but

		of resources in this process			• Industry variables e.g. environmental jolt, dynamism	with independents outperforming subsidiaries during the jolt.
	Bradley et al. (2011b)	Examines the slack and profitability link; combined contexts of environmental dynamism and munificence	High technology industries (aerospace, computers, electronics, pharmaceuticals, technical machinery) and non-technology intensive industries (wood and paper products, materials manufacturing, manufacturing and recycling)	Annual report	• Financial slack (Available slack) • Environmental variables (Dynamism was operationalised as instability in sales growth measured by the standard error of the regression slope divided by the mean value of sales using a moving five-year average prior to the panel year.)	• Financial slack provides buffering capacity (in hostile and dynamic environments), and flexibility for experimentation (in munificent and dynamic environments.
	Dowell et al. (2011)	Examines whether financial crisis changes the relative costs and benefits of governance mechanisms and that more independent and smaller boards become more valuable in distressed firms	333 internet firms founded in 1994 or later that conducted independent public offerings (IPOs) from 1996 through 1999 (inclusive)	• Financial data • Event-history analysis	• The proportion of independent directors • Size of the board • CEO power	• The relationship between governance and survival depends on the firm and its environmental context, and one-size-fits-all prescriptions for governance mechanisms are therefore likely to be ineffective.
	Lekmat and Chellah (2011)	Examines the antecedents to corporate entrepreneurship in Thailand's auto-parts manufacturing industry in the post Asian financial crisis era using a mixed-method approach	220 automotive SMEs	• Questionnaire • Interview	• Environmental conditions • Organisational strategy • Organisational culture	• Environmental dynamism and heterogeneity offer opportunities that can be derived from the development of new products and technologies and from access to new markets.
	Lee et al. (2012)	Examines the impact of internationalisation on small and medium enterprise (SME) survival and the direct and moderating effects of technology resources and research and development (R&D) alliances	1612 high technology SMEs	Questionnaire	• Technology resources • External R&D resources (alliances)	• Technology resources provide no direct survival benefits. • R&D intensity acts as a moderator in the internationalisation-to-survival relationship. • The accumulation of technology resources may be more important when firms seek international expansion.

	Zona (2012)	Examines how slack resources shape executives' risk preferences during a global crisis	108 manufacturing firms	Questionnaire	Financial slack	• Firms may respond to global crisis with innovation investment.
	Armstrong (2013)	Demonstrates how strategic preferences that presumably allow larger firms both to survive and grow do not have the same effects for smaller firms	754 small firms from various industries	Questionnaire	• The types of strategies	• Small firms can focus on both survival and growth when they pursue competency based strategies, but risk their survival when pursuing flexibility-based strategies.
	Garcia-Appendini and Montoriol-Garriga (2013)	Study the effect of financial crisis on intra-firm liquidity provision: trade credit	Non-financial firms	Financial data	• Crisis • Crisis x liquidity • Net profit margin • Sales growth • Tobin's Q	• Firms provide liquidity insurance to their clients when bank credit is scarce and those firms subsequently experience better performance as compared with ex-ante cash-poor firms. • This motivates firms to accumulate cash reserves.
	Maier et al. (2013)	To test whether financial flexibility leads to superior performance during crisis	• Consumer non-durable • Consumer durable • Manufacturing • Energy • High-tech business equipment	Financial data	• Cash and cash equivalents • Debt (short-term) and total • Net debt	• Mature manufacturing firms have higher debt-to-asset ratio than firms in risky or growth industries.
	Zagelmeyer and Heckmann (2013)	To identify the extent of labour flexibility contribute to crisis resistance at establishment level	Various industries	Questionnaire	• Size of the organisation • Sector of economic activity • Geography location • Business condition before crisis • Numerical flexibility	• Use of temporary agency workers or fixed-term employees showed no significant association with crisis
	Arslan-Ayaydin et al. (2014)	The impact of financial flexibility on the performance of East Asian firms over period 1994-2009	Firms from various industries except financial firms	Financial data	• Cash return on assets • Market to book ratio • Leverage • Debt ratio • Dividends	• Flexible firms have greater growth opportunities • Cash is a form of insurance against bankruptcy • Leverage is the main driver of investment behaviour during the crisis

	Makkonen et al. (2014)	Explains organisational adaptive behaviour in a financial crisis	Food processing, maritime, media industries	Questionnaire. Case study	• Sensing and seizing • Knowledge creation • Knowledge integration • Renewing capabilities etc	• Constantly monitor and develop internal efficiency before and during crisis are essential.
3. Institutional	McKinley et al. (2014)	Identifies the manner in which the decline-induced responses of innovation or rigidity lead to turnaround or further decline	Various industries	Existing literature.	• Innovation • Risk avoidance	• A keen awareness of the organisation's history, as well as the nature of demand in the current market, can help managers react appropriately if their organisation "goes rigid" in response to an episode of organisational decline
	Sun and Cui (2014).	Examines the relationship through which corporate social responsibility helps firms reduce the risk of falling into default	303 firms from mining and construction, manufacturing, retail and wholesale, finance, insurance and real estate, services and others industry	Data from Fortune Magazine, Standard and Poor's Corporate Credit Rating, company websites and annual reports	• Dynamism • Complexity • Firm capability	• Corporate social responsibility has a strong effect on default risk reduction • The relationship is stronger on firms in high dynamism environments than in low dynamism environments

2.3   The Resource-Based View Theory

This section introduces and discusses the resource-based view theory (RBV), which will frame and define the theoretical underpinning of this thesis. It starts with an introduction to the theory, followed by a discussion of its role in firm survival and performance.

The RBV theory advocates that the possession of resources enables firms to obtain sustainable competitive advantage and achieve greater long-term performance (Penrose, 1959; Wernerfelt, 1984; Grant 1991; Barney, 2001; Ray et al., 2004; Bustinza et al., 2010; Barney et al., 2011; Lin and Wu, 2014). Resources are essential sources of competitive advantage, especially with regard to cost advantages and differentiation (Porter, 1980; Miller, 1996; Porter, 1996; Lioukas et al., 2016). The RBV theory explains the substantial differences in performance of firms, even when they are from the same industry (Barney et al., 2011).

Although the RBV theory highlights the importance of resources, it fails to consider the instrument or technique of internal analysis. RBV is more appropriately an integrative conceptual framework for the analysis, formulation and implementation of business strategies (Ireland and Hitt, 1999; Ireland and Hitt 2005). It does not distinguish between resources and capabilities, which demonstrate that the combination and coordination of resources are vital to realise their values. In fact, organisational resources and capabilities are set of elements, factors, assets, abilities and attributes that the firm possesses or controls and then enable it to formulate and put into action a competitive strategy (Grant 1996; Sirmon et al., 2007).

The literature defines resources as stock, capabilities as the actions to deploy resources (Mahoney and Pandian, 1992) and organisational routines as facilitator of the resource deployment (Helfat and Peteraf, 2003). Organisational routines are the link that enables the firm to continue creating this hierarchy from the integration of specific resources and capabilities.

Thus, the relationships between the firm's resources and capabilities are moderated by organisational routines (Helfat and Peteraf, 2003).

The existing literature demonstrates that resources are essential to sustain competitive advantage and improve performance (Spanos and Lioukas, 2001; Powell et al., 2006). When resources are scarce, they become valuable and this leads to temporary competitive advantages; when the resources are not imitable, transferrable or substitutable, then they become the source of sustainable competitive advantages (Parker and Russell 2004).

2.3.1   The Resource-Based View Theory, Firm Survival and Performance

RBV emphasises the firm's internal characteristics and the role of firm-level resources as source of competitive advantage. It explains how different strategic choices can lead to various outcomes (Parker and Russell 2004). The theory advocates that the ability to develop distinct resources enhances adaptability in a changing competitive environment and improves survival prospects. Previous work on firm survival has revealed a positive relationship between resources and the likelihood of firm survival (Parker and Russell 2004; Esteve-Pérez and Mañez-Castillejo, 2008; Barney et al., 2011). Studies show that a firm's productivity significantly determines its relative efficiency and therefore its probability of survival. Some scholars predict that the probability of survival is poorer for low-productive firms during recessions (Jovanovic, 1982; Ericson and Pakes, 1995; Melitz, 2003).

As for firm profitability, high profitability can be a sign both of efficiency and of market power (Melitz, 2003). When the origin of high profitability is market power, firms with more resources generate better performance. Sequentially, revenues allow firms to obtain necessary resources to develop firm-specific assets, such as innovation and advertising, that can ease firm survival and improve performance. However, less attention has been devoted to investigating the

importance of firm strategies, which help to generate the necessary resources to successfully adapt to changing market conditions.

This thesis views firms are heterogeneous. Each firm is a unique bundle of tangible and intangible resources and capabilities that are acquired, developed and expanded over time (Esteve-Pérez and Mañez-Castillejo, 2008). Organisational resources and capabilities are the result of its strategic choices and resource commitments across time and ultimately determine its performance at any time (Esteve-Pérez and Mañez-Castillejo, 2008). A shortcoming of the existing literature is that its findings arise from the study of how organisational resources act in improving firm endurance. Therefore, this thesis aims to investigate how the resources deployment impacts organisational survival and performance. In the next section, four strategic management concepts are selected to discuss firm abilities in deploying resources based on the literature.

2.4   Conceptual Approaches

How does a firm survive a punctuated event and thrive after it?

A punctuated event generates a situation that stimulates a crisis condition (Moerschell and Lao, 2012). A crisis causes organisational change, which requires firms to modify their resources, strategies, structures and processes to remain competitive in a demanding business environment (Wischnevsky and Damanpour, 2006).

The contemporary organisational theory argues that the environment determines organisational change and transforms an organisation. For instance, the contingency theory implies organisational adaptation to changes in environmental states (Donaldson, 2001; McKinley, 2011), while the population ecology view suggests that the environment is equally deterministic but the changes are established through a selection process rather than an adaptation process (Hanna and Freeman, 1984; Baum and Shipilov, 2006; McKinley, 2011). The population

ecology view advocates that the environment is the one that defines a firm's survival, based on a set of organisational attributes. Institutional rules are established to define good management and firm structure. Hence, the ideal firm structure design must ensure a good match with both the external environment and institutional rules (Singh et al., 1986; Baum and Oliver, 1991; McKinley, 2011).

The resource-based view (RBV) suggests that the internal management of the resource endowment across firms is the source of sustainable competitive advantage. This view contradicts the traditional industrial organisation economics concept, which emphasises the firms' external management (Bain, 1959; Barney, 1986; Barney, 1991; Armstrong, 2013). Strategic resources allow firms to implement market expansion strategy, develop flexibility in operation, provide firms with strategic options and allow them to achieve competitive advantage, which ultimately improve the likelihood of survival (Amit and Schoemaker, 1993; Miller and Shamsie, 1996; Combs et al., 2011).

The next section is devoted to four concepts on the capabilities to deploy resources, which suggest that resource utilisation abilities are as crucial as the possession of strategic resources.

2.4.1 Flexibility

The concept of flexibility emerged as a strategic imperative in the 1970s and then increasingly gained the attention of scholars and business practitioners (Verdú-Jover et al., 2006). The concept originates from the notion of managerial capabilities (managerial challenge) and responsiveness of the organisation (Volberda, 1996). The extent of flexibility is closely related to the environment, which a firm operates in (Verdú-Jover et al., 2006) and thus, it represents the essential element in a firm's survival during periods of uncertainty (Sanchez, 1993).

Organisational flexibility is defined as an organisation's ability to adapt to substantial changes that require rapid reaction to create significant impact on performance (Aaker and Mascarenhas,

1984; Verdú-Jover et al., 2006). Organisational flexibility highlights the adaptive capacity of management in terms of an ability (Aaker and Mascarenhas, 1984), a degree of freedom (Sanchez, 1993), availability of options (Quinn, 1985) to overcome or to adapt to changes.

Flexibility facilitates strategic choices especially in highly competitive environments, where a core competence may convert to a core rigidity (Teece, 1984; Volberda, 1996). Core rigidities with highly specialised resources or high productivity enhance profits at the price of reducing flexibility and innovative capacity (Leonard-Barton, 1992). Thus, market globalisation, rapid technological change, increasing competition from rivals and shortening of product life cycles require a change from specialised routines to adaptive capability in management and operationalisation. Indeed, Volberda (1996) recognises organisational flexibility as the control capacity of management and the controllability of the organisation.

It is challenging to use flexibility to tackle changes and ensure a better fit between the firm and its environment simultaneously (Miles and Snow, 1984; Verdú-Jover et al., 2006). The fit is the interconnection between the firm's internal and external environments (Verdú-Jover et al., 2006). The ability to achieve a better fit is important, because the "quality" of organisational flexibility is measured by the magnitude of flexibility, the extent to which a firm's management has fulfilled the demand of its environment. For instance, a firm can be very flexible from a strategic and structural point of view, but have excess flexibility as its external environment does not require it. In contrast, a firm could be less strategically and structurally flexible and yet more efficient, because that configuration is what is required by the environment (Verdú-Jover et al., 2006). Thus, the extent of flexibility can be measured at a specific point in time by matching the environment requirement with the offer from the firm.

Two elements define the potential of a firm to be flexible: organisational capacity and learning capacity (Verdú-Jover et al., 2006). First, the organisational capacity proposes that the firm's

liquidity, or resources that are not pledged to long-term initiatives, may contribute positively to flexibility (Evans, 1991; Volberda, 1999). It provides the ability to confront environmental changes, aided by organisational slack (Bourgeois, 1981; Singh, 1986), financial flexibility (Aaker and Mascarenhas, 1984) and minimum cost penalties (Kickert, 1985; Upton, 1994; Sanchez, 1995). The second flexibility element - learning capacity or metaflexibility - denotes a firm's potential to remain flexible in the face of uncertainty (Volberda, 1997). This element suggests that the firm can achieve learning capacity with a learning system and dynamic capability to extend its range of measures, velocity and intentionality (Verdú-Jover et al., 2006).

In addition, the research highlights that flexibility is an output from the interaction between a managerial task and an organisational design task (Figure 1). A managerial task consists of managerial capabilities that characterise a firm possessing flexibility (Volberda, 1996). It includes the creation of capabilities to confront unexpected events, the speed and dynamic capabilities within individual in a firm. Flexibility in a managerial task requires more democratic and participative forms of decision making. The flexibility in an organisational design task involves the controllability or modifiability of a firm based on the availability of the right conditions, such as machinery, equipment, technologies, culture, structure and resources (Adler, 1988). Therefore, flexibility is the mixture of managerial task and organisational design task.

Moreover, studies show that the flexibility concept is multidimensional (Suarez et al., 1995) and polymorphous (Evans, 1991). Flexibility can be achieved across four dimensions: temporal, range, intention and focus (Evans, 1991); measured by four metrics: efficiency, responsiveness, versatility and robustness (Golden and Powell, 2000); and manifested in four types of flexibility mix: steady-state, operational, structural, and strategic (Ansoff and Brandenburg, 1971; Grant,

1996; Volberda, 1996). Thus, flexibility can be characterised as an easy-to-understand concept, yet challenging to properly implement.

Figure 1   Creating Flexibility with Managerial and Organisational Conditions

(Adapted from: Golden and Powell, 2000)
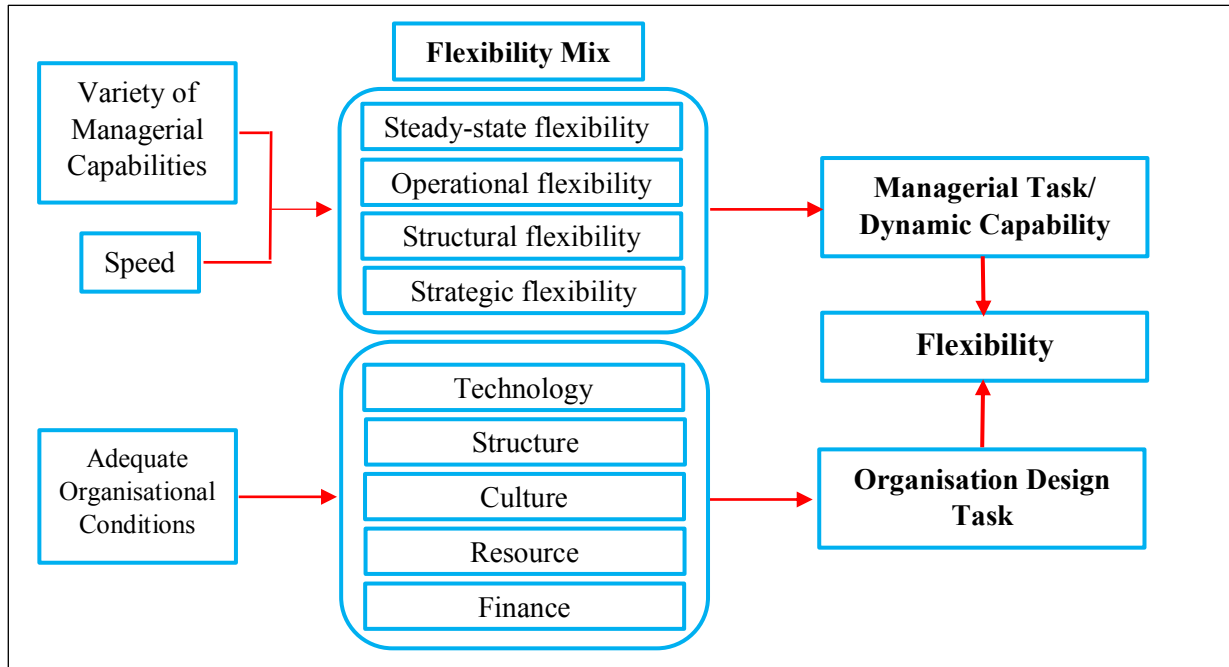
The literature often portrays flexibility as a "good thing" for firms (Adler, 1988; Avison et al., 1995; Golden and Powell, 2000). Nevertheless, flexibility always presence with cost (Carlsson, 1989; Golden and Powell, 2000). For instance, a production plant may experience higher unit cost curve if it produces more than one product compared to a plant specialising in the production of a single product (Golden and Powell, 2000). Moreover, the literature also associates strategic flexibility with increasing cost, stress on employees and failure of organisational focus. Despite those potential trade-offs, studies show that firms strive to implement flexibility into their organisational management, because of its ability to underpin development of competitive advantage and survival of environmental jolts.

The process of developing metrics for the flexibility concept is challenging due to its inherent characteristics. It has different meanings in different contexts. Moreover, the measures of the

concept are judgemental, subjective and informal (Aaker and Mascarenhas, 1984), because it is difficult to quantify the "value of flexibility" as well incorporate the concept into the standard financial methodology (Adler, 1988; Golden and Powell, 2000).

Therefore, the literature suggests that flexibility has to be measured within a given context. For instance, flexibility can be identified in the interval context (Adler, 1988), such as a firm's ability to change or react with minimum time, effort and cost (Upton, 1994). The interval context can be translated into four metrics, which are efficiency, responsiveness, versatility and robustness.

First, the efficiency perspective views flexibility as the ability of the production system to accommodate change with minimal impact on performance (Anderson, 1993). In this case, the target firm has to demonstrate uniformity of a certain performance measure, such as profit or quality, within an acceptable range. For instance, the manufacturing industry could develop flexibility through efficiency in accommodating or adapting to an unpredictable event.

Second, flexibility can be measured by the extent of a firm's responsiveness to an unforeseen event within an appropriate time frame, such as the ability and speed of a plant to change between processes quickly. Responsiveness involves the range, mobility and dimension (Upton, 1994), which can shift within a range with minimum transition penalties (Golden and Powell, 2000). Thus, the degree of flexibility from the responsiveness perspective is measured based on the time a firm takes to adapt to a new environment (Golden and Powell, 2000).

Third, versatility defined flexibility as the extent to which a firm has planned for and can respond to uncertainty (Golden and Powell, 2000). The versatility metric highlights the range of activities that a firm has contingently planned for foreseeable changes. For instance, a firm may build up its versatility level by altering its operation to take into account developments in the business environment that are likely to occur, and to provide avenues to react to

unpredictable events. Versatility measures the "range", such as the range of output, products or volume. Accordingly, this measure identifies the ability of the firm to equip itself with possible strategic options within a specific range to accommodate foreseen future change (Golden and Powell, 2000).

Finally, flexibility can be measured from the perspective of robustness, which is defined as the ability to respond to unpredictable environmental change. In this case, flexibility occurs when a firm repositions itself in a market or modifies its strategy to improve performance or to increase its chances of survival during environmental jolts. The literature suggests that the concept of flexibility is most closely related to robustness (Golden and Powell, 2000). Figure 2 shows the relationship between the dimensions and metrics of flexibility.

Figure 2   Relationship Between the Dimensions and Metrics of Flexibility

(Adapted from: Golden and Powell, 2000)
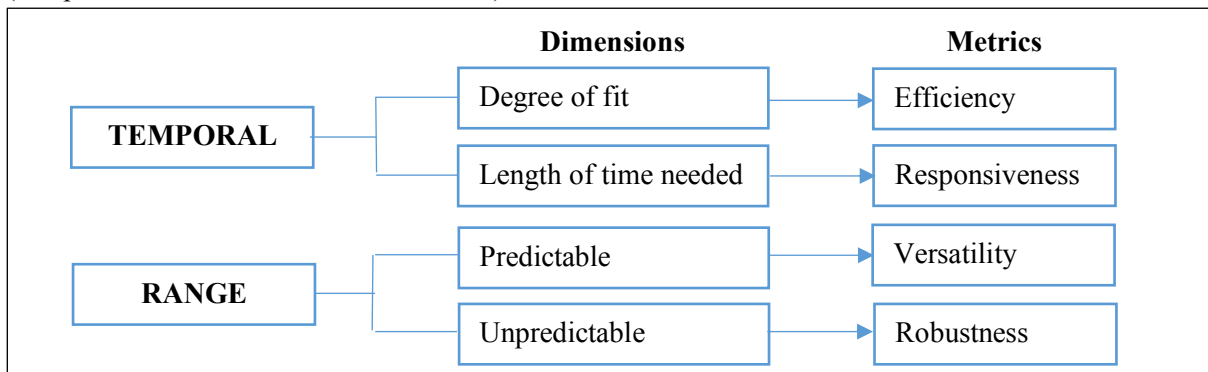
2.4.2   Dynamic Capability

The value of RBV lies in a firm's ability to identify and utilise its resources (Vanpoucke et al., 2014). In turn, dynamic capabilities permit firms to create, extend, modify and recognise ways to sustain themselves (Helfat et al., 2007; Vanpoucke et al., 2014). Dynamic capability is defined as a "firm's practice to use resources: specifically, to integrate, reconfigure, gain and release resources, to match and even induce changing environments" (Eisenhardt and Martin, 2000, p.1107). Others, such as Zollo and Winter (2002, p.340), portray dynamic capability from an organisational learning perspective and define the concept as "a learned and stable pattern

of collective activity through which the organisation generates and modifies its operating routines in pursuit of improved effectiveness".

Dynamic capabilities involve the ability to sense and seize opportunities, to transform and reconfigure resources to cope with potential threats (Teece et al., 1997; Bowman and Ambrosini, 2003; Teece, 2007; McKelvie and Davidsson, 2009; Naldi et al., 2014; Vanpoucke et al., 2014; Wilden and Gudergan, 2015). Sensing and seizing capabilities require firms to be ambidextrous and innovative (Gibson and Birkinshaw, 2004; He and Wong, 2004; Rothaermel and Alexandre, 2009; Naldi et al., 2014), which emphasise the ability to transform their resources even with a risk to disrupting existing routines.

Organisational and strategic practices, created by dynamic capabilities, allow firms to configure new resources when they are confronted with uncertainty. The changing allocation and utilisation of resources, such as human capital, employees, technological capital and knowledge based capital, are critical parts of the dynamic capabilities (Easterby-Smith et al., 2009).

There are three main characteristics of dynamic capability that distinguish it from accidents or luck (Zahra et al., 2006; Helfat et al., 2007; Sune and Gibb, 2015). First, dynamic capability is a capability and it is important to distinguish it from one-time idiosyncratic change to the resource base of a firm. Dynamic capabilities must contain certain level of patterned problem answering elements (Winter, 2003), rather than simply ad hoc problem solving. Second, dynamic capabilities are related to purposeful, even if not entirely explicitly, developed competencies. They are the opposite of organisational routines, which consist of recurring organisational activities that lack intention (Sune and Gibb, 2015). Finally, dynamic capabilities involve strategic, intentional change to the resource base (Ambrosini et al., 2009).

Several studies propose a hierarchy of capabilities, which consists of three levels (Collis, 1994; Danneels, 2002; Winter, 2003; Helfat and Winter, 2011; Sune and Gibb, 2015). The first order

capabilities are the zero level capabilities or substantive capabilities that involve resources and operating routines (Collis, 1994; Danneels, 2002; Winter, 2003; Zahra et al., 2006; Sune and Gibb, 2015). The second order capabilities consist of changes in products, procedures, production volumes or the target markets (Collis, 1994; Danneels, 2002; Winter, 2003). The third order capabilities, which are the highest order of capabilities, involve activities that create and modify lower order capabilities (Collis, 1994; Winter, 2003).

Overall, dynamic capabilities are responses to the need for change (Sune and Gibb, 2015). They represent the ability to "identify the need or opportunity for change, formulate a response to such a need or opportunity, and implement a course of action" (Helfat et al., 2007, p.2). The notion of dynamic capabilities suggests that firms need to be creative, constantly evolve and rearrange resources into new source of competitive advantage. Thus, innovation is the basis for dynamic capabilities (Helfat, 1997; Eisenhardt and Martin, 2000; McKelvie and Davidsson, 2009). The dynamic capabilities theory implies that the availability of resources seldom leads to performance differences on its own (Grant, 1991). The application of resources is the differentiating factor that facilitates superior performance and enables firms to survive during crisis.

2.4.3   Ambidexterity

Ambidexterity denotes competent firms that are capable of mastering and balancing different strategic orientations (Halevi et al., 2015). The increasingly unstable business environment generates demand for building various capabilities to confront intensifying paradoxes. However, managing different strategic orientations remains a major managerial challenge.

Exploitation and exploration, the two strategic orientations in ambidexterity, involve different skills and resources. Exploitation can be characterised by such keywords as "refinement, efficiency, selection and implementation", while exploration involves "search, variation,

experimentation and discovery" (March, 1991, p.102). Therefore, the development of ambidextrous capabilities relies on the successful fusion of fundamentally different organisational structures and contexts.

Early research had often claimed that it may be impossible to achieve ambidexterity. The contemporary management theory had thus related ambidexterity with isolated, conflicting categories, driving firms to focus on either exploitation or exploration (Ghemawat and Ricart Costa, 1993). However, overemphasis on only one of the strategic orientations may cause detriment to the firm. Excessive focus on exploitation may improve short-term performance, but may also result in a competency trap as firms may be unable to overcome environmental turbulence (Leonard-Barton, 1992; Ahuja and Lampert, 2001; Raisch and Birkinshaw, 2008). In contrast, over-exploration may improve the knowledge base, but can trap firms in an endless and unrewarding search (Volberda and Lewin, 2003; Raisch and Birkinshaw, 2008).

How do firms with resource constraints simultaneously address explorative and exploitative activities? According to Raisch and Birkinshaw (2008) firms can resolve the paradox by externalising their activities, for instance R&D, through a strategic alliance or outsourcing (Bustinza et al., 2010). Firms may also temporarily cycle through periods of exploitation and periods of exploration (Venkatraman et al., 2007). Regardless of the approach, being ambidextrous is likely to improve the probability of crisis survival as exploitation facilitates the organisation's current viability and exploration – the future viability (Levinthal and March, 1993). Organisational ambidexterity is discussed further in Chapter 3.

2.4.4 Resilience

Economic recessions, natural disasters, terrorist attacks, human errors, equipment failure and a variety of other events can pose major threats to incumbent firms. The latter have to be independent and try to resist succumbing to shocks, while maintaining a competitive position

(Bhamra et al., 2011). Certainly, firms may have business continuity plans in place to address disruptions (Cerullo and Cerullo, 2004). However, the effectiveness of these plans depends on their intuitive implementation, especially during crises (Bhamra et al., 2011). Hence, resilience - the ability to resist, respond to a shock and recover - is seen as essential for organisational survival (Carvalho et al., 2012; Annarelli and Nonino, 2016; Sawik, 2016) and performance.

From an organisational perspective, resilience is the capability to adjust and maintain desirable functions under distress conditions (Weick et al., 1999; Ponomarov and Holcomb, 2009); a dynamic capacity of firm adaptability that grows and develops over time; and the ability to bounce back from hardship (Sutcliffe and Vogus, 2003; Ponomarov and Holcomb, 2009). Mitroff and Alpasan (2003) suggest that resilience is more than recovery. It offers a level of flexibility to adapt to changes in the environment and it represents a distinct source of sustainable competitive advantage. In short, resilience is about adaptability, flexibility, maintenance and recovery.

Resilience is conceptualised as a complex system involving interconnected agents that form a network of linkages (Dooley, 1997; Comfort et al, 2001; Crichton et al., 2009; Bhamra et al., 2011). The interaction creates feedback loops and reinforces the cause and effect relationship between agents. The increasing environmental complexity requires a significant increase in information, communication and coordination. Hence, resilience generates the balance between preparedness and anticipation (Comfort et al., 2001; Bhamra et al., 2011).

The real managerial stake behind a resilience strategy is its reflective comprehension of all organisational functions, build together in a proactive manner, rather than applying the strategy only as a defensive response to critical events (Annarelli and Nonino, 2016; Sawik, 2016). Therefore, resilience comprises preventive actions, resource management, proactive strategy based on a set of practices, capable of fostering daily effectiveness of organisational operations.

2.4.5 Conclusion: Flexibility, Dynamic Capabilities, Ambidexterity and Resilience

A detailed description of four management strategies, associated with crisis survival - flexibility, dynamic capabilities, ambidexterity and resilience - have been discussed in this section. The proposed concepts in this chapter reflect some of the most commonly discussed concepts by scholars in recent years. Figure 3 shows the key definitions of the discussed concepts. All four have different definitions, functions and focuses. Dynamic capability and resilience are triggered when uncertainties occur, while flexibility and ambidexterity are ongoing strategies that may improve the likelihood of survival and performance.

Figure 3   Key Definitions

(Source: Personal collection of author)

Concept	Definition
Flexibility	Organisation's ability to adapt to substantial and uncertain changes that require rapid reaction, to create a significant impact on performance (Aaker and Mascarenhas, 1984; Verdú-Jover et al., 2006)
Dynamic Capability	Firm's practice to use resources: specifically, to integrate, reconfigure, gain and release resources, to match and even induce changing environments (Eisenhardt and Martin, 2000)
Ambidexterity	Firms that are capable of mastering and balancing different strategic orientations: explore and exploit (Halevi et al., 2015).
Resilience	The ability of the firms to resist and respond to a shock and to recover (Carvalho et al., 2012).

Literature often portrays these concepts as a "good thing" for firms and a solution during financial distress (Golden and Powell, 2000). However, the implementation of all these strategies require initial investments. For instance, ambidexterity requires substantial resources to achieve organisational efficiency and explore a new technology simultaneously. Dynamic capabilities, which involve sensing and seizing capabilities, require firms to be ambidextrous and innovative in the first place (Gibson and Birkinshaw, 2004; He and Wong, 2004; Rothaermel and Alexandre, 2009; Naldi et al., 2014). Similarly, a manufacturing plant that aims to achieve flexibility in production may experience higher unit cost curve when it produces

more than one type of product, compared with a plant specialising in the production of single good (Golden and Powell, 2000).

Moreover, literature also associates strategic flexibility, dynamic capabilities and ambidexterity with increasing cost, stress on employees and failure in organisational focus. For instance, managing an ambidextrous firm requires specific skills to coordinate firm resources, which may result in tension during resource allocation and within organisational units. In additional, stress on employees may occur when promoting dynamic capabilities within an organisation, as employees are expected to be able to create, extend, modify and recognise the ways for firms to sustain (Helfat et al., 2007; Vanpoucke et al., 2014).

Despite these potential negatives, the literature shows that firms strive to incorporate flexibility, dynamic capabilities, ambidexterity and resilience into their organisational management, because they support firms in their drive to achieve competitive advantage and survive during periods of environmental turbulence.

2.5   Crisis Survival Model

A research model has been designed, based on the information from the empirical studies reviewed in Section 2.2. Figure 4 demonstrates the identification of firm's survival or prosperity strategy, starting from the event that triggers a crisis. Three attributes: Individual, Organisational and Institutional, are identified and their attributes described, based on the information found in the empirical studies (Section 2.2). In the last column, the figure shows the summary of the actions and strategies that later lead to the desire outcomes: survival and prosperity.

The Individual attribute illustrates that the CEO experience, personality, executive narcissism and stakeholders play a vital role at the crisis survival stage. CEO's experience and personality form positive organisational culture, which encourages rapid response, innovation, changes and

flexibility in the firm's operation and management. In addition, less narcissistic leadership style has also been proven to reduce the risk of making inappropriate decisions, as the management is focused on the actual problems rather than personal image or wellbeing. The Organisational attribute demonstrates that flexibility, dynamic capabilities, ambidexterity, slack resources, innovation, corporate social responsibility and governance mechanism may facilitate maintaining prosperity during environmental jolts. This attribute concludes that being flexible is essential for firm's survival - it has to constantly revise its strategy to ensure a sustainable competitive advantage. The third attribute is about the role of Institution during a punctuated event. Government bailout, monetary policy and fiscal policy are found to be effective in combating the negative impacts of a crisis.

In conclusion, empirical evidence shows that there are various ways to ensure crisis survival. The most crucial part of crisis survival is the suitability of the strategy or approach, availability of the resources and capability to implement the right strategy.

2.6   Multidimensional Approaches to Define Crisis Survival

The empirical study in this chapter shows that most of the research to date has perceived crisis survival as unidimensional. However, this study aims to propose that there are strong emerging trends in the crisis survival literature and this concept can be divided into multiple dimensions (Table 5). Indeed, the three crisis survival attributes: Individual, Organisational and Institutional, can be further distinguished into different strategic orientations and timescales.

The reclassification of the concept enables scholars to capture the idea from different perspectives. It also provides a platform for business practitioners to differentiate the available strategic options and enables the firm to visualise what they can do before and during crisis.

Figure 4   Survival in a Moment of Crisis

Attributes/Characteristics	Actions/Strategies

Individual

CEO's experience	Form positive organisational culture, rapid response, promote changes and innovation
CEO's personality	Emotional stability and openness foster flexibility, drive strategic change
Executive narcissism	Less narcissistic improves performance, engages in strategy repositioning, cost cutting, investing in innovation, and marketing
Stakeholder's influence	Improve network position, e.g. obtain resources

Organisational

Flexibility, Dynamic Capabilities, Ambidexterity, Resilience	Financial flexibility, export, foreign direct investment, diversification, R&D alliances, invest in potential new projects
Slack resources	Strategic change, buffer capacity, experimentation, innovation investment
Innovation	Differentiation and cost leadership, marketing innovation, improve the marketing mix
Corporate social responsibilities	Growth opportunity, prevent bankruptcy
Governance mechanism	Smaller board size, larger proportion of independent directors

Institutional

Government bailout	Prevent default
Monetary policy	Influence the demand and supply of money: interest rate
Fiscal policy	Changing in government spending and taxation

Crisis/ Event → Individual, Organisational, Institutional → Survival / Post-crisis "success"

2.6.1 Embracing the Multidimensional Perspective

Advances in technology have made information more available than ever before. The literature on strategy and organisational decision making advocates that the quality of decisions can be improved with the quantity of information in use. Thus, this study proposes that firm should examine crisis survival from multiple dimensions in order to identify the best measures to ensure organisational continuity.

In general, a decline in business performance leads to the selection of strategic choices that are either offensive reorientations or defensive shifts (Tan and See, 2004). Offensive reorientation management involves strategic actions that are expansionary and lie outside the firm's current domain of operations (Woolley et al., 2013). These actions are usually new to the firm and riskier. They require the pursuit of objectives, whose accomplishment occurs at the expense of an opponent or rival. The offensive strategic orientation is built upon a period of poor performance and the concept suggests that a firm tends to be a risk-taker and engaged in expansionary and reorientation strategies (Bowman, 1982). For instance, a turnaround strategy and product/market refocus strategies are classified as offensive strategies (Hofer, 1980).

In contrast, a defensive shift involves the pursuit of relatively conservative activity by preventing loss at the hands of an opponent or rival (Woolley et al., 2013). Defender prospectors constantly look for new market opportunities and compete through product or market innovation (Miles and Snow, 1978). Defensive prospectors constantly monitor changes in the external environment and emphasise flexibility in their management practices. Miles and Snow (1978) suggest that a defensive shift is more appropriate in a relatively stable business environment.

Based on the definition of strategic orientation, the elements listed under Individual and Institutional attributes are categorised as defensive shift strategies, while the Organisational

attribute, including flexibility, strategic preferences and innovation, is categorised as an offensive strategic orientation.

In addition, differences in terms of timescale are also found within the crisis survival attributes. The Individual and Institutional attribute, as well several features from the Organisational attribute, such as relationships with stakeholders, CEO personality, and corporate social responsibility, require longer time in structuring and planning. In contrast, activities such as changes in structural choice, simplification of firm structure and changes in strategy preferences generally require relatively shorter time to prepare and implement. Table 5 shows the multiple dimensions of the organisational crisis survival concept.

Table 5   Distinguishing among the Three Dimensions of Crisis Survival

(Source: Personal collection of author)

Attributes	Individual	Organisational	Institutional
Strategic Orientation	Defensive	Offensive	Defensive
Timescale (The length of time that firm requires to implement a new strategy or to modify its existing strategy)	Long	Long/Short	Long
The effectiveness of implementation either before crisis or during crisis	Before crisis	Before crisis/ During crisis	During crisis

2.7   Research Agenda and Future Research Directions

A crisis may cause downward spirals that threaten a firm survival. The literature suggests that several scenarios can unfold when firms either innovate or respond rigidly to organisational crisis. For instance, McKinley et al. (2014) propose turnaround through innovation, downward turnaround through rigidity, downward spiral through rigidity and turnaround through risk avoidance as strategic options that are available during environmental jolts.

What happens in a firm after an episode of a punctuated event? This question has attracted considerable attention from scholars over the last thirty years (McKinley et al., 2014). Based on the crisis survival literature, the answers can be summarised in two opposing points (in

addition to the role of government and institution): organisational crisis is a 'facilitator for adaptation and innovation' or organisational crisis 'inhibits adaptation and innovation' (McKinley, 1993; McKinley et al., 2014).

It may seem intuitive that innovative products, services and process (Parry et al., 2012) can revitalise subpar performance. However, innovation may drain critical resources, degrade firm's performance and trigger its eventual demise (McKinley et al., 2014).

Nevertheless, overemphasis on tighter budgets, increased accountability, cost cutting and efficiency may risk rigidity limiting innovation activities. Although studies show that rigidity tends to accelerate decline, under certain circumstances, through rigidity practitioners may achieve the desired turnaround and mitigate risks (Staw et al., 1981; McKinley et al., 2014). In other words, eliminating costly innovation with substantial risks of unfulfilled revenue generation might support reversal of organisational decline. The empirical evidence about crisis survival (Table 5) supports both points by suggesting that both innovative and rigid responses to organisational crisis can lead to survival. The actual decision is based on the scenarios at play and the characteristics of the firm.

2.7.1 Future Research Directions

The literature review identified four research gaps, reflecting the weaknesses of the existing research designs, which open new directions for future research.

First, the empirical evidence shows that the crisis survival concept is operationalised mainly through quantitative approaches, such as structured questionnaire survey (Nadkarni and Herrmann, 2010; Naidoo, 2010; Lekmat and Chellah, 2011; Lee et al., 2012; Armstrong, 2013; Zagelmeyer and Heckmann, 2013; Makkonen et al., 2014), structured observation (Pajunen, 2006; Pangarkar, 2007; Bradley et al., 2011a; Bock et al., 2012; McKinley et al., 2014; Sun and Cui, 2014), financial data analysis (Chung et al., 2008; Lee and Makhija, 2009; Lim et al., 2009;

Wan and Yiu, 2009; Nadkarni and Herrmann, 2010; Bradley et al., 2011b; Dowell et al., 2011; Garcia-Appendini and Montoriol-Garriga, 2013; Maier et al., 2013; Arslan-Ayaydin et al., 2014) and interview (Naidoo, 2010; Lekmat and Chellah, 2011; Patel et al., 2014). There are only a few studies (Nadkarni and Herrmann, 2010; Dowell et al., 2011) that have applied a mixed method. Future research may consider using a mixed method research to triangulate findings and achieve greater validity by offsetting the weaknesses of sole quantitative or qualitative research and drawing on the strengths of both.

Second, most of the crisis survival studies only focus on a single country. Future research may consider comparative approach and replicate a similar design in various country settings. According to Hofstede (1993), the diversity in management practice around the world has created the need for "comparative management". Based on Hofstede's cultural dimension theory, the role of CEOs, management boards and stakeholders might be different in various country settings due to dissimilarities in management style, culture and legislation (Kogut and Singh, 1988). It is worthwhile to investigate the crisis survival concept from this aspect to avoid overgeneralisation of the research findings from any study. However, comparative research design should be carefully conducted as culture differences may lead to misinterpretation (that delivered from research tools and research finding) and most importantly, not every study is replicable.

Third, the crisis survival literature summary shows that most of the studies have focused only on one survival attribute, either individual, organisational or institutional, during crisis. Future research may focus on more than one attribute, such as to analyse the impact of individual and organisational strategies in crisis survival or the role of government and individual leadership style during crisis. After all, in reality it is rare that a firm's survival is based just on a single

feature or element. Crucially, employing several attributes in a study may also increase its generalisability.

Last, future studies may consider expanding the research timeframe by examining a firm's condition before, during and after a crisis rather than only during and after. Placing additional attention on the pre-crisis period may provide different insight into the firm's decision-making process and explain whether the pre-crisis condition is associated with the firm's survival.

Hence, a research agenda (Figure 5) is proposed to address the weaknesses of the existing literature. This longitudinal study is operationalised with financial ratios to identify the factors, which have contributed to firm survival during crisis.

Figure 5   Research Agenda

How does a firm survive a punctuated event and thrive after it?

⬇

Has organisational ambidexterity promoted firm survival and performance through the Global Financial Crisis?

⬇   ⬇   ⬇

Empirical Chapter 1 *Descriptive Review*	Empirical Chapter 2 *Crisis Survival*	Empirical Chapter 3 *Firm Performance*
Did actually Corporate America experience a crisis in 2008 and 2009?	Why and how did some firms survive the Crisis, while others did not?	What types of ambidexterity were more likely to promote prosperity after the Crisis?

2.8   Conclusion

The main objective of this chapter is to analyse firms' activities in response to a crisis, aimed at survival and prosperity. To develop this focus, the chapter illustrated and analysed resource-based view articles and crisis survival literature. Three main attributes that underpin a crisis survival strategy were identified, a crisis survival model was developed and the multidimensional view of crisis survival literature was discussed. At the end, future research directions were highlighted.

The synthesis of the strategic management literature on the organisational crisis survival construct reveals its complexity. The empirical study analysis shows that the construct has emerged. Each of these attributes (Individual, Organisational and Institutional) is consistent with the view of organisational crisis survival as an objective reality for the firm, even though it is held and subjectively created by outside observer.

The strategic literature review shows that the multidimensional view of crisis survival presents a challenge, because it requires specificity about the dimension (or dimensions) of crisis survival under investigation. At the same time, the multidimensional view may serve as a crisis survival guideline for firms. It reflects the importance of flexibility and the ability to match a firm's capability with resources in response to the external environment.

As noted earlier, most of the empirical studies describe crisis survival based on one dimension or attribute. As a result, the synthesis of strategic literature allows the identification of research gaps within the concept and provides future research directions.

CHAPTER 3: Conceptual Development

The Antecedents of Organisational Ambidexterity and Firms' Ability to Survive and Prosper

3.0   Introduction

The main body of this review consists of four sections. The first section shows the critical review of the notion of ambidexterity, followed by the development of hypotheses to set the scene for and provide contextualising information about the research topic. Then, the relationship of ambidexterity with organisational survival and prosperity during and after the crisis are discussed. Next, theoretical frameworks of the research are formed. This chapter concludes with discussion on how ambidexterity can serve as a strategic option to improve firm's performance during environmental turbulence.

3.1   Ambidexterity

Has organisational ambidexterity promoted firm survival and performance through the Global Financial Crisis?

Ambidexterity is defined as a firm's ability to pursue two disparate things at the same time (Gibson and Birkinshaw, 2004). An ambidextrous organisation is characterised by its ability to exploit, hone and extend its current knowledge, seek greater efficiency and improvements to enable incremental innovation. Simultaneously, it possesses the ability to explore new knowledge, experimenting to foster the variation and novelty needed for more radical innovation (Atuahene-Gima, 2005; Andriopoulos and Lewis, 2009). Organisational success and firm's sustainability are closely related to its ability to balance these two organisational learning modes. Although ambidexterity is based on an inter-related pair of activities, which are essential for a firm's survival, the application of the ambidexterity concept into organisation management implies the need and ability to deal with two of the most striking organisational dilemmas (Adler et al. 2008; O'Reilly and Tushman 2008; Güttel et al., 2015).

3.1.1 The Notion of Exploitation and Exploration

Distinguishing exploration from exploitation is even more challenging, considering the multidimensionality of knowledge, the amount of learning the two activities involve and the tendency to attribute each to distinctive value-chain functions (Li et al., 2008; Lavie et al., 2010; Junni et al., 2013).

The concepts of exploration and exploitation have been considered in a wide range of research, such as organisational design (Tushman and O'Reilly, 2006), organisational learning (March, 1991; Levinthal and March, 1993), adaptation (Eisenhardt and Brown, 1997) and knowledge management (Brown and Duguid, 2001). Both concepts have been applied to various settings, such as strategic alliances (Koza and Lewin, 1998; Rothaermel, 2001; Beckman et al., 2004; Rothaermel and Deeds, 2004), technology development (He and Wong, 2004; Greve, 2007) and management (McGrath, 2001; Beckman, 2006; Lavie et al., 2010).

The strategic management literature shows that both exploration and exploitation have developed into umbrella terms for antagonistic logics within the ambidexterity concept (Güttel et al., 2015). According to March (1991), exploration is about "the search, variation, risk taking, experimentation, play, flexibility, discovery, innovation", while exploitation includes elements such as "refinement, choice, production, efficiency, selection, implementation, execution" (Levinthal and March 1993; Güttel et al., 2015). The vague definition of both terms has resulted in their unsystematic application to various activities and contexts, which actually refer to similar learning actions (Lavie et al. 2010; Turner et al. 2012; Güttel et al., 2015).

For instance, innovation management distinguishes exploration and exploitation dichotomy as radical (exploratory) and incremental (exploitative) innovations in product development and innovation activities (Benner and Tushman, 2002; Sidhu et al., 2007; Güttel et al., 2015). Radical (exploratory) innovations are about "generating new solutions based on new

knowledge", while incremental (exploitative) innovations refer to "small improvement within an existing frame of reference" (Güttel et al., 2015).

In addition, there are studies that identify exploration as organisational adaptability and exploitation as organisational alignment (Gibson and Birkinshaw, 2004; Güttel et al., 2015). From this perspective, ambidexterity is defined as simultaneity of activities that are directed towards alignment and adaptability, which enables firms to continuously improve existing and implement new procedures; and therefore paves the way for resolving the productivity dilemma that deals with this tension (Adler et al. 2008). Table 6 shows the multidimensional view of exploration and exploitation in literature.

Table 6   Dimensions of Exploration and Exploitation

(Source: Personal collection of author)

Facilitators	Outcomes: Exploration	Outcomes: Exploitation
Organisational strategy (Porter, 1996)	Differentiation	Low cost
Resources and learning processes (Benner and Tushman, 2002; Sidhu et al., 2007; Güttel et al., 2015)	Radical innovation	Incremental innovation
Organisational design and culture (Gibson and Birkinshaw, 2004; Adler et al. 2008; Güttel et al., 2015)	Adaptability	Alignment
Business operation (Güttel et al., 2015)	Innovator	Productivity
Strategic options (Güttel et al., 2015)	Flexibility	Learning

Based on Table 6, it can be concluded that both exploration and exploitation are associated with learning and innovation, albeit different terms are used in the various studies (Baum et al., 2000; Benner and Tushman, 2002; He and Wong, 2004). In other words, learning, improvement and acquisition of new knowledge are central to both exploitation and exploration. The differences between them exist where the new learning occurs along the same route as the old one or it starts on an entirely different route (Gupta et al., 2006).

Exploration and exploitation have been conceptualised as a continuum and firms have been found to move from exploration to exploitation activity and vice versa over time. Literature shows that the ability of a firm to acquire and develop new knowledge is based on the firm's current knowledge base (Cohen and Levinthal, 1990; Lavie et al., 2010). As a result, exploration is acknowledged as the fundamental element that allows exploitation with subsequent knowledge application. For instance, a firm is involved in an exploration activity when it is experimenting with a new technology. However, when the firm keeps applying this particular technology in its operations it creates exploitation routines. Thus, it is possible an exploration activity to evolve into an exploitation activity under certain circumstances (Brunner et al., 2009). Likewise, based on this assumption, an alliance portfolio may shift from technology alliances to marketing alliances or an alliance may feature a combination of exploration and exploitation alliances (Lavie et al., 2010). As a result, exploration and exploitation form sequential stages, whereby exploitation follows exploration (Rothaermel and Deeds, 2004). This phenomenon shows that exploration and exploitation are interrelated and this concept is perceived as a continuum rather than a discrete choice model.

Literature shows that exploration and exploitation are subject to relativity, because the concepts are defined from the viewpoint of a given firm or unit. For instance, a particular technology, knowledge or market that are perceived as new by 'Firm A' might not be viewed the same way by 'Firm B'. Thus, an activity that is perceived as exploration by one firm might be identified as exploitation by another. Moreover, the uneven distribution of knowledge between units within a single firm can lead to a perception of the same activity as exploration by one division and exploitation by another. (Lavie et al., 2010).

Lavie et al. (2010) argue that exploration and exploitation should be operationalised along a continuum rather than as discrete choices, given the interrelationship and relativity of both

concepts. Indeed, literature has concluded that it is challenging to conceptualise and operationalise exploration and exploitation activities with separate variables due to the inherent trade-offs between these two concepts (Katila and Ahuja, 2002; He and Wong, 2004; Auh and Menguc, 2005; Gupta et al., 2006; Jansen et al., 2006).

3.1.2 Trade-offs between Exploitation and Exploration

The literature has distinguished two streams of learning modes to achieve ambidexterity. One stream recognises ambidexterity as two ends of one continuum and claims that firms should identify the relative mode along the continuum. The other stream of literature emphasises the potential return of ambidexterity from both perspectives and suggests that firms may achieve better performance by combining both ambidexterity learning modes to leverage their complementarities (Birkinshaw and Gibson, 2004; Yalcinkaya et al., 2007; Andriopoulos and Lewis, 2008; Simsek et al., 2009; Smith and Lewis, 2011). In addition, there are studies that advocate the balance dimension as more suitable to resource-constrained firms, while the combined dimension as more suitable to resource-rich firms (He and Wong, 2004; Cao et al., 2009; Wei et al., 2014).

Ambidexterity includes activities that compete for organisational resources, such as human resource, financial or managerial attention, which require idiosyncratic mindsets and mentalities in diverse areas (March, 1991; March, 1996; Gupta et al., 2006; March, 2006). In general, when a firm allocates more resources to an exploration activity, this implies fewer resources will be available for an exploitation activity. Gupta et al. (2006) argue that it is impossible to pursue both exploration and exploitation simultaneously, because they require different mindsets and organisational routines.

Moreover, exploration and exploitation are iteratively self-reinforcing even assuming all else is equal. The broad dispersion of the range of possible outcomes implies that an exploration

activity often leads to failure. Very often, in this situation the firm tends to promote the search for even newer idea and encourage more exploration activities, thereby resulting in a "failure trap". On the other hand, an exploitation activity that often leads to early success directs the firm to engage in further exploitation along the same route, thereby creating a "success trap" (Levitt and March, 1988; Gupta et al., 2006). As a result, exploration and exploitation tend to drive each other out and it is therefore challenging for a firm to balance these potentially conflicting activities (March, 1991; Adler et al., 1999).

In addition, exploration and exploitation create tension for decision makers when they have to decide between stability and adaptability. Exploration is associated with flexibility and changes, while exploitation is linked to stability and inertia (March, 1991; Lewin et al., 1999; Lavie et al., 2010). Firms with emphasis on exploitation trade flexibility for stability, because exploitation tends to build organisational inertia that discourage changes during environmental jolts, and vice versa.

Some studies highlight that the internal organisational tensions caused by ambidexterity can never be effectively reconciled (Ford and Ford, 1994; Lewis, 2000). Porter (1996) argue that the trade-off between low cost and differentiated position is insurmountable, therefore the firm has to prioritise one strategy over the other, instead of pursuing both. Exploration or exploitation, innovator's dilemma or productivity dilemma - the two sides of the same coin.

However, some research suggests that the contradictions between exploration and exploitation can be resolved by focusing precisely on the inherent tension between the concepts (Lavie et al., 2010). Loosely coupled units (Koza and Lewin, 1998; Beckman et al., 2004) and leveraging external resources (Katila and Ahuja, 2002) are found to be capable in mitigating this tension (Lavie et al., 2010).

Consider the argument on resource scarcity. Gupta et al. (2006) claim that although resources are finite for most firms, some resources such as information and knowledge may be infinite (Shapiro and Varian, 1998; Gupta et al., 2006). Moreover, in general, resources can be sourced from the internal and external environments (Powell et al., 1996). Thus, external resources such as public information, articles published in journals or established relationship with stakeholders are found to be able to ease the constraint caused by the scarcity of internal resources (Katila and Ahuja, 2002). In addition, the conflicts over mindsets and organisational routines can be resolved when exploration and exploitation are analysed in two different domains that are either loosely connected or linked via standardised/modular interfaces (Gupta et al., 2006). Last but not least, the capability of senior management team to integrate and communicate the concept has also been highlighted as important for successful implementation of the concept (Helfat and Peteraf, 2009).

The temporal spill over between exploration and exploitation has also been discussed in the literature (Lavie et al., 2010). Research shows that an exploration activity may generate an opportunity that a firm can exploit later. In turn, an exploitation activity that produces income can be reinvested in future exploration. Overall, the trade-offs between exploration and exploitation do not rule out an indirect reinforcing relationship between the two activities (Eisenhardt and Brown, 1997; Rothaermel and Deeds, 2004; Lavie et al., 2010).

It is clear that these trade-offs can never be entirely removed. However, the literature shows that the most successful firms are trying to be ambidextrous and mitigate the inherent tension to a certain extent to enhance their long-term competitive advantage (Gibson and Birkinshaw, 2004). The ambidexterity lens allows a potential powerful framework to examine the cited phenomena. Thus, ambidexterity is a concept worth exploring despite all potential challenges that come with it.

3.2 The Antecedents of Ambidexterity

Empirical research has identified limited or mixed evidence on the causes and prerequisites of ambidexterity (Gupta et al., 2006). This section highlights the environmental factors (such as dynamism, exogenous shocks and competitive intensity), organisational factors (such as organisational age, size, slack resources, structure, culture, absorptive capacity) and managerial bias that are found to contribute to a firm's desire to engage in exploration and exploitation activities (Lavie et al., 2010). It proposes a multidimensional view of ambidexterity, which includes potential indicators for measuring this concept.

3.2.1 Environmental Antecedents

There is a systematic difference across industries with respect to firms' tendencies to get involved in exploration and exploitation. Research shows that environmental factors, such as exogenous shocks, environmental dynamism, competitive intensity and appropriability regime, may impact firms' learning requirements (Lavie et al., 2010).

3.2.1.1   Environmental Dynamism

An unstable and unpredictable environment (Dess and Beard, 1984; Ruiz-Ortega et al., 2013; Cooper et al., 2014) requires firms to be innovative and risk takers, while a stable environment encourages firms to engage in exploitation activities (Rauch et al., 2009). Studies show that firms tend to be effective and efficient in identifying exploration and exploitation opportunities, especially in highly dynamic business environments, to improve the likelihood of their survival (Ireland et al., 2009; Zhou and Wu, 2010).

In dynamic business environments, identifying, measuring or forecasting cause-effect relationships between a firm and its environment is challenging (Priem et al., 1995; Halevi et al., 2015). In such situations, managers do not rely on prescribed sets of procedures or

experience, but rather prefer to "make it up as they go along" (Baron, 2008, p.329; Halevi et al., 2015).

A dynamic environment reduces the attractiveness of existing products, services and markets, forcing firms to explore opportunities (Sorensen and Stuart, 2000; Jansen et al., 2009; Lavie et al., 2010) and promptly take advantage of emerging opportunities (Hannan and Freeman, 1984). Environmental dynamism places higher burden on management to redesign the firm's capabilities and bundle resources into a new configuration.

High level of dynamism leads to greater exploration learning. It is due to the firms' attempt to diminish uncertainty with information acquisition (March, 1991; Sidhu et al., 2004) and desire to identify external resources from similar and familiar partners (Beckman et al., 2004). Studies show that firms tend to allocate more resources towards exploration in turbulent environment, because of a belief that innovative activities improve chances for survival (Lant and Mezias, 1992; Lavie et al., 2010). However, there are studies arguing that a continuous turbulent environment hampers high research and development intensity efforts, because it invalidates the value of prior knowledge and repudiates new knowledge obtained from exploration (Kim and Rhee, 2009). Yet, Kim and Rhee (2009) propose that the combination of frequency and magnitude of environmental change defines the degree of exploration needed by firms to support organisational adaptation and survival. It is worth highlighting that to date there is still no valid finding that discusses organisational behaviour in the context of uncertain environmental conditions (David et al., 2009; Lavie et al., 2010).

It is challenging to continuously navigate the organisational orientation against the backdrop of an ever-changing environment. Despite the difficulties in implementing the concept, balancing exploration and exploitation is essential in any given organisation to survive. Indeed, organisational dynamism is almost built into the definition of ambidexterity by extrapolating

the firm's ability to be "efficient and aligned in its current business demands while simultaneously being adaptive to changes in the environment" (Raisch and Birkinshaw, 2008, p. 375). The accelerating obsolescence of existing knowledge and pressure to find more suitable opportunities, caused by unpredictable changes, have raised the importance of ambidexterity in highly dynamic compared to stable environment. Dynamic environments influence firms to develop better understanding of their knowledge base, thereby facilitating an ambidextrous orientation.

3.2.1.2 *Exogenous Shocks*

An exogenous shock manifests itself in periods of volatility that are beyond the control of any firm. It is caused by unforeseen events, such as deregulation or technological breakthrough, that arise from the external business environment (Meyer, 1982). Exogenous shocks or environmental jolts often obsolete existing skills and technology (Tushman and Anderson, 1986; Romanelli and Tushman, 1994), requiring immediate response (Meyer et al., 1990). Some affected firms may focus on exploration efforts as a solution to prosper in the subsequent era of incremental change (Lavie et al., 2010). Others may focus on exploitation activities to recover their past or existing investments during environmental jolts rather than exploring for new opportunities (Lavie et al., 2010).

3.2.1.3 *Competitive Intensity*

Competitive intensity refers to the degree to which a firm is likely to maintain a zero-sum relationship with a rival, when competing for the same pool of limited resources (Barnett, 1997; Lavie et al., 2010) or magnitude of impact that a firm has on its rival's survival chance. A weak competitor is characterised as the one that harms its rival's performance slightly, while a strong competitor can impact the firm's survival (Barnett, 1997).

Porter (1980) suggests that competitive pressure stemming from the increased number of firms in the same industry causes a price war, resulting in tighter margins and competition for resources. Exploitation activities, such as continuous improvement of flexibility, efficiency, existing products and production process, are found to be insufficient for withstanding competition. Thus, highly intensive, competitive environments drive firms to engage in exploration activities that can lead to changes and cultivate new sources of competitive advantage (Levinthal and March, 1993; Lavie et al., 2010). This approach, however, requires sufficient amount of internal resources which might not be available to every firm. Studies also show that firms may still prefer to engage in exploitation, if it can generate reasonable return on investment without incurring exploration risk (Lavie et al., 2010).

Rather than focus on a single type of innovation, literature shows that local environmental conditions, such as competitiveness, can push firms towards a more balanced orientation in their strategic and structural alignment (March, 1991; Volberda, 1998; Levinthal and March, 1993; Floyd and Lane, 2000; Raisch and Birkinshaw, 2008). Empirical research supports the argument that when environmental conditions became increasingly hostile, firms tend to simultaneously pursue exploration and exploitation, and become ambidextrous (Jansen et al., 2005; Raisch and Birkinshaw, 2008). Similar finding was recorded by Auh and Menguc (2005), who proposed that firms have to be ambidextrous when confronted with increasing environmental competition.

Overall, some studies show that exploration is preferable to exploitation, while others advocate both innovations are needed to strengthen the market position and establish presence in new markets during a period of competitive rivalry (Park et al., 2002; Voss et al., 2008).

3.2.1.4   *Appropriability Regime*

Appropriability regime is defined as a set of mechanisms that enable firms to protect and utilise their intangible assets and innovations (Hurmelinna-Laukkanen, 2009; Hurmelinna-Laukkanen, 2012). This is a protective strategy that ensures proprietary resources and R&D derived knowledge are not spilled out to competitors. Literature shows that the appropriability regime influences the building of absorptive capacity of both internal and external knowledge sources (Todorava and Durisin, 2007) and improves innovation performance (Peters and Johnston, 2009).

The appropriability regime for intangible assets and innovation consists of formal institutions and informal mechanisms, such as intellectual property rights (IPR) (Winter, 2006), contracts, labour law (Hurmelinna-Laukkanen and Puumalainen, 2007) and lead time. Research shows that the value of exploration is diminished when the appropriability regime is weak, for instance, insufficient government protection of intellectual property rights (Teece, 1986). In such conditions, firms may prefer to focus on exploitation rather than exploration activities.

3.2.2   Organisational Antecedents

Environmental antecedents portray the systematic trends of gravitation towards either exploration or exploitation. However, they fail to explain the differences between these tendencies across firms within an industry. Based on the strategic management literature, the decision to either explore or exploit may be impacted by the organisation's identity, such as absorptive capability, resources, organisational structure, culture, age and size (Lavie et al., 2010). This section reviews the relationship between organisational antecedents and ambidexterity.

3.2.2.1   *Absorptive Capacity*

Absorptive capacity or the "ability of a firm to identify the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990, p.128) has long been recognised as an important driver of firms' innovative performance (Henderson and Cockburn, 1994; Tsai, 2001; Tortoriello, 2015). The benefits of absorptive capacity in developing and mediating the speed, frequency and magnitude of knowledge and innovation have been widely accepted in the management literature (Peeters et al., 2014). Absorptive capacity has been found to have the capability to increase a firm's interaction with the external environment, which later improves its internal cross-unit learning and the firm's overall performance (Lane and Lubatkin, 1998; Rosenkopf and Nerkar, 2001; Lavie et al., 2010; Tortoriello, 2015). It enables firms to operate proactively, explore emerging technologies and markets (Cohen and Levinthal, 1990; Lavie and Rosenkopf, 2006; Rothaermel and Alexandre, 2009; Lavie et al., 2010).

Research shows that firms with developed knowledge base are better positioned to build absorptive capacity and most likely to engage in exploration (Van den Bosch et al., 1999). However, Cohen and Levinthal (1990) highlight the potential drawback of absorptive capacity by arguing that it may limit the scale and scope of acquiring external knowledge, because of the tendency to pick only the knowledge related to the current knowledge base. Absorptive capacity may facilitate exploration activities, but given the broad scope of both constructs and the possible drawbacks firms have to carefully distinguish and validate the causal association between them.

3.2.2.2   *Resource Endowment*

Firms need resources for growth (Penrose, 1959), survival (Pfeffer and Salancik, 2003), improvement of financial performance (Daniel et al., 2004), buffering environmental jolts,

more discretion and flexibility in responding to rival strategies (George, 2005) and obtaining competitive advantage (Barney, 1991). Several studies suggest that resource differences can moderate the relationship between ambidexterity and performance (Kyriakopoulos and Moorman, 2004; Venkatraman et al., 2007; Raisch and Birkinshaw, 2008). Resource constraints are found to hinder firm growth and decrease the probability of survival (Becchetti and Trovato, 2002; Musso and Schiavo, 2008; Dolmans et al., 2014). Yet, resource constraints can also help to promote creativity among firms and encourage them to deal with problems promptly (Bhide, 1992; Dolmans et al., 2014).

Literature shows contradictory views on the impact of slack resources on ambidexterity. In general, firms that possess abundant resources are able to exploit and explore simultaneously, whereas firms without slack resources and hierarchical administration systems may not be able to afford ambidexterity as part of their strategy (Lubatkin et al., 2006). Studies suggest that excess resources allow risk taking, innovation and experiment (Singh, 1986; Nohria and Gulati, 1996; Greve, 2007), but also that firms with slack resources tend to neglect competitive pressure and market dynamism leading them to possible failure (Bourgeois, 1981). One scholar highlighted that the firms' motivation to explore is weaker when they notice that they meet their performance objectives by just consuming current slack resources rather than by exploring new opportunities (Bourgeois, 1981). The contingency view suggests a curvilinear association between slack resources and exploration by stating that insufficient slack is detrimental to exploration because it discourages risky experimentation, whereas excessive slack may adversely affect exploration by loosening discipline and prompting dubious undertakings (Nohria and Gulati, 1996; Lavie et al., 2010).

In addition, an empirical study shows that small firms may benefit more from a single type of innovation than being ambidextrous (Ebben and Johnson, 2005). A simultaneous pursuit of both

exploitative and exploratory innovations can decrease slack resource. As a result, ambidexterity may depend on the availability of sufficient resources (Raisch and Birkinshaw, 2008).

3.2.2.3 *Organisational Structure*

The organisational structure defines the distribution of power, responsibilities and resources across different units and functions. The organisational theory has long discussed the challenge of managing organisational design, such as mechanistic and organic structure, to achieve efficiency and flexibility. Mechanistic structures promote efficiency, emphasise centralisation, standardisation and hierarchy, support formal duties, routine types of operation and functional specialisation, whereas organic structures focus on high levels of decentralisation, autonomy, informal structure and less rigid establishment to support flexibility (Raisch and Birkinshaw, 2008; Lavie et al., 2010).

Lavie et al. (2010) suggest that formalisation and centralised organisational structure constrain exploration, but facilitate exploitation activities through incremental improvement in business operations. Nevertheless, there has been no study to date which demonstrates that exploitation is positively associated with centralisation or exploration is negatively associated with formalisation, possibly because of the use of separate measures for exploration and exploitation. In order to be ambidextrous, the firm has to exploit its resources while creating innovation. However, it is challenging to reconcile the two organisational designs within a single firm (Ford and Ford, 1994; Lewis, 2000) as they tend to involve a "paradox of administration" (Thompson, 1967; Raisch and Birkinshaw, 2008).

From an organisational structure perspective, ambidexterity is the firm's ability to operate complex organisational designs in order to achieve short-term efficiency and long-term innovation (Tushman and O'Reilly, 1996; Raisch and Birkinshaw, 2008). Thus, ambidexterity can be achieved by combining features from both mechanistic and organic structures (Adler et

al., 1999; Sheremata, 2000; Jansen et al., 2005) or by using collective organisational design (Gibson and Birkinshaw, 2004).

3.2.2.4   Organisational Culture and Identity

Organisational culture and identity represent the distinctive and enduring organisational attributes, which consist of organisational goal, mission and central logic that drive firms to explore and exploit (Tripsas, 2009). Strong cultures tend to encapsulate a firm within the realm of what is known and established (Andrews et al., 1999). Firms with strong cultures are inclined to exploit existing capabilities at the expense of exploration, because the consensus on corporate goals and values provides a strong foundation for organisations' exploitation capabilities (Sorensen, 2002; Lavie et al., 2010). However, strong organisational cultures may also hinder the firm's ability to identify and respond to environmental jolts (Andriopoulos and Lewis, 2009). In contrast, there are studies that propose positive association between organisational culture and exploration, when the firm's mission encourages continuous innovation and experimentation (Sidhu et al., 2004; Ravasi and Schultz, 2006).

3.2.2.5   Organisational Age

Young ventures, which are subject to liabilities such as lack of resources and limited customer base, tend to invest in exploration to establish their identity, structure, network and market position (Lavie et al., 2010). In contrast, aging organisations subject to strong inertia are more likely to rely on existing knowledge, network and resources, and engage in exploitation rather than exploitation to respond in a consistent and accountable manner to environmental challenges. Research shows that stakeholders from the aging firms, who prefer rational action and reliable performance, are more likely to commit to existing structures, routines and competencies. Thus, aging organisations tend to reinforce the exploitation of existing capability and leverage past experience (Benner, 2007; Lavie et al., 2010). Nevertheless, uncovering the

underlying conceptual mechanisms and isolating the effects of age from other age related organisational characteristics remains a challenge for empirical research.

3.2.2.6   *Organisational Size*

Contradictory findings exist on the impact of organisational size on the tendency to explore versus exploit. Literature shows that organisational inertia increases with size, leading to productivity along existing trajectories, while restricting exploratory activities (Hannan and Freeman, 1984; Rothaermel and Deeds, 2004). In contrast, there are scholars who advocate that larger firms may have better access to internal resources and thus, can support exploration in their alliances (Beckman et al., 2004). In addition, Sidhu et al. (2004) propose that there is no significant relationship between organisational size and the tendency of information acquisition. As a result, the association between organisational size and tendency to explore versus exploit is still unclear.

3.2.3   Managerial Antecedents

Environmental uncertainty requires business practitioners to constantly redesign capabilities and integrate them into business operations as the firm's competencies rapidly lose their value due to market fluctuations and consumer demands (Halevi et al., 2015). Contextual ambidexterity, which means "the behavioural capacity that simultaneously demonstrate alignment and adaptability across an entire business unit" (Gibson and Birkinshaw, 2004, p.209), advocate the role of the management team over dual structural designs to achieve ambidexterity.

Research shows that the behavioural inclination of senior management team may impact the firm's tendency to explore or exploit. A risk-averse management team may prefer exploitation over exploration, because the returns from exploitation are more certain, proximate and immediate (Lewin et al., 1999). In contrast, a management team dominated by risk takers may

be driven by survival or performance aspiration, which lead to exploitation-focused business activities (March and Shapira, 1992).

Lavie et al. (2010) suggest that the optimum requirement of exploration and exploitation for survival strategies can vary between growth strategies. As a result, the extent of a management team's risk aversion influences their bias towards exploitation activities at the expense of exploration. Thus, very often a successful exploitation limits the search for new competencies, which may lead to a "success trap" (Leonard-Barton, 1992; Levinthal and March, 1993; Hambrick et al., 2005; O'Reilly and Tushman, 2008). Given that exploration and exploitation require distinctive sets of resources, skills, capabilities and routines, as the firm builds more experience with either exploration or exploitation, it is confined in its path dependence reinforcing the domain activity (Lavie and Rosenkopf, 2006).

In addition to experience, a management team may rely on performance feedback to decide the desirable extent of exploration and exploitation to be incorporated in the firm's operation. When a firm's performance does not match expectations of exploitation activities, it forces it to engage in exploration activities to identify new competencies.

3.2.4 Conclusion: Understanding the Role of Organisational Ambidexterity in Promoting Firm Survival and Performance

Environmental, organisational and managerial antecedents demonstrate a firm's inclination to explore versus exploit. Further investigation is needed to identify how to balance the conflicting pressures from exploration and exploitation (Siggelkow and Levinthal, 2003; Raisch and Birkinshaw, 2008; Mom et al., 2009). Contradictions have been found between the ambidexterity antecedents. For instance, the presence of slack resources allows larger firms to be ambidextrous. However, it is common for larger firms to have strong organisational culture, which may create a form of inertia preventing the firm to explore its resources.

Overall, this section as well as section 3.1 aim to provide a foundation for investigating the research agenda of this study: *Has organisational ambidexterity promoted firm survival and performance?* Based on the literature, this thesis proposes that organisational ambidexterity can help to improve the probability of firm survival and promote better performance. The ambidexterity concept, which emphasises enhancing firm efficiency and the search of new knowledge, allows accumulation of sufficient funds to maintain daily activities and building competitive advantage with novel ideas. This thesis proposes that ambidexterity, exploitation and exploration orientations can improve the probability of survival as well as firm performance.

3.3   Ambidexterity, Organisational Survival, Strategic Choice and Performance

This section explores the conditions under which the ambidexterity concept is likely to emerge and shows the development of the concept based on the literature. In the development of the theoretical framework, this study distinguishes between exploration and exploitation as factors in crisis survival or failure. The theoretical model extends the current literature on organisational survival, highlights the effects of ambidexterity and relates ambidexterity with strategic options.

3.3.1   Ambidextrous Organisation

Globalisation has increased the need for firms' ability to perform both organisational adaptation (exploration) and organisational alignment (exploitation) (Gibson and Birkinshaw, 2004). The degrees of adaptability and alignment within a firm are impacted by the way the latter designs its structure, culture and norms. Firms have to align processes to achieve management efficiency, while being adaptive enough to anticipate emerging opportunities brought by changes in the environment (Tushman and O'Reilly, 1996; Gibson and Birkinshaw, 2004). There is an emerging change in firms' strategy focus from trade-off (either/or) to a paradoxical

both/and (Bouchikhi, 1998; Morgeson and Hofmann, 1999; Lewis, 2000; Earley and Gibson, 2002).

The literature suggests that being ambidextrous is increasingly important for firms to survive and become successful in a dynamic environment. Organisational ambidexterity enables firms to achieve better performance, competitive advantage, technology innovation, organisational design, organisational adaptation, organisational learning and survival (March, 1991; McGrath, 2001; Burgelman, 2002; Katila and Ahuja, 2002; Benner and Tushman, 2003; Lee et al., 2003; Sigglekow and Levinthal, 2003; Gupta et al., 2006).

Organisational ambidexterity is proven to bring superior performance to firms (March, 1991; Tushman and O'Reilly, 1996; Gibson and Birkinshaw, 2004; He and Wong, 2004; Yalcinkay et al., 2007; Andriopoulos and Lewis, 2008; Cao et al., 2009; Wei et al., 2014), especially when they operate in a highly turbulent environment (Hoskisson et al., 2000; Wright et al., 2005; Andriopoulos and Lewis, 2008; Li et al., 2010; Sheng et al., 2011; Wei et al., 2014). Wei et al. (2014) propose that ambidexterity is a more viable option in a transition economy rather than punctuated equilibrium event (Gupta et al., 2006; Jansen et al., 2006; Wang and Li, 2008; Simsek et al., 2009).

The literature shows that the fundamental means of ambidextrous firms, which involve avoidance of overspecialisation in one domain, allow them to create a common frame of reference or collective filter for individual cognitions (Eggers and Kaplan, 2013). It facilitates the decision-making process (Eisenhardt et al., 2010; Güttel et al., 2015) and perception schemes (Daft and Weick, 1984). According to Lubatkin et al. (2006). Top management plays a vital role in developing a frame of reference by defining the boundaries of the strategic corridor, encouraging teams and employees to switch between exploration and exploitation activities, to apply and utilise existing knowledge and capabilities while seizing new market

opportunities whenever they present themselves (Güttel and Konlechner, 2009; Eggers and Kaplan, 2013).

Empirical studies demonstrate the importance of combining exploration and exploitation (in whichever form) for firms. Although the optimal combination between exploration and exploitation is idiosyncratic and fragile (Levinthal and March, 1993; Cao et al., 2009; Güttel et al., 2015), studies show that long-term imbalances between the two learning modes may lead to poor performance or even total failure (Leonard-Barton, 1992; Tripsas and Gavetti, 2000; Chesbrough and Rosenbloom, 2002; Güttel et al., 2015). Table 7 shows the design of ambidextrous organisation based on the discussion in section 3.2.

The ambidexterity concept proposes a means to simultaneously deal with tensions in multiple dimensions (Güttel et al., 2015). Ambidexterity can be achieved via two mechanisms: structural ambidexterity and contextual ambidexterity. These mechanisms are complementary rather than exclusive (Adler et al., 1999; Gibson and Birkinshaw, 2004). The literature shows that structural and contextual ambidexterity allow firms to mitigate or resolve the dilemma when operating ambidextrously. Structural ambidexterity refers to the firm's contradictory positions in structures and systems, such as task partitioning by arranging one business unit taking on an organic structure and another adopting a mechanistic structure. Both business units are highly differentiated and loosely coupled with each other at the same time (Benner and Tushman, 2003). Structural ambidexterity builds on the assumption that firms should separate the two different innovation modes (i.e. exploration and exploitation) by setting up distinctive structures for each activity (Tushman and O'Reilly, 1996; O'Reilly and Tushman, 2008). Structural ambidexterity requires the integration of heterogeneous learning outcomes as a central managerial task (Smith and Tushman, 2005).

Table 7   The Design of Ambidextrous Organisation

(Source: Personal collection of author)

Organisational Ambidexterity Antecedents	Antecedents	Exploration	Exploitation	Notes
Environmental Antecedents	High environmental dynamism	✓	No information from existing literature	-
	Exogenous shocks	✓	No information from existing literature	-
	High competitive intensity	✓	No information from existing literature	Exploitation is preferable if it can generate a reasonable return
	Appropriability regime available	✓	No information from existing literature	-
Organisational Antecedents	Absorptive capacity	✓	No information from existing literature	-
	Resource endowment	Abandon of resources	No information from literature	-
	Organisational culture	Unclear	Unclear	It depends on the organisational goal, mission and central logic
	Organisational age	Young	Mature	-
	Organisational size	Unclear	Unclear	Organisational inertia increases with size (exploitation) or larger firms may have better access to internal resources (exploration)
Managerial Antecedents	Management style	Risk taker	Risk-averse	-

The implementation of dual structures requires developing idiosyncratic mindsets and mentalities in diverse fields (Gilbert, 2005) to help resolve conflicts, which otherwise may arise from the assorted demands of heterogeneous learning modes (Benner and Tushman, 2003). Supporting the knowledge transfer between highly specialised subunits is recognised as one of the main challenges for top management teams at structurally ambidextrous firms (Jansen et al., 2008).

In addition, despite the challenges in integrating the heterogeneous subunit, empirical studies show that the coexistence of heterogeneous learning modes may produce frames of reference,

which allow firms to prepare for various future scenarios (Gilbert, 2005; Andriopoulos and Lewis, 2009; Güttel et al., 2015). Structural ambidexterity is feasible where competitive advantage can be derived from specialisation (Bradach, 1997; Winter and Szulanski, 2001; Güttel et al., 2015). This is common among replicator organisations that grow by using the replication of concepts, management and operating procedures (Winter and Szulanski, 2001). The structural separation between different learning modes empowers replicator organisations to combine system-wide uniformity and adaptation (Bradach, 1997; Combs et al., 2004).

In contrast, contextual ambidexterity emphasises contextual features that enable individuals (or small firm's subunits) to combine the two different modes of ambidextrous activities through behavioural integration (Gibson and Birkinshaw, 2004; Mom et al., 2007; Güttel and Konlechner, 2009; Güttel et al., 2015). This mechanism highlights the specific roles of individuals within the firm. Under the contextual ambidexterity concept, the firm has to decide to establish either a performance management system or social context that grant decision making powers to employees to balance conflict in demand (Gibson and Birkinshaw, 2004). The main issue in contextual ambidexterity configuration is that the requirement of balancing heterogeneous expectations is tied to task fulfilment in exploration and exploitation. It focuses on the availability of a workforce, who is able to dispose high levels of background knowledge that assists mutual understanding (Mom et al., 2007; Mom et al., 2009).

The implementation of contextual ambidexterity is feasible in organisational units, small and modular type of organisations (Gibson and Birkinshaw, 2004; Gupta et al., 2006). In addition, research shows that contextual ambidextrous organisations that focus on the integration of employees with diverse backgrounds can develop competitive advantage, because they take shorter time to capture an idea and transform it into a marketable product or service (Güttel and Konlechner, 2009).

Structural and contextual ambidexterity deserve critical attention (Raisch et al., 2009). The criticism of the structural ambidexterity concept is mainly about the conceptualisation of the top management as the main or only driver of integration. Raisch (2008) suggests that this issue can be avoided by bridging at multiple hierarchical levels within the firm and using formal and informal integration mechanisms (for instance, senior team social integration or cross functional teams) to relieve the pressure on the top level to act as intermediary between various highly specialised departments units (Jansen et al., 2009; Güttel et al., 2015). Contextual ambidexterity is criticised about its restricted scope, because there are only very few firms or units that can integrate employees with diverse backgrounds (Inkpen and Tsang, 2005). Raisch and Birkinshaw (2008) argue that structural and contextual ambidexterity should not be perceived as alternative, but rather as complementary antecedents to organisational ambidexterity. However, the dynamics of their interaction require further research.

3.3.2 Ambidexterity and Organisational Survival

The increasing environment dynamism and the accelerated pace of change requires firms to renew their knowledge base by simultaneously exploiting existing learnings and exploring new knowledge to achieve both adaptability and alignment (Floyd and Lane, 2000; Gibson and Birkinshaw, 2004; He and Wong, 2004; Jansen et al., 2006; Wei et al., 2014). Firms with simultaneous exploration and exploitation activities are found to have better chance to survive during punctuated events (Burgelman, 2002; Benner and Tushman, 2003; Gupta et al., 2006). The consequences of ambidexterity are associated with diverse success parameters such as innovation and learning (Adler et al., 1999; Holmquist, 2004; Rothaermel and Deeds, 2004), sales growth (He and Wong, 2004) or financial performance (Gibson and Birkinshaw, 2004; Güttel et al., 2015).

The literature shows that firms engaged in exploration to the exclusion of exploitation are likely to possess many undeveloped new ideas with little distinctive competitive advantage (March, 1993). At the same time, firms engaged only in exploitation activities are likely to get trapped in suboptimal stable equilibria (March, 1993). As a result, both exploration and exploitation are important for firms' performance and survival (March, 1991; Dougherty, 1992; Levinthal and March, 1993; March, 1996; Eisenhardt and Martin, 2000; Ancona et al, 2001; Benner and Tushman, 2002; Feinberg and Gupta, 2004; March, 2006).

Although there is a wide consensus on the need to engage in ambidexterity, there is considerably less clarity how to achieve it, measure it and under what circumstances a firm should engage more in exploration versus exploitation activities. For instance, environmental antecedents demonstrate systematic tendencies of firms to gravitate toward exploration or exploration, but fail to clarify the heterogeneity trend in exploration and exploration.

This study recognises the inherent tension between exploration and exploitation and investigates their role in a punctuated equilibrium event. Table 8 shows the empirical studies on the ambidexterity concept, which analyse firms' behaviour to explain why some of them prefer exploration while others emphasise exploitation during a crisis period. 24 ambidexterity studies have been identified and their research purposes, target industries, research methods, variables and conclusions have been summarised.

Three major trends have been found from the existing literature. First, there is a limited and mixed evidence about ambidexterity. For instance, Auh and Menguc (2005) found that excessive exploration is negatively related to firm performance, while He and Wong (2004), Sidhu et al. (2004), Jansen et al. (2006) and Cao et al. (2009) found a positive relationship between ambidexterity constructs and firm performance. Second, the existing studies measure ambidexterity, exploration and exploitation via questionnaire surveys (Gibson and Birkinshaw,

2004; He and Wong, 2004; Sidhu et al., 2004; Auh and Menguc, 2005; Jansen et al., 2006; Lubatkin et al., 2006; Ambos et al., 2008; Menguc and Auh, 2008; Morgan and Berthon, 2008; Mom et al., 2009; Cao et al., 2009; Cao et al., 2010; Fernhaber and Patel, 2012; Kouropalatis et al., 2012; Patel et al., 2012; Voss and Voss, 2013; Blindenbach-Driessen and Ende, 2014; Hill and Birkinshaw, 2014; Tan and Liu, 2014; Wang and Rafiq, 2014), interviews (Wei et al., 2013) and case studies (Simsek, 2009; William et al., 2010; Boumgarden et al., 2012). Third, the relationship between ambidexterity and firm survival during crisis has remained untested.

Prior research has failed to employ broad measures for operationalising the concept, with almost inexistent longitudinal research designs, which are essential to control for unobserved heterogeneity and endogeneity in analysing the linkage between ambidexterity and firm performance. First, this weakness may restrain the development of the concept since scholars may have applied their own sets of measures and definitions. Second, it limits the ability to document the effects of the concept over time.

This thesis aims to address the identified research gaps by developing a new firm-level analysis using financial performance ratios to operationalise the ambidexterity constructs. It derives an explanation of the relationship between the constructs, the probability of survival and performance using statistical methods, which are comparable, more convincing and objective in a large-scale longitudinal research design. The latter plays a defining role, because it explains the effects of strategic choices on survival and performance.

Table 8   Review of Ambidexterity Studies

No	Study	Research Purpose	Target Industry/ Year	Estimator	Variables	Conclusions
1	Gibson and Birkinshaw (2004).	Investigates contextual organisational ambidexterity which is defined as capacity to achieve alignment and adaptability simultaneously at a business level.	4195 firms from various industries and countries.	Questionnaire survey.	*Dependent variable:* • Performance. *Independent variables:* • Ambidexterity. • Organisation context.	Encouraging a supportive organisational context that generates capacities for alignment and adaptability may be a source of competitive advantage.
		Hypotheses: H1: The higher the level of ambidexterity in a business unit, the higher the level of performance. *(Supported.)* H2: The more that a business-unit context is characterised by an interaction of stretch, discipline, support, and trust, the higher the level of ambidexterity. *(Supported.)* H3: Ambidexterity mediates the relationship between context—as captured by the interaction of discipline, stretch, support and trust—and business-unit performance. *(Supported.)*					
2	He and Wong (2004).	Examines how exploration and exploitation can jointly influence firm performance in the context of firms' approach to technological innovation.	371 manufacturing firms in Singapore and 192 manufacturing firms in Malaysia.	Questionnaire survey.	*Dependent variable:* • Sales growth rate. *Independent variables:* • Exploration. • Exploitation.	Ambidexterity is positively related to sales growth rate.
		Hypotheses: H1a: There is a positive interaction effect between explorative and exploitative innovation strategies on firm performance. *(Supported.)* H1b: The relative imbalance (absolute difference) between explorative and exploitative innovation strategies is negatively related to firm performance (*Supported*, but *weak relationship*). H2: Firms that specialise in explorative innovation strategy exhibit larger intragroup variation in performance, relative to their mean values of performance, than firms that specialise in exploitative innovation strategy. *(Supported.)* H3: Ambidextrous firms (scoring high on both explorative and exploitative innovation strategies) exhibit smaller intragroup variation in performance, relative to their mean values of performance, than firms that specialise in explorative innovation strategy. *(Supported.)*					

3	Sidhu et al. (2004).	Conceptualises exploration orientation in term of scope of information acquisition.	200 Dutch metal and electrical engineering firms.	Questionnaire survey.	*Dependent variable:* • Exploration *Independent variables:* • Dynamism. • Organisation mission. • Prospector orientation. • Technology inflexibility • Environment-monitoring budget. • Formal environment-monitoring staff. • Organisation size.	Environment dynamism, stronger organisation mission and larger slack resources are associated with a greater exploration orientation.
		Hypotheses: H1: The greater the environmental dynamism, the greater the exploration orientation of an organization. *(Supported.)* H2: The stronger the organisation mission, the greater the exploration orientation. *(Supported.)* H3: A greater prospector orientation is positively related to a greater exploration orientation. *(Supported.)* H4: The greater the inflexibility of technology, the greater the exploration orientation. *(Not Supported.)* H5: The larger the environment-monitoring budget, the greater the exploration orientation. *(Supported.)* H6: The larger the formal environment-monitoring staff, the greater the exploration orientation. *(Supported.)*					
4	Auh and Menguc (2005).	Develops a contingency model that tests the moderating role of competitive intensity on the relative effectiveness of exploration and exploitation on firm performance for prospectors and defenders.	260 manufacturing firms in Australia.	Questionnaire survey.	*Dependent variable:* • Firm performance. *Independent variables:* • Exploration. • Exploitation. • Competitive intensity. • Firm efficiency. • Firm effectiveness.	• Excessive exploration is negatively related to firm performance. • Additional exploitation when confronted with increasing competition reduces firm performance.
		Hypotheses: H1a: For both prospectors and defenders, exploration will be more positively related to effective firm performance than will exploitation. *(Supported.)* H1b: For both prospectors and defenders, exploitation will be more positively related to efficient firm performance than will exploration. *(Not supported. For prospectors, but not defenders.)* H2: For defenders, the effect of exploration on effective firm performance will increase with competitive intensity, while the effect of exploitation on efficient firm performance will decrease with competitive intensity. *(Not supported. High levels of competitive intensity exploration was not related to firm effectiveness, while exploitation was related negatively and significant to firm efficiency.)* H3: For prospectors, the effect of exploration on effective firm performance will decrease when competition intensifies, while the effect of exploitation on efficient firm performance will increase when competition intensifies.					

		(*Not supported. High levels of competitive intensity exploration was not related to firm effectiveness; while exploitation was related positively and significantly to firm efficiency.*)			
5	Jansen et al. (2006).	Examines how environmental aspects (dynamism and competitiveness) moderate the effectiveness of exploratory and exploitative innovation.	283 large European financial services firm. Data collection: 2002.	Questionnaire survey.	*Dependent variables:* • Financial profitability. (Average profitability.) • Exploratory innovation. • Exploitative innovation. *Independent variables:* • Centralisation. • Formalisation. • Connectedness. • Environmental dynamism. • Environmental competitiveness.	• Centralisation negatively affects exploratory innovation. • Formalisation positively influences exploitative innovation. • Exploratory innovation is more effective in dynamic environments. • Exploitative innovation is more beneficial in competitive environments.

Hypotheses:

H1a: The higher a unit's centralisation of decision making the lower its level of exploratory innovation. *(Supported.)*

H1b: The higher a unit's centralisation of decision making the higher its level of exploitative innovation. *(Not supported.)*

H2a: The higher a unit's formalisation, the lower its level of exploratory innovation. *(Not supported.)*

H2b: The higher a unit's formalisation, the higher its level of exploitative innovation. *(Supported.)*

H3a: There will be an inverted U-shaped relationship between a unit's connectedness among its members and the level of exploratory innovation. *(Not supported.)*

H3b: The higher a unit's connectedness among its members, the higher its level of exploitative innovation. *(Supported.)*

H4a: Environmental dynamism positively moderates the relationship between exploratory innovation and financial performance. *(Supported.)*

H4b: Environmental dynamism negatively moderates the relationship between exploitative innovation and financial performance. *(Supported.)*

H5a: Environmental competitiveness negatively moderates the relationship between exploratory innovation and financial performance. *(Not supported.)*

H5b: Environmental competitiveness positively moderates the relationship between exploitative innovation and financial performance. *(Supported.)*

6	Lubatkin et al. (2006).	Focuses on the pivotal role of top management team behavioural integration in assisting the processing of dissimilar demands essential to attaining ambidexterity in SMEs.	139 SMEs in New England.	Questionnaire survey. 5-point Likert scale.	*Dependent variable:* • Relative firm performance. *Independent variables:* • Behavioural integration. • Ambidexterity orientation.	• Senior managers of larger firms may want to reconsider creating structurally separate business units that focus on either exploitation or exploration, and instead strive to create business units that are capable of pursuing both.

Hypotheses:

H1: The level of behavioural integration of top management teams in SMEs is positively associated with the extent to which they pursue an ambidextrous orientation. *(Supported.)*

H2: The extent to which SMEs pursue an ambidextrous orientation is positively associated with their subsequent relative performance. *(Supported.)*

7	Ambos et al. (2008).	Examines the tensions that make it difficult for a research-oriented university to achieve commercial outcomes.	207 academic research projects funded by Engineering and Physical Sciences Research Council (EPSRC) in the United Kingdom.	Questionnaire survey.	*Dependent variable:* • Commercial output. (Patent, license, spin-out company) *Independent variables:* • Organisation-Level Determinants of Commercial Outputs. • Individual-Level Determinants of Commercial Outputs.	• Universities show they are able to manage between academic and commercial demands, through creation of 'dual structures'. • People who deliver commercial outcomes tend to be different to those who are accustomed to producing academic outcomes.
		Hypotheses: H1a: Research projects that take place in universities with a specialised technology transfer office (TTO), have a higher likelihood of a commercial output from the project. *(Supported.)* H1b: The greater the breadth of technology transfer office (TTO) support in the university where the research project takes place, the higher the likelihood of commercial output from the project. *(Not supported.)* H1c: The higher the experience of the technology transfer office (TTO) in the university where the research project takes place, the higher the likelihood of a commercial output from the project. *(Not supported.)* H2: The higher the scientific excellence of the academic department where the research project takes place, the higher the likelihood of a commercial output from the project. *(Supported.)* H3a: Compared to projects led by professors, projects led by lower-ranking academics will have a higher likelihood of a commercial output. *(Supported.)* H3b: The less time the principal investigator has spent in academia, the higher the likelihood of a commercial output from the project. *(Supported.)* H4: The greater the experience of the principal investigator with industry interaction, the higher the likelihood of a commercial output from the project. *(Not supported.)* H5: The lower the scientific excellence of the principal investigator of the research project, the higher the likelihood of a commercial output from the project. *(Supported.)* H6: The higher: (a) The principal investigator's belief in the compatibility between industry engagement and an academic career, the stronger the relationship. *(Supported.)* (b) The principal investigator's interest in applied research, *(Supported.)* (c) The likelihood of commercial output from the project. *(Supported.)*				
8	Menguc and Auh (2008).	Examines the relationship between ambidexterity and firm performance for prospectors and defenders.	260 Australian firms in a variety of manufacturing industry.	Questionnaire survey.	*Dependent variable:* • Firm performance. *Independent variables:* • Business strategy. • Ambidexterity. • Market orientation.	Exploration and exploitation are complementary only when high market orientation.

Hypotheses:
H1: For prospectors, the positive effect of exploration will be greater than the positive effect of exploitation on firm performance. *(Supported.)*
H2: For defenders, the positive effect of exploitation will be greater than the positive effect of exploration on firm performance. (*No relationship*)
H3: Ambidexterity has a negative effect on firm performance for both prospectors and defenders. (*No relationship*)
H4: The negative effect of ambidexterity on firm performance will be stronger for defenders than for prospectors. *(Supported.)*
H5: The negative effect of ambidexterity on firm performance will be attenuated as a result of greater market orientation among both prospectors and defenders. *(Supported.)*
H6: Market orientation will be higher among prospectors than defenders. *(Supported.)*
H7: As market orientation increases, the negative effect of ambidexterity on firm performance will become less negative for prospectors than for defenders. *(Supported.)*

9	Morgan and Berthon (2008).	Establishes relationships between market orientation and generative learning and their respective impact on exploitative innovation strategy and explorative innovation strategy.	160 bioscience firms in the UK.	Questionnaire survey.	*Dependent variable:* • Business performance. *Independent variables:* • Market orientation. • Generative learning. • Exploitative and explorative innovation strategy.	Exploitative innovation strategy and explorative innovation strategy explains firms' business performance.

Hypotheses:
H1: Market orientation and generative learning are positively associated. *(Supported.)*
H2: Market orientation is positively associated with exploitative innovation strategy. *(Supported.)*
H3: Generative learning is positively associated with explorative innovation strategy. *(Supported.)*
H4: Exploitative innovation strategy is positively associated with business performance. *(Supported.)*
H5: Explorative innovation strategy is positively associated with business performance. *(Supported.)*
H6: Firms exhibiting ambidexterity (those specializing in both exploitative and explorative innovation strategies) are positively associated with business performance. *(Supported.)*

10	Cao et al. (2009).	Identifies organisational ambidexterity by differentiate the concept into balance dimension of ambidexterity and combined dimension of ambidexterity.	High tech firms in China. 2006.	Questionnaire survey.	*Dependent variable:* • Firm performance. *Independent variables:* • Exploration. • Exploitation.	• Balanced ambidexterity is more beneficial to resource-constrained firms. • Combined ambidexterity is suitable to firms having greater access to internal and/external resources.

		Hypotheses: H1a: Balanced ambidexterity (BD) is positively related to firm performance. *(Supported.)* H1b: Combined ambidexterity (CD) is positively related to firm performance. *(Supported.)* H1c: High levels of both BD and CD synergistically lead to better firm performance. *(Supported.)* H2a: Organisation size moderates the relationship between BD and firm performance. High BD is more beneficial for smaller firms. *(Supported.)* H2b: Organisation size moderates the relationship between CD and firm performance. High CD is more beneficial to larger firms. *(Supported.)* H3a: Environmental munificence moderates the relationship between BD and firm performance. High BD is more beneficial for firms operating in less munificent environments. *(Supported.)* H3b: Environmental munificence moderates the relationship between CD and firm performance. High CD is more beneficial for firms operating in more munificent environments. *(Supported.)*			
11	Cao et al. (2010)	Demonstrates how firms attain ambidexterity by looking at top management teams.	122 SMEs in three high-tech parks in China.	Questionnaire survey.	*Dependent variable:* • Organisational ambidexterity. *Independent variables:* • Extensiveness of the CEO's information network. • CEO-Top Management Team (TMT) communication richness. • CEO-TMT functional complementarity. • CEO-TMT power decentralisation.	• CEO network extensiveness was positively associated with the firm's ambidextrous orientation. • Relationship between CEO network extensiveness and organizational ambidexterity is more pronounced when the CEO communicates well with the other TMT members.
		Hypotheses: H1: The extensiveness of the CEO's information network in SMEs is positively associated with the extent to which they pursue an ambidextrous orientation. *(Supported.)* H2: The positive relationship between the extensiveness of the CEO's information network and SMEs' pursuit of an ambidextrous orientation will be strengthened as communication richness between the CEO and the rest of the TMT increases. *(Supported.)* H3: The positive relationship between the extensiveness of the CEO's information network and SMEs' pursuit of an ambidextrous orientation will be strengthened as functional complementarity between the CEO and the rest of the top management team increases. *(Not supported)* H4: The positive relationship between the extensiveness of the CEO's information network and SMEs' pursuit of an ambidextrous orientation will be strengthened as power decentralization within the TMT increases. *(Supported.)*			
12	Mom et al. (2009).	Investigates managers' ambidexterity.	716 business unit level and operational level managers in 5 large firms.	Questionnaire survey.	*Dependent variable:* • Managers' ambidexterity. *Independent variable*: • A manager's decision-making authority.	• Manager's decision-making authority positively relates to this manager's ambidexterity. • Both the participation of a manager in cross-functional interfaces and the connectedness of a manager to other organisation

						members positively relate to this manager's ambidexterity.

Hypotheses:

H1: A manager's decision-making authority will be positively related to this manager's ambidexterity. *(Supported.)*

H2: Formalisation of a manager's tasks will be negatively related to this manager's ambidexterity. *(Not supported.)*

H3: Participation in cross-functional interfaces by a manager will be positively related to this manager's ambidexterity. *(Supported.)*

H4: There will be an inverted U-shaped relationship between connectedness of a manager to other organisation members and this manager's ambidexterity. *(Not supported.)*

H5: There will be positive interaction effects between a manager's decision-making authority and participation in cross-functional interfaces by the manager, on this manager's ambidexterity. *(Supported.)*

H6: There will be positive interaction effects between a manager's decision-making authority and connectedness of the manager to other organisation members, on this manager's ambidexterity. *(Supported.)*

H7: There will be positive interaction effects between formalization of a manager's tasks and participation in cross-functional interfaces by the manager, on this manager's ambidexterity. *(Supported.)*

H8: There will be positive interaction effects between formalization of a manager's tasks and connectedness of the manager to other organisation members, on this manager's ambidexterity. *(Supported.)*

| 13 | Simsek (2009). | Review previous research on the conceptualisation, antecedents, and consequences of ambidexterity. | Not relevant. | Reviewed existing research using an input–process–output framework. | • Constructs to develop argument and proposition.
• Interactive, cross-level influences.
• Organisational ambidexterity and performance link.
• Alternative conceptualisations of organisational ambidexterity.
• The effects of interfirm ties on organisational ambidexterity. | Organisational ambidexterity remains an under theorised, under conceptualised, and poorly understood phenomenon. |

Propositions:

P1a: Network centrality has a curvilinear (inverted U-shaped) relationship with organisational ambidexterity.

P2a: Diversity of the organisation's network of ties is positively related to organisational ambidexterity.

P2b: A dual structural architecture positively moderates the relationship between network diversity and organisational ambidexterity, such that when an organization has this structure, the relationship will be stronger.

P3a: Behavioural context positively moderates the curvilinear relationship between network centrality and organisational ambidexterity, such that in a high-performance context, the apex of the curve will shift to the right and upward, further increasing organisational ambidexterity.

P3b: Behavioural context positively moderates the relationship between network diversity and organisational ambidexterity, such that in a high-performance context, this relationship will be stronger.

P4a: The level of top management team behavioural integration positively moderates the curvilinear relationship between network centrality and organisational ambidexterity, such that when it is high, the apex of the curve will shift to the right and upward, further increasing organisational ambidexterity.

P4b: The level of top management team behavioural integration positively moderates the relationship between network diversity and organisational ambidexterity, such that when it is high, this relationship will be stronger.

		P5a: Environmental dynamism negatively moderates the curvilinear relationship between network centrality and organisational ambidexterity, such that when dynamism is high, the apex of the curve will shift to the left and downward, thereby decreasing OA. P5b: Environmental dynamism negatively moderates the relationship between network diversity and OA, such that when dynamism is high, this relationship will be weaker. P6a: Environmental complexity positively moderates the curvilinear relationship between network centrality and OA, such that when complexity is high, the apex of the curve will shift to the right and upward, further increasing OA. P6b: Environmental complexity positively moderates the relationship between network diversity and OA, such that when complexity is high, this relationship will be stronger. P7: Environmental dynamism positively moderates the relationship between OA and organizational performance, such that when dynamism is high, this relationship will be stronger. P8: Environmental complexity positively moderates the relationship between OA and organizational performance, such that when complexity is high, this influence will be stronger.				
14	William et al. (2010).	Investigates the performance implications of exploitation, exploration and organisational ambidexterity.	94 furniture tools and materials suppliers in the US.	Questionnaire survey.	*Dependent variable:* • Performance. *Independent variables:* • Strategic orientation. • Deftness, potency, communication/cooperation and centralisation.	• Low centralisation is related to organisational ambidexterity. • Ambidexterity is positively related to revenue and growth.
		Hypotheses: H1: Firms that engage in an implicit ambidextrous strategy experience greater performance than firms with an exploitation or exploration strategy. *(Supported.)* H2: Greater levels of organisational deftness are positively related to an ambidextrous adaptive strategy. *(Supported.)* H3: Greater levels of group potency are positively related to an ambidextrous adaptive strategy. *(Supported.)* H4: Greater levels of management communication and cooperation are positively related to an ambidextrous adaptive strategy. *(Supported.)* H5: Greater levels of centralization are negatively related to an ambidextrous adaptive strategy. *(Supported.)*				
15	Boumgarden et al. (2012).	Explains and illustrates the comparative functionality of organisational ambidexterity and vacillation. Compare respective relationships as strategic paths to economic performance.	• 25 years of Hewlett-Packard's organisational history. • 20 years of USA Today.	Case study.	*Dependent variables:* • Performance. *Independent variables:* • Organisational ambidexterity. • Organisational vacillation.	• Vacillation may offer higher long run performance than ambidexterity. • Ambidexterity enhances performance on the margin when utilised within larger epochs of vacillation. • Ambidexterity and vacillation are complements with respect.

16	Fernhaber and Patel (2012).	Examines relationship between absorptive capacity and ambidexterity are vital to enhancing the benefits and mitigating the costs of increasing product portfolio complexity.	215 young high tech firms.	Questionnaire survey.	*Dependent variables:* • Performance. (Sales growth, employee growth, and operating profit growth.) • Product portfolio complexity. *Independent variable:* • Ambidexterity. • Absorptive capacity.	Positive moderating effects of absorptive capacity and ambidexterity on the inverted U-shaped relationship between product portfolio complexity and firm performance.
		Hypotheses: H1: There will be an inverted U-shaped relationship between PPC and firm performance where product portfolio complexity is positively related to firm performance to a point, after which it becomes negative. *(Supported.)* H2: Absorptive capacity moderates the inverted U-shaped relationship between product portfolio complexity and firm performance such that at high levels of PPC, firms high in absorptive capacity outperform firms low in absorptive capacity. *(Supported.)* H3: Ambidexterity moderates the inverted U-shaped relationship between product portfolio complexity and firm performance such that at high levels of product portfolio complexity, firms that are high in ambidexterity outperform firms that are low in ambidexterity. *(Supported.)*					
17	Kouropalatis et al. (2012).	Examines strategic ambidexterity through flexibility and commitment to identify if performance benefits from both concept.	Marketing firms in the UK.	Questionnaire survey.	*Dependent variable:* • Strategic ambidexterity. *Independent variables:* • Flexibility. • Commitment.	Strategic ambidexterity endows significant performance benefits.
		Hypotheses: H1: Firms with high levels of strategic ambidexterity exhibit greater levels of strategic resources compared with low strategic ambidexterity firms. *(Supported.)* H2: Firms with high levels of strategic ambidexterity exhibit greater levels of decentralisation compared with low strategic ambidexterity firms. *(Supported.)* H3: Firms with high levels of strategic ambidexterity exhibit greater levels of informalisation compared with low strategic ambidexterity firms. (*Weak relationship*) H4: Firms with high levels of strategic ambidexterity exhibit greater levels of product-market strategy process effectiveness compared with low strategic ambidexterity firms. *(Supported.)* H5: Firms with high levels of strategic ambidexterity exhibit greater levels of implementation effectiveness compared with low strategic ambidexterity firms. *(Supported.)* H6a: Firms with high levels of strategic ambidexterity exhibit greater levels of market performance compared with low strategic ambidexterity firms. *(Supported.)* H6b: Firms with high levels of strategic ambidexterity exhibit greater levels of financial performance compared with low strategic ambidexterity firms. *(Supported.)*					

18.	Patel et al. (2012).	Explores the applicability of two organisational learning contingencies to the operations environment: operational absorptive capability and operational ambidexterity.	852 manufacturing firms	Questionnaire survey.	*Dependent variables:* • Performance: sales growth, employee growth, and operational profit growth. *Independent variables:* • Environmental uncertainty. • Manufacturing flexibility. • Operational absorptive capacity. • Organisational ambidexterity. *Control variables:* • Firm size and age.	• Firms increase manufacturing flexibility during environmental uncertainty. • Firms with manufacturing flexibility capabilities has better performance. • Firms that are better able to acquire, assimilate, and transform information are more likely to respond to environmental uncertainty with manufacturing flexibility. • Ambidextrous firms are more likely to realise returns from manufacturing flexibility.
		Hypotheses: H1: Manufacturing flexibility mediates the relationship between environmental uncertainty and firm performance. *(Supported)* H2: Operational absorptive capacity moderates the mediated relationship between environmental uncertainty and firm performance. Specifically, operational absorptive capacity positively moderates the relationship between (a) environmental uncertainty and manufacturing flexibility, and (b) manufacturing flexibility and firm performance. *(Supported)* H3: Operational ambidexterity moderates the mediated relationship between environmental uncertainty and firm performance. Specifically, operational ambidexterity positively moderates the relationship between (a) environmental uncertainty and manufacturing flexibility, and (b) manufacturing flexibility and firm performance. *(Supported)*				
19	Wei et al. (2013).	Explores how firms dynamically reconfigure resource portfolios to leverage organisational ambidexterity.	Firms from broad scope of industries.	Interview survey.	*Dependent variable:* • Exploitative learning. • Explorative learning. *Independent variables:* • New product development. • Resource flexibility. • Coordination flexibility.	Optimal level of exploration to exploitation is dependent on the level of resource flexibility or coordination flexibility.

<table>
<tr><td colspan="7">Hypotheses:
H1: Relative exploratory dimension has an inverse U-shaped effect on new product development performance. (Supported.)
H2: The interactive dimension is positively related to new product development performance. (Supported.)
H3a: When the relative exploratory dimension is low; resource flexibility strengthens the positive effect of the relative exploratory dimension on new product development performance; when the relative exploratory dimension is high, resource flexibility weakens the negative effect of the relative exploratory dimension on new product development performance. (Supported.)
H3b: Resource flexibility strengthens the positive effect of the interactive dimension on new product development performance. (Supported.)
H4a: When the relative exploratory dimension is low, coordination flexibility strengthens the positive effect of the relative exploratory dimension on new product development performance; when the relative exploratory dimension is high, coordination flexibility weakens the negative effect of the relative exploratory dimension on new product development performance. (Supported.)
H4b: Coordination flexibility strengthens the positive effect of the interactive dimension on new product development performance. (Supported.)</td></tr>
<tr>
<td>20</td>
<td>Voss and Voss (2013).</td>
<td>Connects organisational performance to strategic combinations of exploration and exploitation in both product and market domains.</td>
<td>162 non-profit professional theatre industry in the United States.</td>
<td>Questionnaire survey.</td>
<td>Dependent variable:
• Ticket revenue per available seat.
• Marketing expenditure.

Independent variables:
• Strategic emphasis measures. (Experimentation with non-traditional play or incremental departure from tradition.)

Moderating variables:
• Firm size.
• Firm age.</td>
<td>• Larger, older firms have the resources, capabilities, and experience required to benefit from a product ambidexterity strategy, but larger, older firms are less likely to implement product ambidexterity.
• Only larger firms have the resources and capabilities required to benefit from a market ambidexterity strategy.
• Developing and sustaining market ambidexterity is necessary to drive long-term growth.</td>
</tr>
</table>

		Hypotheses:
		H1: A pure focus on:
		    (a) Product exploitation and market exploitation.
		       (Supported. Product exploitation x Market exploitation interaction is significantly positive.)
		    (b) Product exploration and market exploration will exert positive interaction effects on SME revenue performance.
		       (Supported. Product exploration x Market exploration interaction is significantly positive.)
		H2: Cross-functional ambidexterity featuring:
		    (a) Product exploitation and market exploration (a market development strategy).
		       (Supported. Product exploitation x Market exploration interaction is significantly positive.)
		    (b) Product exploration and market exploitation (a product development strategy) will exert positive interaction effects on SME revenue performance.
		       (Not supported. Product exploration x Market exploitation interaction term is not significant.)
		H3: Firm size will exert a positive moderating effect on product and market ambidexterity, such that:
		    (a) Product exploration, product exploitation, and firm size will exert a positive three-way interaction effect on SME revenue performance.
		       (Supported. Product exploitation x Product exploration x Firm size interaction is significantly positive.)
		    (b) Market exploration, market exploitation, and firm size will exert a positive three-way interaction effect on SME revenue performance.
		       (Supported. Market exploitation x Market exploration x Firm size interaction is significantly positive.)
		H4: Firm age will exert a positive moderating effect on product and market ambidexterity, such that
		    (a) Product exploration, product exploitation, and firm age will exert a positive three-way interaction effect on SME revenue performance.
		       (Supported. Product exploitation x Product exploration x Firm age interaction significantly is positive.)
		    (b) Market exploration, market exploitation, and firm age will exert a positive three-way interaction effect on SME revenue performance.
		       (Supported. Market exploitation x Market exploration x Firm age interaction is significantly positive.)			

21	Blindenbach-Driessen and Ende (2014).	Investigates the effects of having a separate innovation unit on exploration, exploitation, and ambidexterity in manufacturing and service firms.	1281 manufacturing and 2704 service firms in Netherlands.	2004-2006 Dutch Community Innovation Survey (CIS).	*Dependent variables:* • Exploration. • Exploitation. • Ambidexterity *Independent variables:* • Industry type (manufacturing versus service). • Separate innovation unit.	• A separate innovation unit increases exploration, exploitation, and ambidexterity. • Both manufacturing and service firms benefit from having a separate innovation unit, with the advantages being greatest for manufacturing firms.

Hypotheses:
H1: Having a separate innovation unit has a positive effect on exploration. *(Supported.)*
H2a: Having a separate innovation unit has a negative effect on exploitation. *(Not supported.)*
H2b: Having a separate innovation unit has a positive effect on exploitation. *(Supported.)*
H3: Having a separate innovation unit has a positive effect on ambidexterity. *(Supported.)*
H4: In service firms, having a separate innovation unit has a less positive effect on exploration than in manufacturing firms. *(Supported.)*
H5a: In service firms, having a separate innovation unit has a less negative effect on exploitation than in manufacturing firms. *(Not supported.)*
H5b: In service firms, having a separate innovation unit has a less positive effect on exploitation than in manufacturing firms. *(Not supported.)*
H6: In service firms, having a separate innovation unit has a less positive effect on ambidexterity than in manufacturing firms. *(Supported.)*

22	Hill and Birkinshaw (2014).	Examines why and how some corporate venture units last significantly longer than others.	95 corporate venture units listed in the 2001 Corporate Venturing Directory and Yearbook represented by broad cross-section of industries.	2 steps: 1. Exploratory interviews with 50 individuals in 40 corporate venture units across eight countries to understand corporate venture. 2. Formed and distributed questionnaire survey. *Control variables:* • Number of full time employees. • Age of the unit. • Number of investments.	*Dependent variable:* • Survival. *Independent variables:* • Venturing ambidexterity. (Exploration [Building new capabilities for the parent firm] and exploitation [Making better use of the existing capabilities of the parent firm].) • Relationship with senior executives (in the parent firm). • Relationship with business units. • Relationship with the venture capitalists community.	• Exploration-oriented unit does not only explore—it must also develop the capacity to integrate its activities with those of its exploitation-oriented sibling units. • Access to resources as a facilitator of ambidexterity. • Resource brokering strategies may provide one means through which organisations and their units overcome trade-offs imposed by resource scarcity.

Hypotheses:
H1: The higher the level of venturing ambidexterity (i.e., the interaction of exploitation and exploration), the higher the likelihood of survival of the corporate venture unit. *(Supported.)*
H2: A positive three-way interaction occurs between the strength of a CV unit's relationships with:
    a) Senior executives in the parent firm. *(Supported.)*
    b) Other business units. *(Supported.)*
    c) The venture capitalist community, and the unit's level of venturing ambidexterity. *(Supported.)*
H3: Venturing ambidexterity mediates between the relational context and the likelihood of survival of the corporate venture unit. *(Supported.)*

| 23 | Tan and Liu (2014). | Examines how responsive and proactive market orientation affect business performance in SMEs from an ambidexterity perspective. | 186 high-tech firms in China. | Questionnaire survey. | *Dependent variable:*
• Business performance.

Independent variables:
• Responsive market orientation. | • Ambidexterity market orientation (AMO) has a positive impact on innovation ambidexterity. |

					• Proactive market orientation. • Exploitative innovation strategy. • Explorative innovation strategy.	• Ambidexterity innovation mediates the relationship between AMO and business performance. • Ambidexterity innovation has a more positive impact than exploitative and exploratory innovation strategies on business performance.

Hypotheses:

H1a: Responsive market orientation is positively related to exploitative innovation strategy. *(Supported.)*

H1b: Proactive market orientation is positively related to exploratory innovation strategy. *(Supported.)*

H2a: Exploitative innovation strategy is positively related to business performance. *(Supported.)*

H2b: Exploratory innovation strategy is positively related to business performance. *(Supported.)*

H2c: Innovation ambidexterity is positively related to business performance. *(Supported.)*

H3a: The relationship between innovation ambidexterity and business performance is more positive than the relationship between exploitative innovation strategy and business performance. *(Supported.)*

H3b: The relationship between innovation ambidexterity and business performance is more positive than the relationship between exploratory innovation strategy and business performance. *(Supported.)*

H4a: Exploitative innovation strategy mediates the relationship between responsive market orientation and business performance. (*No relationship*)

H4b: Exploratory innovation strategy mediates the relationship between proactive market orientation and business performance. (*No relationship*)

H5: Innovation ambidexterity mediates the relationship between ambidextrous market orientation and business performance. *(Supported.)*

24	Wang and Rafiq (2014).	Examines the relationships between ambidextrous organisational culture, contextual ambidexterity and new product innovation in a cross-cultural context.	150 UK and 242 Chinese high-tech firms.	Questionnaire survey.	*Dependent variables:* • New product innovation. • Contextual ambidexterity. *Independent variables:* • Organisational diversity. • Shared vision. • Competence exploration. • Competence exploitation. • Speed to the market.	Contextual ambidexterity and new product innovation outcomes are dependent on business unit level heterogeneity (ambidextrous organisational culture and R&D strength) rather than industry or cross-cultural differences.

Hypotheses:

H1: Ambidextrous organizational culture has a positive impact on contextual ambidexterity. *(Supported.)*

H2: Contextual ambidexterity has a positive impact on new product innovation outcomes. *(Supported.)*

H3: Contextual ambidexterity mediates the relationship between ambidextrous organisational culture and new product innovation outcomes. *(Supported.)*

3.4   The Development of Theoretical Framework: Ambidexterity, Crisis Survival

Why and how did some firms survive the Crisis, while others did not?

Earlier research claims that organisational practices, which simultaneously address exploitation and exploration, might be impossible to achieve. Thus, the contemporary strategic management theory has presented organisational ambidexterity in contrasting views and suggest focusing on either exploration or exploitation learning (Denison et al., 1995; Raisch and Birkinshaw, 2008). In contrast, empirical studies show that long-term success requires a balance between continuity and change (Tushman and Romanelli, 1985; Volberda, 1996; Brown and Eisenhardt, 1997; Leana and Barry, 2000; Probst and Raisch, 2005; Raisch and Birkinshaw, 2008). Hence, this study proposes that a successful firm should not only stress on exploitation and alignment, but also pursue radical transformation in periods of revolutionary change (Tushman and O'Reilly, 1996; Raisch and Birkinshaw, 2008).

Does simultaneously pursuing exploration and exploitation innovation compromise the potential value required by a firm to survive? Empirical studies show that given the potential challenges of pursuing the two innovations, ambidextrous firms might run the risk of being mediocre. From this perspective, it might be appropriate for firms to prioritise one activity over the other to avoid sacrificing internal consistency, which may lead to inferior performance compared to more focused firms (Miller and Friesen, 1986; Wernerfelt and Montgomery, 1988; Barney, 1991; Ghemawat and Ricart i Costa, 1993; Raisch and Birkinshaw, 2008).

However, based on the 'ambidexterity premise' concept, ambidextrous firms are more likely to achieve superior performance compared to firms prioritising a single learning mode. For instance, firms that chiefly engage in exploration ordinarily suffer from unrealised returns of its exploration, which later leads to endless downward cycle of identification, unrewarding search and failure (Levinthal and March, 1993; Volberda and Lewin, 2003; Raisch and Birkinshaw,

2008). In contrast, firms that principally pursue exploitation usually obtain predictable but unsustainable returns, because increasingly rigid cognitive maps and highly specialised competencies lead to a competence trap from the reduced ability to respond adequately to environmental changes (Leonard-Barton, 1992; Levinthal and March, 1993; Ahuja and Lampert, 2001; Raisch and Birkinshaw, 2008).

This thesis suggests that exploration and exploitation are inseparable (Floyd and Lane, 2000) and ambidexterity is the main driver of long-term firm performance and survival. In addition, literature suggests that the ability to achieve ambidexterity is related to dynamic capabilities (Teece et al., 1997; Eisenhardt and Martin, 2000; Raisch and Birkinshaw, 2008). At the same time, firms with insufficient resources may survive by focusing on one orientation and perform it well. Figure 6 shows the survival matrix, which reflects the characteristics and inherent capabilities of explorative and exploitative firms. The vertical axis depicts the magnitude of exploitation, whereas the horizontal axis shows the magnitude of exploration. Based on the survival matrix, high exploitation and high exploration lead to high performance, which implies crisis survival. Firms with low exploitation and low exploration may face discontinuity. This type of firms does not have sufficient resources to exploit, aggravated by the scarcity of resources during recession. Besides, they are not innovative enough to identify better ways to sustain their operations. Hence, the survival matrix predicts this type of firm cannot survive through a crisis. Next, firms with high exploitation and low exploration may survive by producing high quality products, having flexible operations which allows them to react accordingly during the crisis (for instance, the decrease in product demand during the financial crisis) and low production costs. Last, low exploitation and high exploration firms may survive through turbulences as the introduction of new products, exploration of new markets, high innovation in R&D and marketing, provide more strategic options to explore.

Figure 6   Ambidexterity: The Survival Matrix

(Source: Personal collection of author)
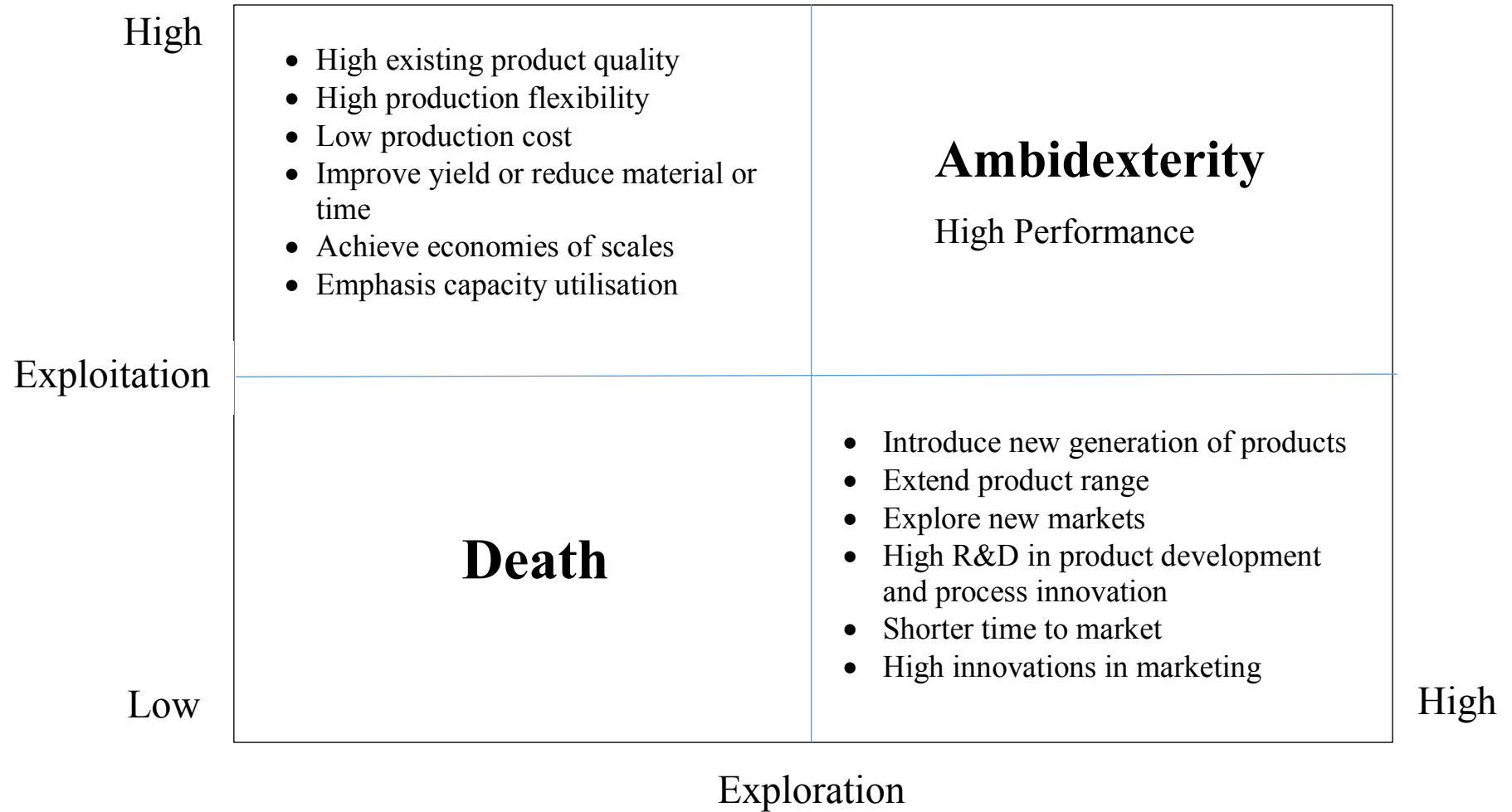
3.5   Theoretical Framework: Ambidexterity and Firm Performance

This section focuses on whether ambidextrous firms are in better position than non-ambidextrous firms to prosper after environmental jolts. It advocates that ambidexterity generates strategic options for firms to choose from when necessary.

Strategic options are defined as alternative courses of action (Sanchez, 1995; Greenley and Oktemgil, 1998; Rudd et al., 2008; Combe et al., 2012). They represent the possible outcomes of management cognition and are created by various forms of flexible behaviour. During an environmental turbulence, the availability of strategic options is important as they serve the role of alternative routes.

The relationship between ambidexterity and firm performance have been discussed widely in the strategic management literature. Most of the empirical studies suggest a positive relationship between ambidexterity, exploitation, exploration and organisational performance. However, no ambidexterity study to date has focused on post crisis firm performance.

Figure 7 shows the implications of organisational ambidexterity antecedents on the decision-making process to pursue either exploration or exploitation activities. The antecedents of ambidexterity from Section 3.2 are illustrated on the left side of the framework. They reflect the impetus that stimulates exploitation and exploration activities in the firm. All the ambidexterity antecedents form three clusters based on their inherent association with exploration and exploration activities discussed in Section 3.2 and summarised in Table 7. The first cluster shows that environmental dynamism, exogenous shocks, competitive intensity, appropriability regimes, absorptive capacity, young organisations and risk averse management style promote exploration activities. For instance, environmental dynamism and exogenous shocks may influence firms to introduce new products to cater for changes in consumer spending and requirements, explore new markets, increase research and development (R&D)

in production and marketing to attract their customers. The second cluster shows that high absorptive capacity, organisation maturity and risk averse management style can promote learning and constant improvement, fostering inertia to change and the tendency to avoid risky activities, which promote exploitation activities. The firms in this cluster strive to maintain high existing product quality and high production flexibility that lead to low production cost and economies of scale. Lastly, the third ambidexterity antecedents cluster is formed by organisational slack, organisational culture and organisational size. These antecedents can lead to either exploitation or exploration activities. For instance, abundant slack resources encourage firms to explore new opportunities and develop new product ranges, improving existing operations, flexibility and reducing operational cost.

Engaging in both exploration and exploitation activities creates ambidextrous firms (Figure 7). This thesis proposes that ambidexterity, exploitation and exploration are positively associated with firm performance during and after crisis, because they provide the ability to simultaneously juggle two different learning modes. In turn, this ability provides an array of strategic options, which promote the likelihood of organisational survival and better firm performance.

Figure 7   Theoretical Framework: Ambidexterity, Strategic Options and Survival

(Source: Personal collection of author)
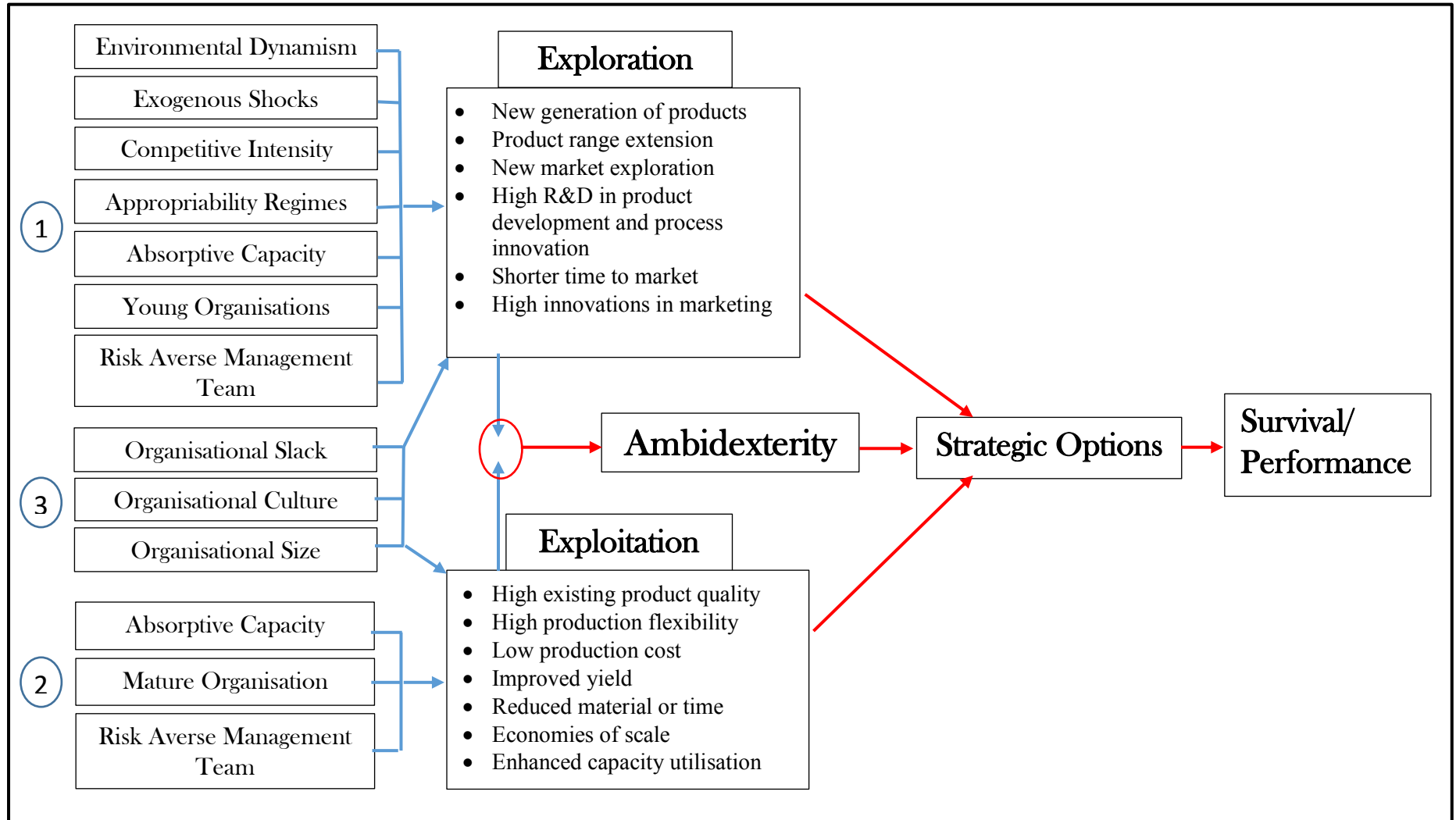
3.6   Conclusion

Earlier studies often refer to ambidexterity as insurmountable, but more recent studies have put forward different structural mechanisms to support ambidexterity (Raisch and Birkinshaw, 2008). There two factors that drive to the synthesis of the research streams on organisational ambidexterity study.

First, an increasing variety of research domains has led to a disconnected and complex ambidexterity concept. This may cause a lack of transparency in the literature as well as lower validity of the research findings. Hence, two theoretical models were proposed earlier in this chapter to integrate various insights from prior research.

Secondly, research gaps were found from the literature review that point to important avenues for future research. For instance, the view about organisational ambidexterity as a prerequisite for organisational survival and success during crisis remains a vacuum.

In this chapter, a comprehensive framework was developed to discuss the literature, antecedents, moderators and predictions about ambidexterity. Analysis shows that despite a rapid growth in the number of organisational ambidexterity studies, empirical tests on ambidexterity and firm's survival during crisis remain scarce. Overall, the organisational ambidexterity concept requires further research to overcome the remaining ambiguity.

CHAPTER 4: Research Methodology

4.0 Introduction

This chapter covers the overall research strategy of the thesis. It presents overarching information about the employed methods and key considerations underpinning this work. The detailed discussion of the sample or methodology specifics are covered in the respective empirical chapters.

The discussion will start with an overview of the epistemology and ontology, which guided the overall study. Then, it will examine the research strategy and research designs applied in previous ambidexterity studies. A discussion of the research data will follow, focusing on the general key data sources and justification of the data choice. The study will conclude with a brief discussion on the limitations of the selected methodology.

4.1 Epistemology and Ontology

Epistemology and ontology are two important elements of the philosophy of knowledge. Epistemology is concerned with the questions "what do you know?" and "how do you know it?", whilst ontology is concerned with "what is there?" (Bryman and Bell, 2011). The two elements act as the foundations to approach research questions.

Epistemology examines what constitutes acceptable knowledge in a field of study (Saunders et al., 2012). There are two primary "epistemological paradigms" in research: positivism and interpretivism. The paradigms are distinguished based on whether social science should or can be studied, following the same approach applied to the natural science (Bryman and Bell, 2011).

Positivism supports the application of natural science methods to study social reality and beyond. It proposes that an objective external reality exists beyond its descriptions and that only knowledge, which can be confirmed by the senses, is to be considered knowledge. Positivism entails both deductive and inductive strategy and it makes a sharp distinction between theory

and research (Bryman and Bell, 2011). The positivists view research as the medium to test theory and to provide material for the development of laws.

Interpretivism is a contrasting epistemology to positivism. The term subsumes the views of researchers, who are critical of the application of the scientific model to the social world research. Interpretivism suggests that the research about human behaviour and institutions is different from natural sciences. A study about the social world should adopt a different logic of procedure to reflect the distinctiveness of humans against the natural order.

This study applies the positivism paradigm (Bryman and Bell, 2011). The position that underlines this study is that organisational ambidexterity is an observable phenomenon, which can be measured despite the challenges and limitations discussed in earlier sections.

Ontology examines the natural social entities. The idea suggests there is no right or wrong answer, because the role, value sets or background of people affect the way we view the world. These positions are frequently referred to as objectivism and constructionism.

Objectivism is an ontological position that perceives social phenomena as external facts beyond our reach and influence. It implies that social phenomena exist independently. The alternative ontological position – constructivism - suggests that social phenomena and meaning are continually accomplished by social actors. Constructionism proposes that social phenomena is not produced through social interaction, but it is formed by a constant state of revision (Bryman and Bell, 2011). If the two positions are considered as the two ends of the ontological spectrum, this thesis leans towards the objectivism position. The underpinning study identifies firms as tangible objects with rules and regulations, who adopt standardised procedures to get things done, with hierarchy and mission statements that have existence and are separate from actors.

4.2   Research Methodology

The research methodology of this thesis is guided by the objective to answer three research questions about the influence of ambidexterity on firm performance. The research starts with identifying the impacts of the 2008-2009 Global Financial Crisis on firm turnover from firm level to industry level. Then, the study investigates the role of ambidexterity on the probability of firm survival during the Crisis. Finally, the research explores the types of ambidexterity that promote prosperity after the recession. Figure 8 shows the empirical scheme of the research, commencing with the broad point of inquiry and drilling down into the specific research questions.

Figure 8   Research Agenda
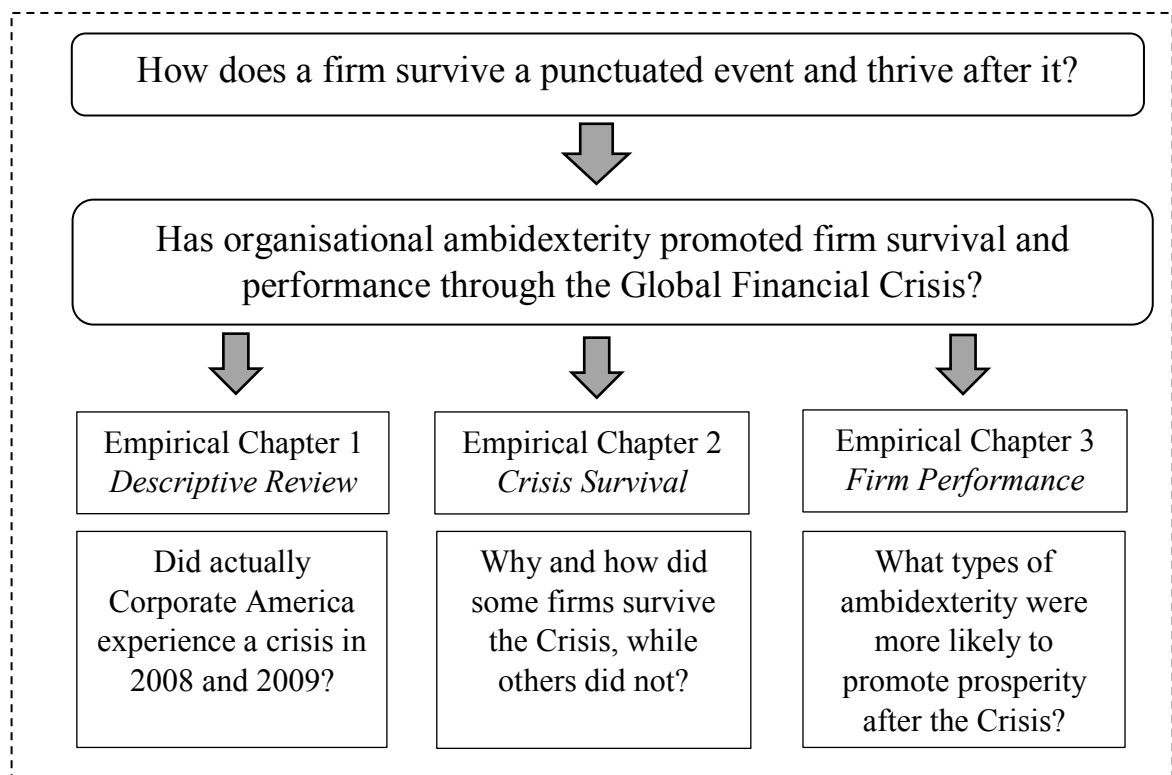
In order to achieve the research objective, this study has been designed to explore the role of organisational ambidexterity at firm level. Crucially, its longitudinal lens allowed an in-depth analysis of company performance before, during and after the Global Financial Crisis of 2008-2009 over a nine-year period and facilitated the discovery of empirical answers to the posed research questions.

4.3 Research Strategy

A research strategy is defined as a plan of action to answer research questions. Research strategies are principally linked to qualitative and quantitative research designs (Saunders et al., 2012). Qualitative strategy is associated with an inductive approach, where naturalistic and emergent research design is used to develop rich theoretical perspective. The research studies participants' meaning and their relationships using non-standardised collection techniques, which allow naturalistic and interactive research engagement. In contrast, quantitative strategy applies a deductive approach and is associated with positivism. It utilises predetermined and highly structured data collection techniques. Quantitative research measures the relationship between variables numerically and analyses using statistical techniques (Saunders et al., 2012). In a quantitative research, the researcher is seen as independent from those being researched or the respondents. This study uses a quantitative strategy, which followed the process of deduction, as outlined below:

1. Theoretical review: Firm survival and firm performance literature was reviewed to understand the research and applied methodologies to date. Then, a review of the ambidexterity studies was undertaken to grasp the role of organisational ambidexterity in promoting crisis survival and prosperity. Next, a conceptual framework was developed and specific theoretical pieces were included within each empirical chapter.

2. Hypothesis: Hypotheses for each of the three empirical questions were developed, based on the existing theory.

3. Data collection: Secondary data was gathered from a database for the dependent and independent variables, based on the theoretical review and the existing literature.

4. Concept operationalisation: The existing literature measures the ambidexterity construct using the questionnaire survey method. This study operationalised ambidexterity with

financial ratios. Please refer to section 4.7 for further details about operationalising the concept.

5. Findings: Data analysis was conducted and relevant findings emerged.

6. Hypothesis review: The hypotheses were reviewed and were either confirmed or rejected.

7. Revision of theory: In each empirical chapter and the overall thesis, the discussion was focused on the extent to which this study's findings and the theory aligned or contradicted each other.

Given the stated epistemology and ontology discussion as well as the research objective of this longitudinal study, a quantitative strategy seemed most appropriate to enable the analysis of large number of observations and data using statistical techniques.

4.4 Time Horizon

This thesis employed a combination of cross-sectional and longitudinal research designs, appropriate for each research question and discussed in the dedicated empirical chapters. Cross-sectional design involves the collection of data on more than one case at a single point in time. This research design allows the examination of the patterns of association, for instance firm turnover during a crisis period (Bryman and Bell, 2011). Longitudinal design is typically used to track changes, such as firm performance, over an extended period. This design provides insights into the time order of a variable and allows the establishment of causal inferences (Bryman and Bell, 2011).

4.5 Methods of Analysis

This study applied regression testing to explore the relationship between organisational ambidexterity and firm survival (Chapter 6) as well as firm performance after the crisis (Chapter 7). The overall methods of analysis applied in past ambidexterity studies will be discussed in

this section. Later in the thesis, each empirical chapter will contain a segment for scrutinizing the respective methods of analysis in greater detail.

Alignment with the Existing Studies on Ambidexterity

The choice of the research strategy, methods and designs in the existing ambidexterity studies were explored in order to ensure this study applied an appropriate methodology to fulfil its objectives. Table 9 shows a summary of 25 ambidexterity studies.

Several trends in the ambidexterity studies were revealed. Most of the research adopted the quantitative approach and relied on large samples. Questionnaire survey is the predominant method of analysis: out of 25 studies, 21 studies adopted the questionnaire survey method (Gibson and Birkinshaw, 2004; He and Wong, 2004; Sidhu et al., 2004; Auh and Menguc, 2005; Jansen et al., 2006; Lubatkin et al., 2006; Ambos et al., 2008; Menguc and Auh, 2008; Morgan and Berthon, 2008; Mom et al., 2009; Cao et al., 2009; Cao et al., 2010; William et al., 2010); Fernhaber and Patel, 2012; Kouropalatis et al., 2012; Patel et al., 2012; Voss and Voss, 2013; Blindenbach-Driessen and Ende, 2014; Hill and Birkinshaw, 2014; Tan and Liu, 2014; Wang and Rafiq, 2014), one interview (Wei et al., 2013); one case study (Boumgarden et al., 2012); and two studies reviewed the existing literature (Raisch et al. 2009; Simsek, 2009). Cross-sectional research dominates and none of the studies adopted a longitudinal approach.

In addition, the dependent variables of the existing studies consist of firm performance (Gibson and Birkinshaw, 2004; Auh and Menguc, 2005; Jansen et al., 2006; Lubatkin et al., 2006; Ambos et al., 2008; Menguc and Auh, 2008; Morgan and Berthon, 2008; Cao et al., 2010; Mom et al., 2009; William et al., 2010; Boumgarden et al., 2012; Fernhaber and Patel, 2012; Tan and Liu, 2014), sales growth rate (He and Wong, 2004; Fernhaber and Patel, 2012; Patel et al., 2012), exploration (Sidhu et al., 2004; Cao et al., 2009; Wei et al., 2013; Blindenbach-Driessen and Ende, 2014), exploitation (Cao et al., 2009; Wei et al., 2013; Blindenbach-Driessen and Ende,

2014), ambidexterity (Kouropalatis et al., 2012; Blindenbach-Driessen and Ende, 2014; Wang and Rafiq, 2014), marketing expenditure (Voss and Voss, 2013) and corporate venture survival rate (Hill and Birkinshaw, 2014). The independent variables consist of firm involvement in ambidexterity activities (Gibson and Birkinshaw, 2004; He and Wong, 2004; Auh and Menguc, 2005; Lubatkin et al., 2006; Ambos et al., 2008; Menguc and Auh, 2008; Cao et al., 2009; Boumgarden et al., 2012; Patel et al., 2012; Hill and Birkinshaw, 2014), environmental dynamism (Sidhu et al., 2004; Jansen et al., 2006; Patel et al., 2012), innovation (Sidhu et al., 2004; Morgan and Berthon, 2008; Blindenbach-Driessen and Ende, 2014), firm size (Sidhu et al., 2004), management style (Jansen et al., 2006; Mom et al., 2009), market orientation (Menguc and Auh, 2008; Tan and Liu, 2014), the role of the top management team (Cao et al., 2010), strategic orientation (William et al., 2010; Voss and Voss, 2013; Wang and Rafiq, 2014), absorptive capacity (Fernhaber and Patel, 2012; Patel et al., 2012), flexibility (Kouropalatis et al., 2012; Patel et al., 2012; Wei et al., 2013) and new product development (Wei et al., 2013).

This thesis aims to address the research gaps by developing a new firm-level analysis using business performance ratios to operationalise the ambidexterity. It derives an explanation of the relationship between the constructs, the probability of survival and performance using statistical methods, which are comparable, more convincing and objective in a large-scale longitudinal research design. The latter plays a defining role, because it explains the effects of strategic choices on survival and performance.

Table 9   Summary of Ambidexterity Studies

No	Study	Research Purpose	Target Industry/Year	Estimator	Variables	Conclusions
1	Gibson and Birkinshaw (2004).	Investigates contextual organisational ambidexterity, which is defined as capacity to achieve alignment and adaptability simultaneously at a business level.	4195 firms from various industries and countries.	Questionnaire survey.	*Dependent variable:* • Performance. *Independent variables:* • Ambidexterity. • Organisation context.	Encouraging a supportive organisational context that generates capacities for alignment and adaptability may be a key source of competitive advantage.
2	He and Wong (2004).	Examines how exploration and exploitation can jointly influence firm performance in the context of firms' approach to technological innovation.	371 manufacturing firms in Singapore and 192 manufacturing firms in Malaysia.	Questionnaire survey.	*Dependent variable:* • Sales growth rate. *Independent variables:* • Exploration. • Exploitation.	Ambidexterity is positively related to sales growth rate.
3	Sidhu et al. (2004).	Conceptualises exploration orientation in terms of scope of information acquisition.	200 Dutch metal and electrical engineering firms.	Questionnaire survey.	*Dependent variable:* • Exploration *Independent variables:* • Dynamism • Organisation mission • Prospector orientation • Technology inflexibility • Environment-monitoring budget • Formal environment-monitoring staff. • Organisation size	Environment dynamism, stronger organisation mission, a prospector orientation and slack resources are associated with greater exploration orientation.
4	Auh and Menguc (2005).	Develops a contingency model that tests the moderating role of competitive intensity on the relative effectiveness of exploration and exploitation on	260 manufacturing firms in Australia.	Questionnaire survey.	*Dependent variable:* • Firm performance. *Independent variables:*	• Excessive exploration does not positively relate to effective firm performance. • Additional exploitation, when confronted with

		firm performance for prospectors and defenders.			• Exploration. • Exploitation. • Competitive intensity. • Firm efficiency. • Firm effectiveness.	increased competition, contributes to less efficient firm performance.
5	Jansen et al. (2006).	Examines how environmental aspects (dynamism and competitiveness) moderate the effectiveness of exploratory and exploitative innovation.	283 large European financial services firm. Data collection: 2002.	Questionnaire survey. 7-point Likert scale.	*Dependent variables:* • Financial profitability. (Average profitability.) • Exploratory innovation. • Exploitative innovation. *Independent variables:* • Centralisation. • Formalisation. • Connectedness. • Environmental dynamism. • Environmental competitiveness.	• Centralisation negatively affects exploratory innovation. • Formalisation positively influences exploitative innovation. • Exploratory innovation is more effective in dynamic environments. • Exploitative innovation is more beneficial in competitive environments.
6	Lubatkin et al. (2006).	Focuses on the pivotal role of top management team behavioural integration in assisting the processing of dissimilar demands essential to attaining ambidexterity in SMEs.	139 SMEs in New England.	Questionnaire survey. 5-point Likert scale.	*Dependent variable:* • Relative firm performance. *Independent variables:* • Behavioural integration. • Ambidexterity orientation.	• Large firms may want to reconsider creating structurally separate business units that focus on either exploitation or exploration, and instead strive to create business units that are capable of pursuing both.
7	Ambos et al. (2008).	Examines the tensions that make it difficult for a research-oriented university to achieve commercial outcomes.	207 academic research projects funded by Engineering and Physical Sciences Research Council (EPSRC) in the United Kingdom.	Questionnaire survey.	*Dependent variable:* • Commercial output. (Patent, license, spin-out company) *Independent variables:*	• Universities show they are able to manage academic and commercial demands through the creation of 'dual structures'. • People who deliver commercial outcomes tend to be different from these

					• Organisation-Level Determinants of Commercial Outputs. • Individual-Level Determinants of Commercial Outputs.	who are accustomed to producing academic outcomes.
8	Menguc and Auh (2008).	Examines the relationship between ambidexterity and firm performance for prospectors and defenders.	260 Australian firms in a variety of manufacturing industry.	Questionnaire survey.	*Dependent variable:* • Firm performance. *Independent variables:* • Business strategy. • Ambidexterity. • Market orientation. *Control variables:* • CEO background. • Type of firms. • Firm size (log transformation of full time employees. • Type of operations. • Environmental dynamism (5-point Likert scale.	Exploration and exploitation are complementary only in high market orientation.
9	Morgan and Berthon (2008).	Establishes relationships between market orientation and generative learning and their respective impact on exploitative innovation strategy and explorative innovation strategy.	160 bioscience firms in the UK.	Questionnaire survey.	*Dependent variable:* • Business performance. *Independent variables:* • Market orientation. • Generative learning. • Exploitative and explorative innovation strategy.	Exploitative innovation strategy and explorative innovation strategy explain improvements in firms' business performance.

10	Cao et al. (2009).	Identifies organisational ambidexterity by differentiate the concept into balance dimension of ambidexterity and combined dimension of ambidexterity.	High tech firms in China. 2006.	Questionnaire survey.	*Dependent variable:* • Firm performance. *Independent variables:* • Exploration. • Exploitation.	• Balanced ambidexterity is more beneficial to resource-constrained firms. • Combined ambidexterity is suitable to firms having greater access to internal and external resources.
11	Cao et al. (2010)	Demonstrates how firms might attain ambidexterity by looking at top management teams.	122 SMEs in three high-tech parks in China.	Questionnaire survey.	*Dependent variable:* • Organisational ambidexterity. *Independent variables:* • Extensiveness of the CEO's information network. • CEO-Top Management Team (TMT) communication richness. • CEO-TMT functional complementarity. • CEO-TMT power decentralisation.	• CEO network extensiveness is positively associated with the firm's ambidextrous orientation. • Relationship between CEO network extensiveness and organizational ambidexterity is more pronounced when the CEO communicates well with the other TMT members.
12	Mom et al. (2009).	Investigates managers' ambidexterity.	716 business unit level and operational level managers in 5 large firms.	Questionnaire survey.	*Dependent variable:* • Managers' ambidexterity. *Independent variable*: • A manager's decision-making authority.	• Manager's decision-making authority positively relates to this manager's ambidexterity, whereas formalization of a manager's tasks has no significant relationship with this manager's ambidexterity. • Both the participation of a manager in cross-functional interfaces and the connectedness of a manager to other organization members

						positively relate to this manager's ambidexterity.
13	Raisch et al. (2009).	Identifies if balancing exploitation and exploration activities lead to sustainable performance.	Summarise seven articles and relate them to four proposed tensions.	Reviewed existing literature about ambidexterity.	• Differentiation vs. integration • Individual vs. organisation • Static vs. dynamic • Internal vs. external	• The probabilities of success in exploration are lower than exploitation, thereby reinforcing the tendency towards exploitation. • Differences in size, resource endowment, industry contexts and environmental dynamism matter when relating ambidexterity to performance. • Balance dimension is more beneficial to resource-constrained firms. • Combined dimension is more suitable for firms with greater access to resources.
14	Simsek (2009).	Reviews previous research about the conceptualisation, antecedents, and consequences of ambidexterity.	Not relevant.	Reviewed existing research using an input–process–output framework.	• Constructs to develop argument and proposition. • Interactive, cross-level influences. • Organisational ambidexterity and performance link. • Alternative conceptualisations of organisational ambidexterity. • The effects of interfirm ties on organisational ambidexterity.	• Organisational ambidexterity still remains an under theorised, under conceptualised, and poorly understood phenomenon.
15	William et al. (2010).	Investigates the performance implications of exploitation, exploration and organisational ambidexterity.	94 furniture tools and materials suppliers in the US.	Questionnaire survey.	*Dependent variable:* • Performance. *Independent variables:*	• Low centralisation is related to organisational ambidexterity.

					• Strategic orientation. • Deftness, potency, communication/cooperation and centralisation.	• Ambidexterity is positively related to revenue and growth.
16	Boumgarden et al. (2012).	Explains and illustrates the comparative functionality of organisational ambidexterity and vacillation. Compare respective relationships as strategic paths to economic performance.	• 25 years of Hewlett-Packard's organisational history. • 20 years of USA Today.	Case study.	*Dependent variables:* • Performance. *Independent variables:* • Organisational ambidexterity. • Organisational vacillation.	• Vacillation may offer higher long run performance than ambidexterity. • Ambidexterity enhances performance on the margin when utilized within larger epochs of vacillation. • Ambidexterity and vacillation are complements with respect.
17	Fernhaber and Patel (2012).	Examines relationship between absorptive capacity and ambidexterity are vital to enhancing the benefits and mitigating the costs of increasing product portfolio complexity.	215 young high tech firms.	Questionnaire survey.	*Dependent variables:* • Performance. (Sales growth, employee growth, and operating profit growth.) • Product portfolio complexity. *Independent variable:* • Ambidexterity. • Absorptive capacity.	• Positive moderating effects of absorptive capacity and ambidexterity on the inverted U-shaped relationship between product portfolio complexity and firm performance.
18	Kouropalatis et al. (2012).	Examines strategic ambidexterity through flexibility and commitment to identify if performance benefits from both concepts.	Marketing firms in the UK.	Questionnaire survey.	*Dependent variable:* • Strategic ambidexterity. *Independent variables:* • Flexibility. • Commitment.	Strategic ambidexterity endows significant performance benefits.

19	Patel et al. (2012).	Explores the applicability of two organisational learning contingencies to the operations environment: operational absorptive capability and operational ambidexterity.	852 manufacturing firms	Questionnaire survey.	*Dependent variables:* • Performance: sales growth, employee growth, and operational profit growth. *Independent variables:* • Environmental uncertainty. • Manufacturing flexibility. • Operational absorptive capacity. • Organisational ambidexterity. *Control variables:* • Firm size and age.	• Firms increase manufacturing flexibility during environmental uncertainty. • Firms with manufacturing flexibility capabilities have better performance. • Firms that are better in acquiring, assimilating, and transforming information are more likely to respond to environmental uncertainty with manufacturing flexibility. • Ambidextrous firms are more likely to realise returns from manufacturing flexibility.
20	Wei et al. (2013).	Explores how firms dynamically reconfigure resource portfolios to leverage organisational ambidexterity.	Firms from broad scope of industries.	Interview survey.	*Dependent variable:* • Exploitative learning. • Explorative learning. *Independent variables:* • New product development. • Resource flexibility. • Coordination flexibility.	Optimal relative level of exploration to exploitation is dependent on the level of resource flexibility or coordination flexibility.
21	Voss and Voss (2013).	Connects organisational performance to strategic combinations of exploration and exploitation in both product and market domains.	162 non-profit professional theatre industry in the United States.	Questionnaire survey.	*Dependent variable:* • Ticket revenue per available seat.	• Larger, older firms have the resources, capabilities, and experience required to benefit from a *product ambidexterity* strategy, but

					• Marketing expenditure. *Independent variables:* • Strategic emphasis measures. (Experimentation with non-traditional play or incremental departure from tradition.) *Moderating variables:* • Firm size. • Firm age.	larger, older firms are less likely to implement *product ambidexterity*. • Only larger firms have the resources and capabilities required to benefit from a *market ambidexterity* strategy. • Developing and sustaining *market ambidexterity* is necessary to drive long-term growth.
22	Blindenbach-Driessen and Ende (2014).	Investigates the effects of having a separate innovation unit on exploration, exploitation, and ambidexterity in manufacturing and service firms.	1281 manufacturing and 2704 service firms in Netherlands.	2004-2006 Dutch Community Innovation Survey (CIS).	*Dependent variables:* • Exploration. • Exploitation. • Ambidexterity *Independent variables:* • Industry type (manufacturing versus service). • Separate innovation unit.	• A separate innovation unit increases exploration, exploitation, and ambidexterity in both manufacturing and service firms. • Both manufacturing and service firms benefit from having a separate innovation unit, with the advantages being greatest for manufacturing firms.
23	Hill and Birkinshaw (2014).	Examines why and how some corporate venture units last significantly longer than others.	95 corporate venture units listed in 2001 Corporate Venturing Directory and Yearbook represented by broad cross-section of industries.	2 steps: 1. Exploratory interviews with 50 individuals in 40 corporate venture units across eight countries to understand corporate venture. 2. Formed and distributed questionnaire survey. Control variables: • Number of full time employees.	*Dependent variable:* • Corporate venture unit survival. *Independent variables:* • Venturing ambidexterity. (Exploration [Building new capabilities for the parent firm] and exploitation [Making better use of the existing capabilities of the parent firm].)	• Exploration-oriented unit does not only explore—it must also develop the capacity to integrate its activities with those of its exploitation-oriented sibling units. • Access to resources as a facilitator of ambidexterity. • Resource brokering strategies may provide one way through which organisations and their units overcome trade-offs

					• Age of the unit. • Number of investments. • High-tech sector. • Number of investments. • Strategic performance. • Financial performance.	• Relationship with senior executives (in the parent firm). • Relationship with business units. • Relationship with the venture capital community.	imposed by resource scarcity.
24	Tan and Liu (2014).	Examines how responsive and proactive market orientation affect business performance in SMEs from an ambidexterity perspective.	186 high-tech firms in China.	Questionnaire survey.	*Dependent variable:* • Business performance. *Independent variables:* • Responsive market orientation. • Proactive market orientation. • Exploitative innovation strategy. • Explorative innovation strategy.		• Ambidexterity market orientation (AMO) has a positive impact on innovation ambidexterity. • Ambidexterity innovation mediates the relationship between AMO and business performance. • Ambidexterity innovation has a more positive impact than exploitative and exploratory innovation strategies on business performance.
25	Wang and Rafiq (2014).	Examines the relationships between ambidextrous organisational culture, contextual ambidexterity and new product innovation in a cross-cultural context.	150 UK and 242 Chinese high-tech firms.	Questionnaire survey.	*Dependent variables:* • New product innovation. • Contextual ambidexterity. *Independent variables:* • Organisational diversity. • Shared vision. • Competence exploration. • Competence exploitation. • Speed to the market.		• Contextual ambidexterity • and new product innovation outcomes are dependent on business unit level heterogeneity • (ambidextrous organisational culture and research and development strength) rather than industry or cross-cultural differences.

4.6   Data

This section presents an overview of the dependent and independent variables in this study, along with the data sources and challenges encountered in the process of data collection. Specific details of the data sample and building the dependent variables are discussed in each empirical chapter.

Sample

Datasets of the Nasdaq Composite Index (NASDAQ), New York Stock Exchange (NYSE) Composite Index and delisted firms in the United States (data series: DEADUS 1, DEADUS 2, DEADUS 3, DEADUS 4, DEADUS 5 and DEADUS 6) from 2006 to 2014 were extracted from the Datastream database to form the research sample of the study.

Datastream was selected, because it provides current and historical time series data on stocks, interest rates, stock indices, bonds, futures, options, currencies and economic data. The abundance of available data types served as a good source of financial information to comprehensively understand firm performance. The database consists of time series for more than 3.5 million financial instruments, securities and indicators with over 50 years of historical data, providing a suitable source for longitudinal research. Moreover, the database contains historical data on inactive and dead companies, for example companies that are no longer listed following an acquisition, merger or bankruptcy. The study utilised this data as basis for the dataset of non-survival firms.

As discussed earlier, NASDAQ, NYSE and the historical records of delisted firms in the U.S. (data series: DEADUS) formed the dataset of this thesis. NASDAQ contains the information about the market capitalisation-weighted index of approximately 3,000 common equities listed on the Nasdaq stock exchange. The types of securities include common stocks, real estate investment trusts (REITs), American depositary receipts and tracking stocks, as well as limited

partnership interests (Investopedia, 2017). Similar to NASDAQ, the NYSE is an index that measures the performance of all stocks listed on the New York Stock Exchange. The NYSE Composite Index includes more than 1,900 stocks, of which over 1,500 are U.S. companies. The extensiveness of the index makes it a much better indicator of market performance, compared with narrow indexes that have far fewer components (Investopedia, 2017).

There are three benefits of using the NASDAQ and NYSE composite indexes in this study. First, both indices provide high quality and reliable datasets as all its constituents have to meet the stringent listing requirements of the respective exchange. Second, the global diversification of the composite provides wide sample range for crisis evaluation. Last, both composites contain firms from a wide range of industries, which provide a rich dataset to explore and study crisis impacts across industries.

The sample frame for this thesis consists of 11,290 firms. The historical financial information of the sample was obtained from Datastream to create a longitudinal study. The sample is split into 9 groups, based on the year of listing on and delisting from the stock markets. Table 10 shows the summary of the sample.

Table 10   Summary of Groups

Group	Sub Total	Grand Total	Percent
Group 1: Dead before crisis		**1426**	**12.63**
Group 1a: Dead before crisis: Acquired	700		
Group 1b: Dead before crisis: Merged	213		
Group 1c: Dead before crisis: Bankrupt	179		
Group 1d: Dead before crisis: Going Private	334		
Group 2: Born in crisis and died in crisis		**29**	**0.26**
Group 2a: Born in crisis and died in crisis: Acquired	3		
Group 2b: Born in crisis and died in crisis: Merged	2		
Group 2c: Born in crisis and died in crisis: Bankrupt	1		
Group 2d: Born in crisis and died in crisis: Going Private	23		
Group 3: Born during and died after		**139**	**1.23**
Group 3a: Born during and died after: Acquired	56		
Group 3b: Born during and died after: Merged	14		
Group 3c: Born during and died after: Bankrupt	16		
Group 3d: Born during and died after: Going Private	53		
Group 4: Born during and still going		**466**	**4.13**
Group 5: Born after and died		**71**	**0.63**
Group 5a: Born after and died: Acquired	32		
Group 5b: Born after and died: Merged	16		
Group 5c: Born after and died: Bankrupt	2		
Group 5d: Born after and died: Going Private	21		
Group 6: Born after and still going		**715**	**6.33**
Group 7 Alive before and died during		**1115**	**9.88**
Group 7a: Alive before and died during: Acquired	492		
Group 7b: Alive before and died during: Merged	100		
Group 7c: Alive before and died during: Bankrupt	237		
Group 7d: Alive before and died during: Going Private	286		
Group 8: Alive before and died after		**1915**	**16.96**
Group 8a: Alive before and died after: Acquired	1141		
Group 8b: Alive before and died after: Merged	218		
Group 8c: Alive before and died after: Bankrupt	189		
Group 8d: Alive before and died after: Going Private	367		
Group 9: Alive before and still going		**5414**	**47.95**
Grand Total		**11290**	**100.00**

Dependent Variables

There are eight dependent variables in this study. Table 11 summarises the dependent variables and indicates the chapter they are adopted in. Specific details on the sample and building of dependent variables are discussed in each empirical chapter.

Table 11   **Summary of Dependent Variables**

No	Variable Name	Label	Values	Source of Information	Empirical Chapter
1.	Survival	A firm is considered to be a survivor, if it was still listed on the stock market at the end of 2009 and remained listed until 2014	1	Datastream, company profiles and U.S. Securities and Exchange Commission (SEC) website	5, 6, 7
2.	Non-survival	A firm is bundled in the non-survival category when it is delisted from the stock markets at any point between 2006 and 2014	0	Datastream, company profiles, U.S. Securities and Exchange Commission (SEC) website	5, 6, 7
3.	Return on invested capital	Determinant of firm performance and strategic change (Net income-dividends)/Total capital	• Any • A higher ratio indicates invested capital is being used efficiently	Datastream	7
4.	Return on equity	Measure of profitability and efficiency Net income/ Shareholder equity	• Any • A higher ratio indicates a high growth company	Datastream	7
5.	Return on assets	Measure of profitable. Net income/Total assets	• Any • A higher ratio indicates as firms with better assets management	Total income is available from Datastream Net income from ThomsonOne.com	7
6.	Net margin	Indicators of a business's financial health	• Any • A higher net margin indicates better business profitability	Datastream	7
7.	Tobin's Q	A measure of firm assets in relation to a firm's market value (Market value x1000)/ Total assets	• Any • A ratio that less than one indicates a poor firm performance. A ratio higher than one suggests good firm performance	Datastream	7
8.	Price-earnings ratio	Indicates the value of a company Price-earnings ratio/ P/E ratio	• Any • A higher P/E ratio indicates a better performance	Datastream	7

This section provides an overview of the independent variables and control variables used in the study. All variables were selected based on the literature review and conceptual development. Table 12 summarises the variables and indicates the chapter they are adopted in.

Table 12   Summary of Independent and Control Variables

No	Variable Name	Label	Values	Source of Information	Empirical Chapter
Independent Variables					
1.	Exploitation*	Factor scores: • Operating ratio • Sales per employee • Total assets per employee Higher exploitation factor score indicates high engagement in exploitation	Any	* The details about the operationalisation of the exploitation variable are available in section 4.7	6, 7
2.	Exploration*	Factor scores: • Research and development to assets • Selling, general and administrative expenses to assets A higher exploration factor score indicates high engagement in exploration activities	Any	* The details about the operationalisation of the exploration variable are available in section 4.7	6, 7
3.	Ambidexterity*	Exploitation x Exploration A higher ambidexterity factor score indicates high ambidexterity	Any	* The details about the operationalisation of the ambidexterity variable are available in section 4.7	6, 7
Control Variables					
1.	Industry type	Classified based on the ICB Industrial Classification, which has 10 sectors. Firms without classification are marked as NA in the database	Dummy variable 1 = Basic Materials 2 = Consumer Goods 3 = Consumer Services 4 = Financials 5 = Health Care 6 = Industrials 7 = NA 8 = Oil and Gas 9 = Technology 10 =Telecommunications 11 = Utilities	Datastream	5, 6, 7

2.	Firm age	Year 2014 minus the (first accounting year)	Any	Datastream	7
3.	Firm size	Firm size measured as the log of employees	Any	Datastream	6, 7
4.	Year	Dummy variable	Year 2010 to 2014	Datastream	7
5.	Return on invested capital	(Net income-dividends)/Total capital	Any A higher ratio indicates invested capital is being used efficiently	Datastream	6, 7
6.	Total debt to total assets	Leverage. Total debt/total assets	1 to 0 A higher ratio indicates a high degree of leverage	Datastream	7
7.	Working capital to sales	Working capital/total sales	1 to 0 A higher ratio shows efficiency in using short-term assets	Datastream	7
8.	Board size	Board size	Any	Available from ASSET4 corporate governance database on Datastream	6, 7
9.	Board structure/ CEO-chairman separation	Whether or not the CEO is a chairman of the board	1 or 0 1 = Yes 0 = No	Available from ASSET4 corporate governance database on Datastream	6, 7
10.	Board structure/ Board gender diversity	Board gender diversity	Any	Available from ASSET4 corporate governance database on Datastream	6, 7
11.	Board Structure/ Independent Board Members	The degree to which board members are not affiliated with the firm through employment or economic exchange relationship	Any	Available from ASSET4 corporate governance database on Datastream	6, 7
12.	Board Structure/ Experienced Board	The average number of years each board member has been on the board	Any	Available from ASSET4 corporate governance database on Datastream	6, 7
13.	Board Structure/ Specific Skills	The number (in percentage) of board members, who have either industry specific background or strong financial background	Any	Available from ASSET4 corporate governance database on Datastream	6, 7

4.7   Operationalisation of Ambidexterity

The ambidexterity theory emphasises firms' ability to demonstrate both exploitation and exploration capabilities (Raish and Birkinshaw, 2008). However, there is a considerable ambiguity regarding the nature of the ambidexterity construct. When March (1991) first introduced the concept of ambidexterity, he argued that exploitation and exploration should be viewed as the ends of a continuum. March (1991) believes that the choice of being ambidextrous

inherits cost, as it could cause pressure on the organisational resources. As such, the concept of ambidexterity is about finding the appropriate balance between the two orientations (Ghemawat and Costa, 1993; Auh and Menguc, 2005; Smith & Tushman, 2005; Sidhu et al., 2007; Cao et al., 2009).

Alternatively, some studies view exploitation and exploration as independent activities, which are orthogonal to one another. Firms can choose to engage in high levels of both activities at the same time. (Gupta et al., 2006). In other words, this view allows firms to maximise their capacity by pursuing exploitation and exploration concurrently rather than managing a trade-off by finding the most appropriate balance between the two approaches (Beckman, 2006; Jansen et al., 2006; Lavie and Rosenkopf, 2006; Lubatkin et al., 2006; Cao et al., 2009).

There is an evident, broad agreement in the literature that the operationalisation of organisational ambidexterity is achieved by a simultaneous pursuit of exploratory and exploitative activities. However, there is a lack of conceptual clarity in the literature regarding the healthy, relative magnitude of exploitation and exploration in an ambidextrous strategy as well as the combined degree of both. This absence of consensus here may be caused by the various ways used to measure the concept. As a result, it is challenging to compare and contrast findings across studies and build a core set of conclusions. Moreover, the ambiguity in the operationalisation of the concept has also reduced its practicality for scholars and practitioners.

Therefore, this study proposes to address the mentioned weaknesses by demonstrating a different quantitative research approach to measure the construct. Most, but not all, of the ambidextrous studies to date have applied questionnaire survey, interview survey and case study research methods to explain organisational ambidexterity. This study believes that a new approach could achieve greater conceptual clarity and provide a more solid base for the interpretation of findings, because it allows an easy comparison between studies.

This section begins by reviewing the ambidexterity literature in order to provide a clear picture of the operationalisation of the ambidexterity concept in existing studies. Then, five financial ratios are selected to represent the outcomes of exploitation and exploration activities, followed by factor analysis to confirm their statistical relationship.

In conclusion, this study aims to provide greater precision in the conceptualisation and operationalisation of organisational ambidexterity, leading to improved practical application of the concept for business practitioners and researchers. The result has proven that the operationalisation of ambidexterity concept can be redesigned and measured with financial variables, which could help address the existing research gaps.

The Research Design of Ambidexterity Studies

Table 13 highlights that most of the ambidexterity studies have used questionnaire surveys as research method. The initial finding suggests that the nature of the ambidexterity construct may have contributed to restricting the research method types applied in the existing studies. In other words, most of scholars perceive surveys as the most feasible way to measure the ambidexterity construct, but they fail to foresee that this method may restrict other users to compare their research findings, which ultimately hinders the growth of the ambidexterity literature.

Back to the basic question: How to distinguish qualitative research from quantitative research? According to Saunders et al. (2012), qualitative research is used as a synonym for any data collection technique (such as interview) or data analysis that generates non-numerical data. Literature defines qualitative research design as interpretive, because researchers need to make sense of the social and subjectively constructed meanings expressed about the phenomenon (Saunders et al., 2012). Very often, qualitative research commences with an inductive approach and emergent research design to develop a richer theoretical perspective.

In comparison, the quantitative research is associated with any data collection technique (such as questionnaire) or data analysis procedure that generates or uses numerical data. Quantitative research is related with positivism and highly structured data collection techniques. Quantitative research is usually linked with a deductive approach, which uses data to test theory (Saunders et al., 2012)

In addition, literature has shown that the distinction between both research designs is narrow and problematic. For instance, there are questionnaire surveys which involve respondents in answering some "open" questions rather than marking the appropriate box. Similarly, there is qualitative research data analysed quantitatively or used to inform the design of a subsequent questionnaire. Thus, some of the ambidexterity studies can be categorised as mixed research design.

Nevertheless, quantitative research design is seen to be more appropriate to this thesis, because it allows hypotheses testing, identification of the role of organisational ambidexterity in firm survival and then, making a prediction how exploitation and exploration activities impact firm performance. In addition, the type of data used in this study - financial data - necessitates quantitative research design as more suitable, because it offers precise measurement with its structured and validated data collection instruments. Moreover, quantitative research can help eliminate bias, because the researcher is considered independent from these being researched. It will produce generalisable findings that can be applied to other populations (Lichtman, 2006; Johnson and Christensen, 2008). Last, but not least, a quantitative research method helps improve the validity of the result, which is defined as the ability to capture the ideas contained in a corresponding concept (Adcock and Collier, 2001).

Table 13 and Table 14 summarise the way the existing studies measure the exploitation and exploration orientations.

Table 13   Items Used to Operationalise the Exploitation Construct

No	Variables	Examples
1.	Knowledge exploitation (Kohli et al., 1993; Cegarra-Navarro et al., 2011).	• All members of the organization share the same aim to which they feel committed. • Several departments get together periodically to plan a response to changes taking place in the firm's business environment. • The firm constantly considers how to exploit knowledge better. • The company develops internal rotation programmes to facilitate the shift of employees from one department or function to another. • Employees have a common language regarding firm's products and services.
2.	Competence exploitation (Zahra et al., 2000; Atuahene-Gima, 2005).	To what extent has firm: • Upgraded current knowledge and skills for familiar products and technologies? • Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations? • Enhanced competencies in searching for solutions to customer problems that are near to existing solutions rather than completely new solutions? • Upgraded skills in product development processes in which the firm already possesses significant experience? • Strengthened its knowledge and skills for projects that improve efficiency of existing innovation activities?
3.	Exploitation emphasis (He and Wong, 2004; William, 2010).	• Improve existing product quality • Improve production flexibility • Reduce production cost • Improve yield or reduce material or time
4.	Exploitation (Auh and Menguc, 2005; Menguc and Auh, 2008).	• Modernisation and automation of production processes • Effort to achieve economies of scales • Capacity utilisation
5.	Exploitative innovation (Jansen et al., 2006).	• Firm frequently refines the provision of existing products and services. • Firm regularly implements small adaptations to existing products and services. • Firm introduces improved, but existing, products and services to the local market. • Firm improves provision's efficiency of products and services. • Firm increases economies of scales in existing markets. • Firm expands services for existing clients. • Lowering costs of internal processes is an important objective. (Item deleted after exploitative factor analysis)

6.	Exploitative learning (Atuahene-Gima and Murray, 2007).	• Search for information to refine common methods and ideas in solving problems in the project. • Search for ideas and information that can be implemented well to ensure productivity, rather than these ideas that could lead to implementation mistakes in the project and in the marketplace. • Search for the usual and generally proven methods and solutions to product development problems. • Used information acquisition methods (e.g., survey of current customers and competitors) that helped to understand and update the firm's current project and market experiences. • Emphasised the use of knowledge related to existing project experience.
7.	Exploitative Innovation Strategy (Morgan and Berthon, 2008).	Products and/or processes are analysed to search for improvements. • Business unit seeks to improve processes to reduce costs. • Business unit seeks to reduce costs for the customer through process improvements. • Business unit seeks to improve processes to reduce the time taken for unit production. • Business unit aims to add value to its products and/or services through process improvements.
8.	Market Orientation (Morgan and Berthon, 2008).	*Intelligence generation:* • Meeting with customers at least once a year to find out what requirements they will need in the future. • Firm does a lot of in-house market research. • Firm is slow to detect changes in customers' product preferences. (Reverse coded) • Poll end users at least once a year to assess the quality of products and services. • Slow to detect fundamental shifts in our industry (e.g. competition, technology, regulation). (Reverse coded) • Periodically review the likely effect of changes in business environment (e.g. regulation) on customers. *Intelligence dissemination:* • Have interdepartmental meetings at least once a quarter to discuss market trends and developments. • Marketing personnel in business unit spend time discussing customers' future needs with other functional departments. • When something important happens to a major customer or market, the whole business unit knows about it in a short period. • Data on customer satisfaction are disseminated at all levels in this business unit on a regular basis. • When one department finds out something important about competitors, it is slow to alert other departments. (Reverse coded) *Responsiveness:* • If a major competitor were to launch an intensive campaign targeted at its customers, firm would implement a response immediately.

		• The activities of the different departments in this business unit are well coordinated. • Customer complaints fall on deaf ears in this business unit. (Reverse coded) • Even if firm came up with a great marketing plan, firm probably would not be able to implement it in a timely fashion. (Reverse coded) • When firm find that customers would like us to modify a product or service, the departments involved make concerted efforts to do so.
9.	Managers' exploitation activities (Mom et al., 2009).	• Activities of which a lot of experience has been accumulated by manager. • Activities which managers carry out as if it were routine. • Activities which serve existing (internal) customers with existing services/products. • Activities of which it is clear to manager how to conduct them. • Activities primarily focused on achieving short-term goals. • Activities which a manager can properly conduct by using present knowledge. • Activities which clearly fit into existing company policy.
10.	Ambidextrous firm strategy: Exploitation (Sarkess et al., 2010).	*Firm exploitation:* • Organization works coherently to support its overall objectives. • Organization uses its resources effectively. • Management provides clear goals and objectives for the functional units. *Market exploitation:* • Firm focuses on refining existing products/services. • Firm is very efficient in serving current customers. • Firm works well with other functional units within organization. • Firm applies knowledge from other functional units to better serve current customers.
11.	Exploitative practices (Kristal et al., 2010).	• In order to stay competitive, supply chain managers focus on reducing operational redundancies in existing processes. • Leveraging current supply chain technologies is important to firm's strategy. • In order to stay competitive, supply chain managers focus on improving existing technologies. • Managers focus on developing stronger competencies in existing supply chain processes.
12.	Exploitation (Voss and Voss, 2013).	Industry: Non-profit theatre industry *Product exploitation:* • Maximizing the contribution of our in-house artistic and production skills. • Producing shows similar to these that have done well for us in the past. *Market exploitation:* • Getting single-ticket buyers to attend multiple shows. • Encouraging more frequent attendance by our core audience base.

No	Variables	Examples
13.	Exploitative innovation strategy (Tan and Liu, 2014).	• Products and/or processes are analysed to search for improvements. • Seeks to improve processes to reduce costs. • Seeks to reduce costs to the customer through process improvements. • Seeks to improve processes to reduce the time taken for unit production
14.	Competence exploitation (Wang and Rafiq, 2014).	Over the last three years, this business unit has: • Upgraded current knowledge and skills for familiar products and technologies. • Enhanced skills in exploiting well-established technologies that improve productivity of current innovation operations. • Enhanced competences in searching for solutions to customer problems that are close to established solutions rather than completely new solutions. • Upgraded skills in product development processes in which the business unit already possessed significant experience. • Strengthened knowledge and skills for projects that improve efficiency of existing innovation activities.
15.	Exploitation: use existing capabilities (Hill and Birkinshaw, 2014).	How important is this (venture unit) objective to the corporation? • Retention and motivation of employees. • Better use of existing corporate assets. • Creation of spin-out companies. • Source of funding for internal entrepreneurs.

Table 14   Items Used to Operationalise the Exploration Construct

No	Variables	Examples
1.	Knowledge exploration (Kohli et al., 1993; Cegarra-Navarro et al., 2011)	• In this business unit, the firm meets with customers at least once a year to find out what products or services they will need in the future. • The firm is in touch with professionals and expert technicians. • In this business unit, the firm does a lot of in-house market research. • The firm polls end users at least once a year to assess the quality of products and services. • Employees maintain frequent collaboration with customers to accomplish and/or improve products and services.
2.	New product development (Griffin and Page, 1993; Garcia et al., 2008; Molina-Castillo and Munuera-Aleman, 2009; Wei et al., 2013).	Compared with major competitors, firm is more successful in terms of: • New-product success rate is better. • Time to market is shorter. • Development cycle is shorter. • Market potential of our new products.
3.	Competence exploration (Zahra et al., 2000; Atuahene-Gima, 2005).	To what extent has firm: • Acquired manufacturing technologies and skills entirely new to the firm?

		• Learned product development skills and processes (such as product design, prototyping new products, timing of new product introductions, and customizing products for local markets) entirely new to the industry? • Acquired entirely new managerial and organizational skills that are important for innovation (such as forecasting technological and customer trends; identifying emerging markets and technologies; coordinating and integrating R&D; marketing, manufacturing, and other functions; managing the product development process)? • Learned new skills in areas such as funding new technology, staffing R&D function, training and development of R&D, and engineering personnel for the first time? • Strengthened innovation skills in areas where it had no prior experience?
4.	Exploratory emphasis (He and Wong, 2004; William, 2010).	• Introduce new generation of products. • Extend product range. • Open new markets. • Enter new technology field.
5.	Exploration (Auh and Menguc, 2005; Menguc and Auh, 2008).	• Research and development expenditures for product development. • Research and development expenditures for process innovation. • Rate of product innovations. • Innovations in marketing.
6.	Exploratory innovation (Jansen et al., 2006).	• The firm accepts demands that go beyond existing products and services. • The firm invents new products and services. • The firm experiments with new products and services in local market. • The firm commercialises products and services that are completely new to unit. • The firm frequently utilises new opportunities in new markets. • The firm regularly uses new distribution channels. • The firm regularly searches for and approach new clients in new markets. (Item deleted after exploratory factor analysis)
7.	Explorative learning (Atuahene-Gima and Murray, 2007).	• In information search, focused on acquiring knowledge of project strategies that involved experimentation and high market risks. • Preferred to collect information with no identifiable strategic market needs to ensure experimentation in the project. • Acquire knowledge to develop a project that led to new areas of learning such as new markets and technological areas. • Collected novel information and ideas that went beyond current market and technological experiences. • Collect new information that forced firm to learn new things in the product development project.
8.	Explorative Innovation Strategy (Morgan and Berthon, 2008).	• Business unit follows other companies' ideas within the same industry. (Reverse coded) • A 'pioneering' strategy is pursued by firm's business unit. • Product innovation is 'offensive' (as opposed to 'defensive'). • Products offer unique features not available from competitors' offerings. • Products are highly innovative.

9.	Generative learning (Morgan and Berthon, 2008).	*Idea generation and distribution:* • Individuals in this business unit have a 'license to think'. • Individuals in this business unit are encouraged to think for themselves. • The 'system' is open to new ideas. • Ideas in this business unit flow freely and openly. • Ideas in this business unit are shared. *Risk-taking action:* • The philosophy of our management is that in the long-run we get ahead faster by playing it slow, safe and sure. (Reverse coded) • Our business has been built up by taking calculated risks at the right time. • Decision-making in this organization is too cautious for maximum effectiveness. (Reverse coded) • Our management is willing to take a chance on a good idea. • We have to take some pretty big risks occasionally to keep ahead of the competition in the business we are in.
10.	Managers' exploration activities (Mom et al., 2009)	• Searching for new possibilities with respect to products/services, processes or markets. • Evaluating diverse options with respect to products/services, processes or markets. • Focusing on strong renewal of products/services or processes. • Activities, whose associated yields or costs, are currently unclear. • Activities requiring adaptability of manager. • Activities requiring manager to learn new skills or knowledge. • Activities that are not (yet) clearly existing company policy.
11.	Ambidextrous firm strategy: Exploration (Sarkess et al., 2010)	*Firm exploration:* • Employees are encouraged to challenge outdated traditions and practices. • Organisation is flexible enough to allow employees to respond quickly to market changes. • Organisation evolves rapidly in response to shifts in business priorities. *Marketing exploration:* • Organisation interacts regularly with customers in emerging market segments. • Organisation focuses on developing new product/services for customers. • Organisation has a broad range of products/services. • Organisation has extensive customer service capabilities.
12.	Explorative practices (Kristal et al., 2010).	• Proactively pursue new supply chain solutions. • Continually experiment to find new solutions that will improve supply chain. • To improve supply chain, continually explore new opportunities. • Constantly seek novel approaches to solve supply chain problems.

13.	Exploration (Voss and Voss, 2013).	Industry: Non-profit theatre industry. *Product exploration:* • Creating revolutionary new conceptual approaches. • Experimenting with radical new works. • Challenging traditional artistic boundaries. *Market exploration:* • Challenging the firm to increase the number of first-time theatre. • Initiating programs designed to attract new audiences. • Seeking out audiences in new markets.
14.	Explorative innovation strategy (Tan and Liu, 2014).	• The firm's business does not follow other companies' ideas within the same industry. • A 'pioneering' strategy is pursued by the firm. • Product innovation is 'offensive' (as opposed to 'defensive'). • Products offer unique features not available from competitors' offerings.
15.	Competence exploration (Wang and Rafiq, 2014).	Over the last three years, this business unit has: • Acquired technologies and skills entirely new to the business unit. • Learned product development skills and processes entirely new to the industry (e.g. product design, prototyping new products, timing of new product introductions and customizing products for local markets). • Acquired entirely new managerial and organizational skills that are important for innovation (e.g. forecasting technological and customer trends; identifying emerging markets and technologies; integrating R&D, marketing, manufacturing and other functions; managing the product development process). • Learned new skills for the first time (e.g. funding new technology, staffing R&D function, training and development of R&D and engineering personnel). • Strengthened innovation skills in areas where it had no prior experience.
16.	Exploration: build new capabilities (Hill and Birkinshaw, 2014).	How important is this (venture unit) objective to the corporation? • Creation of breakthrough technology for the corporation. • Investment in disruptive technologies that potentially cannibalise existing technologies. • Window on emerging technologies.

4.8 Measuring Ambidexterity with Financial Ratios

The survey items in Table 13 and Table 14 serve as a guideline to identify the financial ratios, which could be used to represent exploitation and exploration activities. In this section, the discussion will focus on the selection process of these financial ratios.

Measuring Exploitation Using Financial Ratios

The literature associates exploitation activities with efficiency, refinement, production, selection, implementation, choice and execution (March, 1991; Uotila et al., 2009). Most of the studies have identified efficiency in operational performance and employee productivity as the basis to measure exploitative capacities. However, it is challenging to replace the existing exploitative measurements with financial ratios, because in reality firms are of various size, age and industry background. For instance, financial industry tends to have less total assets compared to the basic materials industry. Hence, the selection of variables must include the consideration of various factors and ideally, they must represent the majority firms in the data. Eventually, two variables were selected to represent the extent of exploitation, which reflect the outcomes of firm efficiency: sales per employee and total assets per employee.

Sales per employee (or revenue per employee) is a measure of how efficient a firm is in utilising its employees. In general, high sales per employee ratio indicates high productivity and efficient use of resources. Total assets per employee measures a company's total assets over the number of its employees. This ratio reflects a company's efficiency in managing its significant assets. Simply put, the higher the assets per employee ratio, the more efficient the firm is.

Measuring Exploration Using Financial Ratios

Exploration is associated with risk taking, innovation, searching, experimentation, flexibility and discovery activities (March, 1991; Uotila et al., 2009). Management studies associate the levels of exploration with R&D intensity, marketing activities, mergers and acquisitions and export. Three variables are selected to measure the magnitude of exploration: R&D to assets, selling, general and administrative expenses to assets and operating ratio.

The first variable - R&D to assets ratio - indicates the magnitude of exploration activities in relation to the R&D intensity. A higher R&D to assets ratio shows that a firm spends more in

R&D in relation to total assets. The second variable - selling, general and administrative expenses to assets ratio - represents the proportion of expenses that a firm spends on marketing and administrative activities when exploring markets. Last but not least, the operating ratio indicates how efficient a company's management is by comparing operating expenses to net sales. The lower the ratio, the greater the organisation's ability to generate profit when firm's revenues decrease. It is interesting to notice that the operating ratio is applied to explorative activities, despite that it measures the efficiency of company operations. In fact, this decision is made based on the assumption that firms with high explorative activities tend to have a high operating ratio, because the operating expenses capture all the expenditures from R&D, marketing and market exploration. Thus, high explorative capabilities may reflect a high operating ratio. The next section discusses the factor analysis, which is applied to confirm the strength and clusters of the five selected variables.

4.9   Factor Analysis

To confirm the relationship between the five variables described in the previous section, the study utilised financial data covering the years 2006 to 2014 for 11,290 firms on the NYSE, NASDAQ stock markets and the DeadUS list to form a large pool of survived (still listed firms) and non-survived firms. The statistical package used in this thesis is SPSS.

Measures

Factor analysis is a broad term representing a variety of statistical techniques for identifying clusters of variables (Field, 2012) and their interrelationship (Kim and Mueller, 1978; Gorsuch, 1983; Matsunaga, 2010; Sundberg and Feldmann, 2016). Factor analysis attempts to achieve parsimony by explaining the maximum amount of common variance in a correlation matrix using the smallest number of explanatory constructs or factors (Field, 2012).

In this thesis, exploitation and exploration are identified as the factors that contribute to organisational ambidexterity. The factor analysis is used to provide confirmation of the correlation magnitude between the selected financial variables and the factor significance. In other words, this section intends to evaluate whether the suggested variables are in line with the statistically expected pattern and they have indeed measured what they are purported to measure (Matsunaga, 2010). Next, the discussion focuses on illustrating the stages in the exploratory factor analysis and the analysis result.

Identifying the Types of Factor Analysis

Various methods for unearthing factors in data have been discussed in the literature (Field, 2012). There are two methods for factor analysis: exploratory and confirmatory factor analysis (Thompson, 2004; Matsunaga, 2010). Tinsley and Tinsley (1987) suggest that the choice of methods depends on: whether to use the finding to generalise a population (theory building) or whether to test a specific hypothesis (theory testing).

In this study, exploratory factor analysis is applied to explain the relationship between the observed variables and the underlying ambidexterity concept in mind (Thompson, 2004, Reio, Jr. and Shuck, 2015). Exploratory factor analysis is more suitable for this study, because it allows the identification of the factor structure of a set of variables without imposing a prior structure on exploration and exploitation constructs (Stevens, 2009; Reio, Jr. and Shuck, 2015). In addition, the nature of the exploratory factor analysis enables this study to inform and develop theory and contribute positively to the ambidexterity literature. In whole, the application of exploratory factor analysis in this study allows to evaluate construct validity and refine measures (Conway and Huffcutt, 2003).

Confirmatory factor analysis, which is used to test or confirm a priority theory, is not appropriate for this study because it fails to answer the research objective of this analysis: to

investigate if the selected financial variables are significant to the exploration and exploitation constructs. Moreover, the main purpose of this study is to form a set of measurements to measure the degree of ambidexterity and investigate the respective firms' characteristics rather than replicating a study or confirming the existing ambidexterity concept. Therefore, confirmatory factor analysis, which hypothesises a priority model of a target construct, has been found unsuitable to the research purpose of this study.

Walking through Factor Analysis

This section illustrates the steps to conduct factor analysis.

Step 1: Generating and screening items

The literature shows that the initial pools of items should be expansive to maximise the face validity of scale under study (Nevo, 1985; Bornstein, 1996; Matsunaga, 2011). In addition, the literature suggests that the stability of component patterns is largely determined by the sample size (Svensson, 2000; Matsunaga, 2011). In this study, the variables were extracted from the databases based on the ambidexterity construct's conceptualisation. There are 101,736 entries in this study and they form an ideal sample size to conduct factor analysis (N>200).

Step 2: Running the analysis

Five variables were identified as significant to explorative and exploitative activities and were included in the analysis. Table 15 shows the list of variables.

Step 3: Choosing a factor extraction method

There are several factor extraction methods: unweighted least squares, general least squares, maximum likelihood, principal axis factoring, alpha factoring and image factoring. Maximum likelihood factoring and principal axis factoring are two of the most popular factor extraction methods in exploratory factor analysis (Winter and Dodou, 2011). The maximum likelihood estimator is known as asymptotically efficient, while principal axis factoring allows recovery

of weak factors (Winter and Dodou, 2011). This study uses the maximum likelihood extraction method, because it has been better formalised in a statistical framework. Furthermore, it allows the 'calculation of a wide range of indexes and allows statistical significant testing of loadings and correlations among factors' (Fabrigar et al., 1999, p.277; Costello and Osborne, 2005).

The principal axis factoring is not applied in this study, because it fails to cope with complex cases of model misspecification and unequal loading within factors especially when these factors are correlated (Winter and Dodou, 2011). In comparison, maximum likelihood factoring method is more flexible and able to cope with severe model misspecifications. Therefore, maximum likelihood is applied into the study, because it creates more stable and less biased result in terms of both empirical fit and recovery of the fundamental structure compared to principal axis factoring (Olsson et al., 2000).

Table 15   **Factor Analysis: List of Variables**

No	Variable
1.	Research and development to assets
2.	Selling, general and administrative expenses to assets
3.	Operating ratio
4.	Total assets per employees
5.	Sales per employees

Step 4: Improving interpretation: Factor rotation

Factor rotation is used to discriminate between factors. There are two types of rotation: orthogonal rotation and oblique rotation (Field, 2012). Orthogonal rotation rotates factors while keeping them independent and unrelated, whereas oblique rotation rotates factors while keeping them correlated. In this study, the exploration and exploitation factors are expected to be independent. It is assumed that there is a clear cut between variables that symbolise explorative and exploitative activities. Therefore, orthogonal rotation (varimax) was selected. This option can maximise the dispersion loading within factors by loading a smaller number of variables that are highly correlated, producing more interpretable clusters of factors (Field, 2012).

The Result of Factor Analysis

A maximum likelihood factor analysis was conducted on five items with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sample adequacy. The KMO statistical value is 0.55 (Table 16), which is above the minimum criterion of 0.5 (Field, 2013). An initial analysis was run to obtain eigenvalues for each factor in the data. Two factors had eigenvalues over the Kaiser's criterion of 1 and in combination explained 73.43% of the variance (Table 17). The scree plot showed inflexions that justify the two factors and the factors were retained. Table 18 shows the factor loading after rotation with two items indicating exploitative activities and three items indicating explorative activities.

Table 16   Kaiser-Meyer-Olkin and Bartlett's Test

Kaiser-Meyer-Olkin		0.549
Bartlett's Test of Sphericity	Approx. Chi-Square	79097.756
	df.	10
	Sig.	0.000

Table 17   Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.165	43.310	43.310	1.805	36.100	36.100	1.737	34.733	34.733
2	1.506	30.120	73.430	1.170	23.396	59.496	1.238	24.763	59.496
3	.659	13.183	86.613						
4	.531	10.630	97.242						
5	.138	2.758	100.000						
Extraction Method: Maximum Likelihood									

Table 18   Rotated Factor Matrix

Variables	Factor	
	1. Exploitation	2. Exploration
Research and development to assets	-.083	.658
Selling, general and administrative expenses to assets	-.148	.698
Operating ratio	.008	.547
Sales per employee	.850	-.075
Total assets per employee	.993	-.114
Extraction Method: Maximum Likelihood. *Rotation Method: Varimax with Kaiser Normalization*		
a. Rotation converged in 3 iterations		

4.10   Methodology Limitations

This section highlights the main limitations of this chapter. There are two limitations of the dataset and the employed methods. First, this thesis adopted datasets that cover only listed firms and delisted firms. Hence, the role of ambidexterity on the performance of small and medium enterprises (SME) is not detectable in this study. This could be an interesting research direction, because resource availability differs for listed companies and SME's and this may impact the strategic choices of firms.

Second, the descriptive summary of the existing literature presents questionnaire survey methods as most commonly used in ambidexterity studies, but there is not a single widely accepted list of variables to measure ambidexterity. This thesis promotes the use of financial ratios to operationalise the ambidexterity construct and apply statistical methods to analyse the relationship between ambidexterity and crisis survival as well as firm performance. In other words, while every effort has been made to ensure the choice of variables is based on a solid argument and clear methodology, there is some degree of researcher discretion. Thus, it will be interesting to compare the findings of this study by replicating it with alternative variable combinations.

4.11   Summary

This chapter presents an overview of the key methodological aspects of this thesis. The detailed description of the methods used will be further discussed within each empirical chapter. This thesis adopts quantitative approach, using a combination of cross-sectional and longitudinal designs. It also combines three datasets to create a large sample size, which is more representative of the population, limiting the influence of outliers or extreme observations. Moreover, this thesis also introduces a novel method to operationalise ambidexterity, which incorporates financial ratios to measure the magnitude of exploitative and explorative capabilities of firms.

CHAPTER 5: Descriptive Overview

Understanding the Global Financial Crisis and the Effects on Corporate America.

5.0   Global Financial Crisis

The integration of the global financial markets has improved the efficiency of resource allocation and sped up economic growth. However, this achievement has come at a cost of increased systemic fragility, proved by the recent crisis (Acharya et al., 2009).

The financial sector plays an important role in producing economic efficiencies: it acts as an intermediary between parties that need to borrow and parties willing to invest or lend. This relationship facilitates day-to-day business operations. As a result, a widespread failure of financial institutions or freezing up of capital markets may result in systemic risk, which can substantially reduce the supply of capital to businesses and the real economy (Acharya et al., 2009). The United States experienced this type of systemic failure in 2008-2009 and continued to struggle in 2010 with its consequences.

An obscure, albeit wide-spread financial instrument – the asset-based security, especially the type based on subprime mortgages – undermined the foundations of the American financial system. A subprime mortgage is defined as a type of loan granted to individuals with deficient credit ratings, who would not be eligible for conventional mortgages. As subprime borrowers present a higher risk for lenders, subprime mortgages charge interest rates above the prime lending rate (Carther, 2016). Before the 2008-2009 financial crisis, various subprime mortgages contained a balloon interest payment, which enabled borrowers to refinance within a short period to avoid a mortgage rate increase. The bankruptcy of Ownit Mortgage Solutions in late 2006 and the failure of the second largest subprime lender at the time, New Century Financial, in April 2007, loudly marked the end of the subprime game and the start of a systemic event.

In August 2007, the subprime mortgages became illiquid and fell sharply in value, which later turned the extraordinary housing boom into a housing burst. The effects of the subprime mortgages spilled into the US economy. Many firms wrote down these losses and caused sharp capital depletions. In addition, records show that financial instruments, such as repurchase agreements and commercial paper, began to freeze due to the uncertainty in the U.S financial market (Acharya et al., 2009). At that moment, there was not enough information and disclosure to market participants about the overall losses of financial institutions due to lack of financial market transparency and increased opacity of the U.S financial markets.

In September 2008, the crisis intensified when government sponsored enterprises - the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) - which supported a large proportion of the mortgage market, were taken into government conservatorship (Frame et al., 2015; Federal Housing Finance Agency, 2016). This action was required in response to a significant deterioration in the housing market that severely damaged Fannie Mae's and Freddie Mac's financial condition and they were unable to operate without government intervention. The crisis reached panic proportions when a major investment bank - Lehman Brothers - declared bankruptcy. The collapse of Lehman Brothers triggered a classic run on the other financial institutions, despite their greater solvency (Acharya et al., 2009). Then, the crisis engulfed American International Group (AIG), most of whose equity was acquired by the U.S government in exchange for an emergency loan from the Federal Reserve (Fed) (Acharya et al., 2009).

### *The Costs and Consequences of the Global Financial Crisis*

Various studies claim that the 2008-2009 Great Recession is the worst since the Great Depression for the US economy. Research has shown that a large number of households lost the majority of their wealth, when the real house prices started racing steeply downwards in 2006 (Webel and Labonte, 2010) and by the end of 2007 they had fallen approximately 15

percent from their peak (Baker, 2008; Holt, 2009; S&P Down Jones Indexes, 2016a; S&P Down Jones Indexes, 2016b). This evidence implies that the recession might have occurred before the Global Financial Crisis. However, most studies agree that the collapse of Lehman Brothers in 2008 had the most significant impacts on the U.S. economy.

The 2008-2009 Global Financial Crisis sent shockwaves across the financial markets. It caused a sharp decrease in global trade in terms of both volume and its pattern. Projects were abandoned because of difficulty to obtain credit. Demand for goods and services also fell sharply. The Organization for Economic Corporation and Development (OECD) calculated that world trade volume shrank by 12 percent in 2009 compared with 2008 (McKibbin and Stoeckel, 2009; Hurd and Rohwedder, 2010).

Figure 9 shows the changes in four components of real GDP during the 2008-2009 period. Net exports show a decrease and the government expenditure show an upward trend. The U.S. economy experienced sizable declines in the growth of exports, particularly in 2008, was contributed to production and employment cuts by the various business sectors. The increase in government expenditure was due to an array of fiscal and monetary policies aimed to stabilise the U.S. financial market. The figure shows that the decline in real GDP could be attributed to the decrease in consumption of non-durables and services, and largely in investment, which were broadly impacted. The decline in these two components can be explained from two perspectives. Firstly, all elements of investment rely on the availability of funds from the financial markets. The difficulty in obtaining finance and the market uncertainty during the crisis noticeably diminished the attractiveness of speculative activities. Secondly, the decrease of potential output was endogenous and mainly caused by the slowdown in the demand side of the output (McKibbin and Stoeckel, 2009; Hurd and Rohwedder, 2010). Hence, the slowdown of demand for goods and services from households and the broader economy during the recession may have caused the reduction in the supply of output.

Figure 9   Changes from second quarter of 2008 in real GDP during the crisis
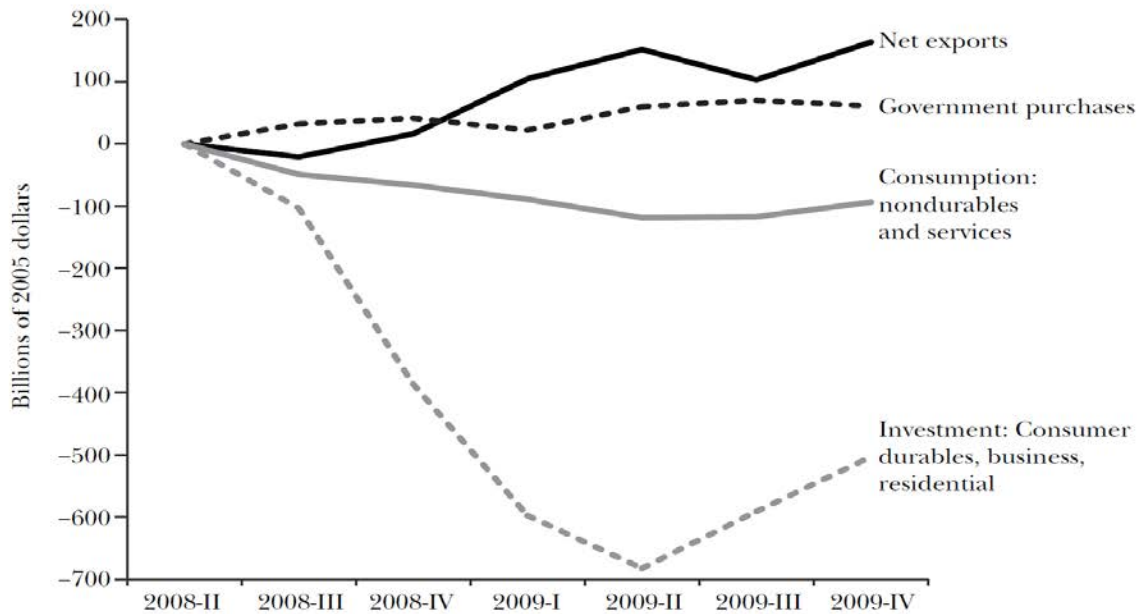
Source: U.S. National Income and Product Accounts, Table 1.1.6.
Adopted from: Hall (2010), Why does the economy fall to pieces after a financial crisis?

The downturn in various economic activities during the crisis caused an increase in the unemployment rate in the U.S. The unemployment rate in September 2007 was 4.7 percent and it increased to 6.2 percent in September 2008, which was considered a modest increment (Board of Governors of the Federal Reserve System, 2016). However, the rate continued to climb and saw a steeper increase from 6.6 percent in October 2008 to 7.4 percent in December 2008 (Hurd and Rohwedder, 2010). In October 2009, the unemployment rate peaked at 10 percent (Levine, 2013). A total of 7.8 million jobs were lost from 2007 to 2010 across various industries (U.S. Bureau of Labor Statistics, 2010; Levine, 2013). According to the Board of Governors of the Federal Reserve System (2016), the normal level of unemployment rate the U.S. economy can sustain in the long run, in the absence of shockwaves to the economy, is in the range of between 4.5 percent and 6 percent. During the 2008-2009 recession, firms responded to the crisis by increasing redundancies as the demand for goods and services plummeted. Hence, the deeper the downturn in the business cycle, the greater the rise in unemployment rate. Figure 10 shows

that demand for employees fell across industries during the crisis. Figure 11 reveals that the manufacturing and construction industries were hit with the highest number of job losses.

Figure 10   Total nonfarm employment, seasonal adjusted data from 2000 to 2010
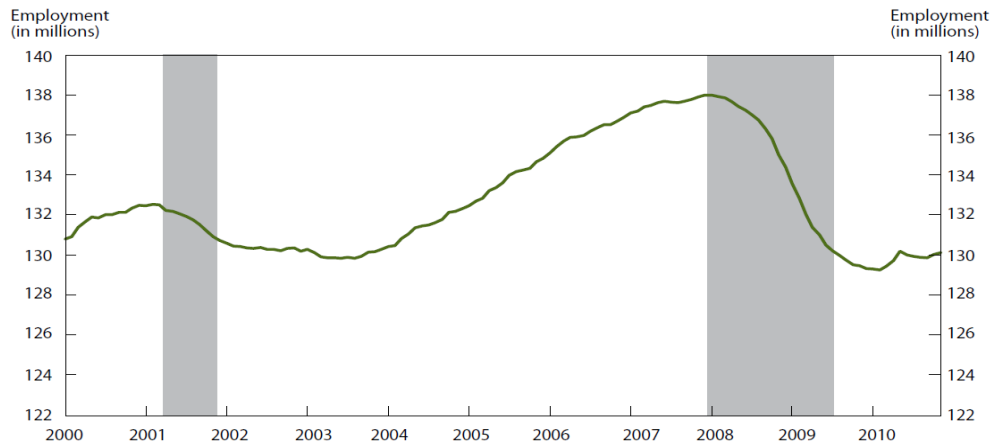
NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.

Source: U.S. Bureau of Labor Statistics (2016) Current Employment Statistics survey
Adopted from: Goodman and Mance (2011), Employment loss and the 2007–09 recession: an overview.

Figure 11   Changing in the number of jobs by industry from 2007 to 2010
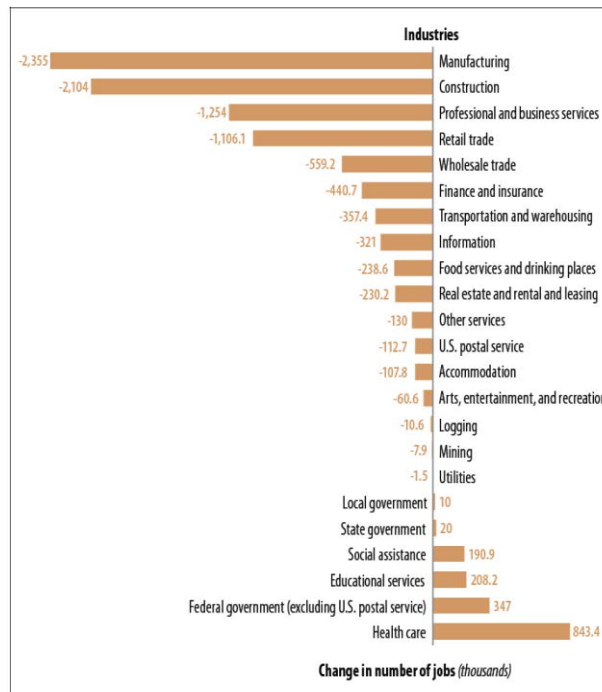
Source: U.S. Bureau of Labor Statistics (2016) data from the Current Employment Statistics program.
Adopted from: Levine (2013), The increase in unemployment Since 2007: Is it cyclical or structural?

The losses of highly leveraged financial institutions led to a significant credit crunch. It dragged GDP lower and caused high unemployment rate, which in turn triggered an overall economic contraction, ultimately turning into a vicious circle. As a result, government intervention was seen as essential for restoring normality in the U.S financial markets.

The Types of Government Intervention during the Crisis

Financial crises are expensive, because they involve significant cost from bankruptcy, subsequent social deadweight losses from debt restructuring and liquidation among households, firms and financial institutions alike. When the credit and assets price bubbles went bust triggering the Global Financial Crisis, they caused substantial real economic costs and amplified the recession.

Since 2007, the federal government has taken a number of steps to address the widespread disruption to the functioning of the financial markets. In general, the public interventions in response to the 2008-2009 financial crisis can be summarised in five broad categories: (1) liquidity provision by central banks; (2) bailout packages to prevent the failure of troubled firms; (3) purchase of illiquid assets from financial institutions in order to restore confidence in their balance sheets; (4) involvement in specific, dysfunctional financial markets; and (5) channelled capital to financial institutions to help them recover from asset write-offs (Webel and Labonte, 2010; Financial Crisis Inquiry Commission, 2011).

First of all, let's focus on the lending operations introduced by the Federal Reserve. Initially, the government approach was focused on strengthening individual institutions on a case by case basis. For instance, in December 2007 the Federal Reserve created the Term Action Facility (TAF) to auction term funds to depository institutions and provide long-term liquidity to financial markets. In March 2008, the Primary Dealer Credit Facilities (PDCF) was formed to provide overnight loans to primary dealers and expand the range of institutions with access to

its facilities. In October 2008, the Money Market Investor Funding Facility (MMIFF) was introduced to provide liquidity to money market investors. Last but not least, in November 2008, the Term Asset-Backed Securities Loan Facilities (TALF) was created by the Federal Reserve to spur the credit lending of households and small businesses. This programme supported the issuance of asset-backed securities based on collateralised car leases, student loans, credit card loans and loans guaranteed by the Small Business Administration (SBA).

However, the failure of Lehman Brothers in September 2008 convinced the Federal Government of the United States that a more systematic approach was essential to curb the problems. Relying solely on liquidity aid was not sufficient to counter financial turmoil effectively (Sjostrom, 2009; Webel and Labonte, 2010; Financial Crisis Inquiry Commission, 2011). In October 2008, Congress enacted the Emergency Economic Stabilization Act (EESA) to create the Troubled Asset Relief Program (TARP), whereby the government would purchase toxic assets and equity from U.S financial institutions and automobile manufacturers to strengthen the economy. In addition, the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC) implemented broad lending and guaranty programmes to tackle a number of disparate problems (Acharya et al., 2009).

The Review of Government Interventions

The U.S. Government enacted a number of policies and aid programmes during and immediately after the 2008-2009 crisis in order to reduce its negative impact on the U.S economy. The chosen path was undeniably of a great cost to the taxpayer. The liquidity provision and bailout packages resulted in a considerable wealth transfer from the government coffers to the impacted institutions without corresponding returns and resolution of the credit crisis at hand. Somewhat unexpectedly, the intervention also instigated a moral hazard in the form of a race among the impacted institutions to become systemic.

Acharya et al. (2009) criticise the one-size-fits-all approach adopted by the Federal Government as too generous and not taking into account the impact of credit risk, i.e. financial institutions such as Goldman Sachs and Morgan Stanley carried substantially higher credit risk compared to other firms, but they were not among the institutions that received aid. Apart from the sizeable cost incurred, there was a lack of exit plan, too. For instance, the loan guarantee scheme during the Crisis transferred between $13 and $70 billion of the tax payers' wealth to financial institutions with a flat fee of 75 basis points per annum regardless of the credit risk. In addition, the implementation of the loan guarantees and recapitalisation schemes encouraged the dependency of financial institutions on government aid until the crisis has fully settled. According to Acharya et al. (2009), such guarantees may lead to a new round of moral hazard due to their unfair pricing.

Furthermore, the massive rescue plan benefited only the U.S financial sector and automobile manufacturers. The other industries did not receive adequate or comparable attention. In fact, some scholars criticise the government intervention as being against the Darwinian evolution and competence-based theory, which suggest that firms constantly invoke the biological metaphor of nature selection (Schumpeter, 1954; Hodgson, 1998; Johnson et al., 2013). Based on the theory, better firms find a way to survive while poor performers are weeded out. Acharya et al. (2009) argue that government interventions should be based on a consistent set of principles to avoid excessive politicisation or capture by interest groups. This is essential to prevent long-term economic stagnation.

In conclusion, various government interventions took place during the 2008-2009 financial turmoil to mitigate the financial panic and restore normality in the U.S financial markets. Considering solely the main purpose of the intervention, the programmes were arguably a success as financial markets are largely functioning again. Restoring the U.S financial markets at zero cost to taxpayers is never realistic (Webel and Labonte, 2010). The financial crisis would

have led to an extraordinary cost to economic output, if it had been left to pullulate without government intervention.

The Global Financial Crisis: The Conclusion

This section illustrates the main features of a financial crisis: a credit boom feeds an oversized leveraging of financial institutions and an asset bubble, which culminate into a credit bust triggering price corrections and series of deleveraging, which led to the 2008-2009 financial crisis.

The Crisis imposed serious cost challenges to the Federal government. Measures with varied success were taken to reduce the negative impacts on the U.S economy. Although, financial crises may to a certain extent be unavoidable and preparation for them insufficient to mitigate completely their consequences, the recent experience demonstrates typical crisis features and their possible counteractions. The 2008-2009 financial jolts provide a fundamental basis to learn from and improve the effectiveness of future responses.

5.1   Did actually Corporate America experience a crisis in 2008 and 2009?

The widespread impact of the 2008-2009 Global Financial Crisis suggests that crises are equal opportunity threats (Reinhart and Rogoff, 2009; Claessens and Kose, 2013). They are multidimensional events and are often associated with one or more phenomena: severe disruptions in financial intermediation and the supply of external financing, substantial changes in asset prices and credit volume; large scale balance sheet problem (households and firms) and large scale of government support (Claessens and Kose, 2013). There are two major types of financial crises: currency and sudden stop crises, and debt and banking crises. The first type is classified using a strictly quantitative definition and the latter relies on qualitative and judgemental analysis (Reinhart and Rogoff, 2009).

The identification and dating of a crisis remains ambiguous despite a number of studies devoted to searching for crisis methodologies (Claessens and Kose, 2013). This is especially relevant to the debt and banking crisis type, because its determination is based on judgemental analysis. In addition, research has showed that methodology variations can result in differences to the start and end dates of a crisis (Claessens and Kose, 2013). Moreover, it is not unusual to have various types of overlapping crises in a single episode, which later lead to greater classification challenges.

The 2008-09 financial crisis is a banking crisis, which have been dated by researchers using a qualitative approach based on several events, such as bankruptcy, mergers and acquisitions, financial institutions' bailout, government interference and runs on several banks. The in-depth assessment of financial performance and fiscal costs have also been used as measures to define the crisis. Besides, looking at the chronology of the large changes (in nominal or real terms) in asset prices and credit boom, burst and crunch, it is not so difficult to recognise this catastrophe.

Still, this paper proposes to address a theme that have not been widely discussed by scholars. The causes, consequences and costs of the 2008-2009 financial crisis constitute the evidence in support of the presence of this punctuated event. However, its discussion among the research community has been mainly focused on the financial, insurance and housing industries. The bailout plans and rescue packages, introduced by the U.S. government, benefited only a small range of industries. There is an apparent lack of studies that analyse the impacts of the recession on non-finance industries. To address this research gap, 11,290 U.S. firms from eleven industries that were listed on the stock markets from 2006 through 2014 are used to form a longitudinal study. This chapter aims to explore the existence of a crisis by looking at the turnover rates of different industries, through the research question: *Did actually Corporate America experience a crisis in 2008 and 2009*?

The search for the answer was split into three phases. First, this study explored the annual turnover of U.S. firms to identify the number of delistings throughout the observation period. Then, a descriptive analysis of the mortality rates of various industries was performed to offer a broad picture of firms' performance. Last, the historical turnover of U.S. firms was compared with the S&P 500 turnover during the period under observation to answer the research question.

Before delving into the research details, it is important to understand why the S&P 500 index constituents were chosen as benchmark for measuring the likelihood of crisis in this study. The relationship between the S&P 500 firms and crises is discussed in the next section.

5.2   Corporate Longevity: Turbulence Ahead for the S&P 500 Firms

Out of the six million firms in the U.S., less than one percent are publicly traded on exchanges such as NASDAQ and the New York Stock Exchange (NYSE) (Stangler and Arbesman, 2012; U.S. Small Business Administration, 2012). However, these listed firms play an outsized economic role. The S&P 500, with a market capitalisation of USD 16.7 trillion, represents approximately 80 percent of available market capitalisation in the U.S. (Asem and Alam, 2012; Mauboissin and Callahan, 2014). Almost 40 percent of the actively-managed U.S. equity funds, or USD5.7 trillion, is benchmarked against S&P 500 (Petajisto, 2013).

The S&P 500 firms are considered as leading companies in leading industries. This faction of corporate behemoths, the likes of Apple, McDonald's, Exxon Mobil, JP Morgan Chase, Citigroup and so on, offer employment to nearly one third of the American workforce (Davis and Kahn, 2008; Stangler and Arbesman, 2012). A report shows that just 28 firms in the S&P 500 collectively hauled in more than half of the total net income generated by U.S. based companies on the stock markets in 2016 (S&P Dow Jones Indices, 2016c). Their economic heft suggests that the relative stability or volatility of publicly listed firms serves as an important economic gauge.

What is actually S&P 500? The Standard & Poor's 500, often abbreviated as the 'S&P 500', is a member of the S&P Global 1200 family of indices. The S&P 500 is an American stock market index, based on the market capitalisation of the 500 largest companies listed on NASDAQ and NYSE stock exchanges (S&P Dow Jones Indices, 2016c). There are five main criteria that a firm has to fulfil in order to be included in the S&P 500 index: (1) market capitalisation: unadjusted company market capitalisation of US$ 5.3 billion or more; (2) liquidity: using composite pricing and volume, the ratio of annual dollar value traded to float-adjusted market capitalisation should be 1.00 or greater; (3) domicile: 10-K annual reports and the primary listing of the common stock is NYSE or NASDAQ; (4) financial viability: the sum of the most recent four consecutive quarters' Generally Accepted Accounting Principles (GAAP) earnings (net income excluding discontinued operations) should be positive as should the most recent quarter; and (5) treatment of IPOs: initial public offerings should be seasoned for six to 12 months before being considered for addition to the Index (S&P Dow Jones Indices, 2016c).

Changes in the S&P 500 list usually occur when a listed firm is involved in a merger, acquisition, bankruptcy or significant restructuring, which makes it no longer compliant with the inclusion criteria (Harris and Gurel, 1986; S&P Dow Jones Indices, 2016c). The removed company is replaced by a larger firm in the same industry, which is not yet on the list.

Turnover among big companies is not a new phenomenon (Stangler and Arbesman, 2012). In fact, the changes to the S&P 500 list provide a meaningful window into American capitalism (Stangler and Arbesman, 2012). The turnover signifies a kaleidoscopic process of efficiencies and sectoral change at the firm level, as well as some less sanguine economic developments. For instance, a higher turnover in the 1980s reflects value creation as corporate conglomerates were taken apart and remade into separate subsidiaries to improve efficiency, while in the 1990s, a higher turnover rate is due to a merger and acquisition boom concentrated in a handful of sectors. In 2007 and 2008, a higher turnover rate was due to the Global Financial Crisis. Hence,

turnover among the Index constituents can be a portrait of discrete temporal and sectoral phenomena as well as a broad economic trend.

Many studies suggest that the annual turnover of the S&P 500 has on average risen over time (Stangler and Arbesman, 2012; Mauboussin and Callahan, 2014). The S&P 500 turnover in historical context will be discussed in the next section.

The S&P 500 Turnover Through the Prism of History

What are the long-term trends? Why do some firms cease to exist?

Nothing lasts forever. The issue of corporate longevity has been associated with the rate of innovation, portfolio turnover and the shifts in valuation (Mauboussin and Callahan, 2014). With data obtained from DataStream, this study sets out to explore the meaningfulness of the S&P 500 turnover.

The S&P 500 constituent lists for each year from 1990 to 2016 were extracted to observe the turnover trends over the period. Figure 12 contains the high-level results of the analysis, which show an apparent prima facie trend in annual turnover. From 1990 to 1999, there is a steady increase in the number of firm deletions. The average turnover for the period is 22.4 firms, or 4.48%, per year. The peak is in 2000, caused by the dot-com bubble. Then, annual turnover decreased sharply from 54 firms (10.8%) in 2000 to 9 firms (1.8%) in 2003. The next several years to 2008 post another steady increase, followed by the somewhat expected plunge in the crisis years of 2008-2009. Then on, until 2014, the turnover rate remains stable around 18.25 firms or 3.65%.

In a decade-long view, however, the fluctuation is not as sharp as the year-on-year trend. The last decade of the 20th century (1990-1999) saw an average annual turnover of 4.48% (22.4 firms), while the next decade (2000-2010) had 5.53% (27.64 firms) turnover.

Nevertheless, the higher turnover in 2000, 2008 and 2009 suggests that larger firms are vulnerable to punctuated events. Inadvertently, scholars propose that some degree of turnover is a healthy sign of risk taking, especially in a free market economy (Acharya et al., 2009). In contrast, a stable market system may indicate low risk-taking and diminished entrepreneurship, which could hinder long-term economic growth. Hence, it is crucial to be able to identify the substantial differences between occasional firms' turnover delivered by the healthy developments in dynamic markets and a systemic financial or corporate crisis, where the delistings are triggered by unfettered risk-taking incentives.

In the next section, 11,290 firms are reviewed to identify the survival trends of U.S. companies from 2006 to 2014. The analysis concludes with a comparison of the average turnover between the research sample and the S&P 500 firms. The findings indicate whether the drawbacks of the 2008-2009 financial crisis were exclusively borne by the financial industry or they had a wider spread impact on the U.S. economy.

Figure 12   S&P 500 Annual Turnover
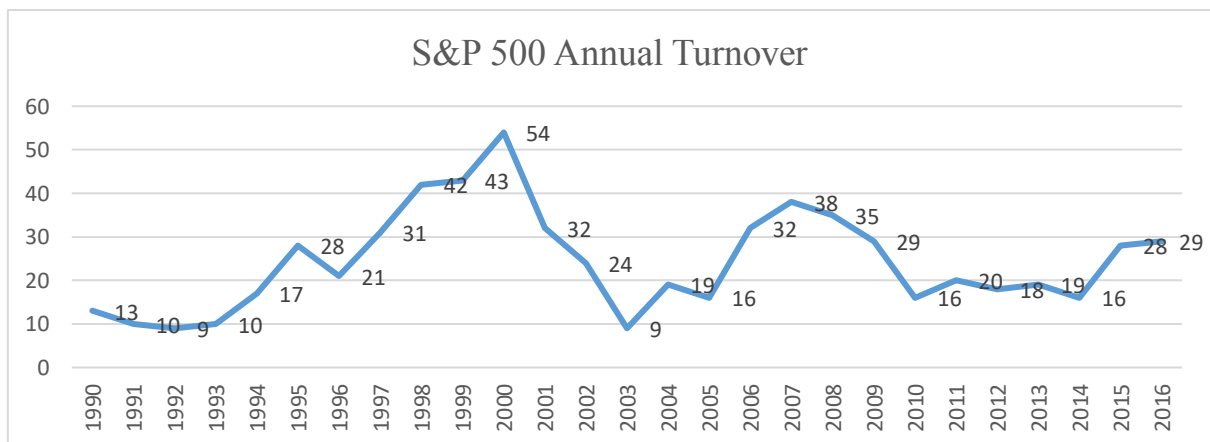
Source of information: Datastream
Index: S&P 500
Period: 1989 to 2016
Point of comparison: Year end

5.3   Data, Variables and Method

This section provides an overview of the data resources and samples used in this study. The financial data was extracted from DataStream and combined with company information from the U.S. Securities and Exchange Commission as well as a number of publicly available sources (refer to the Methodology chapter for full description).

Sample

The sample frame consists of 11,290 firms, listed on NYSE and NASDAQ stock markets, and delisted firms in the United States (U.S.) from 2006 to 2014. The historical financial information of survived and dead firms was obtained from DataStream to create a longitudinal study. The sample is split into 9 groups, based on the year of listing on and delisting from the stock markets. Table 19 shows the summary of the sample.

The main purpose of this chapter is to determine whether the 2008-2009 Global Financial Crisis impacted Corporate America widely by using the historical turnover of the S&P 500 firms as benchmark.

Coding and Operationalisation of Variables

Dependent Variable

To help answer the question posed in this chapter, the dependent variable formed by the historical firm turnover needs to reflect whether U.S. companies experienced a recession at any point of the observation period. This study uses the S&P 500 turnover as a benchmark to indicate whether U.S. firms did (1) or did not (0) experience a crisis throughout the observation period. This study interprets the presence of a crisis if the sample has higher or similar turnover as the S&P 500 in 2008 and 2009, while lower turnover rates indicate the opposite.

Independent Variable

A firm's status in the stock markets, either remained listed or delisted, serves as the independent variable in this study. It is worth highlighting why Group 1 is labelled as "Dead before Crisis". DataStream categorises all delisted firms regardless of whether they have been acquired, merged, bankrupt or going private as "dead" in the system. "Dead" in this thesis implies the status given by the database search, which simply means "delisted".

Table 19   Summary of Groups

Group	Sub Total	Grand Total	Percentage
Group 1: Dead before crisis		1426	12.63
Group 1a: Dead before crisis: Acquired	700		
Group 1b: Dead before crisis: Merged	213		
Group 1c: Dead before crisis: Bankrupt	179		
Group 1d: Dead before crisis: Going Private	334		
Group 2: Born in crisis and died in crisis		29	0.26
Group 2a: Born in crisis and died in crisis: Acquired	3		
Group 2b: Born in crisis and died in crisis: Merged	2		
Group 2c: Born in crisis and died in crisis: Bankrupt	1		
Group 2d: Born in crisis and died in crisis: Going Private	23		
Group 3: Born during and died after		139	1.23
Group 3a: Born during and died after: Acquired	56		
Group 3b: Born during and died after: Merged	14		
Group 3c: Born during and died after: Bankrupt	16		
Group 3d: Born during and died after: Going Private	53		
Group 4: Born during and still going		466	4.13
Group 5: Born after and died		71	0.63
Group 5a: Born after and died: Acquired	32		
Group 5b: Born after and died: Merged	16		
Group 5c: Born after and died: Bankrupt	2		
Group 5d: Born after and died: Going Private	21		
Group 6: Born after and still going		715	6.33
Group 7 Alive before and died during		1115	9.88
Group 7a: Alive before and died during: Acquired	492		
Group 7b: Alive before and died during: Merged	100		
Group 7c: Alive before and died during: Bankrupt	237		
Group 7d: Alive before and died during: Going Private	286		
Group 8: Alive before and died after		1915	16.96
Group 8a: Alive before and died after: Acquired	1141		
Group 8b: Alive before and died after: Merged	218		
Group 8c: Alive before and died after: Bankrupt	189		
Group 8d: Alive before and died after: Going Private	367		
Group 9: Alive before and still going		5414	47.95
Grand Total		11290	100.00

5.4   Methods

Given that the outcome is a numeric variable (turnover rate) and the predictors are categorical variables (remain listed or delisted), a descriptive data analysis was applied. This study uses the historical turnover of the S&P 500 as the reference point compared with the annual turnover of the sample to indicate the presence of environmental jolts. If the turnover rate of the sample falls below the benchmark, this may suggest that the U.S. firms did not experience a crisis from 2006 to 2014. In contrast, a similar or a higher turnover rate may suggest that a crisis occurred.

5.5   Results

Descriptive analysis: The snapshot of Corporate America from 2006 to 2014

Table 19 contains the total of 11,290 companies split into 9 groups, based on the year of listing on and delisting from NYSE and NASDAQ stock exchanges of each firm. 1426 firms (12.63%) were born and died before the crisis (Group 1); 29 firms (0.26%) were born in the crisis and died in the crisis (Group 2); 139 firms (1.23%) were born in the crisis and died during the crisis (Group 3); 466 firms (4.13%) were born during the crisis and are still operating (Group 4); 71 firms (0.63%) were born after the crisis and died before 2014 (Group 5); 715 firms (6.33%) were born after the crisis and are still operating (Group 6); 1115 firms (9.88%) were set up before the crisis and died during the crisis (Group 7); and finally, 1915 firms (16.96%) were established before the crisis and died after the crisis (Group 8). The data shows that only 5,414 (47.95%) firms from the sample remained listed on NYSE and NASDAQ stock markets from 2006 to 2014. The total number of firms that died during and after the crisis is 3,030 or 26.84% of the overall sample. The figures indicate an alarming default rate during the crisis - 1 out of 4 firms did not survive.

The descriptive analysis continues with the discussion about delisted firms. Table 20 shows that delisted firms consist of acquired, merged, bankrupt and going private firms. Among the 4,695

delisted firms, 2,423 (51.63%) companies were delisted because of acquisition, 563 (11.99%) firms were delisted due to a merger, 624 (13.29%) were bankrupt and 1,084 (23.09%) firms went private.

Table 20 reveals that 36.70% ([81+148]/624*100) of the overall bankruptcy happened during the environmental jolt. When concentrating on the crisis period, it is noticeable that the number of firms which declared bankruptcy in 2008 swelled to 81 from 46 or an increase of 76.09% ([81-46]/46*100). 2009 marked another increase of 82.72% ([148-81]/81*100). In the first year after the crisis, the total number of bankrupt firms decreased from 148 to 80 or 45.95% ([80-148]/148*100).

Conversely, the analysis shows that the volume of acquired and merged firms decreased dramatically in 2008 and 2009. Table 20 shows that there was a decrease of 37.36% ([273-375]/375*100) in the total number of acquired firms and a decrease of 50.41% ([61-123]/123*100) in merged firms in 2008. The total number of acquired and merged firms shows further decrease in 2009, when acquired firms reduced to 194 or 28.94% ([194-273]/273*100), while the total number of merged firms decreased 31.15% ([42-61]/61*100). The total number of mergers and acquisitions bounced back in 2010 with 59.28% ([309-194]/194*100) increase in total acquired firms and 54.76% ([65-42]/42*100) in total merged firms.

In addition, the analysis reveals an interesting trend about the immediate pre-crisis period. The Global Financial Crisis is recognised as an isolated turbulence in the US housing market, transformed into a full-blown recession by the end of 2007 (Box, 2011). A higher number of delistings in 2007, compared to 2006 and 2008, may be a symptom of the foreshadow of the financial bubble burst. Figure 13 shows the line chart of delisted firms.

Table 20   **The Breakdown of Delisted Firms**

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	Percent
Acquired	52	375	273	194	309	322	294	334	271	2424	51.63
Merged	27	123	61	42	65	53	69	54	69	563	11.99
Bankrupt	4	46	81	148	80	69	75	58	63	624	13.29
Going Private	11	44	64	87	79	120	171	204	304	1084	23.09
Total	94	588	479	471	533	564	609	650	707	4695	100.00

Figure 13   **Delisted Firms per Year**
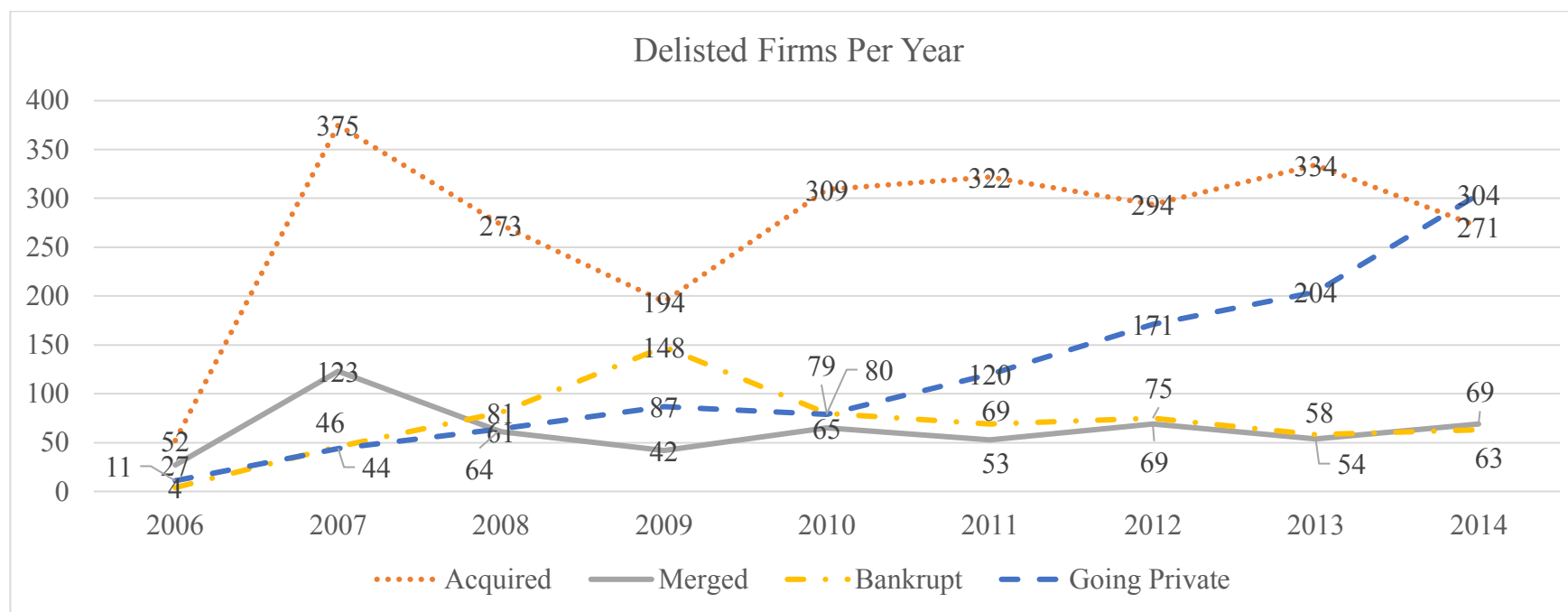
Towards Analysis of Industry: Application to U.S. Firms

The research sample is segregated into eleven sectors (Table 21) based on the Industry Classification Benchmark (ICB). ICB denotes the firms' business nature, which is determined by its primary source of revenue and other publicly available information (FTSE Russell, 2016). An accurate and standardised industry definition is vital in this study, as it allows better understanding of organisational behaviour and performance. For instance, a lot of studies claim that the subprime mortgage market crisis in 2008 severely impacted the financial industry. What happened to non-financial firms in the meantime? Hence, the data used in this analysis encompasses all industries as per ICB, including the financial sector, and the conclusions aim to broaden the existing insights into the survival trends of the wider U.S economy.

The study reveals that of the 11,290 target firms, 20.66% or 2333 are financial companies, followed by industrial (14.88%), technology (11.92%), health care (11.59%), consumer services (11.46%), consumer goods (8.17%), basic materials (8.13%), oil and gas (7.80%), utilities (2.22%), NA (1.62%) and last, but not least, telecommunication firms (1.53%).

The discussion will focus on the firms from Group 7 (Alive before and died during), Group 8 (Alive before and died after) and Group 9 (Alive before and still going) that were listed since 2006, because all these firms have gone through the pre-crisis, crisis and post crisis period, and can provide a better picture of the organisational turnover. In contrast, if the sample for comparison included firms listed in 2008 and delisted in 2009, or listed after 2010 and delisted before 2014, the reasons for delisting could be poor performance or industry specific barriers, along with the recession. Hence, the data is refined to ensure that the turnover of the firms is most likely crisis related.

The data shows the financial industry was highly impacted by the crisis with delisting of 581 firms (Table 22). However, this number does not represent the full picture because the financial

sector also had the highest number of listed firms in the sample. In percentage term, the top three impacted industries were oil and gas (43.40%), health care (42.21%) and basic materials (41.95%) compared to the financial industry with (33.94%). In addition, the data shows that utilities firms possessed the highest chance to survive - 73.49% - and sustain their performance throughout the observation period.

Among the 3030 delisted firms (refer Table 23, Group 7 and Group 8), 58.89% or 1633 firms were delisted because of acquisition, followed by 21.11% firms which went private, 14.05% of firms suffered insolvency and 10.50% of firms were delisted due to a merger. In addition, the data analysis reveals that acquisition activities are most likely to occur in the telecommunication (28.99%), basic materials (25.30%), technology (24.69%) and health care industries (24.30%) during economic turbulence. 8.93% of basic materials and 8.19% of oil and gas firms went private in 2008 and 2009, while merger activities tended to happen in the basic materials (4.60%), oil and gas (5.01%) and technology industries (4.36%). Finally, analysis suggests that oil and gas firms are more inclined to file for bankruptcy during crisis than firms from other industries (8.50% if compared to all delisted firms), followed by financial (6.19%), health care (6.16%) and industrials firms (5.73%).

Overall, the analysis suggests that the oil and gas industry was the most vulnerable industry with the highest delisted rate (43.40%) and bankruptcy rate (8.5%). The financial had the highest total number of delistings (581 firms) of all industries throughout the observation period.

Table 21   The Overall View of Industry Base

Industry	Group 1: Dead before crisis	Group 2: Born in crisis died in crisis	Group 3: Born during and died after	Group 4: Born during and still going	Group 5: Born after and died	Group 6: Born after and still going	Group 7: Alive before and dead during	Group 8: Alive before and dead after	Group 9: Alive before and still going	Total	Percentage
Basic Materials	93	0	19	29	15	23	90	220	429	918	8.13
Consumer Goods	104	5	13	35	0	31	90	125	519	922	8.17
Consumer Services	173	5	15	73	4	82	121	200	621	1294	11.46
Financials	287	8	32	114	30	150	213	368	1131	2333	20.66
Health Care	165	3	9	60	3	209	136	227	497	1309	11.59
Industrials	187	5	16	56	6	58	137	260	955	1680	14.88
NA	53	0	0	0	0	1	30	27	72	183	1.62
Oil & Gas	86	1	18	38	9	70	109	177	373	881	7.80
Technology	231	2	15	55	3	76	146	243	575	1346	11.92
Telecommunications	27	0	0	3	0	5	24	30	84	173	1.53
Utilities	20	0	2	3	1	10	19	38	158	251	2.22
Total	**1426**	**29**	**139**	**466**	**71**	**715**	**1115**	**1915**	**5414**	**11290**	**100.00**

Table 22   The Highlights of Industry Summary

No	Industry	Group 7 Alive before and dead during		Group 8: Alive before and dead after		Group 7+8: Alive before but dead during or after the crisis		Group 9: Alive before and still going		Total
		Number of Firms	Percentage of Overall Number	Number of Firms	Percentage of Overall Number	Number of Firms	Percentage of Overall Number	Number of Firms	Percentage of Overall Number	
1	Utilities	19	8.84	38	17.67	57	26.51	158	73.49	215
2	Consumer Goods	90	12.26	125	17.03	215	29.29	519	70.71	734
3	Industrials	137	10.13	260	19.23	397	29.36	955	70.64	1352
4	Financials	213	12.44	368	21.50	581	33.94	1131	66.06	1712
5	Consumer Services	121	12.85	200	21.23	321	34.08	621	65.92	942
6	Telecommunications	24	17.39	30	21.74	54	39.13	84	60.87	138
7	Technology	146	15.15	243	25.21	389	40.35	575	59.65	964
8	Basic Materials	90	12.18	220	29.77	310	41.95	429	58.05	739
9	Health Care	136	15.81	227	26.40	363	42.21	497	57.79	860
10	Oil & Gas	109	16.54	177	26.86	286	43.40	373	56.60	659
11	NA	30	23.26	27	20.93	57	44.19	72	55.81	129
	Total	1115	13.20	1915	22.68	3030	35.88	5414	64.12	8444

Table 23   Refine Industry Classification: Total and Percentage

No	Industry	Group 7 Alive before and dead during								Group 8: Alive before and dead after								Group 7+8: Alive before crisis and dead during or after crisis								Group 9: Alive before and still going		Total
		Acquired		Merger		Bankrupt		Going Private		Acquired		Merger		Bankrupt		Going Private		Acquired		Merger		Bankrupt		Going Private				
		T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%	
1	Basic Materials	52	7.04	8	1.08	9	1.22	21	2.84	135	18.27	26	3.52	14	1.89	45	6.09	187	25.30	34	4.60	23	3.11	66	8.93	429	58.05	739
2	Consumer Goods	29	3.95	6	0.82	22	3.00	33	4.50	70	9.54	13	1.77	19	2.59	23	3.13	99	13.49	19	2.59	41	5.59	56	7.63	519	70.71	734
3	Consumer Services	48	5.10	8	0.85	31	3.29	34	3.61	119	12.63	17	1.80	23	2.44	41	4.35	167	17.73	25	2.65	54	5.73	75	7.96	621	65.92	942
4	Financials	86	5.02	15	0.88	67	3.91	45	2.63	204	11.92	55	3.21	39	2.28	70	4.09	290	16.94	70	4.09	106	6.19	115	6.72	1131	66.06	1712
5	Health Care	63	7.33	12	1.40	29	3.37	32	3.72	146	16.98	19	2.21	24	2.79	38	4.42	209	24.30	31	3.60	53	6.16	70	8.14	497	57.79	860
6	Industrials	53	3.92	15	1.11	24	1.78	45	3.33	147	10.87	32	2.37	29	2.14	52	3.85	200	14.79	47	3.48	53	3.92	97	7.17	955	70.64	1352
7	NA	13	10.08	5	3.88	3	2.33	9	6.98	15	11.63	3	2.33	0	0.00	9	6.98	28	21.71	8	6.20	3	2.33	18	13.95	72	55.81	129
8	Oil & Gas	40	6.07	11	1.67	32	4.86	26	3.95	103	15.63	22	3.34	24	3.64	28	4.25	143	21.70	33	5.01	56	8.50	54	8.19	373	56.60	659
9	Technology	83	8.61	15	1.56	15	1.56	33	3.42	155	16.08	27	2.80	16	1.66	45	4.67	238	24.69	42	4.36	31	3.22	78	8.09	575	59.65	964
10	Telecommunications	18	13.04	1	0.72	2	1.45	3	2.17	22	15.94	2	1.45	0	0.00	6	4.35	40	28.99	3	2.17	2	1.45	9	6.52	84	60.87	138
11	Utilities	7	3.26	4	1.86	3	1.40	5	2.33	25	11.63	2	0.93	1	0.47	10	4.65	32	14.88	6	2.79	4	1.86	15	6.98	158	73.49	215

Note: T indicates the total number of firms

% indicates the percentage of the overall number (For example, basic materials, Group 7: 52/739*100% = 7.04%)

Comparison between Corporate America and the S&P 500 Firms

The main purpose of this study is to highlight the differences in delisting turnover rates, occurring during normal economic conditions and a systemic crisis, where the delistings are triggered by unfettered risk-taking incentives. This section compares the turnover rates of U.S. firms with S&P 500 to identify whether Corporate America experienced a crisis between 2006 and 2014. The analysis is split into three sections (Table 24): (1) the analysis of S&P 500 firms; (2) the analysis of Corporate America overall; and (3) the analysis of corporate entities listed on the stock markets since 2006 (pre-crisis period).

Table 24 shows that from 2006 to 2014, 223 (4.95%) firms were removed from the S&P 500 list, while 4277 (95.05%) firms remained (also refer to Figure 13). The average deletion is 24.77 firms or 4.95% per year. Table 25 reveals that there was a dramatic change on S&P 500 list in 2006, 2007, 2008 and 2009. The annual turnover for these years is 6.4%, 7.6%, 7.0% and 5.8% respectively, which are all higher than the average turnover rate. The high deletion rates suggest that the S&P 500 firms may have experienced punctuated events throughout that period and these caused the high volatility of the constituent list.

The analysis of the overall corporate American company landscape shows that out of the total of 11,290 firms, 4695 (41.58%) entities were delisted throughout the whole nine-year period. Only 6595 (58.42%) firms remained listed until the end of 2014. The average turnover was 521.67 firms or 4.64% per year (Table 25). The percentage of delistings in 2007 was higher than the average percentage, standing at 5.21% versus 4.64% on average, which might be an indicator of a crisis event. In contrast, the turnover in 2008 (4.24%) and 2009 (4.17%) were both lower than the average percentage (4.64%), which might be pointing towards normality of trading conditions in Corporate America as a whole in 2008 and 2009.

The third section of the analysis - U.S. firms listed on the stock markets since 2006 – shows that among the 8444 firms only 5414 (64.12%) firms managed to survive until 2014, while 3030 (35.88%) companies were delisted during the same period. The average turnover was 336.67 firms or 3.99% per year, which is lower than the average S&P 500 rate of 4.95%.

Table 24   Total Turnover of U.S Firms and the S&P 500 Firms from 2006 to 2014

Target sample	Group	Grand Total	Percent
S&P 500 firms	Total delisting on the S&P 500 list from 2006 to 2014	223	4.95
	Firms that remain on the S&P 500 list	4277	95.05
	Total S&P 500 firms for nine years	**4500**	**100.00**
Corporate America	Total delisting from 2006 to 2014	4695	41.58
	Firms that still going till 2014	6595	58.42
	Total sample	**11290**	**100.00**
Corporate America	Firms that alive in 2006 and died during/after the crisis	3030	35.88
	Firms that alive in 2006 and still going till 2014	5414	64.12
	Total sample that listed before the crisis	**8444**	**100.00**

Table 25   Summary of Turnover from 2006 to 2014

Target sample	Status/ Percent	Year									Average
		2006	2007	2008	2009	2010	2011	2012	2013	2014	
S&P 500 (N=500)	**Delisted**	32	38	35	29	16	20	18	19	16	223
	Percent	6.4	7.6	7.0	5.8	3.2	4.0	3.6	3.8	3.2	4.95
U.S. firms (N=11290)	**Delisted**	95	588	479	471	533	564	609	650	707	521.67
	Percent	0.83	5.21	4.24	4.17	4.72	5.00	5.39	5.76	6.26	4.64

5.6   Discussion and Conclusion

The findings lend support to existing literature that the U.S. firms experienced a crisis in 2008 and 2009. The turnover among S&P 500 firms was exceptionally high in 2008 and 2009 (Table 25). These suggest that a high number of M&A, bankruptcy or a significant restructuring took place in the U.S. during this period (Harris and Gurel, 1986; S&P Dow Jones Indices, 2016c). The high turnover among big companies signifies a kaleidoscopic process of efficiencies and sectoral change, as well as less sanguine economic developments, which are the outcomes of the 2008-2009 Global Financial Crisis.

Besides, the results show that the total bankruptcy volume doubled in 2008-2009, which reinforces the view that a crisis occurred within Corporate America. This finding is backed by the bankruptcy theory, which suggests that bankruptcy is usually seen by firms as a measure when they encounter financial distress, decreasing profitability, increasing market competition and increasing level of debt accumulation (Bergström et al., 2005). All these are consequences of the recession.

The results also point to a decrease in M&A activities in 2008 and 2009. Following the existing literature, the opposite finding should have been documented. Scholars suggest that environmental jolts might be a push factor for M&A, because they redraw and reduce industry barriers (Meyer et al., 1991; Wan and Yiu, 2009). During turmoil, ambitious firms may be tempted to get involved in acquiring substantially deflated assets (Pangarkar and Lie, 2004). Scholars propose that M&A during an environmental jolt can reduce the chance of overpayment and acquired firms are easier to push through restructuring. Viewed in this light, firms can reap benefits by seizing new opportunities through M&A during crisis (Chattopadhyay et al., 2001; Wan and Yiu, 2009).

The analysis findings clearly contradict the existing literature. Considering that the total number of bankruptcies increased and M&A activities decreased in 2008-2009, the crisis may have been the dominant factor in reducing the attractiveness of M&A as corporate strategy during the period. Despite the suggestion in the literature to date that corporate acquisitions are positively correlated to firm performance during turbulence (Wan and Yiu, 2009), this study suggests that the 2008-2009 recession reduced environmental munificence and amplified the requirement for increased financial resources to fund business operations. In addition, the uncertain business environment hindered firms from taking risky decisions. Besides, the fact that 'up to 80% of acquisition activity failed to return greater yields than the annual cost to finance the acquisition' and '34% of the acquisitions were later sold for a loss and only 23% were considered successful'

have also reduced the attractiveness of M&A as strategic option during uncertainty (Bekeir et al. 2001; Butler et al., 2012). It is understandable why M&A appears to be an unfavourable corporate strategy during crisis, as it may involve high risk and unpredictable return.

At industry level, the analysis unveils an interesting paradigm: the financial industry tops the list with the highest number of delisted companies (581), while the oil and gas industry has the highest mortality rate in percentage terms (43.40%). The former supports the findings in the existing literature that the financial sector bore a large negative impact from the crisis, while the latter signifies that a ranking of the most impacted sectors may not be straightforward. In fact, in percentage terms the top three most impacted industries include also health care (42.21%) at second place and basic materials (41.95%) at third, with financials ranking in the bottom quartile with 33.94%. The reason for the relatively low percentage is self-explanatory: the financial industry had the highest number of listed companies in the sample for this study and in Corporate America immediately prior to the crisis, respectively.

This insight is directly correlated with the analysis of the effectiveness of the U.S. Government interventions. Although such analysis is not a primary focus of this research, it is worth pointing out that in hindsight the effectiveness of the government crisis policies might have been weakened by their limited attention on the non-financial sectors of the U.S. economy.

The study has also underlined the high turnover of listed companies on the NYSE and NASDAQ in 2007, 2008 and 2009, which may indicate a significant change in the business environment during the period. Despite the high costs associated with a U.S. stock market listing, there are considerable benefits, comprehensively documented in the existing literature, which offset the former. Thus, in normal trading conditions firms would expect to reap rewards from floating their equity for public trading. In 2008 and 2009, data shows the increased in liquidation in the crisis years. Hence, this study suggests that the 2008-2009 financial crisis

underpinned the high turnover among listed U.S. firms and shaped the status of the stock markets.

Accordingly, this study concludes that Corporate America experienced a crisis in 2008 and 2009. The judgement is based on the increase of total bankruptcy and a high turnover in 2008 and 2009.

5.7 Relevance for the Practitioners and the Theory

This study makes four main contributions to the theory. First, it identifies the characteristics of regular turnover and systemic crisis by examining the firm turnover in historical context. Regular turnover is common in a free market economy, where some degree of turnover or bankruptcy symbolise a healthy sign of risk taking. In contrast, systemic crises, which are triggered by unfettered risk-taking incentives, can result in recession. The two types of turnover require different treatments. The regular turnover could be resolved by the conventional market mechanisms, while a high turnover of financial institutions, requires immediate attention and interventions from various regulatory bodies. The latter, being left to market forces and unattended by regulators, could cause considerably more harm to the economy.

This study also highlights the importance of crisis management. Crises are generally infrequent events (Pearson and Claire, 1998) and every crisis is different. The Asian Financial Crisis, the busting of dotcom bubble and the 2008-2009 Global Financial Crisis impact different countries, markets and the solutions are not similar, too. For instance, the dotcom bubble was a stock market crisis, rather than financial and economic type. Thus, it is wiser for firms to focus on building their core competency, improving efficiency, constantly looking for new opportunities to achieve competitive advantages.

Third, the industry overview largely supports the literature to date that the financial sector was highly impacted by the crisis. However, the findings present a muted picture with regard to

ranking the most affected industries and challenge the depiction of the financial sector as the biggest loser of stock market presence. In percentage terms, the top 3 impacted industries were oil and gas, health care and basic materials with financials ranking in the bottom quartile. Literature shows that the primary government attention and financial aid were channelled towards the financial industry and the automobile sector, which in this study forms part of the consumer goods industry, ranking second in percentage terms as the least impacted industry after the utilities sector. This finding may well be rooted in a number of reasons, including the focused and somewhat effective government intervention policies. However, this study highlights that a financial crisis has wide-spread consequences, the biggest impact is not always identified in a straightforward manner and even less so found solely in the financial industry. Amplifying the effectiveness of government intervention in the future may depend on taking a more holistic, economy-wide approach and considering the knock-on effects of a financial industry-rooted crisis.

Lastly, this study contributes to the crisis literature by demonstrating the applicability of a quantitative data analysis in examining the impacts of the recent financial crisis in the U.S. The quantitative method complements and even surpasses the benefits of qualitative research methods, achieving a comprehensive view of the impacts of the crisis at a firm and industry level. The longitudinal data requires a considerable analysis effort, but it yields significant benefits in the assessment of financial turmoil. The findings demonstrate a high level of robustness, while the data analysis methods are applicable to various research contexts in the future.

5.8   Summary

In this chapter, the implications of the 2008-2009 financial crisis on the U.S. economy was reviewed and the main causes of the crisis, its effects, government interventions and their effectiveness were discussed. Then, the development of the S&P 500 constituents with the U.S.

economy was highlighted. A dataset comprising of 11,290 U.S. firms in total was obtained from DataStream to provide a research sample to answer: Did actually Corporate America experience a crisis in 2008-2009?

The research findings confirm that Corporate America did indeed go through a crisis during the observation period. Both financial and non-financial sectors were impacted, based on the identified and discussed high bankruptcy rate and high firm turnover in this chapter. Some of the findings in the existing literature were supported, while others were challenged. Thus, the study highlights the benefits of conducting a quantitative study with large data sample as opposed to the dominant qualitative research in the crisis literature to date.

CHAPTER 6: Surviving through the Global Financial Crisis

Understanding how firms survived during the Global Financial Crisis through the lens of ambidexterity

6.0   The Role of Ambidexterity in Influencing the Probability of Survival and Death

Is the life expectancy of firms shrinking? The challenges from technological disruptions and various crises have been reducing the life expectancy of large firms for some time. The average lifespan of a company in the S&P 500 index has decreased from 61 years in 1989 to 18 years in 2012 (Innosight, 2012). The past several years previously unthinkable fates have befallen corporate behemoths from investment banking mainstay Lehman Brothers to iconic car manufacturer Saab due to either economic turbulence or severe competition. These occurrences suggest that the challenges to business endurance are increasing. This environment inevitably raises questions – Considering the rapid fluctuations of the business environment and the impacts of these events on business continuity, what can firms do to improve the probability of survival during environmental turmoil? How did firms survive during the Global Financial Crisis? This chapter will reveal the answer.

Nowadays, it is no longer a question whether a business will face a crisis; instead, it is merely a matter of when and how prepared the firm is when faced with an unexpected event (Mitroff et al., 1996; Ponis and Koronis, 2012). The changes in the external environment require a greater measure of management adaptability and versatility. As a result, it is important for firms to understand how to improve their mortality rate during environmental jolts.

The literature further suggests that the factors which influence the probability of firm survival act at multiple levels: individual, organisational and environmental. Individual-based factors such as experience of founder (Delmar and Shane, 2006; Decker et al., 2009), traits and managerial style are found to impact survival probability. For instance, empirical research has

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incorporated psychological and sociological theory to describe various leadership styles in relation to survival outcomes (Decker et al., 2009).

Next, organisational-based factors such as financial condition (Wan and Yiu, 2009; Bradley et al., 2011a; Bradley et al., 2011b; Zona, 2012; Gracia-Appendini and Montoriol-Garriga, 2013; Maier et al., 2013), strategic preferences (Pangarkar, 2007; Lim et al., 2009; Lee and Makhija, 2009; Nadkarni and Herrmann, 2010; Lekmat and Chellah, 2011; Armstrong, 2013; Zagelmeyer and Heckmann, 2013), level of internationalisation (Lee et al., 2012), firm structure simplification (Bock et al., 2012), innovation intensity (Naidoo, 2010; Lee et al., 2012; McKinley et al., 2014), and dynamic capabilities (Makkonen et al., 2014) are found to be significant determinants in the likelihood of firm mortality. For example, there are studies that advocate the positive relationship between the degree of innovation and survival. This association has been identified in the technology industry, where research and development activities are crucial for establishing competitive advantage (Motohashi, 2005; Buddelmeyer et al., 2009).

Lastly, environmental forces, which is the least discussed factor in the management literature, propose that macroeconomics, institutional conditions and industry barriers can influence firm prosperity (Box, 2008). For instance, firms founded during times of economic crisis tend to exhibit lower survival rate. Also, some studies cite that the rate of survival of a firm depends on the industry characteristics, which it operates in. In general, firms that operate in growing sectors tend to have better chances of survival, because it is easier for them to re-position and search for new market niches, when compared with firms operating in a stagnant or slow-growing industry (Dunne et al.,1989; Box, 2008).

While the literature on firm survival has covered a diverse pool of phenomena, little has been discussed about firm endurance from a multidimensional perspective. By far, most of the

research has been focused on individual aspects in isolation, such as the impacts of managerial behaviour; the role of financial resources during crises; the degree of R&D intensity or the effects of export activities on firm survival. Although the analysis of firm survival from a single dimension allows an in-depth study, one cannot refrain from arguing that the success of firms in overcoming environmental jolts could lie in the combination of multiple factors and efforts. To my best knowledge, there has not been a single study on firm survival that offers an integrated view on the probability of firm endurance.

In addition, some of the firm survival studies lack justification on actions and explaining "what to do". For example, studies advocating the importance of financial resources on the probability of firm endurance in general, highlight the role of slack resources by comparing the performance of resource-rich firms and resource-constrained firms. Sad but true, resources do not discover and exploit opportunities by themselves (Sirmon et al., 2010; Ndofor et al., 2011; Paeleman and Vanacker, 2015). In some cases, bundles of resources associated with better performance may even be a threat to firm survival during a crisis if they are not properly utilised. Thus, the ability to develop distinctive capabilities in identifying suitable strategic choices and allocating resources are the keys to improving survival prospects (Esteve-Pérez and Mañez-Castillejo, 2008). Therefore, this study will address the weaknesses of existing literature by providing clearer insights on what firms had done to survive during environmental jolts.

The ambidexterity concept is thus incorporated into this study to address the current research gaps. Ambidexterity denotes a firm's ability to pursue two disparate things at the same time (Gibson and Birkinshaw, 2004). An ambidextrous organisation is characterised by its ability to hone, exploit and extend its current knowledge, seeking greater efficiency and improvements, while exploring new knowledge and experimenting to foster the variation and novelty needed for more radical innovation (Atuahene-Gima, 2005; Andriopoulos and Lewis, 2009).

Prior studies demonstrate that strong focus on exploitation activities can subdue exploration, which can cause stagnation and profitability issues in the long run (Davis et al., 2009; Hill and Birkinshaw, 2014). Accordingly, many of the ambidexterity studies seek to focus on the benefits of ambidexterity activities, such as establishing a separate unit for exploration activities, improving the coordination within the firms so that both exploitation and exploration activities receive sufficient attention from top management, fostering a supportive culture for both activities and improving resource allocation (Gibson and Birkinshaw, 2004; Tushman et al, 2010; Hill and Birkinshaw, 2014).

In this study, the discussion of the role of ambidexterity on firm survival probability consists of two major parts: "Survival versus non-survival" and "Survival versus acquired/merged/ bankrupt/going private". The "Survival versus non-survival" section explores the role of organisational ambidexterity on firm survival, through the research question: *Why and how did some firms survive, while others did not*? This section aims to shed light on whether ambidexterity promoted the likelihood of firm survival during the 2008-2009 Global Financial Crisis.

The second part - "Survival versus acquired/merged/ bankrupt/going private" - delves deeper into the characteristics of delisted firms through the research question: *Are all deaths equally the same?* Similar to "Survival versus non-survival", the second section explores the effects of organisational ambidexterity on firm survival, but does so by comparing survived firms with acquired, merged, going private and bankrupt firms.

6.1 Survival versus Non-survival firms

6.1.1 Understanding the Effects of Ambidexterity on Firm Survival

The way Hewlett-Packard (HP) transformed from electronic instruments to minicomputers to printers manufacturer (House and Price, 2009); International Business Machines Corporation

(IBM) switched from hardware manufacturing to software to services provider (O'Reilly and Tushman, 2013; Tushman et al., 2013); Hearst Corporation mutated from newspapers publisher to data provider; or Fuji that used to manufacture photographic film converted to a fine chemical provider (O'Reilly and Tushman, 2013), suggest that the fundamental, long-term survival requires a sufficient amount of exploitation to ensure current viability and exploration to enhance future success.

Organisational studies show that environmental conditions impact the form of organisational structure, strategies and the likelihood of firm survival (O'Reilly and Tushman, 2013). Building on this insight, firms must constantly change their structure alignments, which is characterised as the trade-off between efficiency and flexibility, in the face of environmental and technological change. The concept of organisational ambidexterity, which emphasises the capability to exploit and explore firm resources simultaneously, could be the answer for organisational endurance.

Studies have documented the effects of ambidexterity from individual to project, business unit and firm level. The antecedents of ambidexterity prove that it is valuable for a firm to operate in a competitive environment (Auc and Menguc, 2005; Geert et al., 2010; O'Reilly and Tushman, 2013); high environmental uncertainty (Uotila et al., 2008; Wang and Li, 2008) and suitable for firms with slack resources (Sidhu et al., 2004; Cao et al., 2009). In addition, abundance of evidence shows that ambidexterity is positively correlated to firm survival (Hill and Birkinshaw, 2010; Kauppila, 2010; Hill and Birkinshaw, 2014; Laplume and Dass, 2015), sales growth (He and Wong, 2004; Auh and Menguc, 2005; Venkatraman, et al., 2006); firm performance (Cao et al., 2009), innovation (Burgers et al., 2009; Tushman et al., 2010; Phene et al., 2012) and the market value of a company's assets (Uotila et al., 2008; Wang and Li, 2008).

However, some studies argue that organisational ambidexterity requires duplication of efforts, creates resource tensions and causes inefficiency when there is insufficient coordination between departments, not all of which will be successful (Ebben and Johnson, 2005; Martens and Backere, 2005). Nevertheless, the empirical evidence suggests ambidexterity has positive effect on firm performance when operating in a dynamic environment (Tushman et al., 2010; Hill and Birkinshaw, 2014).

Does ambidexterity influence the probability of firm survival during environmental jolts?

This study proposes that the extent of ambidexterity orientation impacts the prospects for survival. Firm capabilities are developed overtime when firms engage in both exploitation and exploration activities, these capabilities build on and extend firms' core capabilities (Schildt et al., 2005; Keil et al., 2008; Hill and Birkinshaw, 2014). As discussed earlier, crises can render firms' existing strategies and skills obsolete. Thus, ambidextrous firms are found to be better positioned as they possess sufficient absorptive capacity prior to a crisis, which facilitates the identification of new strategies and decision-making processes during crisis (Cohen and Levinthal, 1990). In addition, research shows that ambidextrous firms tend to have the ability to develop unique and unusual resource combinations that result in competitive advantage, which in turn allows them to have better survival chances than their rivals (Eisenhard and Martin, 2000; Katila and Ahuja, 2002). It is therefore likely that the foundations for ambidextrous activities reside in the existing knowledge and competence bases can help to improve the probability of firm survival during environmental turbulence.

Ambidexterity improves the likelihood of firm survival by also promoting the integration of firm activities. The core principle of organisational design suggests that the level of integration within a firm impacts its performance (Lawrence and Lorsch, 1967; Curado, 2006). Exploitation and exploration activities, by nature, tend to become relatively isolated activities in the organisation (Hill and Birkinshaw, 2014). To reap the benefits from both activities and

achieve superior performance, it is essential to build linkages to increase the flow of people, technology and resources (Hansen and Birkinshaw, 2007). In other words, the knowledge and experience in managing an ambidextrous firm prior to the crisis develops capability to coordinate firm activities and manage linkages between units. Therefore, ambidexterity promotes integration within a firm's units and improves the process of capitalising on existing capabilities, strategies, communication and coordination aptitude during crisis.

Lastly, firms capable of pursuing exploitation and exploration simultaneously are more likely to survive during crisis, because they do not face the trade-off of focusing on a single learning activity (Tushman and O'Reilly, 1996; Raisch and Birkinshaw, 2008). Pursuing only exploration exposes firms to risks of incalculable investment returns and longer investment cycles (Volberda and Lewin, 2003). In contrast, focusing exclusively on exploitation activities ordinarily leads to obsolescence, because highly specialised competencies carry the risk of becoming core rigidities (Leonard-Barton, 1992; Levinthal and March, 1993; Raisch and Birkinshaw, 2008). As a result, a well-balanced combination between exploitation and exploration learnings is the key for organisational survival during crisis. The blend between both activities allows a search for, experiment with and exploring new opportunities and strategies, while continuing to refine and improve efficiency to ensure the longevity of the business (March, 1991; Levinthal and March, 1993; Raisch and Birkinshaw, 2008).

Collectively, these arguments suggest that ambidexterity optimises the probability of firm survival during crisis. The role of ambidexterity lies in the promotion of better internal integration, builds on and extends core competencies and prevents an excessive focus on one orientation at the expense of the other. Therefore, the following hypothesis is suggested:

Hypothesis 1: There is a positive relationship between ambidexterity and firm survival during crisis.

6.1.2 Understanding the effects of exploitation and exploration on crisis survival

Hypothesis 1 tests the influence of ambidexterity on firm survival during the Global Financial Crisis. However, not all firms are gifted with abundant resources, well-designed organisational structures, knowledge, courage and capabilities to reap the benefits of ambidexterity. If a firm fails to master both types of learning, does this imply that the probability of survival during environmental jolts plunges to zero? Specifically, this section discusses how the choices between exploitation and exploration affect the chances of survival.

The contingency theory posits that firms should aim to achieve a fit of their processes, strategies and structure with the environment (Lawrence and Lorsch, 1967; Kauppila, 2010). This infers that the choice between exploitation and exploration is a function of the firms' strategic intent, expected returns and organisational learning (Koza and Lewin, 1998).

In turbulent times, exploration, experimentation and risk-taking activities can constitute competitive strategies to face economic crises (March, 1991; Koza and Lewin, 1998). In addition, recession increases the need for innovation, because faced with lower demand firms have to divert their focus from production activities to searching for new innovations to ensure business continuity (Miotti and Sachwald, 2003). At the same time, the unpredictable returns of exploration investments during recession can be a major drawback. Corporate finance literature suggests that high firm leverage ratio may create negative impacts on firm survival. During a recession, the opportunity cost of being explorative is higher due to the financial and resource constraints. As a result, the focus on improving firm efficiency to ensure sufficient capital for the daily routine is vital (Yamakawa et al., 2011).

Given that returns from exploitation activities are more predictable, proximate and less risky, their performance impacts are more likely to be greater in the short run, (Rowley et al., 2000; Rothaermel, 2001; Yamakawa et al., 2011) Therefore, the following hypothesis is suggested:

Hypothesis 2: There is a positive relationship between exploitation and firm survival during crisis.

Given that the firm may be badly impacted financially by the crisis and exploration activities require a significant amount of initial investment, bringing less direct and immediate financial benefits, such activities could be detrimental to crisis survival. Nevertheless, empirical studies show that a sufficient level of innovation is vital for strategic change and strengthens the core competency of firms (March, 1991; Koza and Lewin, 1998; Miotti and Sachwald, 2003). As a result, this study proposes that exploration is a significant factor in firm survival forming a third hypothesis:

Hypothesis 3: There is a positive relationship between exploration and firm survival during crisis.

6.2   Survival versus Acquired/Merged/Bankrupt and Going Private Firms

Understanding the outcomes of a crisis: The notion of the success and failure continuum

Firms respond differently to environmental turmoil. Crisis management literature suggests that no firm responds in a completely effective or ineffective manner (Pearson and Clair, 1998). The consequences of a crisis are usually portrayed as dichotomous: firms either survived or died (non-survived). Furthermore, studies tend to focus on the successful group, which is formed by survived firms. There is little research that defines the meaning of death or failure as an outcome of any crisis incident. There is no study yet to discuss a systematic and structural evidence about firms' success, failure and midground outcomes (Pearson and Clair, 1998).

While the previous section classified firms as either survived (remain listed) or dead (delisted), this section aims to further highlight the non-survival firms. The non-survival firms are refined to produce four outcomes: acquisitions, mergers, bankruptcy and going private. In addition, it is notable that DataStream categorises all the delisted firms as "dead" in their system. "Dead"

in this thesis implies the status that was found from the database search, which simply suggest "delisted". The term "dead" in this thesis denotes the non-survival firms rather than suggesting failure in performance. Fundamentally, this section aims to answer: *Are all deaths equally the same?*

6.2.1 Survived versus Acquired and Merged Firms

Acquisition is defined as the purchase of one company by another, in which no new company is formed. A merger is often described as 'a marriage since it normally involves two partners more or less equal in strength, which have decided to combine their managerial and operational functions to form a new company with shared resources and corporate objectives (Green Park Partners, no date). Roberts et al. (2012) suggest five primary motivations that define the nature of proposed mergers and acquisitions (M&A). These motivations are strategic rationale, speculative rationale, management failure rationale, financial necessity rationale and political rationale.

Why do M&A happen? Research shows that synergy, diversification, growth and competitor elimination are the reasons for M&A (Calipha et al., 2010; Gomes et al., 2012; Hassan and Ghauri, 2014; Angwin et al., 2016). First, synergy is about combining business activities to improve performance and operational cost. In general, a business will attempt to merge with or acquire another business that has complementary strengths and weaknesses. Second, diversification manifests itself when a company seeks exposure to an unrelated industry for reducing the impact of its own industry's performance on profitability. Essentially, companies look for targets with deeper market penetration in a particular operation. Third, growth happens when firms pursue a merger or acquisition for an opportunity to grow market share without having to really earn it by doing the work themselves. Last, competitor elimination reflects a motive to eliminate future competition and gain a larger market share in the respective product market (Renaud, 2017).

The brief study of the M&A concept reveals important information: being delisted does not absolutely correlate with poor performance, instead firms delisted due to M&A might suggest that their good performance, unique business model, strength or competitive advantage have made them a target. Therefore, the following hypotheses are suggested:

Hypothesis 4: There is a positive relationship of acquired and merged firms with exploitation.

Hypothesis 5: There is a positive relationship of acquired and merged firms with exploration.

Hypothesis 6: There is a positive relationship of acquired and merged firms with ambidexterity.

Next, the discussion continues with the review of survived versus bankrupt firms.

6.2.2   Survived versus Bankrupt Firms

The firm bankruptcy phenomenon has received a considerable research attention, as there is an increasing number of firms around the world that default every year (Lee et al., 2007; Xia et al., 2016). Most of the bankruptcy theories view it as the output of failure in firm management rather than a remedy to facilitate maximisation of return for creditors when firms fail.

Empirical studies suggest that firms tend to see bankruptcy as a resolution to financial distress. The choice between bankruptcy and private debt restructuring relies on two factors: the impediments to renegotiations and the cost saving of avoiding bankruptcy (Gilson et al., 1990; Bergström et al., 2005). The probability of bankruptcy may intensify due to the decreased profitability, increased market competition, level of accumulated debt and environmental jolts (Bergström et al., 2005).

Overall, the 2008-09 financial crisis has resulted in an increase of the total number of bankrupt firms. These bankrupt firms provide an insight into the crisis failure. Their failure may be the

result of weaknesses in managing and allocating resources or foreseeing potential opportunities and threats. Thus, the following hypotheses are suggested:

Hypothesis 7: There is a negative relationship between bankrupt firms and exploitation.

Hypothesis 8: There is a negative relationship between bankrupt firms and exploration.

Hypothesis 9: There is a negative relationship between bankrupt firms and ambidexterity.

6.2.3   Survived versus Going Private

The 2008 financial crisis has pressed many listed firms to review the costs and benefits to remain listed on a national securities exchange. Firms, which experienced dramatic reduction in revenues, have found the compliance costs to be a burden viewed as a percentage of revenues. In 2009, more than 50 firms listed on the New York Stock Exchange (NYSE) and 200 NASDAQ listed firms were facing delisting, because of non-compliance with a listing requirement. Both NYSE and NASDAQ announced a temporary suspension of the continued listing requirement related to bid price and market value as a measure to avoid an avalanche of delistings (Securities and Exchange Commission, 2008). As the recession deepened, the high costs of remaining a public company forced firms to take the voluntary or involuntary delisting path.

Firms that suspended the trading of their shares either voluntary or involuntary experienced highly significant costs after the delisting (Charitou et al., 2007; Macey et al., 2008). Post-delisting costs include: declined stock price by approximately 50%, doubled volatility and tripled percentage spreads compared to the time before delisting (Panchapagesen and Werner, 2004; Charitou et al., 2007). Moreover, scholars associate corporate governance and poor management quality to firms' delisting. In other words, firms with better governance are less likely to produce poor performance, which may lead to going private (Charitou et al., 2007). Nevertheless, evidence shows that voluntary or involuntary delisting is often a step preceding

bankruptcy. These going-private firms appear to be unsuitable for salvation by a merger or acquisition.

Hence, this study suggests that going private firms are generally inefficient in managing their resources and possess low innovation capabilities, which hamper their survival probability during crisis. Hence, the following hypotheses are suggested:

Hypothesis 10: There is a negative relationship between going private firms and exploitation.

Hypothesis 11: There is a negative relationship between going private firms and exploration.

Hypothesis 12: There is a negative relationship between going private firms and ambidexterity.

Are all deaths equally the same?

The brief study of M&A, bankrupt and going private firms confirms that there are various reasons for delisting and death (or delisting) should not always be associated with poor management and performance. M&A alliances, built on mutual benefits and agreements, are seen to have good performance and be relatively more ambidextrous. On the contrary, bankrupt and going private firms, by definition, are delisted due to poor performance, poor governance and insufficient capability for managing company wealth.

6.3 Control Variables

This chapter employed ten sets of control variables.

6.3.1 Industry Type

The study controlled for industry type. Firms were classified into industry categories based on the Industry Classification Benchmark (ICB), the information for which was obtained from DataStream. Industry was controlled, because the impacts of a crisis on the firm survival probability can vary from one industry to another (Miller and Triana, 2009). The dot-com

collapse in 2001 affected badly the internet sector and related firms rather than the oil and gas sector, for example (Teeter and Sandberg, 2016). Overall, the sample consists of eleven industries which are basic materials, consumer goods, consumer services, financials, health care, industrials, manufacturing, oil and gas, others, technology, telecommunications and utilities.

6.3.2 Firm Age

The absolute number of years that a company was in existence was controlled. This study measured firm age as the number of years from a firm's founding year to 2014. Younger firms tend to have higher probability of death than long-established ones since the former have not yet developed organisational routines, repertoires, strengths, pool of resources, or built trust and legitimacy with stakeholders (Shane, 1996). In the context of firm survival, this translates into higher vulnerability of younger firms to environmental jolts, as they have not gained enough time to develop their exploitative and explorative skills to counter the changes of the external environment. In contrast, firms with established track record are less likely to fail, because they are, to a certain extent, forced to follow professional and formalised management structures and possess more resources to implement changes, if necessary (Byrne et al., 2016).

6.3.3 Return on Invested Capital

Return on invested capital (ROIC) is an important determinant of firm performance and strategic change (Greve, 1998). An increase in ROIC reinforces the value of existing strategies and firm efficiency, whereas a decline challenges the effectiveness of existing strategies and forces managers to foster changes. Firms that experience a steady growth in ROIC have a higher probability to survive, because they can allocate and control their capital more efficiently to generate superior returns.

6.3.4 Firm Size

Past studies have found firm size to be significant to firm survival, because larger firms are more likely to weather an extended period of poor performance (Levinthal, 1991; Dowell and Shackell, 2011). Firm size is measured as the logarithmic transformation of employees, rather than total sales or total assets. Total assets or total sales, as measures of firm size, are problematic when the sample consists of firms from various industries. For instance, when both manufacturing and financial firms are included in a sample, using total assets as an indicator for firm size tends to overestimate the size of manufacturing firms relative to financial firms (Chung and Beamish, 2005).

Size plays an important role in determining firm failures. The argument is that larger firms experience higher survival probability than smaller counterparts, because they are less informationally opaque and have access to alternative sources of external finance (Geroski, 1995; Byrne et al., 2016). Moreover, size can have an impact on organisational strategies. Larger firms with more resources tend to pursue riskier strategies (Pandey, 2015), which can improve the probability of survival during the crisis.

6.3.5 Board Structure/CEO-Chairman Separation

The CEO-chairman role separation control variable is concerned with whether the CEO is a chairman of the board. Agency theory, which highlights the divergent interests of management and owners, suggests as unwise to allow too much power in the hands of a CEO because it enables the latter to pursue a personal agenda that might be against the best interests of the firm (Dalton et al, 1998). Moreover, having a powerful CEO strengthens the perception that the board of directors is likely to be under the influence of the CEO. Ultimately, this reduces the effectiveness of firm management and protection of shareholders' interests (Pearce and Zahra, 1991).

In contrast, there are studies in favour of powerful CEOs, because of their ability to make rapid decisions and enact necessary changes without the need to build consensus. In addition, research shows that high-powered CEOs may have greater motivation to look for solutions to save the firm from crises. Research has proven that CEOs of failed firms are stigmatised due to their association with the failure (Semadeni et al., 2008; Dowell and Shackell, 2011). The stigma may be greater for high-powered CEOs, who see the success and failure of firms as part of their responsibility. Last but not least, powerful CEOs are likely to suggest extreme decisions that drastically change a firm's strategy, which could be the only chance the firm has if survival is at stake (Adam et al., 2008). In conclusion, CEO duality that produces a single and unified voice is crucial for firm survival, especially when the environment is characterised with high uncertainty and low munificence, and the speed for decision making process is highly valued (Finkelstein and D'Aveni, 1994; Boyd, 1995).

6.3.6 Board Size

There is inconsistent empirical evidence in the literature regarding the relationship of board size with performance and firm survival (Dowell and Shackell, 2011). The difficulty stems from the differential effects of board size on the three main roles of the board: advising, monitoring and bridging firms with resources.

The literature shows smaller board size is useful in a strategy formation process and underpins faster decision making than larger boards, which are valuable during crises (Goodstein et al., 1994). In addition, smaller boards are more likely to monitor management as they have greater decisiveness and individual commitment (Judge and Zeithaml, 1992; Dowell and Shackell, 2011). Studies also show that smaller boards are more likely to remove poorly performing CEOs and negotiate CEO's compensation contracts based on performance (Boyd, 1994; Certo et al., 2001). In contrast, literature highlights that larger boards are in better position to fulfil the resource provision role, because they offer more opportunities for relationships between

board members and the source of resource (Goodstein et al., 1994; Fischer and Pollock, 2004). This is essential during environmental jolts when the possession of information and resources are crucial for firm survival.

However, in a high velocity environment when information is often inaccurate, unavailable and obsolete, larger board size with its ability to gather more information and present a greater number of strategic options might not prove as valuable as the ability to move quickly. Moreover, a board with larger group of members has a greater likelihood to disapprove risky strategies (Cheng, 2008). In other words, the greater the level of financial distress, the higher the probability that larger board size may increase the risk of failure, because the board cannot act quickly enough to utilise the available resources. Hence, smaller boards are more capable in monitoring firm performance, improve efficiency and firm survival rate during crises.

6.3.7 Board Structure/Board Gender Diversity

The literature shows a positive relationship between the board gender diversity and the market value of the firm (Carter et al., 2003) as well as the accounting performance (Erhardt et al., 2003). Consistent with the research, which applies signalling theory to show the relationship between board characteristics and organisational reputation (Certo et al., 2001; Certo, 2003; Brammer et al., 2007; Miller and Triana, 2009), it is proven that board gender diversity also improves firm outlook and bolsters firm reputation (Certo, 2003; Deutsch and Rose, 2003; Miller and Triana, 2009). As businesses operate increasingly within a global economy, diversity conveys a signal that the firm is well-positioned to meet the need of a diverse market and the desire to emulate stakeholder population, management and labour force (Dowling, 2006). In addition, heterogeneous groups allow creation of a broader range of ideas and information, which can contribute to the identification of new innovation opportunities (Mintzberg et al., 1976; Miller and Triana, 2009). Empirical research on group decision making supports this assertion; through cognitive conflict board diversity produces higher quality of strategic

decision than homogeneous groups (Amason, 1996; Chen et al., 2005). As a result, a firm with diverse board of directors has higher probability of survival during crisis, because it benefits from diversity of ties and it is more likely to innovate, overcome decision bias and improve decision quality.

6.3.8 Board Structure/Independent Board Members

Board independence is assessed by the degree to which board members are not affiliated with the firm through employment or economic exchange relationship (Gordon, 2007; Dowell and Shackell, 2011). Having relatively higher board independence is generally considered advantageous, because it reduces the chance of top management domination. Moreover, independent board members are more likely to propose and direct necessary changes, even confront management reluctance. This is extremely useful when the firm counters a lengthy organisational decline. Independent board members can also play an important role in driving out strategic decisions, which strengthen firms' survival probability when dealing with threats. Dowell and Shackell (2011) argue that the lower the board members' attachment to the current strategy, the greater the likelihood to consider a new strategic direction. Finally, the more independent the board of directors, the higher the probability of firms to receive different and varied sources of information, which is particularly valuable in aligning with the external environment (Agrawak and Knoeber, 2001; Hillman and Dalziel, 2003; Dowell and Shackell, 2011). From this perspective, independent directors have an advantage from agency dependence and resource dependence perspectives, which is crucial for the ability of distressed firms to make changes and survive during crises.

6.3.9 Board Structure/Experienced Board

This study controlled the average number of years each board member is on the board. It is argued that longer standing board members have more experience and deeper understanding of the firm's history, operations, strategies and staff. This experience is expected to positively

contribute to firm performance. Though, experienced board members may appear to be more aggressive and dictatorial in their leadership style and decision-making process, and later undermine the firm's performance (Carlson and Karlsson, 1970). Moreover, experienced board may be reluctant to implement risky strategies (Child, 1975) and oppose drastic change into the firm, which may be necessary during crisis.

Nevertheless, research shows that experienced board members are actually more capable when coping with changes in the business environment due to their deeper understanding of the firm's operations (Wegge et al., 2008). If they are able to work well in a group, this facilitates rapid decision-making process and implementation, which are crucial for firm survival during uncertain periods.

6.3.10 Board Structure/Specific Skills

This study controlled the number (in percentage terms) of board members, who have either an industry specific background or strong financial background. Diversity in board member background brings a broader range of knowledge, information and insights into the firm (Carter et al., 2003). The quality of each board member contributes positively and significantly to management decisions, which later translates into firm performance. A diverse board is highly regarded during environmental turmoil as its receptivity to change in corporate strategy is relatively higher (Wiersema and Bantel, 1992; Nadkarni and Herrmann, 2010) and they are more willing to promote and accept strategic changes. Thus, firms with a board of directors, who possesses specific industry knowledge and strong financial knowledge, are more likely to survive during crisis. Such a board's knowledge can be a source of competitive advantage, manifested through identification of strategies for improvement.

6.4   Data

This section provides an overview of the data resources and samples used in this study, with an explanation of the dependent and independent variables. This study uses financial data provided

by DataStream, combined with company profiles obtained from the U.S. Securities and Exchange Commission and a number of publicly available sources (refer to the Methodology chapter for full description).

Sample

The sample frame for this study consists of 11,290 firms listed on NYSE, Nasdaq stock market as well as delisted firms in the United States (U.S.) from 2006 to 2014. The historical financial information of survived and dead firms was obtained from DataStream to create a longitudinal study. The sample is split into 9 groups, based on the year of listing on and delisting from the stock markets. Table 26 shows the summary of the sample.

The focus of this chapter is the identification of the role of ambidexterity on the probability of firm survival during the 2008-2009 Global Financial Crisis. The non-survival group consists of firms, which were alive before the recession and failed to survive during and after the recession (Group 7 and Group 8), while the survived group represents firms that managed to survive and prosper from 2006 to 2014 (Group 9).

Table 26   Summary of Groups

Group	Sub Total	Grand Total	Percent
Group 1: Dead before crisis		1426	12.63
Group 1a: Dead before crisis: Acquired	700		
Group 1b: Dead before crisis: Merged	213		
Group 1c: Dead before crisis: Bankrupt	179		
Group 1d: Dead before crisis: Going Private	334		
Group 2: Born in crisis and died in crisis		29	0.26
Group 2a: Born in crisis and died in crisis: Acquired	3		
Group 2b: Born in crisis and died in crisis: Merged	2		
Group 2c: Born in crisis and died in crisis: Bankrupt	1		
Group 2d: Born in crisis and died in crisis: Going Private	23		
Group 3: Born during and died after		139	1.23
Group 3a: Born during and died after: Acquired	56		
Group 3b: Born during and died after: Merged	14		
Group 3c: Born during and died after: Bankrupt	16		
Group 3d: Born during and died after: Going Private	53		
Group 4: Born during and still going		466	4.13
Group 5: Born after and died		71	0.63
Group 5a: Born after and died: Acquired	32		

Group 5b: Born after and died: Merged	16		
Group 5c: Born after and died: Bankrupt	2		
Group 5d: Born after and died: Going Private	21		
Group 6: Born after and still going		**715**	**6.33**
Group 7 Alive before and died during		**1115**	**9.88**
Group 7a: Alive before and died during: Acquired	492		
Group 7b: Alive before and died during: Merged	100		
Group 7c: Alive before and died during: Bankrupt	237		
Group 7d: Alive before and died during: Going Private	286		
Group 8: Alive before and died after		**1915**	**16.96**
Group 8a: Alive before and died after: Acquired	1141		
Group 8b: Alive before and died after: Merged	218		
Group 8c: Alive before and died after: Bankrupt	189		
Group 8d: Alive before and died after: Going Private	367		
Group 9: Alive before and still going		**5414**	**47.95**
Grand Total		**11290**	**100.00**

Coding and Operationalisation of Variables

Dependent Variables

To help answer the questions posed in this study, the dependent variable needs to reflect whether a firm has managed to endure and prosper from the 2008-2009 financial crisis. Previous quantitative studies with firm-level dependent variable relied on a dichotomous variable, indicating whether the firm survived or did not survive the crisis (Chung and Beamish, 2005; Berger and Bouwman, 2013; Hill and Birkinshaw, 2014) in a given year. This paper adopts similar approach using a binary variable to indicate whether a firm did (1) or did not (0) survive. It is notable that this study interprets a survived firm as a firm which managed to overcome the 2008-2009 recession and continued to prosper until 2014, while a dead firm is delisted and failed to overcome the environmental jolts in 2008 and 2009 as well as a firm that was 'wounded' during the crisis and delisted from the stock markets between 2010 and 2014.

Survival

A firm is considered to be a survivor, if it was still listed on the stock market by the end of 2009 and continued to prosper until 2014, which means the firm was not bankrupt, voluntarily or

involuntarily delisted, taken over or merged. 5414 firms survived the 2008-2009 financial crisis and remained listed until 2014.

Non-Survival

Takeover, merger, bankruptcy and going private are bundled in the non-survival category since they signal the end of the business, though the business might continue to exist as a wholly-owned subsidiary or a private company (Dussauge et al., 2000; Pangarkar, 2007). This sample contains 3030 firms. The dummy variable was coded as 1, if a firm was still active late in 2014 (a survivor firm) and 0 if it was not (a non-survival firm).

Acquired firms

Acquired firms were publicly traded on the NASDAQ or NYSE before the crisis and posted a takeover announcement on the Centre for Research in Security Prices (CRSP) file. The final sample contains 1633 firms.

Merged firms

Merged firms were publicly traded on the NASDAQ or NYSE and posted merger announcement on the company profile and the U.S. Securities and Exchange Commission. This study classified merger as non-survival, because it signals the end of the listing on the stock market, though the business might continue to exist as a wholly-owned subsidiary or a new form of business entity. The final sample contains 318 merger firms.

Bankrupt firms

Firms that filed for bankruptcy during the crisis are included in the non-survival category. The bankruptcy data was collected from the U.S. Securities and Exchange Commission and company profiles. Firms that filed for any type of bankruptcy within five years of delisting are considered bankrupt. The final sample contains 426 bankruptcies.

Going private firms

The sample contains 653, either voluntarily or involuntarily going private firms. Going private data was collected from the U.S. Securities and Exchange Commission.

Independent Variables

Exploitation

This study measures the extend of exploitation using the factor scores obtained from factor analysis. The factor scores include the *total sales per employee* ratio and *total assets per employee* ratio of each firm. Both financial ratios indicate the cost of running a firm. They can be insightful when measuring the efficiency of businesses and suggesting how well the latter utilise their existing resources. Interpreting the ratio is fairly straightforward: firms with higher factor score are generally considered more efficient than those with lower score. A higher exploitation factor score suggests that the firm can operate on low overhead costs, which often translates into healthier profits.

Exploration

This study measures the extend of exploration using the factor scores obtained from factor analysis. *Research and development (R&D) to total assets*, *selling, general and administrative expenses (SG&A) to assets* and *operating ratio* are used to measure the magnitude of exploration.

R&D to total assets ratios measures the R&D intensity by comparing the effectiveness of R&D expenditures between companies. *SG&A* measures expenditures related to the daily operations of a firm and not directly related to the production of the product. *SG&A* includes shipping supplies, delivery charges, marketing expenditure, travel costs and the salaries of sales personnel. A higher *R&D to total assets* and *SG&A* ratios indicate that firms are active in explorative activities. The *operating ratio* shows the efficiency of a firm's management by

comparing operating expenses to total sales. A smaller ratio suggests a greater ability to generate profit if revenues decrease. In this study, *operating ratio* represents the magnitude of exploration: the operating expenses rise when more resources are devoted to explorative activities, which later result in a higher *operating ratio*.

In short, a higher exploration factor scores indicate a greater commitment to exploration activities.

Ambidexterity

The interaction between the exploitation and exploration constructs forms the factor scores for the ambidexterity variable. Pursuing both innovation processes reflects a complex capability that provides additional source of competitive advantage beyond these specific to each innovation activity individually (Tushman and O'Reilly, 1996; Ancona et al., 2001; Raisch and Birkinshaw, 2008). Sufficient level of exploitation can ensure current viability, while exploration helps to promote future viability (Levinthal and March, 1993; Raisch and Birkinshaw, 2008).

Some scholars argue that ambidexterity contributes to general shift in organisational resources from trade-off to paradoxical thinking (March, 1991; Eisenhardt, 2000; Lewis, 2000). Studies have increasingly come to recognise the importance of balancing seemingly contradictory tensions for organisational long-term survival and success. Balancing does not mean both capabilities should receive the same amount of resources, rather it emphasises that both learnings should receive adequate attention from business practitioners.

Interpreting the factor score is fairly straightforward: firms with higher score are generally considered more ambidextrous than these with lower score, which translates into better chances to endure environmental jolts. Table 27 shows the descriptive analysis for the independent variable in this study.

Table 27   Descriptive Statistics for the Independent Variables

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Exploitation	5178	-0.50735	3.93541	-0.06271	0.928031
Exploration	5178	-0.83145	3.59515	0.0265	0.861691
Ambidexterity	5178	-2.46	8.64	-0.0228	0.42272
Valid N (listwise)	5178				

6.5   Methods

Given that the outcome is a categorical variable (survival versus non-survival firms), the predictors are continuous variables, thus binary logistic regression was applied for data analysis (Field, 2009). This study uses 2006 as the base year with the assumption that the ambidexterity capabilities developed prior to the recession had played an important role in influencing the probability of firm survival during and after it.

6.6   Results

Table 29 shows descriptive statistics and Pearson correlation coefficients for all the variables in this study. The probability of firm survival in crisis appears to be significantly correlated to most variables, except for the variable representing specific skills of the board of directors. Contrary to the expectation however, the exploitation variable is negatively correlated to firm size, board gender diversity and the presence of independent board members, while the magnitude of exploration is negatively correlated to firm age, return on invested capital, firm size, board size and exploitation. Finally, the variable for ambidexterity is negatively correlated to exploitation and exploration. The remaining relationships are according to expectations. Categorical variables in this study: industry type and CEO-chairman separation variable are excluded from the Pearson correlation coefficient test, because they are neither interval, nor ratio scale.

Table 29 shows that all correlation coefficients conform to the norms as the coefficient is not greater than 0.8 (Field, 2009), which suggests there is low risk of multicollinearity. However, given the potential multicollinearity concern, linear regression was conducted to identify the Variance Inflation Factors (VIF) (Table 28).

Table 28   **Variance Inflation Factors**

Variable	Collinearity Statistics	
	Tolerance	VIF
1 Firm age	.647	1.546
2 Return on invested capital	.970	1.031
3 Firm size	.625	1.600
4 Board size	.768	1.302
5 Board gender diversity	.857	1.167
6 Independent board members	.858	1.165
7 Experienced board	.735	1.361
8 Specific skills	.987	1.014
9 Exploitation	.762	1.312
10 Exploration	.905	1.105

a. Dependent Variable: Ambidexterity

According to Field (2009), a value of VIF above 10 should become a concern as it signals potential problems of multicollinearity. Table 28 shows that none of the variables has VIF above 10 or tolerance statistics below 0.1, thus it eliminates the risk of multicollinearity in this study.

Table 30, 31 and 32 show the result of the binary regressions. The dependent variable in all the models is Survival, which takes a value of 1 if the firm survived the 2008-2009 global financial crisis or 0 if it did not. The analysis results are presented in three tables: model 1a, 2a, 3a, 4a and 5a (Table 30) have a larger sample size with one control variable (N); while, model 1c, 2c, 3c, 4c and 5c (Table 32) represent models that include all control variables but with smaller sample size. Such scenarios occur due to the reduction of sample size (N) when more control variables are included into the analysis. In addition, model 1b, 2b, 3b, 4b and 5b in Table 31 represent a middle ground between maximising sample size and achieving better survival models.

Table 29   Descriptive Statistics and Pearson Correlation Coefficients

Variables	Mean	Std. Deviation	N	1	2	3	4	5	6	7	8	9	10	11
1 Firm age	10.360	7.743	7626	1										
2 Return on invested capital	0.005	0.256	7297	.241**	1									
3 Firm size	2.899	1.055	6685	.485**	.432**	1								
4 Board size	11.011	3.022	1020	.196**	-0.056	.341**	1							
5 Board gender diversity	11.430	9.496	1020	.204**	0.054	.168**	0.056	1						
6 Independent board members	70.534	21.883	963	.204**	0.011	0.036	-.098**	.322**	1					
7 Experienced board	7.902	3.859	920	.447**	0.021	-0.009	0.047	0.015	0.051	1				
8 Specific skills	55.668	28.594	864	-0.043	0.000	-0.067	-.115**	-0.006	-0.006	-0.022	1			
9 Exploitation	-0.063	0.928	5178	.039**	-0.003	-.157**	0.009	-.187**	-.260**	0.031	0.038	1		
10 Exploration	0.027	0.862	5178	-.174**	-.622**	-.412**	-.105**	.121**	0.017	.121**	0.047	-0.026	1	
11 Ambidexterity	-0.023	0.423	5178	.069**	.104**	.273**	0.064	0.000	0.052	-0.016	-0.058	-.499**	-.166**	1

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

Table 30   **Regression Table for Models 1a, 2a, 3a, 4a, 5a (Maximised Sample Size)**

Variables		Survival versus non-survival				Survived versus acquired				Survived versus merger				Survived versus bankrupt				Survived versus going private			
		Model 1a				Model 2a				Model 3a				Model 4a				Model 5a			
		dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig
Industry Type	Consumer Goods	0.042	0.213	0.163	0.191	0.067	0.439	0.195	0.024	0.014	0.325	0.424	0.443	-0.045	-0.919	0.508	0.070	0.007	0.112	0.388	0.773
	Consumer Services	-0.010	-0.046	0.154	0.765	0.017	0.111	0.181	0.539	0.012	0.273	0.409	0.504	-0.061	-1.224	0.494	0.013	-0.007	-0.110	0.370	0.766
	Financials	-0.017	-0.072	0.169	0.669	0.019	0.139	0.199	0.484	0.007	0.176	0.440	0.689	-0.058	-1.158	0.530	0.029	-0.006	-0.107	0.423	0.801
	Health Care	-0.003	-0.002	0.163	0.989	-0.033	-0.172	0.188	0.361	0.005	0.125	0.432	0.772	0.013	0.213	0.523	0.684	0.032	0.731	0.396	0.065
	Industrials	0.029	0.144	0.149	0.332	0.060	0.385	0.175	0.028	-0.002	-0.042	0.368	0.908	-0.026	-0.564	0.498	0.257	-0.015	-0.246	0.348	0.480
	NA	-0.117	-0.554	0.249	0.026	-0.036	-0.201	0.307	0.512	-0.042	-0.891	0.541	0.099	-0.024	-0.451	0.865	0.602	-0.088	-1.389	0.457	0.002
	Oil & Gas	-0.112	-0.535	0.169	0.002	-0.043	-0.244	0.200	0.221	-0.021	-0.476	0.416	0.252	-0.101	-1.937	0.509	0.000	-0.037	-0.657	0.400	0.101
	Technology	-0.030	-0.136	0.155	0.379	-0.041	-0.223	0.178	0.211	-0.017	-0.365	0.382	0.340	0.016	0.135	0.523	0.796	-0.001	0.005	0.364	0.989
	Telecommunications	-0.072	-0.346	0.247	0.161	-0.090	-0.520	0.268	0.052	-0.002	-0.034	0.675	0.960	0.000	17.619	4846	0.997	0.000	-0.048	0.618	0.939
	Utilities	0.104	0.524	0.261	0.044	0.156	1.043	0.362	0.004	0.009	0.200	0.604	0.741	-0.016	-0.446	0.751	0.553	-0.018	-0.339	0.510	0.506
	(base = Basic Materials)																				
Firm age																					
Return on invested capital																					
Firm size																					
Board Structure/CEO-Chairman Separation																					
Board Size																					
Board gender diversity																					
Independent board members																					
Board structure/experienced board																					
Specific Skills																					
Factor	Factor 1: Exploitation	0.050	0.260	0.050	0.000	0.044	0.315	0.071	0.000	0.006	0.127	0.118	0.279	0.027	0.537	0.174	0.002	0.014	0.284	0.116	0.015
	Factor 2: Exploration	-0.101	-0.480	0.042	0.000	-0.047	-0.260	0.054	0.000	-0.011	-0.236	0.114	0.039	-0.054	-0.934	0.084	0.000	-0.052	-0.873	0.075	0.000
	Factor 1*Factor 2	0.031	0.181	0.110	0.101	0.054	0.428	0.158	0.007	0.003	0.087	0.277	0.753	0.030	0.619	0.332	0.062	-0.013	-0.250	0.169	0.139
Constant			0.843	0.130	0.000		1.251	0.149	0.000		3.039	0.326	0.000		3.655	0.467	0.000		2.884	0.317	0.000
	N	5178				4502				3685				3749				3769			
	Survived firms	3511				3511				3511				3511				3511			
	Dead firms	1667				991				174				238				258			
	Chi-square	306.89				182.42				23.42				212.55				171.69			
	-2 Log likelihood	6200.0				4563.3				1378.7				1560.3				1709.9			
	Cox & Snell R Square	0.06				0.04				0.01				0.06				0.04			
	Nagelkerke R Square	0.08				0.06				0.02				0.15				0.11			
	Hosmer and Lemeshow Test's df	8				8.00				8.00				8.00				8.00			
	Hosmer and Lemeshow Test's Sig	0.42				0.68				0.28				0.14				0.00			
	Classification accuracy	69.04				77.97				95.28				93.84				93.34			

Table 31   Regression Table for 1b, 2b, 3b, 4b, 5b (In Between Maximised Sample & Better Fit Model)

Variables		Survival versus non-survival Model 1b				Survived versus acquired Model 2b				Survived versus merger Model 3b				Survived versus bankrupt Model 4b				Survived versus going private Model 5b			
		dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig
Industry																					
Type	Consumer Goods	-0.010	-0.053	0.183	0.773	0.024	0.172	0.216	0.425	-0.001	0.008	0.462	0.985	-0.044	-1.033	0.529	0.051	-0.002	-0.028	0.458	0.951
	Consumer Services	-0.074	-0.398	0.174	0.022	-0.030	-0.192	0.202	0.344	-0.003	-0.075	0.449	0.867	-0.070	-1.621	0.513	0.002	-0.024	-0.471	0.434	0.277
	Financials	0.006	0.017	0.188	0.930	0.027	0.153	0.219	0.484	0.006	0.174	0.478	0.716	-0.043	-1.092	0.551	0.047	0.011	0.228	0.510	0.655
	Health Care	-0.055	-0.286	0.182	0.117	-0.067	-0.409	0.208	0.049	-0.009	-0.177	0.470	0.707	0.002	-0.096	0.538	0.858	0.012	0.278	0.447	0.534
	Industrials	-0.006	-0.032	0.167	0.848	0.028	0.187	0.195	0.338	-0.011	-0.245	0.408	0.548	-0.021	-0.574	0.518	0.268	-0.022	-0.489	0.402	0.223
	NA	-0.136	-0.720	0.268	0.007	-0.071	-0.460	0.320	0.151	-0.042	-1.001	0.596	0.093	-0.031	-0.856	0.872	0.326	-0.077	-1.695	0.532	0.001
	Oil & Gas	-0.063	-0.339	0.190	0.075	-0.025	-0.176	0.222	0.429	-0.016	-0.327	0.465	0.483	-0.063	-1.540	0.533	0.004	-0.010	-0.315	0.458	0.491
	Technology	-0.079	-0.418	0.174	0.016	-0.070	-0.432	0.198	0.030	-0.024	-0.576	0.421	0.171	0.009	0.030	0.553	0.957	-0.018	-0.387	0.415	0.352
	Telecommunications	-0.085	-0.460	0.282	0.103	-0.095	-0.602	0.306	0.049	-0.020	-0.475	0.703	0.500	0.000	17.522	4796	0.997	-0.004	-0.136	0.733	0.853
	Utilities	0.044	0.236	0.288	0.412	0.079	0.567	0.375	0.131	-0.011	-0.254	0.632	0.688	0.014	0.082	0.901	0.927	-0.026	-0.617	0.614	0.315
	(base = Basic Materials)																				
Firm age		0.005	0.028	0.005	0.000	0.004	0.025	0.006	0.000	0.001	0.026	0.013	0.048	0.001	0.018	0.014	0.179	0.002	0.053	0.015	0.000
Return on invested capital		0.001	0.006	0.002	0.001	0.000	-0.001	0.002	0.798	0.000	-0.002	0.005	0.704	0.001	0.021	0.003	0.000	0.001	0.015	0.003	0.000
Firm size		0.090	0.479	0.046	0.000	0.059	0.374	0.055	0.000	0.019	0.465	0.114	0.000	0.032	0.700	0.111	0.000	0.038	0.890	0.112	0.000
Board Structure/CEO-Chairman Separation																					
Board size																					
Board gender diversity																					
Independent board members																					
Board structure/experienced board																					
Specific Skills																					
Factor	Factor 1: Exploitation	0.059	0.348	0.058	0.000	0.054	0.423	0.088	0.000	0.007	0.185	0.129	0.152	0.044	1.096	0.308	0.000	0.019	0.633	0.203	0.002
	Factor 2: Exploration	-0.013	-0.063	0.059	0.290	-0.013	-0.057	0.072	0.424	0.001	0.029	0.153	0.847	-0.003	-0.069	0.125	0.582	0.001	0.001	0.125	0.995
	Factor 1*Factor 2	0.013	0.084	0.118	0.476	0.056	0.463	0.182	0.011	-0.005	-0.111	0.275	0.688	0.021	0.464	0.454	0.307	-0.024	-0.543	0.227	0.017
Constant			-0.688	0.190	0.000		0.035	0.221	0.873		1.580	0.462	0.001		1.688	0.546	0.002		0.234	0.446	0.600
	N	4788				4235				3479				3523				3518			
	Survived firms	3324				3324				3324				3324				3324			
	Dead firms	1464				911				155				199				194			
	Chi-square	526.98				293.08				49.59				291.50				284.70			
	-2 Log likelihood	5368.6				4116.8				1217.8				1238.8				1216.7			
	Cox & Snell R Square	0.10				0.07				0.01				0.08				0.08			
	Nagelkerke R Square	0.15				0.10				0.05				0.23				0.22			
	Hosmer and Lemeshow Test's df	8.00				8.00				8.00				8.00				8.00			
	Hosmer and Lemeshow Test's Sig	0.34				0.10				0.43				0.93				0.00			
	Classification accuracy	71.32				78.44				95.54				94.66				94.68			

Table 32   Regression Table for Models 1c, 2c, 3c, 4c, 5c (Better Fit Models, Smaller Sample)

	Variables	Survival versus non-survival				Survived versus acquired				Survived versus merger				Survived versus bankrupt				Survived versus going private			
		Model 1c				Model 2c				Model 3c				Model 4c				Model 5c			
		dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig	dy/dx	B	SE	Sig
Industry Type	Consumer Goods	-0.026	-0.248	0.624	0.691	0.009	0.112	0.660	0.866	0.003	-17.750	6526	0.998	0.004	-16.57	6496	0.998		-59.03	19329	0.998
	Consumer Services	0.069	0.604	0.672	0.369	0.105	1.367	0.813	0.093	0.041	16.209	6526	0.998	0.000	-17.06	6496	0.998		-40.76	9483	0.997
	Financials	0.084	0.780	0.709	0.271	0.128	1.574	0.841	0.061	0.000	17.870	6526	0.998	-0.001	-16.91	6496	0.998		-5.229	11394	1.000
	Health Care	-0.044	-0.447	0.627	0.476	-0.029	-0.378	0.647	0.560	0.025	-16.794	6526	0.998		0.039	8275	1.000		-76.93	10101	0.994
	Industrials	-0.040	-0.419	0.600	0.485	-0.006	-0.064	0.640	0.921	0.031	16.564	6526	0.998		-16.95	6496	0.998	0.000	-83.40	12742	0.995
	NA	-0.002	0.042	1.282	0.974	-0.012	-0.006	1.314	0.996	0.000	0.441	16075	1.000		1.701	14589	1.000		-141.1	21377	0.995
	Oil & Gas	-0.037	-0.339	0.642	0.598	0.010	0.162	0.698	0.817	-0.012	18.294	6526	0.998		-0.312	8401	1.000		16.627	12490	0.999
	Technology	0.055	0.547	0.677	0.419	0.058	0.680	0.710	0.339	0.000	0.669	8022	1.000		0.134	7945	1.000		-101.2	12588	0.994
	Telecommunications	-0.082	-0.918	0.784	0.242	-0.038	-0.541	0.855	0.527	-0.023	-19.111	6526	0.998		0.084	10741	1.000		-85.05	10051	0.993
	Utilities (base = Basic Materials)	-0.016	-0.220	0.753	0.770	0.010	0.097	0.818	0.905	0.000	-18.196	6526	0.998		-0.825	9904	1.000		-84.43	8252	0.992
Firm age		-0.001	-0.008	0.021	0.695	-0.001	-0.015	0.024	0.539	0.000	-0.010	0.050	0.837	0.000	0.015	0.075	0.838	0.000	1.626	109.61	0.988
Return on invested capital		0.001	0.009	0.012	0.461	0.002	0.022	0.014	0.111	-0.001	-0.056	0.038	0.144	0.001	0.023	0.048	0.629	0.000	-2.829	142.38	0.984
Firm size		0.104	1.030	0.275	0.000	0.082	1.024	0.324	0.002	0.012	0.547	0.663	0.409	0.012	0.854	0.971	0.379	0.000	15.840	2513.0	0.995
Board Structure/CEO-Chairman Separation		0.028	0.297	0.271	0.273	0.030	0.378	0.305	0.215	-0.008	-0.212	0.774	0.785	0.010	0.587	0.928	0.527	0.000	-3.591	6806.9	1.000
Board size		0.002	0.021	0.063	0.739	0.002	0.023	0.073	0.754	0.002	0.099	0.177	0.576	-0.001	-0.059	0.197	0.763	0.000	-7.219	559.69	0.990
Board gender diversity		-0.001	-0.007	0.014	0.644	0.000	0.003	0.017	0.869	0.000	-0.010	0.031	0.759	-0.001	-0.031	0.050	0.532	0.000	0.128	98.180	0.999
Independent board members		0.000	0.003	0.009	0.691	0.001	0.007	0.010	0.445	-0.001	-0.051	0.034	0.139	0.000	0.018	0.028	0.521	0.000	-0.038	165.93	1.000
Board structure/experienced board		0.012	0.115	0.042	0.007	0.007	0.088	0.046	0.056	0.006	0.264	0.139	0.058	0.002	0.157	0.169	0.351	0.000	1.801	733.56	0.998
Specific Skills		0.000	0.000	0.005	0.986	0.000	0.000	0.005	0.981	0.000	-0.003	0.012	0.786	0.000	-0.009	0.017	0.572	0.000	0.450	39.985	0.991
Factor	Factor 1: Exploitation	0.482	4.717	1.991	0.018	0.361	4.571	2.135	0.032	0.136	5.343	7.536	0.478	0.303	18.254	18.018	0.311	0.006	356.71	85074	0.997
	Factor 2: Exploration	0.136	1.297	0.873	0.137	0.110	1.358	0.917	0.138	0.037	1.228	3.640	0.736	0.127	7.658	9.599	0.425	0.004	291.14	36407	0.994
	Factor 1*Factor 2	0.681	6.631	3.006	0.027	0.530	6.648	3.259	0.041	0.198	7.620	11.220	0.497	0.414	25.201	25.443	0.322	0.009	571.35	113307	0.996
Constant			-2.279	1.317	0.084		-2.621	1.499	0.080		23.103	6526.7	0.997		22.060	6496.3	0.997		291.62	22395	0.990
	N	671				650				601				595				592			
	Survived firms	589				589				589				589				589			
	Dead firms	82				61				12				6				3			
	Chi-square	45.32				44.21				28.97				15.92				37.69			
	-2 Log likelihood	452.96				360.54				88.72				51.18				0.00			
	Cox & Snell R Square	0.07				0.07				0.05				0.03				0.06			
	Nagelkerke R Square	0.12				0.14				0.26				0.25				1.00			
	Hosmer and Lemeshow Test's df	8.00				8.00				8.00				8.00				0.00			
	Hosmer and Lemeshow Test's Sig	0.04				0.61				0.59				0.96							
	Classification accuracy	88.23				90.62				98.00				98.99				100.00			

Model 1a: Maximising the sample size, the story of survival versus non-survival firms

Model 1a is the base model with only one control variable: industry type. The dependent variables are all survived firms and delisted firms (acquired, merged, bankrupt and going private firms).

The data shows that firms with exploitative capabilities are more likely to survive the 2008-2009 financial crisis. For every unit of increase in exploitation activities, the odds of a firm to survive goes up by 1.297 ($p<0.01$). In contrast, data shows that exploration activities are more likely to decrease the likelihood of survival. For every unit of increase in exploration activities, the survival probability decreases by 0.619 ($p<0.01$). The ambidexterity variable was not significant in this model. Model 1a explained only 8% of the variance in firm survival (Nagelkerke R Square) and the model correctly classified 69.04% of the cases.

Model 2a: Maximising the sample size, the story of survival versus acquired firms

Model 2a aims to provide a refined version of crisis survival by comparing survivors with acquired firms, which takes a value of 1 if the firm was a survivor or 0 if firm was acquired during the crisis. The data shows that the ability to exploit remains positive and significant to organisational survival. Every unit of increase in exploitation improves the probability of survival by 1.370 ($p<0.01$). In contrast, exploration remains negative and significant - for every unit increase in exploration, the odds of survival decrease by 0.771 ($p<0.01$). Model 2a also reveals the positive and significant relationship between ambidexterity and the survival probability. Ambidexterity increases the odds of survival by 1.533 ($p<0.01$), which is much higher than exploitative capabilities alone (1.370). Model 2a offers a weaker explanatory power compared to Model 1a by explaining 6.1% of the variation (Nagelkerke R Square). At the same time, the model classification accuracy increases to 77.97%.

Model 3a: Maximising the sample size, the story of survival versus merger firms

Similar to Model 2a, Model 3a is a refined version of Model 2a and compares survived with merged firms. It takes a value of 1 if the firm was still listed on the stock market in 2014 or 0 if the firm was merged. The model reaffirms the finding that exploration remains negatively correlated to firm survival. The odds of survival decrease by 0.790 for every unit of investment in R&D and marketing activities. The exploitation and ambidexterity variables were not significant in this model. Model 3a offers a weaker explanatory power than Model 1a and 2a. Model 3a explains 2% of the variance (Nagelkerke R Square) and correctly classified 95.28% of the cases.

Model 4a: Maximising the sample size, the story of survival versus bankrupt firms

Models 4a portrays the probability of survival between survived firms and bankrupt firms. This model is most likely to provide the most detailed insights of organisational survival compared to Model 1a, 2a, 3a and 5a, because the bankruptcy is usually labelled as one of the worst scenarios for any business. The results suggest that firms with explorative capabilities are more likely to survive. For every unit of increase in investment, the odds to endure during a crisis goes up to 1.71 ($p<0.01$). In contrast, exploration decreases the likelihood of survival by 0.393 ($p<0.01$). The ambidexterity variable was not significant in this model. Model 4a has the highest explanatory power of 14.63% of the variance in firm survival (Nagelkerke R Square), and the model correctly classified 93.84% of the cases.

Model 5a: Maximising the sample size, the story of survival versus going private firms

Model 5a presents the probability of survival comparing survived firms with going private firms. The results suggest that explorative capabilities improve the likelihood of crisis survival. For every unit of increase in investment, the odds of survival go up by 1.329 ($p<0.05$). In contrast, exploration decreases the likelihood of survival by 0.418 ($p<0.01$). Data shows that the model

explains 11.33% of the variation (Nagelkerke R Square) and the classification accuracy is 93.34%.

Model 1b: Somewhere in between, the story of survival versus non-survival firms

Model 1b builds on model 1a by adding three control variables - firm age, return on invested capital (ROIC) and firm size - to represent an improved survival model. The data reveals that all three control variables and exploitation capabilities are positive and significant to firm survival. For every unit of increase in firm age, ROIC, firm size and exploitative activities, the odds of survival go up by 1.028 ($p<0.01$), 1.006 ($p<0.01$), 1.615 ($p<0.01$) and 1.417 ($p<0.01$) respectively. The exploration and ambidexterity variables were not significant in this model. Data shows that the model explains 14.72% of the variance (Nagelkerke R Square), adding 6.68% to the explanatory power of the base model with model classification accuracy of 71.32%.

Model 2b: *Somewhere in between, the story of survival versus acquired firms*

Model 2b builds on model 1b by adding three control variables - firm age, return on invested capital (ROIC) and firm size. Similar results were found from model 1b and 2b: the explorative and ambidexterity variables are positively correlated and significant to firm survival. For every unit of increase in operational efficiency, the odds of survival go up by 1.527 ($p<0.01$). In addition, the probability of survival increases by 1.588 ($p<0.01$) for every unit of increase in ambidexterity. The exploration variable was not significant in this model. The model explains 10.33% of the variance (Nagelkerke R Square), adding 4.23% to the explanatory power of the base model. The model classification accuracy is 78.44%.

Model 3b: Somewhere in between, the story of survival versus merged firms

Models 3b portrays the probability of survival against merged firms with three control variables: firm age, return on invested capital (ROIC) and firm size. The model has poor explanatory power as the model explains 4.64% of the variance in firm survival (Nagelkerke R Square), and

the classification accuracy is 95.54%. The situation occurs due to the sample size of merged firms (N=155) being relatively small for the test.

Model 3b suggests that firm age and firm size are positively correlated and significant to organisational survival. For every unit of increase in firm age, the odds of survival go up by 1.027 (p<0.05). Firm size improves the likelihood of survival by 1.592 (p<0.01). The exploitation, exploration and ambidexterity variables were not significant (p>0.05) in this model.

Model 4b: Somewhere in between, the story of survival versus bankrupt firms

Model 4b builds on model 4a by adding the same three control variables: firm age, return on invested capital (ROIC) and firm size to identify the probability of firm survival and bankruptcy during environmental jolts. Model 4b suggests that ROIC, firm size and exploitation are positively correlated and significant to organisational endurance. The likelihood to survive goes up by 1.021 (p<0.01), 2.014 (p<0.01) and 2.992 (p<0.01) respectively, for every unit of increase in these variables. Model 4b represent an important improvement compared to model 4a, because it reconfirms the positive relationship between firm survival and exploitation orientation. The model explains 22.53% of the variance in firm survival (Nagelkerke R Square), and the classification accuracy is 94.66%.

Model 5b: Somewhere in between, the story of survival versus going private firms

Models 5b shows the probability of survival against going private. The data reveals that firm age, ROIC, firm size and exploitation capabilities are positive and significant to firm survival. For every unit of increase in all these variables, the odds of survival go up by 1.055 (p<0.01), 1.015 (p<0.01), 2.435 (p<0.01) and 1.884 (p<0.01) respectively. The exploration and ambidexterity variables were not significant in this model. The results show that the model

explains 22.38% of the variance (Nagelkerke R Square), adding 11.05% to the explanatory power of the base model with model classification accuracy of 94.68%.

Model 1c: Perfect model with smaller sample size: survival versus non-survival firms

Model 1c builds on models 1a and 1b, using all variables (refer Table 32) representing the probability of firm survival during environmental turbulence. The exploitation and ambidexterity variables remain the key elements to organisational endurance. For every unit of increase in these variables, the likelihood to survive goes up to 111.858 ($p<0.01$) and 757.947 ($p<0.05$), respectively. The odd ratio of the exploitation variable in model 1c is 78.94 times higher than model 1b. Model 1c signifies an important improvement compared to model 1b, because it reconfirms the positive relationship between firm survival and exploitation and ambidextrous orientations. The model explains 12.46% of the variance in firm survival (Nagelkerke R Square), and the classification accuracy is 88.23%.

Model 2c: Perfect model with smaller sample size: survival versus acquired firms

Model 2c builds on models 2a and 2b, using all variables (refer Table 32) representing the probability of firm survival during environmental turbulence. Like model 1c, the exploitation and ambidexterity variables remain the crucial elements to predict organisational survival. For every unit of increase in these variables, the likelihood to survive increases to 96.604 ($p<0.05$) and 770.983 ($p<0.05$) respectively. The odd ratio of the exploitation variable in model 2c is 63.26 times higher than in model 1c, while the ambidexterity variable experiences 485.5 times increase in the odd ratio compared to model 1c. The model explains 14.19% of the variance in firm survival (Nagelkerke R Square), and the classification accuracy is 90.62%.

Model 3c: Perfect model with smaller sample size: survival versus merged firms

Model 3c builds on model 3b and aims to identify the probability of survival and merger during the crisis. Data shows that none of the predictor variables are significant to firm survival. This

is due to insufficient sample size for the regression test (survived firms, N=589; merged firms, N=12). The sample size reduces dramatically when more control variables are added to the test. The model explains 26.46% of the variance in firm survival (Nagelkerke R Square), and the classification accuracy is 98%.

Model 4c: Perfect model with smaller sample size: survival versus bankrupt firms

As the previous model, model 4c shows no significance of any of the predictor variables to firm survival. Insufficient sample size led to this result (survived firms, N=589; bankrupt firms, N=6). The model explains 24.75% of the variance in firm survival (Nagelkerke R Square) and the classification accuracy is 98.99%.

Model 5c: Perfect model with smaller sample size: survival versus going private firms

Like models 3c and 4c, model 5c shows that there is no predictor variable significant to firm survival due to insufficient sample size (survived firms, N=589; going private firms, N=3). The sample size reduces dramatically when more control variables are added to the test. The model explains 100% of the variance in firm survival (Nagelkerke R Square) and the classification accuracy is 100%.

6.7   Discussing the Hypotheses

A summary of the hypotheses is presented in Table 33. Hypothesis 1 is supported. Models 2a, 4a, 2b, 5b, 1c and 2c show that the ambidexterity variable is significant to firm survival. Hypothesis 2 is also supported - models 1a, 2a, 4a, 5a, 1b, 2b, 4b, 5b, 1c and 2c prove that exploitation capabilities have positive influence on firm endurance during environmental jolts. Hypothesis 3 is rejected. Models 1a, 2a, 3a, 4a and 5a show that exploration is negatively associated to firm survival and suggest that investment in exploration activities could reduce the likelihood of firm survival during crisis. The findings from models 2a, 3a, 2b and 2c are consistent and all of them reject Hypothesis 4, Hypothesis 5 and Hypothesis 6 which propose a

positive relationship of acquired and merged firms with exploitation, exploration and ambidexterity. Hypothesis 7, Hypothesis 8 and Hypothesis 9 which suggest a negative relationship of bankrupt firms with exploitation, exploration and ambidexterity, are supported by models 4a and 4b. Finally, Hypothesis 10, Hypothesis 11 and Hypothesis 12 are supported, as models 5a and 5b show a negative relationship of going private firms with exploitation, exploration and ambidexterity. Hence, there are no differences in term of survival characteristics within delisted firms.

Table 33   Hypotheses Conclusion

Hypotheses	Conclusion
Hypothesis 1: There is a positive relationship between ambidexterity and firm survival during crisis.	Supported
Hypothesis 2: There is a positive relationship between exploitation and firm survival during crisis.	Supported
Hypothesis 3: There is a positive relationship between exploration and firm survival during crisis.	Not supported
Hypothesis 4: There is a positive relationship of acquired and merged firms with exploitation.	Not supported
Hypothesis 5: There is a positive relationship of acquired and merged firms with exploration.	Not supported
Hypothesis 6: There is a positive relationship of acquired and merged firms with ambidexterity.	Not supported
Hypothesis 7: There is a negative relationship between bankrupt firms and exploitation.	Supported
Hypothesis 8: There is a negative relationship between bankrupt firms and exploration.	Supported
Hypothesis 9: There is a negative relationship between bankrupt firms and ambidexterity.	Supported
Hypothesis 10: There is a negative relationship between going private firms and exploitation.	Supported
Hypothesis 11: There is a negative relationship between going private firms and exploration.	Supported
Hypothesis 12: There is a negative relationship between going private firms and ambidexterity.	Supported

6.8   Discussion and Conclusion

This chapter aimed at understanding the factors that may influence firms' survival during environmental turbulence. The research results show the central, unwavering role of mastering

organisational ambidexterity in boosting the probability of organisational endurance during crisis. Analysis at firm level allows for a robust understanding of the drivers of survival outcomes. Three important findings emerged from this study.

First, organisational ambidexterity is positively correlated to firm survival. Firms increase their prospects for survival to the extent they develop an ambidextrous orientation (Hill and Birkinshaw, 2014). Firms that constantly exploit and explore their resources develop the capability to identify and evaluate new opportunities over time. Drawing on existing capabilities, ambidexterity promotes the development of skills to combine and utilise various resources in a meaningful way. Furthermore, ambidextrous firms are inclined to survive due to their ability to coordinate various units in the organisation. The organisational design and the established link to integrating the flow of information, technology, capital and people, make it easy for firms to implement new strategies or introduce strategic change during environmental jolts.

Second, the findings suggest that firms focused on refinement and extension of existing competencies have better survival prospects, compared with firms which overly explore their resources during crisis. The typical argument adopted in firm survival studies highlights the role of exploration in maintaining competitive advantage. Although there is an element of truth in this line of argument, it only tells one side of the story since it ignores the fact that exploration is subject to fundamental uncertainty and unknown returns. There is nothing wrong with being highly explorative, but firms must ensure that they have sufficient funds to cover the expenses and the potential losses that might be incurred from the explorative activities. In contrast, exploitative activities, which are integral to improving firm efficiency and accumulating resources, appear to be more appropriate during recession.

Third, the characteristics of delisted firms appear to be homogenous and consistent. In other words, the extent of exploitation and exploration of M&A and bankrupt firms could be similar. Such finding can be explained from two perspectives. First, the 2008-2009 financial crisis has impacted most firms in the U.S. Hence, companies that were either acquired or merged during the crisis period generally had poorer performance than during the non-crisis period. Second, it is possible that acquired or merged firms were actually more explorative and less exploitative in nature. After all, being explorative and possessing unique set of know-how and abilities tend to be the attractive characteristics for acquiring firms. As a result, it is not unusual for M&A, bankrupt and going private firms to have similar practices in managing their resources.

In conclusion, ambidexterity and exploitation have been found to be positively related to organisational survival, while exploration has reverse relationship with crisis survival.

6.9   Relevance for Practitioners and for the Theory

Overall, this study makes three contributions. First, departing from conventional wisdom in the crisis survival literature, this study adopts ambidexterity lens to provide new empirical evidence on how some firms survived the 2008-2009 financial crisis, while others did not. This study discovers that ambidexterity, indeed, helps to improve the probability of firm survival. In addition, the ability to strike a delicate balance between exploiting existing capabilities and exploring new opportunities is also seen as crucial. The analysis suggests that excessive focus on exploration activities is doing more harm than good in firms' efforts to overcome a crisis period. The findings disclose some practical implications on resource allocation during environmental jolts.

Second, this study contributes to the ambidexterity literature by providing insights into how a discrete firm may need to be ambidextrous in its own right, rather than simply focus on exploitation and/or exploration activities blindly. As discussed earlier, not all firms have the

capabilities and resources to invest in both learnings. This study, indeed, provides a new insight to scholars and practitioners regarding the interaction between exploitation and exploration impacts on the probability of firm survival.

Although exploration alone is found to be negatively correlated to firm survival, the study does not imply that firms should abandon R&D and marketing activities in order to sustain themselves. Instead, exploration activities should be conducted along with exploitation activities in order to ensure the firm generates sufficient resources to support both daily operations and future viability.

Last but not least, this study demonstrates a novel perspective on operationalising the ambidexterity concept. The existing ambidexterity studies tend to apply questionnaire survey methods to measure the concept. It is undeniable that this method allows in-depth understanding of its role in organisational behaviour, firm decision-making process and firm performance. However, it has been highlighted that the findings of such studies are difficult to compare. Each scholar may have developed their own set of constructs to suit their research objectives. Hence, the application of financial ratios and statistical methods in this study can help in addressing the above research gap by allowing better comparison of the findings in different contexts.

6.10   Summary

Firm performance and the probability of survival are two distinct outcomes with complex relationship (Gimeno et al., 1997). Performance may not guarantee survival, while survival may not guarantee performance (Paeleman and Vanacker, 2015). This study creates a bridge by suggesting ideal ways to manage firm resources through the lens of ambidexterity. The research into the implications of ambidexterity on firm survival provides an essential extension to the existing survival and ambidexterity literature.

Using a sample of 8,444 American corporates listed on the stock exchange markets from 2006 to 2009, this longitudinal study identifies the extent to which ambidexterity impacts the probability of firm survival during the Global Financial Crisis. The 2008-2009 Global Financial Crisis serves as a valuable setting for this research. It allows a clearer portrait of the firm survival and death trend by considering the firm's competence in managing its resources. Overall, this study extends the current research by providing a nuanced view of relationships between ambidexterity and firm survival.

The discussion about the determinants of organisational survival is split into two. The first part of the study focuses on the role of ambidexterity on firm survival, while the second part identifies the characteristics of non-survival firms (acquired, merged, bankrupt and going private) during the crisis. Results shows that ambidexterity and exploitation contribute positively to firm survival, while explorative activities are found to have negative relationship with firm survival. In addition, the results suggest that delisted firms have similar characteristics in term of the magnitude of ambidexterity. This finding contradicts the general perception that merged/acquired and bankrupt firms are delisted for different reasons.

In conclusion, this chapter confirms that survival is not purely dependent on luck or the possession of slack resources. The latter, often associated with better performance, may in fact be a principal source of threats to firm survival if not utilised properly. Hence, the ability to exploit and explore resources is extremely valuable for long-term survival. Considering that the strategic choices of firms are driven by their intrinsic characteristics, each firm is bound to develop distinctive capabilities to cope with the changing business environment and thus, improve their individual survival prospects during environmental turbulence (Esteve-Pérez and Mañez-Castillejo, 2008).

CHAPTER 7: The Post Crisis Performance

Understanding the post crisis performance

7.0   Post Crisis Firm Performance: When the Dust Has Settled

"Never let a good crisis go to waste" has been attributed to Winston Churchill about the conditions post the Second World War that allowed for the formation of the United Nations. It refers to the peculiar environment that surrounds people during a crisis where somehow all paradigms seem up for debate and rules are to be questioned (Low, 2016).

The survival of a financial crisis does not seem to conjure great strategic fears in the strategic management literature. It is somewhat assumed that firms would fail one way or another survive the crisis until new business opportunities start to emerge. There is limited strategic research about post crisis performance as scholars are primarily occupied with crisis survival and sustaining performance during turbulence (Katila and Ahuja, 2002; He and Wong, 2004; Jansen et al, 2006; Lubatkin et al., 2006; Uotila et al., 2009).

Table 34 shows that the number of delisted firms continued to increase in 2010 after the Global Financial Crisis. The number of bankruptcies decreased, but the total turnover rate kept its upward trend due to the elevated acquisition activities and reversion to private trading. The data shows a grim picture of the mortality rate of the listed companies in the U.S. It seems as if the financial crisis triggered a near existential threat to 5% of the listed companies, which were acquired, merged, delisted or simply went bankrupt, as discussed in Chapter 5.

The increase in the total turnover suggest that the crisis may have modified the business environment, which resulted in changes to the opportunities and threats after the crisis. Two conclusions are formed from the observation. First, the increase in the total turnover might be contributed to firms, which have survived from the crisis but failed to sustain their performance after the recession. These "wounded" firms require improvement in operations, revision of the

existing strategies, strengthening of their financial and market positions in the post crisis period to continue to perform. In general, "wounded" firms have weaker financials, which constrain the availability of strategic choices and options. Thus, knowing the best strategies or measures to overcome flat performance is essential for these "wounded" firms, as they have limited resources to invest in modifying existing operations. Second, a steady increase in the volume of acquisitions after the crisis suggests that some firms took timely advantage of their superior performance and devoured some of the weakened rivals.

Table 34   The Breakdown of Delisted Firms

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	%
Acquired	52	375	273	194	309	322	294	334	271	2424	51.63
Merged	27	123	61	42	65	53	69	54	69	563	11.99
Bankrupt	4	46	81	148	80	69	75	58	63	624	13.29
Going Private	11	44	64	87	79	120	171	204	304	1084	23.09
Total	94	588	479	471	533	564	609	650	707	4695	100

Source of data: Datastream
Sample size: 11, 290
Period: 2006 to 2014

This chapter proposes to integrate the organisational ambidexterity concept into the discussion of and examine its impact on firm performance after the crisis by posing the research question: *What types of ambidexterity were more likely to promote prosperity after the Global Financial Crisis?*

7.1   Organisational Ambidexterity and Firm Performance

Ambidextrous firms are characterised by their ability to reconcile internal tensions and resolve conflicts in their task environment (Raisch and Birkinshaw, 2008). Organisational ambidexterity consists of two fundamentally different learning activities, namely exploitation and exploration, which require firms to divide their attention and resources (Raisch and Birkinshaw, 2008). Exploitation is associated with activities that involve "refinement, efficiency, selection and implementation", while exploration comprises activities such as "search, variation, experimentation and discovery" (March, 1991).

Organisational ambidexterity is a prerequisite of organisational survival and success. The relationship between ambidexterity and firm performance has been proven by the literature. When both orientations are performed simultaneously, they can improve financial performance and ensure long-term success (He and Wong, 2004; Gibson and Birkinshaw, 2004; Lubatkin et al., 2006; Voss and Voss, 2013). The key to the latter is the delicate balance between the need for innovation to adapt to environmental changes and simultaneous refinement of existing processes to ensure efficiency (March, 1991; Voss and Voss, 2013).

Despite intensive scholarly scrutiny, 'the empirical evidence of the organisational ambidexterity and performance remains mixed and limited' (Raisch and Birkinshaw, 2008; Voss and Voss, 2013) due to the practical challenges for implementing both activities concurrently. They require different and inconsistent organisational structures (Smith and Tushman, 2005, organisational learning modes (Eisenhardt and Martin, 2000; Benner and Tushman, 2003; Voss and Voss, 2013) and their simultaneous implementation create tensions in resource allocation (March, 1991; March, 2006).

Nevertheless, the argument that firms need to balance exploitation and exploration learning to achieve optimal performance is widely accepted in the literature (Ghemawat and Ricart Costa, 1993; Benner and Tushman, 2002; Gupta et al., 2006; Uotila et al., 2009; Phene et al., 2012). Overemphasis on exploration may result in spending scarce resources with very little pay back (March, 1991; Uotila et al., 2009). Conversely, overemphasis on exploitation may reduce opportunities for learning new skills and facilitate sliding into captivity of outdated knowledge and practices, which ultimately depress long-term performance.

However, most of the studies hinge on the assumption that an environment with limited resources confronts firms with the choice to allocate their resources. Yet, the empirical tests of how ambidexterity relate to performance have modelled them as positively correlated,

orthogonal activities (Katila and Ahuja, 2002; He and Wong, 2004; Jansen et al., 2006; Lubatkin et al., 2006). The relationship between ambidexterity and firm performance in various environmental settings has remained largely untested. Moreover, prior research has failed to incorporate firm-level analysis of ambidexterity with longitudinal research designs.

Two factors motivated this study to research the relationship between organisational ambidexterity and firm success. First, despite the increasing variety of research domains, the focus debate on ambidexterity has become complex and disconnected. This is due to lack of consensus in the use of vocabulary and lack of discussion about the effects of ambidexterity in different settings (Raisch and Birkinshaw, 2008). Therefore, this study believes that the literature would benefit from a comprehensive research that integrates insights from prior findings, while identifying the impacts of the external environment on the ambidexterity orientation.

7.2   The Role of Ambidexterity in Firm Performance After the Crisis

Environmental factors, which relate to the level of competitiveness and dynamism in a business environment, are important boundary conditions for organisational ambidexterity (Levinthal and March, 1993; Siggelkow and Levinthal, 2003; Volberda and Lewin, 2003; Gibson and Birkinshaw, 2004; Raisch and Birkinshaw, 2008). Studies show that the effectiveness of exploitation and exploration differs under different contextual conditions (Raisch and Birkinshaw, 2008).

An increase in market competition and dynamism require firms to become ambidextrous (March, 1991; Levinthal and March, 1993; Floyd and Lane, 2000; Volberda and Lewin, 2003; Raisch and Birkinshaw, 2008). A persistent theme in organisational literature suggests that successful firms are ambidextrous (Tushman and O'Reilly, 1996; Gibson and Birkinshaw, 2004; Raisch and Birkinshaw, 2008). As the pace of change accelerates and the competition

intensifies, firms may be confronted with a dilemma to choose between exploiting existing capabilities and exploring new knowledge. Empirical evidence shows that firms are more likely to become ambidextrous when the external environment is characterised by high dynamism and competitiveness (Jansen et al., 2006). Similarly, another study shows that firms manage to strike a balance between exploitation and exploration when faced with increasing uncertainty (Auh and Menguc, 2005).

From business and economy point of view, crises change the market structures, reduce market attractiveness and environmental munificence, obsolete existing technologies, redistribute wealth and power from one entity to another, reduce demand for goods and services, all of which ultimately impact firm performance. Hence, it is vital for survived firms to rebuild their competitive advantages by redesigning organisational structures and strategies after a punctuated event.

This study suggests that ambidextrous firms are more likely to have better performance after crisis. Exploitation orientation, which focuses on utilising existing firm resources, enhances operational efficiency, allows companies to improve their financial condition and fund exploratory activities. In contrast, exploration activities that emphasise R&D activities and market development provide firms with opportunities to explore and implement new knowledge, technologies and ideas. Exploration identifies the latest market needs, which may have changed after the crisis, and allows firms to reconfigure and act according to market changes. Overall, ambidexterity helps firms restore their operational capabilities and tackle the damages caused by the crisis. Hence, this study expects ambidexterity to have a positive relationship with firm performance after the crisis.

Hypothesis 1: Ambidexterity has a positive relationship with firm performance after the Crisis.

7.3   The Role of Exploitation and Exploration in Firm Performance After the Crisis

Exploitation and exploration entail fundamentally different organisational strategies, structures and contexts (Raisch and Birkinshaw, 2008). There may be a trade-off when steering the firm to exploit its existing competencies and explore new ones (Levinthal and March, 1993; Floyd and Lane, 2000; Ancona et al., 2001). Earlier studies claimed that tackling simultaneously both learnings could be challenging as this may cause tensions within an organisation's operations and resource allocation processes. Both orientations are discrete and contrasting, and firms should pursue either exploration or exploitation (Miller and Friesen, 1986; Denison et al., 1995). Nevertheless, some studies suggest that an ambidextrous strategy is vital for long-term performance. Too much exploitation may improve short-term performance, but firms may fall in a competency trap, as they are unable to respond adequately to environmental changes (Leonard-Barton, 1992; Ahuja and Lampert, 2001). Similarly, significant focus on exploration may improve firms' ability to renew their knowledge base, but may position them into an endless cycle of search and unrewarding change (Volberda and Lewin, 2003). Hence, the long-term survival is delivered by the ability to juggle both learnings at the same time (Levinthal and March, 1993).

Does the simultaneous pursuit of exploitation and exploration compromise the potential value of each one of them individually? Given the inherent challenges of incorporating both orientations into a firm's operations, some businesses may run the risk of being mediocre in both. Hence, some might make a choice that favour one activity over the other (Barney, 1991; Ghemawat and Ricart Costa, 1993).

Based on the organisational culture and identity literature, this study hypothesises that a focus on exploitation or exploration can improve the operational effectiveness and internal consistency. Pursuing a single learning mode creates organisation-wide consensus, provides clearer justification of the action plans and allows firms to invest their resources in worthwhile

activities (Voss et al., 2006; Voss and Voss, 2013). It eliminates the complexities associated with ambidexterity and enables firms to take advantage of the most profitable part of the portfolio (Van Looy et al., 2005). Research shows that, applied individually, exploitation or exploration strategy can improve firm performance as they integrate challenges by enhancing the flow of knowledge and experience sharing across the firm (Jansen et al., 2009). Moreover, exploitation has been found as more beneficial to financial performance in competitive environment, while exploration - in dynamic environment (Jansen et al., 2006).

Firms that survived the 2008-2009 financial crisis might have suffered from flat performance, because most of the slack resources have been channelled into firm operations to increase the likelihood of survival during turmoil. It is not unusual that some firms may even look upon their survival as a priority and consider performance improvement during highly uncertain periods secondary. However, well-applied exploitative capabilities can help a firm restore its level of resources and improve its performance.

Exploitation-centred strategy is more likely to be adopted by firms, which survived the crisis and yet, do not have enough capital to invest in R&D and innovative activities. Instead, they focus on sustainable rebuilding of the resource base and constructing the foundation for riskier future investments. In addition, firms that focus on exploitation strategy integrate similar cognitive models and routines in their operations. These efforts facilitate communication and integration, moderate conflict within organisational units and later result in complementary effects on firm performance (Christensen and Bower, 1996; Slater and Narver, 1998; Voss and Voss, 2013). Thus, this study expects exploitative activities to have positive relationship with firm performance after the crisis.

Hypothesis 2: Exploitation has a positive relationship with firm performance after the Crisis.

During the crisis, firms may have been inclined to allocate their resources to activities that can ensure their survival. As the return on investment from exploration is less predictable than exploitation, firms may prefer to reduce, forgo or delay explorative activities. Such strategic direction has its own challenges – as less attention is devoted to R&D and new idea generation activities during the turbulent period, after the crisis firms may experience the negative effects of obsolete technologies and processes. The exploration of new capabilities, knowledge and markets entails similar cognitive models and routine operations. The exploration strategy is backed by the diffusion of the innovation theory, which addresses the role of exploration in the search of innovation, the diffusion of knowledge, communication and the adoption of new knowledge (Bustinza et al., 2017). Engaging proactively in exploration allows firms to identify the current market needs and trends, which may have changed after the crisis. Hence, this study hypothesises that exploration capabilities, which include R&D, marketing and market development activities, have a positive relationship with firm performance after the crisis.

Hypothesis 3: Exploration has a positive relationship with firm performance after the Crisis.

7.4 Control Variables

This chapter employed twelve sets of control variables.

7.4.1 Industry Type

The study controlled for industry type. Firms were classified based on the Industry Classification Benchmark (ICB). The information was obtained from DataStream. Industry was controlled, because the firm performance can vary from one industry to another (Miller and Triana, 2009). The industry effects portray the contextual factors such as industry structure, market share, the stage of development, entry mode, entry barriers, potential earnings and level of growth in which a firm operates and which determine its performance. All these factors distinguish the level of attractiveness, concentration, economies of scale, entry and exit barriers

(Porter, 2008). In this study, the industry type was controlled because the impacts of the financial crisis on each industry were different. Hence, the performance of each after the crisis could diverge due to the respective degree of damage. Overall, the sample consists of eleven industries: basic materials, consumer goods, consumer services, financials, health care, industrials, manufacturing, oil and gas, other, technology, telecommunication and utilities.

7.4.2 Year

This study controlled for the year. This control variable allows differentiation of firm performance at different periods after the crisis (between 2010 to 2014). Firm performance in one year after the crisis (2010) could be poorer compared to four years (2014) later.

7.4.3 Total Debt to Total Assets

The total debt to total assets ratio is an indicator of financial leverage. It tells the percentage of total assets that are financed by creditors, liabilities, debt. This ratio enables comparison of leverage to be made across different companies. A higher ratio indicates a higher degree of leverage, which can translate as higher financial risk. Therefore, a company with a high ratio may find it more difficult to sustain its performance after the crisis. This study controlled total debt to total assets ratio since the debt ratios vary widely across industries, while the research data consists of firms from various industries.

7.4.4 Firm size

Studies show firm size to be significant to firm performance, because larger firms are more likely to weather an extended period of poor performance and restore its performance after a crisis (Levinthal, 1991; Dowell and Shackell, 2011). In this study, firm size is measured as the logarithmic transformation of employees, rather than total sales or total assets. Total assets or total sales as a measure of firm size is problematic, when the sample consists of firms from various industries. For instance, when both manufacturing and financial firms are included in a

sample, using total assets as an indicator for firm size tends to overestimate the size of manufacturing firms relative to financial firms (Chung and Beamish, 2005).

In addition, larger firms are less informationally opaque and have access to alternative sources of external finance (Geroski, 1995; Byrne et al., 2016). Size can also have an impact on organisational strategies. Larger firms, which possess more resources than smaller firms, tend to follow riskier strategies and implement necessary changes (Pandey, 2015), which can later enhance their performance.

7.4.5 Working Capital to Sales

The working capital to sales or working capital turnover is a measure comparing the depletion of working capital used to fund operations and purchase inventory, which is then converted into sales revenue for the firm. This ratio symbolises the relationship between the capital invested in operations and the revenue generated from these activities. A high ratio indicates that a company is running smoothly and has limited need for additional funding. It ensures financial flexibility and may indicate positive firm performance, even give it a competitive edge over its rivals (Investopedia, 2017). This study controlled working capital to sales ratio as it varies from one industry to another, while the data itself consists of various industries.

7.4.6 Firm Age

The absolute number of years that a company was in existence was controlled. This study measured firm age as the number of years from the firm's founding year to 2014. Younger firms tend to have poorer performance than long-established ones, since the former have not yet developed organisational routines, repertoires, strengths, pool of resources, or built trust and legitimacy with stakeholders (Shane, 1996). In the context of firm performance, this translates into higher vulnerability of younger firms during the post-crisis period, as they have not had enough time and gained enough momentum to develop their exploitative and explorative skills

to counter the changes that occur after the crisis. In contrast, firms with an established track record are less likely to fail, because they are, to a certain extent, forced to implement professional and formalised management structures and possess more resources to implement changes if necessary (Byrne et al., 2016).

7.4.7 Board Structure/CEO-Chairman Separation

The CEO-chairman role separation control variable is concerned with whether the chief executive officer (CEO) is also the chairman of the board. Agency theory, which highlights the divergent interests of management and owners, suggests as unwise to allow too much power in the hands of a CEO. This enables the latter to pursue a personal agenda that might be against the best interests of their shareholders (Dalton et al, 1998). Moreover, having a powerful CEO strengthens the perception that the board of directors is likely to be under the influence of the CEO. Ultimately, this reduces the effectiveness of firm management and protection of shareholders' interests (Pearce and Zahra, 1991).

In contrast, there are studies in favour of powerful CEOs, because of their ability to make rapid decisions and enact necessary changes without the need to build consensus. In addition, research shows that high-powered CEOs may have greater motivation to look for solutions to improve firm performance after the recession. Research has proven that CEOs of failed firms are stigmatised due to their association with the failure (Semadeni et al., 2008; Dowell and Shackell, 2011). The stigma may be greater for high-powered CEOs, who see the success and failure of firms as part of their responsibility. Finally, powerful CEOs are likely to suggest extreme decisions that drastically change a firm's strategy (Adam et al., 2008). In conclusion, CEO duality that produces a single and unified voice is crucial for positive firm performance, especially when the environment is characterised with high uncertainty and low munificence, and the speed of the decision-making process is highly valued (Finkelstein and D'Aveni, 1994; Boyd, 1995).

7.4.8 Board Size

There is inconsistent empirical evidence in the literature regarding the relationship between board size and performance, and the impact of board size on firm survival (Dowell and Shackell, 2011). The difficulty comes from the differential effects of board size on the three main roles of the board: advising, monitoring and bridging firms with resources.

The literature shows smaller board size is useful in the strategy formation process and underpins faster decision making than larger boards (Goodstein et al., 1994). In addition, smaller boards are more likely to monitor management as they have greater decisiveness and individual commitment (Judge and Zeithaml, 1992; Dowell and Shackell, 2011). Studies also show that smaller boards are more likely to remove poorly performing CEOs and negotiate CEO's compensation contracts based on performance (Boyd, 1994; Certo et al., 2001). In contrast, the literature highlights that larger boards are in better position to fulfil the resource provision role, because they offer more opportunities for relationships between board members and the source of resource (Goodstein et al., 1994; Fischer and Pollock, 2004). This is essential after the crisis as the possession of information and resources are crucial for firm survival.

However, in a high velocity environment when information is often inaccurate, unavailable and obsolete, larger board size with its ability to gather more information and present a greater number of strategic options might not prove as valuable as the ability to move quickly. Moreover, a board with a larger group of members has a greater likelihood to disapprove risky strategies (Cheng, 2008). In other words, the greater the level of financial distress, the higher the probability that larger board size may increase the risk of failure, because the board cannot act quickly enough to utilise the available resources. Hence, smaller boards are more capable of monitoring firm performance, improve efficiency and firm performance.

7.4.9   Board Structure/Board Gender Diversity

Literature shows a positive relationship between a board's gender diversity and the market value of the firm (Carter et al., 2003) as well as the accounting performance (Erhardt et al., 2003). Consistent with this research, which apply the signalling theory to show the relationship between board characteristics and organisational reputation (Certo et al., 2001; Certo, 2003; Miller and Triana, 2009), it is proven that board gender diversity also improves firm outlook and bolsters firm reputation (Certo, 2003; Deutsch and Rose, 2003; Miller and Triana, 2009). As businesses operate increasingly within a global economy, diversity conveys a signal that the firm is well-positioned to meet the need of a diverse market and the desire to emulate stakeholder population, management and labour force (Dowling, 2006). In addition, heterogeneous groups allow creation of a broader range of ideas and information, which can contribute to the identification of innovation opportunities (Mintzberg et al., 1976; Miller and Triana, 2009). Empirical research on group decision making supports this assertion; through cognitive conflict board diversity produces higher quality strategic decisions than homogeneous groups (Amason, 1996; Chen et al., 2005). Thus, a firm with diverse board of directors has better performance after the crisis as it benefits from diversity of ties and it is more likely to innovate, overcome decision bias and improve decision quality.

7.4.10   Board Structure/Specific Skills

This study controlled the number (in percentage) of board members, who have either an industry specific background or a strong financial background. Diversity in board member background brings a broader range of knowledge, information and insights into the firm (Carter et al., 2003). The quality of each board member contributes positively and significantly to management decisions, which later translates into firm performance. A diverse board is highly regarded after a crisis as its receptivity to change in corporate strategy is relatively higher (Wiersema and Bantel, 1992; Nadkarni and Herrmann, 2010) and they are more willing to

promote and accept strategic changes. Thus, firms with a board of directors, who possess specific industry knowledge and strong financial knowledge, are more likely to have better performance after the crisis, as the board's knowledge can be a source of competitive advantage manifested through identification of strategies for improvement.

7.4.11 Board Structure/Independent Board Members

Board independence is assessed by the degree to which board members are not affiliated with the firm through employment or economic exchange relationship (Gordon, 2007; Dowell and Shackell, 2011). Having relatively higher board independence is generally considered advantageous, because it reduces the chance of top management domination. Moreover, independent board members are more likely to propose and direct necessary changes, even confront management reluctance. This is extremely useful when the firm counters a lengthy organisational decline. Independent board members can also play an important role in driving out strategic decisions, which strengthen firms' survival probability when dealing with threats. Dowell and Shackell (2011) argue that the lower the board members' attachment to the current strategy, the greater the likelihood to consider a new strategic direction. Finally, the more independent the board of directors, the higher the probability of firms to receive different and varied sources of information, which is particularly valuable in aligning with the external environment (Agrawak and Knoeber, 2001; Hillman and Dalziel, 2003; Dowell and Shackell, 2011). From this perspective, independent directors have an advantage from agency dependence and resource dependence perspective, which is crucial for the ability of distressed firms to make changes and survive during crises.

7.4.12 Board Structure/Experienced Board

This study controlled the average number of years each board member is on the board. It is argued that longer standing board members have more experience and deeper understanding of the firm's history, operations, strategies and staff. This experience is expected to positively

contribute to better firm performance. Though, experienced board members may appear to be more aggressive and dictatorial in their leadership style and the decision-making process, and later undermine a firm's performance (Carlson and Karlsson, 1970). Moreover, experienced board may be reluctant to implement risky strategies (Child, 1975) and oppose drastic change into the firm, which may be necessary for better firm performance after environmental jolts.

Nevertheless, research shows that experienced board members are actually more capable when coping with changes in the business environment due to their deeper understanding of the firm's operations (Wegge et al., 2008). If they are able to work well in a group, this facilitates a rapid decision-making process and implementation, which are crucial for firm performance during uncertain periods.

7.5 Data

This section shows an overview of the data resources and samples used in this study, with an explanation of the dependent and independent variables. The financial data was retrieved from DataStream, combined with company profiles obtained from the U.S. Securities and Exchange Commission website and a number of publicly available sources (refer to the Methodology chapter for full description).

Sample

The sample frame for this study consists of 11,290 firms listed on NYSE, Nasdaq stock market as well as delisted firms in the United States (U.S.) from 2006 to 2014. The historical financial information of survived and dead firms was obtained from DataStream to create a longitudinal study. The sample is split into 9 groups, based on the year of listing on and delisting from the stock markets. Table 35 shows the summary of the sample.

The focus of this chapter is the identification of the role of ambidexterity on firm performance after the 2008-2009 Global Financial Crisis. The target sample consists of all firms that managed to survive and prosper from 2006 to 2014 (Group 9).

Table 35   Summary of Groups

Group	Sub Total	Grand Total	Percent
Group 1: Dead before crisis		1426	12.63
Group 1a: Dead before crisis: Acquired	700		
Group 1b: Dead before crisis: Merged	213		
Group 1c: Dead before crisis: Bankrupt	179		
Group 1d: Dead before crisis: Going Private	334		
Group 2: Born in crisis and died in crisis		29	0.26
Group 2a: Born in crisis and died in crisis: Acquired	3		
Group 2b: Born in crisis and died in crisis: Merged	2		
Group 2c: Born in crisis and died in crisis: Bankrupt	1		
Group 2d: Born in crisis and died in crisis: Going Private	23		
Group 3: Born during and died after		139	1.23
Group 3a: Born during and died after: Acquired	56		
Group 3b: Born during and died after: Merged	14		
Group 3c: Born during and died after: Bankrupt	16		
Group 3d: Born during and died after: Going Private	53		
Group 4: Born during and still going		466	4.13
Group 5: Born after and died		71	0.63
Group 5a: Born after and died: Acquired	32		
Group 5b: Born after and died: Merged	16		
Group 5c: Born after and died: Bankrupt	2		
Group 5d: Born after and died: Going Private	21		
Group 6: Born after and still going		715	6.33
Group 7 Alive before and died during		1115	9.88
Group 7a: Alive before and died during: Acquired	492		
Group 7b: Alive before and died during: Merged	100		
Group 7c: Alive before and died during: Bankrupt	237		
Group 7d: Alive before and died during: Going Private	286		
Group 8: Alive before and died after		1915	16.96
Group 8a: Alive before and died after: Acquired	1141		
Group 8b: Alive before and died after: Merged	218		
Group 8c: Alive before and died after: Bankrupt	189		
Group 8d: Alive before and died after: Going Private	367		
Group 9: Alive before and still going		5414	47.95
Grand Total		11290	100.00

Coding and Operationalisation of Variables

Dependent Variables

To help answer the questions posed in this study, six dependent variables (return on invested capital, return on equity, return on assets, net margin, Tobin's Q and price-earnings ratio) were selected to reflect firm performance after the financial crisis. To account for any lag effects of exploration activities on firm performance, the analysis was conducted using firm performance (dependent variables) with one-year lag (Huselid et al., 1997; Stuart, 2000; Collins and Clark, 2003; Chandler et al., 2013; Patel and Chrisman, 2014; Shin and Konrad, 2014; Berry, 2015).

Return on Invested Capital

Return on invested capital (ROIC) is an important determinant of firm performance and strategic change (Greve, 1998). An increase in ROIC reinforces the value of existing strategies and firm efficiency, whereas a decline challenges the effectiveness of existing strategies and forces managers to instigate changes. Firms that experience a steady growth in ROIC have a better performance, because they can allocate and control their capital more efficiently to generate superior returns.

Return on Equity

Return on equity (ROE) is a measure of profitability and efficiency. An increase in ROE reflects the ability to generate profit without needing as much capital (Investopedia, 2017). ROE also indicates how well a company's management is deploying the shareholders' capital (Orlitzky et al., 2003). Companies with high ROE demonstrate ability to utilise shareholders' funds more efficiently for profit generation, which leads to better firm performance.

Return on Assets

Return on assets (ROA) measures the level of profitability of a company relative to its total assets. The ratio represents the management efficiency and portrays how well a firm is using its

assets to generate earnings. The higher the ROA, the more efficient management is in utilizing its asset base. The ROA ratio varies greatly among industries (Orlitzky et al., 2003). Capital-intensive industries (with a large investment in fixed assets) tend to have more assets than technology or service businesses (Investopedia, 2017). In this study, firms with higher ROA are viewed as having better performance.

Net Margin

Net margin is the ratio of net profits to revenues. It is one of the most important indicators of a firm's financial health. This ratio provides a more accurate view of how profitable a business is than its cash flow. A firm can assess whether current practices are working by tracking the trend of its net margin. Net margin can be used as a tool to forecast profits based on revenues (Investopedia, 2017). Changes in net margin are endlessly scrutinized. In general, when a firm experiences a decline in net margin over time, a myriad of problems could be the reasons, ranging from decreasing sales to poor customer experience to inadequate expense management, which ultimately lead to poor firm performance.

Tobin's Q

The Tobin's Q ratio is a measure of firm assets in relation to a firm's market value. The ratio is calculated as the market value of a firm divided by the replacement value of the firm's assets. A ratio of less than one indicates a poor firm performance. Such firm would be better off selling its assets rather than putting them to use. From investors' point of view, a ratio lower than one indicates an undervalued company, attractive to corporate raiders or potential purchasers. In contrast, a ratio higher than one suggests good firm performance with profit generation exceeding the cost of the assets. From investors' standpoint, a firm with Tobin's Q ratio higher than one may be overvalued and thus, may appear less attractive to corporate raiders or potential buyers (Investopedia, 2017).

Price-earnings Ratio

The price-earnings ratio (P/E ratio) indicates the value of a company. The ratio measures a firm's current share price relative to its per-share earnings. In theory, the P/E ratio represents the amount that an investor is assumed to invest in a company to receive one dollar of the company's earnings. In this study, firms with a higher P/E ratio are generally better performers. It suggests that investors expect higher earnings growth at these firms in the future compared to companies with a lower P/E. In contrast, a low P/E ratio may indicate either that a company is currently undervalued or that the company is doing exceptionally well relative to its past trends.

Independent variable

Exploitation

This study measures the extent of exploitation using the factor scores obtained from factor analysis. The factor scores consist of total sales per employee ratio and total assets per employee ratio of each firm. Both financial ratios indicate the cost of running a company. They can be insightful when measuring the efficiency of businesses and suggest how well firms utilise their existing resources. Interpreting the ratio is fairly straightforward: firms with higher factor score are generally considered more efficient than those with lower score. A higher exploitation factor score suggests that the firm can operate on lower overhead costs, which often translates into healthier profits.

Exploration

This study measures the extent of exploration using the factor scores obtained from factor analysis. Research and development (R&D) to total assets, selling, general and administrative expenses (SG&A) to assets and operating ratios are used to measure the magnitude of exploration.

R&D to total assets ratio measures the R&D intensity by comparing the effectiveness of R&D expenditures between companies. SG&A measures expenditure related to the daily operations of a firm and not directly related to the production of the product. SG&A includes shipping supplies, delivery charges, marketing expenditure, travel costs and the salaries of sales personnel. A higher R&D to total assets and SG&A ratios indicate that firms are active in explorative activities. The operating ratio shows the efficiency of a company's management by comparing operating expenses to total sales. A smaller ratio suggests a greater ability to generate profit, if revenues decrease. In this study, operating ratio represents the magnitude of exploration: the operating expenses rise when more resources are devoted to explorative activities, which later result in a higher operating ratio.

In short, a higher exploration factor scores indicate a greater commitment to exploration activities.

Ambidexterity

The interaction between the exploitation and exploration constructs forms the factor scores for the ambidexterity variable. Pursuing both innovation processes reflects a complex capability that provides additional source of competitive advantage beyond these specific to each innovation activity individually (Tushman and O'Reilly, 1996; Ancona et al., 2001; Raisch and Birkinshaw, 2008). Sufficient level of exploitation can ensure current viability, while exploration helps to promote future viability (Levinthal and March, 1993; Raisch and Birkinshaw, 2008).

Some scholars argue that ambidexterity contributes to general shift in organisational resources from trade-off to paradoxical thinking (March, 1991; Eisenhardt, 2000; Lewis, 2000). Studies have increasingly come to recognise the importance of balancing seemingly contradictory tensions for organisational long-term survival and success. Balancing does not mean both

capabilities should receive the same amount of resources, rather it emphasises that both learnings should receive adequate attention from business practitioners.

Interpreting the factor score is fairly straightforward: firms with higher score are generally considered more ambidextrous than these with lower score, which translates into better firm performance after the crisis. Table 36 shows the descriptive analysis for the independent variables in this study.

Table 36   **Descriptive Statistics for the Independent Variables**

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Exploitation	19133	-0.5113	3.8724	0.0665	1.0804
Exploration	19133	-0.8337	3.6077	-0.0698	0.7568
Ambidexterity	19133	-2.4661	7.0229	-0.0454	0.4829
Valid N (listwise)	19133				

7.6   Methods

Given that the outcome variable and predictor variables are both continuous variables, the method used for data analysis was linear regression (Field, 2009). In addition, to account for any lag effects of exploration activities on firm performance, the analysis was conducted using firm performance (dependent variables) with one-year lag (Huselid et al., 1997; Stuart, 2000; Collins and Clark, 2003; Chandler et al., 2013; Patel and Chrisman, 2014; Shin and Konrad, 2014; Berry, 2015).

7.7   Results

Table 38 shows the descriptive statistics and Pearson correlation coefficients for all the variables in this study. Firm performance was found to be significantly correlated to most variables, except for the variables representing the size of the board, specific skills of the board of directors and the number of independent board members. Contrary to expectations, however, the exploitation and exploration variables are negatively correlated to the experience of board

members and the gender of board members. The remaining relationships are according to expectations. The industry type and CEO-chairman separation, which are the categorical variables, are excluded from the Pearson correlation coefficient test, because they are neither interval, nor ratio scale.

Table 38 shows that some correlation coefficients are greater than 0.8 (Field, 2009), which suggests there is risk of multicollinearity. Given the potential multicollinearity concern, linear regression was conducted to identify the Variance Inflation Factors (VIF).

Table 37   Variance Inflation Factors

Variable	Collinearity Statistics	
	Tolerance	VIF
1. Debt to total assets	.598	1.671
2. Firm size	.500	2.000
3. Working capital to sales	.740	1.351
4. Firm age	.636	1.573
5. Board size	.710	1.408
6. Board gender diversity	.757	1.321
7. Specific skills	.876	1.141
8. Independent board members	.757	1.321
9. Experienced board	.804	1.244
10. Exploitation	.043	23.101
11. Exploration	.130	7.713
12. Ambidexterity	.038	26.446
13. Return on equity	.265	3.775
14. Return on assets	.149	6.725
15. Net margin	.445	2.247
16. Tobin's Q	.329	3.042
17. Price-earnings ratio	.612	1.633

a. Dependent Variable: Return on invested capital

A value of VIF above 10 should become a concern as it signals potential problems of multicollinearity (Field, 2009). Table 37 shows that the exploitation and ambidexterity variables have VIF above 10 or tolerance statistics below 0.1, which suggest a risk of multicollinearity.

Table 38   Descriptive Statistics and Pearson Correlation Coefficient

Variable	Mean	Std. Deviation	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Debt to total assets	0.208	0.196	26991	1																	
2. Firm size	3.184	0.975	23340	.155**	1																
3. Working capital to sales	0.434	0.723	21088	-.301**	-.434**	1															
4. Firm age	18.067	8.457	16510	.025**	.382**	-.172**	1														
5. Board size	10.588	2.666	5805	.024	.399**	-.237**	.204**	1													
6. Board gender diversity	13.963	10.053	5805	.018	.214**	-.146**	.287**	.181**	1												
7. Specific skills	56.935	20.523	5766	-.062**	-.222**	.167**	-.149**	-.211**	-.140**	1											
8. Independent board members	74.683	19.610	5737	-.035**	-.106**	.043**	.289**	-.086**	.258**	-.048**	1										
9. Experienced board	9.000	3.676	5623	-.045**	-.068**	.054**	.333**	-.045**	-.049**	.014	.056**	1									
10. Exploitation	0.066	1.080	19133	.071**	-.260**	.074**	-.097**	-.069**	-.041**	.135**	.051**	-.013	1								
11. Exploration	-0.070	0.757	19133	-.273**	-.330**	.377**	-.186**	-.135**	.155**	.059**	.067**	-.001	-.050**	1							
12. Ambidexterity	-0.045	0.483	19133	-.035**	.291**	-.079**	.116**	.100**	-.015	-.158**	-.084**	.010	-.535**	-.055**	1						
13. Return on invested capital	0.017	0.181	20916	.064**	.391**	-.372**	.218**	.005	.072**	-.025	.015	.074**	-.026**	-.494**	.072**	1					
14. Return on equity	0.021	0.249	20251	.057**	.368**	-.325**	.229**	.069**	.096**	-.034*	.019	.059**	-.019*	-.428**	.056**	.939**	1				
15. Return on assets	-0.002	0.119	19889	.036**	.383**	-.341**	.211**	-.032*	.032*	-.022	-.006	.077**	-.064**	-.481**	.084**	.934**	.882**	1			
16. Net margin	-0.048	0.428	20779	.055**	.337**	-.486**	.184**	.060**	-.003	.009	.000	.087**	-.001	-.519**	-.018*	.779**	.731**	.748**	1		
17. Tobin's Q	1.064	1.180	18568	-.188**	-.134**	.192**	-.075**	-.237**	.021	.055**	.092**	.065**	-.210**	.441**	.008	-.099**	-.063**	-.080**	-.185**	1	
18. Price-earnings ratio	24.621	19.505	9960	.025*	-.122**	.112**	-.100**	-.168**	-.029	.062**	.056**	.026	.016	.155**	-.064**	-.212**	-.239**	-.185**	-.145**	.237**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The literature has documented three methods to resolve the multicollinearity issues: remove the highly correlated predictors, combine the problematic predictors and linear them, or use entirely different analysis such as partial least squares regression or principal components analysis to run the test (Field, 2009). However, neither of the three methods are suitable for this study. First, the focus of this chapter is to identify the role of ambidexterity in firm performance and removing this highly correlated predictor would mean the removal of a key independent variable. Second, the linearising of the two problematic predictors is also not acceptable, because the main purpose of this study is to investigate the relationship of these independent variables with firm performance individually. Third, it has been found that the linear regression is the most suitable analytical test to address the research questions by far.

To my best knowledge, there has not been a study on multicollinearity that offers the most appropriate solution to tackle the current issues. Friedrich (1982) suggests that multicollinearity involving interaction terms could be a negligible issue. Hence, the multicollinearity issue in this study is more likely an unavoidable situation as the exploitation variable is part of the ambidexterity variable. This may explain why VIF of both variables is above 10 or the tolerance statistics is below 0.1. Table 39, 40 and 41 show the result of the linear regressions. The firm performance is the dependent variable. It is measured by six different financial ratios which are return on invested capital, return on equity, return on assets, net margin, Tobin's Q and price-earnings ratio. The analysis results are presented in three tables: Table 39 (models M1, M2, M3, M4, M5 and M6) contains models with larger sample size and two control variables that are industry type and year, while Table 41 (models M13, M14, M15, M16, M17 and M18) represent models that include all control variables but with smaller sample size. Such scenarios occur due to the reduction of sample size (N) when more control variables are included into the analysis. Table 40 (models M7, M8, M9, M10, M11 and M12) holds a middle ground between maximising sample size and achieving a better fit model.

Table 39   **Regression Table for Model M1, M2, M3, M4, M5, M6 (Maximised Sample Size)**

Variable	Dependent variable: ROIC			Dependent variable: ROE			Dependent variable: ROA			DV: Net Margin			DV: Tobin's Q			DV: Price Earnings Ratio		
	Model M1			**Model M2**			**Model M3**			**Model M4**			**Model M5**			**Model M6**		
	Standardised Coefficients			Standardised Coefficients			Standardised Coefficients			Standardised Coefficients			Standardised Coefficients			Standardised Coefficients		
	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig
Constant		5.253	0.000		3.344	0.001		3.972	0.000		-7.673	0.000		49.517	0.000		31.871	0.000
Industry Type																		
Basic Materials	-0.034	-4.383	0.000	-0.024	-2.882	0.004	-0.038	-4.783	0.000	-0.043	-5.746	0.000	-0.007	-0.804	0.421	-0.022	-1.843	0.065
Consumer Goods	0.054	6.656	0.000	0.054	6.272	0.000	0.056	6.630	0.000	0.017	2.156	0.031	0.018	2.148	0.032	-0.051	-3.944	0.000
Consumer Services	0.069	8.288	0.000	0.056	6.310	0.000	0.061	7.140	0.000	0.044	5.412	0.000	0.035	3.949	0.000	-0.012	-0.892	0.372
Financials	-0.035	-4.021	0.000	-0.023	-2.556	0.011	-0.051	-5.727	0.000	-0.014	-1.721	0.085	-0.011	-1.178	0.239	0.071	4.865	0.000
Health Care	-0.043	-4.848	0.000	-0.036	-3.870	0.000	-0.045	-4.964	0.000	-0.067	-7.843	0.000	0.173	18.320	0.000	0.056	4.425	0.000
Industrials																		
NA	-0.003	-0.442	0.658	0.001	0.093	0.926	0.000	0.038	0.970	0.009	1.247	0.212	-0.012	-1.628	0.104			
Oil & Gas	-0.090	-11.50	0.000	-0.091	-10.95	0.000	-0.087	-10.88	0.000	-0.086	-11.43	0.000	0.006	0.753	0.452	-0.007	-0.555	0.579
Technology	0.078	9.061	0.000	0.057	6.288	0.000	0.086	9.722	0.000	0.122	14.75	0.000	0.051	5.605	0.000	0.047	3.501	0.000
Telecommunications	-0.008	-1.051	0.293	-0.003	-0.452	0.651	-0.006	-0.747	0.455	-0.007	-0.941	0.347	-0.023	-3.017	0.003	-0.018	-1.602	0.109
Utilities	-0.036	-4.893	0.000	-0.025	-3.203	0.001	-0.044	-5.827	0.000	-0.031	-4.365	0.000	-0.040	-5.168	0.000	-0.031	-2.655	0.008
Year																		
2010	0.025	2.894	0.004	0.023	2.522	0.012							-0.086	-9.567	0.000			
2011							-0.024	-2.779	0.005	-0.016	-1.939	0.053	-0.077	-8.596	0.000	0.045	3.355	0.001
2012	0.005	0.613	0.540	0.005	0.604	0.546	-0.017	-1.946	0.052	-0.004	-0.481	0.630				0.152	11.342	0.000
2013	0.003	0.328	0.743	0.010	1.145	0.252	-0.020	-2.236	0.025	0.006	0.673	0.501	-0.025	-2.800	0.005	0.137	10.225	0.000
2014																		
Total debt to total assets																		
Firm size																		
Working capital to sales																		
Firm age																		
CEO-Chairman separate																		
Board size																		
Board gender diversity																		
Specific skills																		
Independent board																		
Experienced board																		
Factor																		
Exploitation	-0.03	-3.32	0.00	-0.03	-2.98	0.00	-0.07	-7.76	0.00	-0.06	-7.36	0.00	-0.24	-24.70	0.00	0.01	0.14	0.89
Exploration	-0.52	-62.43	0.00	-0.45	-51.19	0.00	-0.52	-60.39	0.00	-0.55	-68.44	0.00	0.32	35.50	0.00	0.14	8.18	0.00
Ambidexterity	0.01	1.32	0.19	0.00	0.49	0.62	0.00	0.25	0.80	-0.08	-10.18	0.00	-0.11	-10.88	0.00	0.01	0.22	0.83
N	15003			14523			14155			15244			13616			7797		
Model summary: R	0.526			0.455			0.521			0.559			0.516			0.248		
R Square	0.277			0.207			0.271			0.312			0.266			0.062		
Durbin-Watson	1.131			1.162			1.101			1.169			0.769			1.404		
ANOVA: F	358.2			237.2			328.7			431.7			308.4			34.1		
ANOVA: Sig	0.000			0.000			0.000			0.000			0.000			0.000		

Table 40   **Regression Table for M7,M8,M9,M10,M11,M12 (In Between Max Sample & Better Fit Model)**

Variable	Dependent variable: ROIC			Dependent variable: ROE			Dependent variable: ROA			DV: Net Margin			DV: Tobin's Q			DV: Price Earnings Ratio		
	Model M7			Model M8			Model M9			Model M10			Model M11			Model M12		
	Standardised Coefficients			Standardised Coefficients			Standardised Coefficients			Standardised Coefficients			Standardised Coefficients			Standardised Coefficients		
	Beta	T	Sig	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig	Beta	t	Sig
Constant		-4.334	0.000		-8.065	0.000		-8.761	0.000		-8.688	0.000		27.669	0.000		24.586	0.000
Industry Type																		
Basic Materials	-0.053	-6.398	0.000	-0.032	-3.624	0.000	-0.025	-3.187	0.001	-0.037	-4.857	0.000	-0.009	-1.064	0.287	-0.029	-2.293	0.022
Consumer Goods	0.009	1.081	0.279	0.023	2.477	0.013	0.050	6.048	0.000	0.001	0.146	0.884	0.027	2.948	0.003	-0.054	-4.007	0.000
Consumer Services	0.000	0.027	0.979				0.035	4.122	0.000	0.024	3.558	0.000	0.052	5.607	0.000	0.010	0.712	0.477
Financials	-0.027	-2.797	0.005	0.011	1.356	0.175	0.011	1.507	0.132	-0.001	-0.092	0.927	0.023	2.863	0.004	0.043	3.581	0.000
Health Care	-0.048	-4.913	0.000	-0.015	-1.460	0.144	0.008	0.907	0.364	-0.014	-1.597	0.110	0.193	19.10	0.000	0.056	4.208	0.000
Industrials				-0.030	-2.865	0.004												
NA	-0.014	-1.956	0.050	-0.005	-0.705	0.481	0.008	1.092	0.275	0.003	0.384	0.701	-0.002	-0.291	0.771			
Oil & Gas	-0.090	-10.66	0.000	-0.075	-8.273	0.000	-0.059	-7.257	0.000	-0.075	-9.596	0.000	0.004	0.467	0.640	-0.015	-1.110	0.267
Technology	0.030	3.249	0.001	0.022	2.178	0.029	0.076	8.671	0.000	0.114	13.25	0.000	0.043	4.497	0.000	0.039	2.762	0.006
Telecommunications	-0.027	-3.658	0.000	-0.018	-2.363	0.018	-0.007	-0.893	0.372	-0.018	-2.661	0.008	-0.011	-1.403	0.161	-0.008	-0.698	0.485
Utilities	-0.044	-5.870	0.000	-0.023	-2.861	0.004	-0.029	-3.838	0.000	-0.033	-4.764	0.000	-0.028	-3.463	0.001	-0.035	-2.768	0.006
Year																		
2010							0.032	3.664	0.000	0.024	3.107	0.002	-0.010	-1.062	0.288	-0.051	-3.641	0.000
2011	-0.032	-3.831	0.000	-0.032	-3.566	0.000												
2012	-0.030	-3.570	0.000	-0.030	-3.326	0.001	0.005	0.596	0.551	0.007	0.852	0.394	0.086	9.041	0.000	0.124	8.848	0.000
2013	-0.031	-3.638	0.000	-0.024	-2.706	0.007	0.005	0.570	0.568	0.017	2.180	0.029	0.057	6.057	0.000	0.108	7.708	0.000
2014																		
Total debt to total assets	-0.150	-19.92	0.000	-0.169	-20.77	0.000	-0.175	-22.47	0.000	-0.15	-21.79	0.000	-0.128	-15.19	0.000	0.045	3.395	0.001
Firm size	0.202	24.18	0.000	0.229	25.66	0.000	0.177	20.56	0.000	0.15	19.159	0.000	-0.052	-5.44	0.000	-0.137	-10.32	0.000
Working capital to sales	-0.166	-19.99	0.000	-0.134	-15.09	0.000	-0.166	-19.61	0.000	-0.32	-41.52	0.000	-0.005	-0.50	0.617	0.054	3.993	0.000
Firm age																		
CEO-Chairman separate																		
Board size																		
Board gender diversity																		
Specific skills																		
Independent board																		
Experienced board																		
Factors																		
Exploitation	0.02	2.55	0.01	0.02	2.67	0.01	-0.03	-3.35	0.00	-0.01	-0.72	0.47	-0.21	-23.57	0.00	-0.03	-0.99	0.32
Exploration	-0.44	-48.30	0.00	-0.38	-39.63	0.00	-0.45	-49.14	0.00	-0.46	-54.81	0.00	0.27	25.89	0.00	0.12	4.98	0.00
Ambidexterity	-0.01	-1.54	0.12	-0.02	-1.99	0.05	-0.01	-1.49	0.14	-0.08	-11.46	0.00	-0.07	-7.75	0.00	-0.04	-0.91	0.36
N	13437			12987			12655			13669			12159			6813		
Model summary: R	0.601			0.545			0.596			0.666			0.522			0.319		
R Square	0.362			0.297			0.355			0.444			0.272			0.102		
Durbin-Watson	1.198			1.227			1.176			1.275			0.783			1.447		
ANOVA: F	399.9			287.8			366.3			573.6			239.2			42.8		
ANOVA: Sig	0.000			0.000			0.000			0.000			0.000			0.000		

Table 41   Regression Table for M13, M14,M15,M16,M17,M18 (Better Fit Models, Smaller Sample)

Variable	Dependent variable: ROIC Model M13 Standardised Coefficients			Dependent variable: ROE Model M14 Standardised Coefficients			Dependent variable: ROA Model M15 Standardised Coefficients			Net Margin Model M16 Standardised Coefficients			Tobin's Q Model M17 Standardised Coefficients			Price Earnings Ratio Model M18 Standardised Coefficients		
	Beta	t	Sig	Beta	t	Sig	Beta	T	Sig	Beta	T	Sig	Beta	t	Sig	Beta	t	Sig
Constant		0.56	0.57		-1.85	0.07		1.50	0.13		-2.43	0.01		15.25	0.00		13.19	0.00
Industry Type																		
Basic Materials	-0.04	-2.23	0.03	-0.03	-1.25	0.21	-0.03	-1.57	0.12	-0.06	-3.17	0.00	-0.05	-2.73	0.01	-0.03	-1.39	0.16
Consumer Goods	0.09	4.36	0.00	0.09	4.00	0.00	0.12	5.57	0.00	0.07	3.70	0.00	0.08	4.45	0.00	-0.05	-2.21	0.03
Consumer Services	0.04	1.66	0.10	-0.03	-1.27	0.20	0.04	1.62	0.10	0.02	1.11	0.27	0.04	2.27	0.02	0.00	0.20	0.84
Financials	-0.01	-0.75	0.45	-0.01	-0.56	0.58	0.00	0.21	0.83	0.03	1.94	0.05	0.02	1.12	0.26	0.05	2.54	0.01
Health Care	0.05	2.39	0.02	0.01	0.69	0.49	0.10	4.87	0.00	0.13	6.83	0.00	0.10	5.46	0.00	0.00	0.14	0.89
Industrials																		
NA																		
Oil & Gas	-0.10	-4.60	0.00	-0.08	-3.75	0.00	-0.06	-2.91	0.00	-0.05	-2.67	0.01	-0.08	-4.30	0.00	-0.08	-3.59	0.00
Technology	0.04	1.70	0.09	-0.01	-0.36	0.72	0.04	1.66	0.10	0.20	9.59	0.00	-0.01	-0.42	0.68	-0.02	-0.70	0.49
Telecommunications	-0.01	-0.55	0.58	0.00	-0.05	0.96	0.00	-0.15	0.88	0.01	0.74	0.46	-0.02	-1.41	0.16	-0.01	-0.67	0.51
Utilities	-0.07	-3.70	0.00	-0.08	-3.85	0.00	-0.07	-3.44	0.00	-0.03	-1.48	0.14	-0.08	-4.68	0.00	-0.03	-1.28	0.20
Year																		
2010	0.07	3.36	0.00										-0.11	-6.38	0.00	-0.09	-4.05	0.00
2011	0.00	-0.24	0.81	-0.06	-3.04	0.00	-0.07	-3.19	0.00	-0.05	-2.49	0.01	-0.09	-5.25	0.00			
2012	0.00	0.02	0.98	-0.05	-2.30	0.02	-0.06	-2.74	0.01	-0.03	-1.42	0.15				0.12	5.84	0.00
2013				-0.04	-1.87	0.06	-0.05	-2.30	0.02	-0.03	-1.35	0.18	0.00	0.02	0.99	0.09	4.28	0.00
2014																		
Total debt to total assets	-0.16	-8.62	0.00	-0.07	-3.89	0.00	-0.19	-10.30	0.00	-0.13	-7.40	0.00	-0.18	-11.42	0.00	0.06	2.87	0.00
Firm size	0.02	0.81	0.42	0.05	1.86	0.06	0.04	1.47	0.14	-0.01	-0.24	0.81	-0.17	-7.83	0.00	-0.17	-6.91	0.00
Working capital to sales	-0.09	-4.27	0.00	-0.05	-2.56	0.01	-0.06	-2.76	0.01	-0.08	-4.38	0.00	0.01	0.39	0.69	0.09	4.05	0.00
Firm age	-0.01	-0.64	0.52	0.00	0.21	0.83	-0.03	-1.17	0.24	0.00	0.21	0.84	-0.15	-7.96	0.00	-0.11	-5.03	0.00
CEO-Chairman separate	0.01	0.54	0.59	0.02	1.18	0.24	0.02	1.16	0.24	0.02	0.94	0.35	0.07	4.74	0.00	0.02	1.34	0.18
Board size	-0.01	-0.49	0.63	0.04	1.81	0.07	-0.02	-0.77	0.44	0.03	1.53	0.13	-0.05	-2.98	0.00	-0.01	-0.69	0.49
Board gender diversity	0.04	2.30	0.02	0.05	2.66	0.01	0.01	0.67	0.50	0.00	-0.03	0.98	-0.01	-0.45	0.65	-0.01	-0.64	0.52
Specific skills	0.00	0.13	0.90	0.01	0.55	0.58	0.00	-0.01	0.99	0.01	0.50	0.61	-0.02	-1.38	0.17	-0.01	-0.48	0.63
Independent board	0.01	0.74	0.46	0.04	2.25	0.02	0.00	0.12	0.90	0.00	-0.09	0.93	0.07	4.17	0.00	0.03	1.58	0.11
Experienced board	0.07	3.52	0.00	0.04	2.31	0.02	0.08	4.08	0.00	0.06	3.58	0.00	0.07	4.43	0.00	-0.01	-0.51	0.61
Factor																		
Exploitation	-0.80	-11.89	0.00	-0.59	-8.64	0.00	-0.59	-8.00	0.00	-0.73	-11.49	0.00	-0.29	-5.00	0.00	0.12	1.43	0.15
Exploration	-0.59	-15.14	0.00	-0.44	-11.14	0.00	-0.44	-9.94	0.00	-0.82	-22.00	0.00	0.14	4.16	0.00	0.20	3.96	0.00
Ambidexterity	-0.89	-12.57	0.00	-0.64	-9.00	0.00	-0.66	-8.32	0.00	-0.92	-13.77	0.00	-0.26	-4.23	0.00	0.11	1.22	0.22
N	3186			3134			3132			3273			3268			2890		
Model summary: R	0.378			0.318			0.340			0.440			0.557			0.374		
R Square	0.143			0.101			0.115			0.194			0.310			0.140		
Durbin-Watson	1.112			1.180			1.128			1.140			0.729			1.469		
ANOVA: F	21.1			14.0			16.2			31.2			58.2			18.7		
ANOVA: Sig	0.000			0.000			0.000			0.000			0.000			0.000		

Model M1, M2, M3, M4, M5 and M6: Base models

The models from Table 39 have the least number of control variables among the models used in this study. The control variables in all models are the same: industry type and year. However, the models deploy different dependent variables to measure firm performance. The dependent variable for Model M1 is return on invested capital (ROIC), for M2 is return on equity (ROE), for M3 is return on assets (ROA), for M4 is net margin, for M5 is Tobin's Q and for M6 is price-earnings ratio.

In model M1, both exploitation and exploration are negatively correlated to the return on invested capital (ROIC). An increase of one unit of exploitation activity results in a decrease of 0.028 in ROIC ($P<0.01$), while a unit increase of exploration activity leads to 0.523 decrease in ROIC ($p<0.01$). The ambidexterity variable is not significant in this model. Model M1, offers a poor model fit by explaining only 27.70% of the variation in firm performance.

Model M2 shows a similar trend as M1 - both exploitation and exploration variables have negative relationship with firm performance, which is the return on equity (ROE). A unit increase in exploitation brings 0.027 decrease in ROE ($p<0.01$) and a 0.454 decrease when a unit of exploration activity is added ($p<0.01$). The ambidexterity variable is not significant in model M2. Model M2 explains 20.73% of the variation.

For model M3, an increase of one unit of exploitation activity results in a decrease of 0.067 of ROA ($P<0.01$), while a unit increase of exploration activity brings 0.520 decrease of ROA ($p<0.01$). A unit increase of exploitation activity can cause a decrease of 0.060 of ROA. Model M3 has similar trends like model M1 and M2, where the ambidexterity variable is not significant. The model explains 27.1% of the variation in firm performance.

Model M4 measures firm performance with net margin. The model shows a similar trend as models M1, M2 and M3. M4 predicts a unit increase of exploitation activity can cause a

decrease of 0.060 in net margin (P<0.01), while a 0.554 unit (p<0.01) decrease when a unit of exploration is incurred into the firm operation. The model predicts a negative relationship between net margin and ambidexterity, which a unit increase of ambidexterity expenses can cause a decrease of 0.084 unit in net margin (p<0.01). Model M4 explains 31.2% of the variation.

Unlike the previous four models, model M5 with Tobin's Q as dependent variable has a positive relationship with exploration, and a negative relationship with exploitation and ambidexterity variables. A unit increase in exploration expenditure can lead to 0.470 units increase in Tobin's Q (p<0.01). In contrast, a unit increase of exploitation reduces 0.245 units in Tobin's Q (p<0.01), which is the highest by far when compared with the previous four models. The model also predicts that a unit decrease of ambidexterity can improve Tobin's Q by 0.109 units (p<0.01). This model explains 26.6% of the variation in firm performance.

Lastly, model M6 predicts a positive relationship between firm performance and exploration. The model predicts a unit increase in exploration leads to increase of 0.141 units in price-earnings ratio. Both exploitation and ambidexterity variables are not significant in model M6. Model M6 offers a poor model fit, which explains only 6.2% of the variation in firm performance.

Model M7, M8, M9, M10, M11 and M12: In between maximising sample size and achieving better fit model

The models from Table 40 employ five control variables. These are the same in all six models: industry type, year, total debt to total assets, firm size and working capital to sales. However, each model has different dependent variables to measure firm performance. The dependent variable for Model M7 is return on invested capital (ROIC), for M8 is return on equity (ROE),

for M9 is return on assets (ROA), for M10 is net margin, for M11 is Tobin's Q and for M12 is price-earnings ratio.

Model M7 predicts a positive relationship of firm performance with exploitation and negative relationship with exploration. The model predicts a unit increase in exploitation increases 0.02 units (p<0.01) of return on invested capital, while a unit increase in exploration can result in a 0.44 units (p<0.01) decrease in dependent variable. Both exploitation and ambidexterity variables are not significant in model M6. Model M7 offers an improved model fit and explains 36.2% of the variation in ROIC.

Model M8 measures firm performance with the return on equity ratio. The model predicts a unit increase of exploitation activity can improve ROE by 0.02 units (P<0.01). ROE may experience a decrease of 0.38 units (p<0.01), when a unit of exploration is incurred into the firm operation. The model predicts a negative relationship between ROE and ambidexterity, where an increase of ambidexterity can lead to 0.02 units decrease in ROE (p<0.05). Model M8 explains 29.7% of the variation in ROE.

For model M9, a one unit increase in exploitation and exploration results in a decrease of 0.03 and 0.45 in ROA respectively (P<0.01). Model M9 has a similar trend like model M1, M2, M3, M6 and M7, because the ambidexterity variable is not significant to firm performance. The model explains 35.5% of the variation in firm performance.

In model M10, the dependent variable is net margin. This model shows a negative relationship of exploration and ambidexterity with net margin. A unit increase of exploration and ambidexterity can cause a decrease of 0.46 and 0.08 units in net margin respectively (P<0.01). The ambidexterity variable is not significant in this model. Model M10 explains 44.4% of the variation in net margin.

Model M11, whose dependent variable is Tobin's Q, shows a positive relationship with exploration and a negative relationship with exploitation and ambidexterity variables, similar to the base model M5. A unit increase in exploration expenditure predicts an increase of 0.27 units in Tobin's Q ($p<0.01$). In contrast, a unit increase in exploitation and ambidexterity may reduce 0.21 and 0.07 units in Tobin's Q respectively ($p<0.01$). Model 11 explains 27.20% of the variation in firm performance.

Lastly, model M12 has similar findings as the base model, M6. It predicts a positive relationship between price-earnings ratio and exploration and insignificant relationship of the price-earnings ratio with exploitation and ambidexterity. The model predicts a unit increase in exploration can lead to increase of 0.12 units in the price-earnings ratio ($p<0.01$). Model M12 offers a poor model fit, explaining only 10.2% of the variation in firm performance.

Model M13, M14, M15, M16, M17 and M18: A complete model

The models from Table 41 contain all the control variables used in this study. The control variables in all models are the same, while the dependent variables to measure firm performance are different. The dependent variable for Model M13 is return on invested capital (ROIC), for M14 is return on equity (ROE), for M15 is return on assets (ROA), for M16 is net margin, for M17 is Tobin's Q and for M18 is price-earnings ratio.

In model M13, exploitation, exploration and ambidexterity are negatively correlated to return on invested capital (ROIC). An increase of one unit of exploitation, exploration and ambidexterity activity results in a decrease of 0.80, 0.59 and 0.89 units in ROIC respectively ($P<0.01$). Model M13 explains 14.30% of the variation in firm performance.

Model M14 suggests that a unit increase of exploitation, exploration and ambidexterity can decrease ROE by 0.59, 0.44 and 0.64 units respectively ($P<0.01$). Model M14, offers a poor model fit by explaining only 10.10% of the variation in firm performance.

Similar to model M13 and M14, model M15 predicts a unit increase in exploitation, exploration, ambidexterity can cause a decrease of 0.59, 0.44 and 0.66 in ROA respectively (P<0.01). Model M15 offers a poor fit by explaining only 11.15% of the variation in firm performance.

M16 predicts a negative relationship of exploitation, exploration and ambidexterity with net margin. A unit increase of exploitation, exploration and ambidexterity can cause a decrease of 0.73, 0.82 and 0.92 units in net margin, respectively (P<0.01). The model explains 19.4% of the variation in net margin.

Model M17 shows the same finding as M5 and M11, which also employ Tobin's Q as the dependent variable, by predicting a positive relationship with exploration and a negative relationship with exploitation and ambidexterity variables. A unit increase in exploration expenditure predicts to increase 0.14 units in Tobin's Q (p<0.01). In contrast, a unit increase in exploitation and ambidexterity may reduce 0.29 and 0.26 units in Tobin's Q, respectively (p<0.01). The model explains 31% of the variation in firm performance.

Lastly, model M18 predicts a positive relationship between price-earnings ratio and exploration and insignificant relationship of price-earnings ratio with exploitation and ambidexterity, which is the same as the base models M6 and M12. The model predicts a unit increase in exploration can lead to an increase of 0.20 units in price-earnings ratio (p<0.01). The analysis shows that model M12 explains only 14% of the variation in firm performance.

7.8   Discussing the Hypotheses

A summary of the hypotheses is presented in Table 42 and the result is in Table 43. Hypothesis 1 is rejected. Models 8, 10, 11, 13, 14, 15, 16 and 17 are consistent and confirm that the ambidexterity variable has negative relationship with firm performance. The findings suggest that being ambidextrous did not improve firm performance after the crisis.

Hypothesis 2 is supported by 2 models and rejected by 13 models - models 7 and 8 prove that exploitation capabilities had positive influence on firm performance after the crisis, while models 1, 2, 3, 4, 5, 9, 11, 13, 14, 15, 16 and 17 show a negative relationship between exploitation and financial performance.

Hypothesis 3 is supported by 6 models and rejected by 12 models. Models 1, 2, 3, 4, 7, 8, 9, 10, 13, 14, 15 and 16 show that exploration is negatively correlated to firm performance and suggest that investment in exploration activities could reduce firm performance after the crisis, while model 5, 6, 11, 12, 17 and 18 suggest the opposite – exploration could improve financial performance after the crisis.

Table 42   Hypotheses Conclusion

Hypotheses	Conclusion
Hypothesis 1: Ambidexterity has a positive relationship with firm performance after the crisis.	Rejected
Hypothesis 2: Exploitation has a positive relationship with firm performance after the crisis.	Rejected by 12 models; supported by 2 models
Hypothesis 3: Exploration has a positive relationship with firm performance after the crisis.	Rejected by 11 models; supported by 6 models

Table 43   Summary of the Results

Model	M1	M7	M13	M2	M8	M14	M3	M9	M15	M4	M10	M16	M5	M11	M17	M6	M12	M18
DV	ROIC	ROIC	ROIC	ROE	ROE	ROE	ROA	ROA	ROA	NM	NM	NM	TQ	TQ	TQ	P/E	P/E	P/E
Ambidexterity	-	-	N	-	N	N	-	-	N	N	N	N	N	N	N	-	-	-
Exploitation	N	P	N	N	P	N	N	N	N	N	-	N	N	N	N	-	-	-
Exploration	N	N	N	N	N	N	N	N	N	N	N	N	P	P	P	P	P	P

Note:
DV: Dependent variable
ROIC: Return on invested capital
ROE: Return on equity
ROA: Return on assets
NM: Net margin
TQ: Tobin's Q
P/E: Price-earnings ratio
P: Positive
N: Negative relationship
-: Not significant

7.9 Discussion and Conclusion

This chapter aimed at understanding the factors that may influence firms' performance after the crisis by answering the question: *What types of ambidexterity were more likely to promote prosperity after the Global Financial Crisis?* Three important findings emerged from this study.

The findings reveal several interesting discoveries about the influences of organisational ambidexterity on firm performance after the crisis. A review of the sample suggests that ambidexterity is more likely to be tied to negative firm performance. Of the 18 observations, 12 instances suggest an inverse relationship between the two variables. The findings also suggest that exploitation is negatively correlated to firm performance and there are two exceptional models that show a positive relationship - the dependent variables are return on invested capital (ROIC) and return on equity (ROE). Lastly, the findings reveal a negative relationship between exploration and firm performance, which is measured with return on invested capital (ROIC), return on equity (ROE), return on assets (ROA) and net margin, while a positive relationship is documented when firm performance is measured with Tobin's Q and price-earnings ratio.

The findings contradict the existing literature. The dependent variables, used for measuring firm performance, may be key to explaining the discrepancies. This study adopts both accounting-based and market-based measures as dependent variables. Market-based measures, such as price-earnings ratio and Tobin's Q, capture future or long-term performance (Lubatkin and Shrieves, 1986; Allen, 1993; Uotila et al., 2009). Accounting-based measures, such as return on invested capital (ROIC), return on equity (ROE), return on assets (ROA) and net margin, reflect historical and short-term financial performance (Lubatkin and Shrieves, 1986; Allen, 1993; Uotila et al., 2009). Thus, deploying both types of measures enables this study to operationalise both short-term and long-term firm performance and yield empirical results.

Although the findings differ from the existing literature, by applying both accounting-based and market-based measures this paper conducts robust tests and ensures comprehensive results.

In general, ambidexterity is negatively correlated to firm performance according to this study. The more a firm spends on exploitation, exploration and ambidexterity, the less profitable the business is. The investment in improving efficiency and enhancing R&D activities requires diversion of resources from other priorities and inevitably leads to inferior financial performance. However, the positive relationship between exploration and variables linked to long-term performance, like Tobin's Q and the price-earnings ratio (P/E), suggests that the former improves the firm's prospects in the long run. The more capital flows into R&D and marketing activities, the higher the Tobin's Q and P/E values.

Financial performance, which evaluates the fulfilment of economic goals, has gained considerable attention in the literature (Comb et al., 2005; Richard et al., 2009; Barney, 2010; Gentry and Shen, 2010). There has been an ongoing debate about the application of accounting and market-based measures as indicators of firm financial performance (Chakravarthy, 1986; Combs et al., 2005; Richard et al., 2009; Gentry and Shen, 2010). Scholars claim that the simultaneous adoption of both measure types may instigate a conflict, because targeting short-term and long-term financial goals at the same time may not be sustainable (Venkatraman and Ramanujam, 1986). In contrast, there are scholars who propose a positive relationship between the two measures, basing their arguments on the relative predictability of prospects on past financial performance (Jacobsen, 1988; Hoskisson et al., 1994).

Taking ambidexterity into perspective, its negative relationship with accounting-based performance measures in the study suggest that investment in such orientation reduces short-term financial performance. Equally, the injection of capital in exploratory activities improves market-based performance measures (Tobin's Q and P/E), as shown in the data findings, by

banking on the future, long-term performance of an organisation. After all, investment in R&D activities takes years to yield a return. Thus, the split of the dependent variables into accounting-based and market-based explains the contradicting results of this study.

In conclusion, the findings suggest that firms with better performance after the 2008-2009 crisis may have exhibited a low or reduced ambidextrous orientation. The explanation may lie into the persisting elevated uncertainty, which hinders risky investments, or may be a result of extended time for rejuvenation before regaining momentum. However, looking at the beta coefficient values (B value), which measure how strong each predictor variable influences the dependent performance variables, the results appear to suggest a rather weak negative relationship between ambidexterity and firm performance.

7.10   Relevance for Practitioners and the Theory

This paper contributes to the literature by examining how exploitation, exploration and organisational ambidexterity influence firm performance after the financial crisis. The study incorporates firm-level operationalisation of the ambidexterity constructs, allowing the examination of their relationship with post crisis firm performance. A large-scale, longitudinal research design was adopted, which enabled a potent analysis of the effects of strategic choices on firm performance.

This study addresses the literature gaps by examining how the ambidexterity construct might be contingent upon the changes of the external environment. The accounting-based and market-based measures reflect two distinct dimensions of firm performance (Combs et al., 2005). They are related and yet, contradictory. Nevertheless, this study identifies these measures as equivalent indicators of a unidimensional construct of financial performance (Keats, 1988; Comb et al., 2005; Gentry and Shen, 2010). Together, they represent an improved version of a composite measurement to evaluate firm performance. Thus, the measures should be used in

combination by scholars and business practitioners in future management studies as they underpin different corporate strategies and may connect firm performance with different fields of study.

Lastly, the findings in this chapter should be subject to scrutiny. The results show that ambidexterity has negative relationship with firm performance. This overarching conclusion strongly contradicts the existing ambidexterity literature. However, the ambidexterity literature to date has not utilised financial ratios to measure ambidexterity, to the best of my knowledge As a result, there is not existing research that could challenge these findings. They may indeed reflect the reality of ambidexterity: in order to be ambidextrous, firms need to invest substantial resources and focus on the long run. The result further suggests that ambidexterity is not rooted only into exploration and exploitation, but is proving to be a more complicated phenomenon.

7.11   Summary

Previous research has suggested a positive relationship between ambidexterity and firm performance. Simultaneous engagement in exploitation (reinforce existing knowledge) and exploration (develop new areas of expertise) promote long-term success and prosperity. This chapter examines the role of ambidexterity after the Global Financial Crisis to answer the following question: *What types of ambidexterity were more likely to promote prosperity after the Global Financial Crisis?* The findings reveal a negative relationship between ambidexterity and firm performance, challenging the existing literature. The contradiction may be explained by the intrinsic nature of the applied dependent variables, split into accounting-based and market-based measures. Such a view, accompanied by the adoption of a longitudinal study and comprehensive financial data, opens a breadth of opportunities for future research.

CHAPTER 8: Conclusion

This chapter summarises and discusses the main findings of the thesis, the key contributions to the academic literature and practitioners as well as its limitations and identified areas for future research. This thesis aimed at improving the understanding of the role of organisational ambidexterity in crisis survival and firm performance. Using resource-based view theory, it aimed at researching how resource allocation capabilities (organisational ambidexterity) may influence organisational survival and performance, in the context of a turbulent external business environment.

According to the literature, organisational ambidexterity leads to positive firm performance and long-term success, improves efficiency in management and adaptability, allowing firms to cope with changing demand. Certainly, the success of the strategy depends on its implementation, which in turn relies on the abilities of the management team, leadership style, organisation structure, internal coordination, resource availability and so on. In addition, literature reveals that being overly exploitative and overly explorative has negative implications on long-term success. Overall, organisational ambidexterity is beneficial for firm performance, but the implementation and balancing the exploitation and exploration constructs remain challenging. Some gaps remain regarding the influence of organisational ambidexterity on firm performance during and after environmental jolts. Moreover, most of the existing studies used questionnaire survey design to operationalise the concept, which limit the development of the concept as it is challenging to compare the findings and replicate similar tests to different contexts. Therefore, further knowledge on these aspects would deepen our theoretical understanding and practical application of the concept, which is valuable for both academics and practitioners.

8.0 Summary and Discussion of Key Findings

The three empirical studies yielded important findings with respectable value for the ambidexterity literature and corporate world. Data shows that Corporate America experienced a crisis in 2008-2009, which serves as a good research setting for this study to understand the effects of ambidexterity on the likelihood of firm survival and longevity.

8.0.1 Did actually Corporate America experience a crisis in 2008 and 2009?

While there is substantial evidence that the United States (U.S) was impacted by the Global Financial Crisis, this study found that its effects differed across industries.

1. There was a decrease in merger and acquisition (M&A) activities during the recession. Following the existing literature, the opposite finding should have been documented. Literature shows that environmental jolts might be a push factor for M&A, because they redraw and reduce industry barriers (Meyer et al., 1991; Wan and Yiu, 2009). During turmoil, ambitious firms may be tempted to get involved in acquiring substantially deflated assets (Pangarkar and Lie, 2004). Scholars propose that M&A during an environmental jolt can reduce the chance of overpayment and acquired firms are easier to push through restructuring. Viewed in this light, firms can reap benefits by seizing new opportunities through M&A during crisis (Chattopadhyay et al., 2001; Wan and Yiu, 2009). The findings clearly contradict the existing studies. The uncertain business environment hindered firms from taking risky decisions. Hence, M&A appears to be an unfavourable corporate strategy during the crisis, as it may involve high risk and unpredictable return.

2. The total bankruptcy volume doubled during the crisis, which reinforces the view that a crisis indeed occurred in Corporate America. This finding is backed by the bankruptcy theory, which suggests that bankruptcy is usually seen by firms as a measure employable in conditions of address financial distress, decreasing profitability, increasing market

competition and increasing level of accumulating debt (Bergström et al., 2005). All these are consequences of the recession.

3. The financial industry tops the list with the highest number of delisted companies, while the oil and gas industry has the highest mortality rate in percentage terms. The former supports the findings in the existing literature that the financial sector bore a large negative impact from the crisis, while the latter signifies that a ranking of the most impacted sectors may not be straightforward. In fact, in percentage terms the top three most impacted industries include also health care in second place and basic materials in third, with financials ranked in the bottom quartile. The reason for the relatively low percentage is self-explanatory: the financial industry had the highest number of listed companies in the sample for this study and in Corporate America immediately prior to the crisis, respectively. It is worth pointing out that in hindsight the effectiveness of the government crisis policies might have been weakened by their limited attention on the non-financial sectors of the U.S. economy.

4. Accordingly, Corporate America experienced a crisis in 2008 and 2009. The judgement is based on the increase of total bankruptcy and a high turnover in 2008 and 2009.

8.0.2   Why and how did some firms survive the Crisis, while others did not?

The literature confirms that ambidexterity is valuable in promoting firm performance in highly dynamic environments. Firm performance and the probability of survival are two distinct outcomes with complex relationship (Gimeno et al., 1997). Performance may not guarantee survival, while survival may not guarantee performance (Paeleman and Vanacker, 2015). This study creates a bridge by suggesting ideal ways to manage firm resources through the lens of ambidexterity. The research into the implications of ambidexterity on firm survival provides an essential extension to the existing survival and ambidexterity literature.

1. Organisational ambidexterity has a positive relationship with firm survival. Firms that constantly exploit and explore their resources develop the capability to identify and evaluate new opportunities over time. Drawing on existing capabilities, ambidexterity promotes the development of skills to combine and utilise various resources in a meaningful way.

2. Exploitative activities, which are integral to improving firm efficiency and accumulating resources, appear to improve the probability of survival, compared with firms that overly explore their resources. Although there is an element of truth in this line of argument, it only tells one side of the story since it ignores the fact that exploration is subject to fundamental uncertainty and unknown returns. There is nothing wrong with being highly explorative, but firms must ensure that they have sufficient funds to cover the expenses and the potential losses that might be incurred from the exploration activities.

3. In conclusion, ambidexterity and exploitation are positively related to organisational survival, while exploration has inverse relationship with crisis survival.

8.0.3 What types of ambidexterity were more likely to promote prosperity after the Crisis?

The literature suggests a positive relationship between ambidexterity and firm performance (He and Wong, 2004; Sidhu et al., 2004; Jansen et al., 2006; Cao et al., 2009). Simultaneous engagement in exploitation (reinforcing existing knowledge) and exploration (developing new areas of expertise) promote long-term success and prosperity. This study examines the role of ambidexterity on firm performance after the Global Financial Crisis.

1. Empirical evidence shows that ambidexterity and exploitation have a negative relationship with financial performance (return on invested capital (ROIC), return on equity (ROE), return on assets (ROA), net margin, Tobin's Q and price-earnings ratio).

Similarly, exploration has a negative relationship with financial performance, except Tobin's Q and price-earnings ratio. The findings contradict the existing literature (He and Wong, 2004; Sidhu et al., 2004; Jansen et al., 2006; Cao et al., 2009).

2. The nature of the dependent variables used to measure firm performance explain the contradictions. This study adopts both accounting-based and market-based financial performance measures as dependent variables. Market-based financial performance measures, such as price-earning's ratio and Tobin's Q, capture long-term prospects, while accounting-based measures, such as return on invested capital (ROIC), return on equity (ROE), return on assets (ROA) and net margin, reflect historical performance. Although the result differs from the existing literature, the findings from accounting-based and market-based measures provide robust tests and consistent results.

3. The result suggests the more a firm spends on exploitation, exploration and ambidexterity, the less profitable the business is. For instance, a decrease in financial performance occurs when the firm engages in exploitation activities, because it diverts its resources to implement these activities.

4. The positive relationship of Tobin's Q and price-earnings ratio (P/E) with exploration suggests that when more capital is invested in exploration activities, such as R&D and marketing, the long-term financial prospects improve.

5. Empirical findings suggest firms that survived the 2008-2009 crisis and thrived after it may have reduced their magnitude of ambidexterity post crisis. They may have adapted to the high uncertainty effectively and embraced the hindrances to risky investments by taking their time to rejuvenate and regain the momentum.

6. The beta coefficient values (B value), which measure how strong each predictor variable influence the dependent performance variables, suggest a rather weak negative relationship between ambidexterity and firm performance. Ambidexterity is negatively

correlated to firm performance, but its effects are not strong based on the beta coefficient values.

8.1 Contributions to the Academic Literature

A key contribution to the literature is the use of financial ratios to operationalise ambidexterity and identify the influence of ambidexterity on firm survival and performance. This longitudinal study allows an in-depth observation about survival trends through the lens of ambidexterity.

Previous studies on ambidexterity have focused on performance (Gibson and Birkinshaw, 2005; Bierly and Daly, 2007; Cao et al., 2009; Burton et al., 2012), sales growth (He and Wong, 2004; Auh and Menguc, 2005; Han and Celly, 2008), innovation (Katila and Ahuja, 2002; Burgers et al., 2009; Tushman et al., 2010) and firm survival (Mitchell and Singh, 1993; Hill and Birkinshaw, 2010; Kaupila, 2010; Laplume and Dass, 2012; Yu and Khessina, 2012). These studies apply either questionnaire survey (Gibson and Birkinshaw, 2004; He and Wang, 2004; Voss and Voss, 2013; Tan and Liu, 2014; Wang and Rafiq, 2014), interview (Wei et al., 2013) or case study designs (Boumgarden et al., 2012). Besides, there are only a few studies that use longitudinal data to examine the effects of ambidexterity over time (Uotila et al., 2008; Caspin-Wagner et al., 2012; Geerts et al., 2012; Goosen et al., 2012). To the best of my knowledge, this is the first longitudinal study that measures the ambidexterity construct with financial ratios by using secondary data, which is arguably an important step in providing a clearer picture about the concept. Moreover, operationalising the ambidexterity construct with financial ratios enables future development of the concept as the findings are comparable and replicable to various contexts.

This study has generated important knowledge on crisis survival. Most ambidexterity research suggests that being ambidextrous can improve the probability of crisis survival as well as performance. However, the findings are debatable as not all firms have the resources and

capability to be ambidextrous. This study contributes to the literature by providing an empirical verification of the influence of exploitation, exploration and ambidexterity on firm survival, utilising the 2008-2009 Global Financial Crisis as a natural setting. The result shows a positive correlation of exploitation and ambidexterity with the likelihood of crisis survival, while a negative relationship between exploration and crisis survival. To the best of my knowledge, there is no study to date that has identified exploration as a negative component in firm survival.

Finally, this study contributes to the literature by empirically testing the role of ambidexterity on post crisis performance. The result shows the differences between accounting-based and market-based performance measures. Exploitation, exploration and ambidexterity are found to have negative implications on firm performance. The findings contradict the existing literature, which suggests a positive relationship between the ambidexterity constructs and firm prosperity. However, this study is the only one that operationalises ambidexterity with financial ratios and the result may have portrayed the truth of ambidexterity. Nevertheless, being ambidextrous does require resources to realise, which may create negative implications for the firm financial performance.

8.2   Contributions to Practitioners

This thesis makes an important contribution for practitioners. It shares valuable evidence on the influence of ambidexterity on firm survival and performance that can be useful for practitioners who encounter similar situations. The evidence that higher ambidexterity increases the likelihood of firm survival reflects the importance of incorporating both learnings into an organisation. The ability to strike a delicate balance between exploiting existing capabilities and exploring new opportunities is crucial for organisational sustainability. The result confirms the existing literature and at the same time, strengthens the argument by using statistical methods with robust findings. Thus, it increases the validity and potency of such strategy.

Next, the empirical evidence of the positive relationship between exploitation and crisis survival suggests that firms should be constantly focused on efficiency, control, certainty and variance reduction for long-term survival. In contrast, a negative relationship between exploration and firm endurance suggests that exploration activities require careful planning. Exploration activities should be conducted along with exploitation activities in order to ensure the firm generates sufficient resources to support both daily operations and future viability.

Finally, the negative relationship between ambidexterity activities and financial firm performance, revealed in the empirical evidence, reflect the reality of most business strategies – they require sizeable upfront investment, which might cost the financial performance of firms. For practitioners, aiming to improve performance via ambidexterity, it is crucial to identify the breakeven point so that they realise the benefits. Moreover, the findings suggest that this strategy requires efforts and appropriate planning to deliver concrete outcomes on the commitments made.

8.3   Limitations and Future Research

The choice of dependent performance variables (Chapter 7) is a strength of this study, because it offers a wide set of accounting-based and market-based financial performance measures to investigate the role of ambidexterity on firm performance. Therefore, it makes an important contribution to the strategic literature. However, the statistical analysis contains a limitation. The measure of firm performance incorporates a one-year lagged effect, which assumes that investment in the initial year will be realised one year later (for instance, firm performance (ROA) in 2010 is represented by ROA in 2011). However, there are studies that suggest an investment in R&D takes a minimum of four years to capitalise on (Huselid et al., 1997; Stuart, 2000; Collins and Clark, 2003; Chandler et al., 2013; Patel and Chrisman, 2014; Shin and Konrad, 2014; Berry, 2015). Therefore, it would be interesting to develop a similar study with longer research timeframe to capture the trend of post-crisis firm performance.

In addition, the descriptive summary of the existing literature presents questionnaire survey methods as most commonly used in ambidexterity studies, but there is not a single widely accepted list of variables to measure ambidexterity. This thesis promotes the use of financial ratios to operationalise the ambidexterity construct and apply statistical methods to analyse the relationship between ambidexterity and crisis survival as well as firm performance. It is important to highlight that while every effort has been made to select independent variables aligned with the exploitation and exploration concepts, there is not a widely agreed set of variables to operationalise the two constructs. The choice is based on a solid theoretical ground, as well as data availability. For instance, this study lacks data to measure export expenditure and M&A activities, which can be used to operationalise exploration. Hence, it would be interesting for future studies to replicate these tests with different set of financial ratios.

Next, the empirical evidence shows that the crisis survival concept is operationalised through quantitative approaches such as structured questionnaire survey (Nadkarni and Herrmann, 2010; Naidoo, 2010; Lekmat and Chellah, 2011; Lee et al., 2012; Armstrong, 2013; Zagelmeyer and Heckmann, 2013; Makkonen et al., 2014), structured observation (Pajunen, 2006; Pangarkar, 2007; Bradley et al., 2011a; Bock et al., 2012; McKinley et al., 2014; Sun and Cui, 2014), financial data analysis (Chung et al., 2008; Lee and Makhija, 2009; Lim et al., 2009; Wan and Yiu, 2009; Nadkarni and Herrmann, 2010; Bradley et al., 2011b; Dowell et al., 2011; Garcia-Appendini and Montoriol-Garriga, 2013; Maier et al., 2013; Arslan-Ayaydin et al., 2014) and interview (Naidoo, 2010; Lekmat and Chellah, 2011; Patel et al., 2014). However, there are only a few studies (Nadkarni and Herrmann, 2010; Dowell et al., 2011) that applied a mixed method. Future research may consider using a mixed method research to triangulate findings, offset the weaknesses of quantitative and qualitative research applied individually and draw on the strength of both to achieve greater validity.

Besides, most of the crisis survival studies only focus on a single country. Future research may consider comparative research design and replicate similar research in multiple country settings. According to Hofstede (1993), the diversity in management practice around the world has caused the need for "comparative management". Based on Hofstede's cultural dimension theory, it is convincing that the role of CEOs, management boards and stakeholders might be different in various country settings due to dissimilarities in management style, culture and legislation (Kogut and Singh, 1988). It is worthwhile to investigate the crisis survival concept from this aspect to avoid overgeneralisation of the research findings from any study. However, comparative research design has to be carefully conducted as culture differences may lead to misinterpretation (delivered from research tools and research findings). Most importantly, not every study is replicable.

Finally, the research sample covers large listed firms, which does not represent the full spectrum of U.S. firms. Therefore, it will be beneficial to research the role of ambidexterity in smaller firms, because they may encounter more significant issues with resource constraints and have more limited strategy choices.

8.4 Concluding Remarks

This thesis contributes to understanding how ambidexterity impacts the likelihood of firm survival and performance during crisis and post-crisis periods. Using the resource-based view theory, this thesis serves as a platform for appreciating the extent of the resource availability role in promoting firm survival and prosperity.

The empirical studies demonstrate that firm performance and the probability of survival are two distinct outcomes with complex relationship (Gimeno et al., 1997). Performance may not guarantee survival, while survival may not guarantee performance (Paeleman and Vanacker, 2015). This study creates a bridge by suggesting ideal ways to manage firm resources through

the lens of ambidexterity. The research into the implications of ambidexterity on firm survival provides an essential extension to the existing survival, firm performance and ambidexterity literature.

In conclusion, this thesis confirms that survival and performance are not purely dependent on luck or the possession of slack resources. The latter, often associated with better performance, may in fact be a principal source of threat to firm survival if not utilised properly. Hence, the ability to exploit and explore resources is extremely valuable for long-term survival. The strategic choices of firms are often driven by their intrinsic characteristics, so each firm is bound to develop distinctive capabilities to cope with the changing business environment and thus, improve their survival prospects during environmental turbulence in idiosyncratic ways (Esteve-Pérez and Mañez-Castillejo, 2008).

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