

CONFIGURATIONS OF DURABILITY CAPABILITIES AND  
THEIR PERFORMANCE IMPLICATIONS DURING AN ECONOMIC SHOCK:  
AN EXPLORATORY STUDY ON NEW VENTURES

By

PAUL SANCHEZ RUIZ

Bachelor of Law  
Escuela Libre de Derecho de Puebla  
Puebla, Mexico  
2007

Master of Business Administration  
Universidad TecMilenio del Sistema Tecnológico de Monterrey  
Puebla, Mexico  
2012

Master of Science in Entrepreneurship  
Oklahoma State University  
Stillwater, Oklahoma  
2014

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Dissertation Approved:

Matthew Rutherford, Ph.D.

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Dissertation Adviser

Curt Moore, Ph.D.

---

Matthew Bowler, Ph.D.

---

Matthew Mazzei, Ph.D.

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Abstract: Organizational resilience (OR) has long been understood as an organizing framework of firm functioning during economic adversity. OR is central to strategic entrepreneurship research because new ventures emerge and exist in an increasingly complex economic environment, where there are unexpected events that threaten firm survival and performance. Recently, entrepreneurship researchers have developed an integrative framework that is focused around key themes of OR, including capabilities for durability—i.e., the capacity of a firm to combine resources that facilitate organizing and managing in the face of major disturbances.

However, no work to date has addressed durability capabilities in an empirical manner. This dissertation addresses this gap in three ways. First, this study empirically derives configurations of durability capabilities. Second, this study analyzes the ontological nature of such configurations of durability capabilities. Third, this study explores the performance implications of the resulting configurations during an economic recession.

By addressing these gaps, this study improves upon the existing literature in three ways. First, by using a longitudinal and larger sample size than previously used. Second, by using the configuration approach. Third, by studying the context of the great economic recession (2008 – 2010). Using a rigorous exploratory technique (configuration approach), this study examined the configurations of durability capabilities on 2,500 new ventures in the medium and high-tech sectors.

To this end, this study shows the importance of the configuration approach when studying durability capabilities in new ventures. The results of this study support the notion that specific configurations are associated with greater probability of firm survival and higher levels of firm performance during the economic recession. The causal inference of this important organizational phenomenon remains to be studied. Research implications and a future research agenda are also discussed.

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CHAPTER I  
INTRODUCTION

**Overview**

New ventures inevitably face threats in their external economic environment. Declines in survival rates and firm performance during a major economic recession (*e.g.*, Chen & Miller, 2010; Mascarenhas & Aaker, 1989; Pearce & Michael, 1997, 2006) demonstrate the complex interplay between environment and firm strategy. Strategic entrepreneurship research addresses problems new ventures encounter in their attempt to survive and thrive during environmental adversity.

One of the most celebrated debates in this literature has been the relative importance of strategy versus environment effects on firm survival and performance (*e.g.*, Aldrich & Martinez, 2001; Romanelli, 1989; Thompson, 1967; Venkataraman & Van de Ven, 1998). Specifically, this debate remains critical as recent calls (Josefy, Harrison, Sirmon, & Carnes, 2017) have emerged that are principally concerned with *how* various strategic actions, *together*, impact firm survival and performance during economic adversity. Understanding configurations of strategic actions are important because they may help to explore the ‘optimal’ path to success when the environment shifts. However, researchers have yet to establish the process by which new ventures configure various strategic actions while accounting for variations in firm survival and performance during economic adversity.

To address this gap, the present dissertation draws on the organizational resilience framework (Sutcliffe & Vogus, 2003) advanced in the entrepreneurship domain (Williams & Shepherd, 2016) and the configuration approach (Cardinal, Sitkin, & Long, 2010; Meyer, Tsui, & Hinings, 1993; Miller, 1996). In so doing, this study identifies and examines configurations of ‘durability capabilities’ (Williams, Gruber, Sutcliffe, Shepherd, & Zhao, 2017). The configurations of durability capabilities will be done via taxonomic analysis (Miller, 1996). Durability capabilities are based on a firm’s resource base and are a source of temporal advantages during adversity. Additionally, this study explores the extent to which each of the resulting configurations of durability capabilities relates to firm survival and performance during economic hardship. The following section begins with the empirical background of this study.

### **Study Rationale and Outline**

Understanding why some new ventures survive and even thrive during a major economic recession<sup>1</sup> has attracted increasing attention within the strategic entrepreneurship literature in recent years (Bradley, Aldrich, Shepherd, & Wiklund, 2011; Cowling, Liu, Ledger, & Zhang, 2015; De Carolis, Yang, Deeds, & Nelling, 2009; Lai, Saridakis, Blackburn, & Johnstone, 2016; Pal, Torstensson, & Mattila, 2014). In part, this is because the recent recurrence of economic recessions<sup>2</sup>—specifically the great recession (2008 –2010)—pose a major threat to the survival

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<sup>1</sup> In this dissertation, the global economic recession (2008 – 2010) represents an environmental jolt that refers to a “transient perturbation whose occurrence is difficult to foresee and whose impact on organizations are disruptive and potentially inimical” (Meyer, 1982, *p.* 515). Thus, as an essential clarifying statement, an economic recession and environmental shock are considered interchangeable terms throughout the dissertation.

<sup>2</sup> For example, the United States has experienced 11 recessions since 1980, the most recent between 2008 and 2010 (*e.g.*, Chakrabarti, 2015; Bamiatzi, Bozos, Cavusgil, & Hult, 2016). During the crisis of 2008 – 2010, as Butter (2012: 127) points out, the general environment of mutual trust quickly transformed to one of mutual distrust, leading to severe credit deficits and illiquidity. The result was a sharp increase in transaction costs with a contemporaneous decline in firm resources (Latham & Braun, 2008, Pearce & Michael, 1997). Such shortage of resources quickly led to declines in productivity and competitiveness, job and wage cuts, reduced efficiency, lower

and financial performance of new ventures (Latham & Braun, 2008; Pearce & Michael, 1997, 2006).<sup>3</sup> Indeed, recent empirical research shows that the average period for which new ventures can survive significantly decrease during a “tough<sup>4</sup>” economic recession (Bradley *et al.*, 2011). In response to these challenges, researchers (*e.g.*, Williams *et al.*, 2017; Williams & Shepherd, 2016) have been highly attentive to the process through which new ventures can survive and thrive during economic adversity.

The organizational resilience framework (OR hereafter) provides significant insights into why some new ventures can survive and even thrive in the face of economic adversity (Van Der Vegt, Essens, Wahlström, & George, 2015). Following early studies by Sutcliffe and Vogus (2003) and others (Meyer, 1982; Wildavsky, 1988), recent work (*e.g.*, Williams *et al.*, 2017) suggests that it is a firm’s *durability capabilities*—built on its resource base (Penrose, 1959; Teece, Pisano, & Shuen, 1997)—that are most critical to shaping its ability to survive and thrive in the face of challenging exogenous conditions. The argument is that durability capabilities facilitate and shape resource configuration, creating a source of temporal competitive advantage during turbulent times. While durability capabilities research is a fertile ground in producing insights on strategic responses and adaptation when the environment shifts, it is theoretically incomplete in two ways.

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profit margins and in several cases default. The above are all evidence that a global crisis, such as the 2008-2010 financial recession can have severe effects on new ventures.

<sup>3</sup> Pearce and Michael (2006) suggest that an average of 500,000 new ventures have failed during each of the economic shocks that have occurred in the U.S. However, during the past economic recession (2008 – 2010), more than one million of new ventures closed operations (*U.S. Census*, 2014)

<sup>4</sup> Although an economic recession presents sudden and unexpected opportunities (*e.g.*, Chakrabarti, 2015), in this dissertation the focus on an economic shock is more in line with in a negative light.

First, previous studies fail to account for *how* firms configure resources to produce durability capabilities that facilitate firm survival and performance during an economic recession. Creating temporal competitive advantages are highly desirable (Penrose, 1959), however, there are countless ways in which a firm can configure resources and thus there are various paths to revitalization (Teece, 2007). Second, while much of the work on durability capabilities has focused on their ‘bright side’ (Sutcliffe & Vogus, 2003; Van Der Vegt *et al.*, 2015), they may also present a ‘dark side’ (Williams *et al.*, 2017). For example, durability capabilities buffer the firm against performance shortfalls during an economic shock, which can give rise to ‘positive illusions that nothing went wrong here.’ However, firms may also fail to pay attention to signals (Weick, 1988) indicating the need to take action (Shepherd, 2003) to improve firm performance during adversity (Weick & Sutcliffe, 2015; Whiteman & Cooper, 2011). A strong dependence on a firm’s dominant logic (durability capabilities) may increase a firm’s vulnerability via maladaptive firm behavior (Hall, 1976; Merton, 1967) that can result in strategic simplicity (Miller, 1990, 1993; Miller, Lant, Milliken, & Kom, 1996), strategic myopia (Ansoff, 1987; Lorsch, 1986), and strategic rigidity (Barr, Stimpert, & Huff, 1992; Dutton & Jackson, 1987; Staw, Sandelands, & Dutton, 1981)—ultimately, threatening both firm survival and performance. To that end, a closer examination of how<sup>5</sup> durability capabilities configure and their performance implications for new ventures during an economic recession is needed in the strategic entrepreneurship literature.

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<sup>5</sup> The difference between why and how it is critical for a good theory (Whetten, 1989). On the one hand, the ‘why’ provides the basis for judging the reasonableness of the proposed causal relationships (i.e., explains). On the other hand, the ‘how’ adds order to the conceptualizations of causal relationships by delineating patterns (i.e., describes).

This dissertation contributes to the growing work on durability capabilities advanced in the entrepreneurship domain (*e.g.*, Williams et al., 2017) by demonstrating the potential of the configuration approach (*e.g.*, Cardinal et al., 2010; Meyer et al., 1993) to shed light on the way firms configure durability capabilities. This is important because there are virtually endless ways to combine a firm's resource base because of their multifaceted nature (Ketchen *et al.*, 1997; Miles & Snow, 1978; Miller, 1986; Payne, 2006); it is possible that some configurations might be more relevant than others to new ventures during an economic recession. Therefore, this study also examines how the empirically derived configurations of durability capabilities are associated with firm survival and performance during an economic recession. Take all together, understanding configurations of durability capabilities will provide a better theoretical explanation of *how* new ventures can survive and even thrive during an economic recession.

The following section begins with an overview of the OR literature, as it provides the framework for understanding the variables and relationships of interest. Specifically, this study relies on durability capabilities given the ability of this particular construct to highlight the unique resources and competencies that facilitate adjustment to adversity. Last, core research gaps are identified, and then following specific research questions are addressed.

## **Theoretical Background**

### **Organizational Resilience Literature**

Organizational resilience (OR) broadly refers to the process of maintaining positive adjustment under challenging conditions (Sutcliffe & Vogus, 2003). In organization theory, resilience (or often resiliency) has been used to refer to (1) a capacity of organizations (Lengnick-Hall &

Wolff, 1999; Lengnick-Hall & Beck, 2005) to absorb and preserve (and even improve) functioning despite the presence of adversity both internal adversity (Staw *et al.*, 1981)—such as rapid change, financial performance and production pressures—and external adversity (Meyer, 1982)—such as environmental jolts, increasing competition, and demands from stakeholders; or (2) an ability to recover, bounce back (a return to the status quo, where the organization left off) (Lengnick-Hall, Beck, & Lengnick-Hall, 2011), and exploit current challenges to emerge stronger and more resourceful (Sutcliffe & Vogus, 2003); or (3) as the “process by which an organization builds and uses its durability capabilities to interact with the environment in a way that positively adjusts and maintains functioning prior to, during, and following adversity” (Williams *et al.*, 2017, *p.* 742). The focus here is on the process of organizational resilience.

The early notion of resilience comes to mind using a metaphor from materials science—as a kind of “super material” or capacity to absorb strain and still maintain its shape (Sutcliffe & Vogus, 2003). For example, Meyer (1982) studied how hospitals adapted to an unexpected doctors’ strike and used the term resiliency (*p.* 520) to refer to an organization's ability to absorb a discrete environmental jolt and restore prior order. Wildavsky’s (1988) view is similar: resilience is the “capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back” (*p.* 77). In contrast to the view of resilience as “super material,” the view of resilience as “development” or ability for adaptability, positive functioning, or competence following adversity is thought to add both to the current strength of the firm and also to the future strength of the firm (Sutcliffe & Vogus, 2003).



A developmental perspective on resilience means that prior experience (e.g., history of adaptation) shapes later decisions and behaviors (adaptation), such that the way in which the firm interprets and responds to adversity depends on the latent endowments (capabilities and resources) that can be activated, combined, and recombined in new situations as challenges arise (Sutcliffe & Vogus, 2003; Weick, Sutcliffe, & Obstfeld, 1999). Indeed, a firm not only survives and thrives by positively adjusting to current adversity, but also, in the process of responding, strengthens its capabilities to make future adjustments (Wildavsky, 1988).

The literatures that speak most directly to understanding OR as a developmental process are those that examine organizational learning and adaptation (Carroll, 1998; Christianson, Farkas, Sutcliffe, & Weick, 2009; Levinthal & March, 1981, 1993; March, Sproull, & Tamuz, 1991; McGrath, 1999; Sitkin, 1992), strategic change capabilities (Capron & Mitchell, 2009; Eisenhardt & Martin, 2000; Huy, 2001; Teece et al., 1997; Thornhill & Amit, 2003), and high reliability organizing (e.g., Bierly & Spender, 1995; Bigley & Roberts, 2001; Roberts, 1990; Weick, Sutcliffe, & Obstfeld, 2008). OR, therefore, is anchored in (a) organizational processes aimed at enhancing a firm's overall ability to *learn* and to *learn from* mistakes; (b) *capabilities* to *rearrange* resources or transfer knowledge to deal with situations as they arise; and (c) restore and develop *efficacy* through enhancing *capabilities* to quickly process *feedback*. Following that logic, this study is driven by the strategic change capability focus on organizational resilience.

OR thus results from enhancing particular capabilities (such as durability) that facilitate access to and manipulation of a firm's resources (Eisenhardt & Martin, 2000; Sutcliffe & Vogus, 2003; Teece et al., 1997). Combining and recombining resources through capabilities enlarge the size

of the action repertoire and organizational competence (Weick, 1998). Capabilities thus improve the “firm’s ability to size up and act in the face of unexpected threats before they escalate out of control” (Weick *et al.*, 1997, *p.* 117). With an extended range of organizational activities, the improvement in a firm’s capabilities shape its ability “to investigate, to learn, and to act without knowing in advance what one will be called to act upon” is the ultimate form of organizational resilience” (Wildavsky, 1988, *p.* 70).

Accordingly, resiliency is dependent upon the firm’s specific capabilities that facilitate durability. When considering the link between OR and capabilities, Williams *et al.* (2017) introduced the *ad hoc* organizational-level notion of “durability capabilities.” Durability capabilities have long referred to the combinations of resources and competencies that organizations possess before adversity and that shape their ability for positive adjustment during hardship (Sutcliffe & Vogus, 2003). These studies conclude that organizations are more likely to create resiliency if enabling conditions are present (*e.g.*, capabilities and resources), as they represent the two main building blocks that create a capacity for resilience. In other words, durability capabilities allow a firm to build, configure, reconfigure, and deploy resources into bundles in order to shape their ability to successfully adapt to environmental challenges (Adner & Helfat, 2003). Therefore, durability capabilities are the essence of the process of resilience (Williams *et al.*, 2017). A graphical representation of the organizational resilience framework, at the broadest level, is provided in Figure 1. This framework highlights the relationships between resilience development (that creates durability capabilities) and performance, as adapted from Williams *et al.* (2017) and Sutcliffe and Vogus (2003).

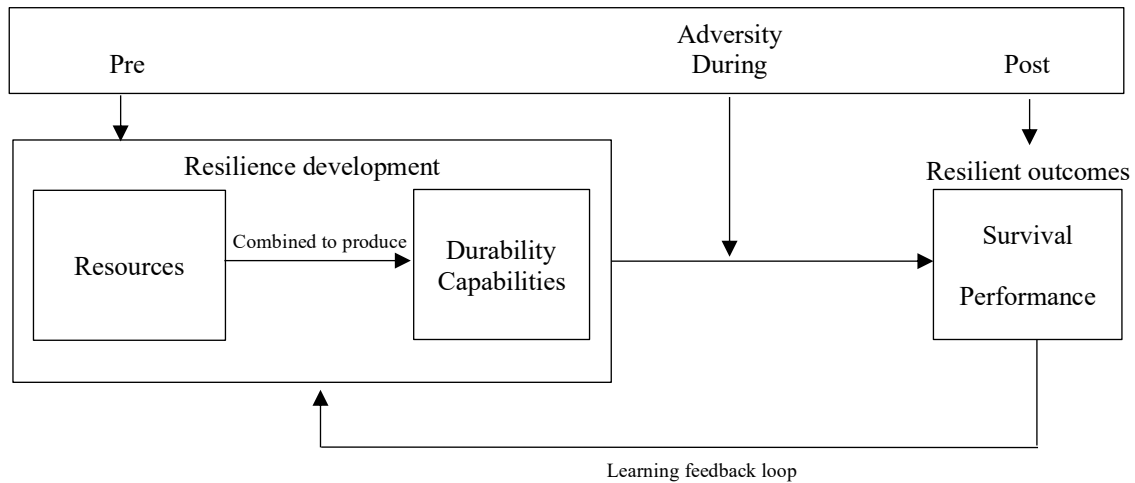


Figure 1. Organizational resilience process framework. Based on Williams *et al.* (2017) and Sutcliffe and Vogus (2003).

In summary, the present study employs the OR framework and a central construct from that framework—durability capabilities—for three main reasons. First, OR offers insight into the relationships among the firm and the external environment that both impact firm performance (Sutcliffe & Vogus, 2003; Van Der Vegt *et al.*, 2015). Second, OR provides insights about the ability of a new venture to anticipate, adapt, and respond to sudden disruptions in their external economic environmental (*e.g.*, Williams & Shepherd, 2016). Third, durability capabilities play a central role in the understanding of new venture survival and performance during a recession (Williams *et al.*, 2017).

Therefore, after a review of the OR literature, this study finds theoretical support to suggest that the construct of durability capabilities is a relevant determinant of a new venture survival and performance during environmental adversity (*e.g.*, Sutcliffe & Vogus, 2003; Williams &

Shepherd, 2016; Williams *et al.*, 2017). Because of that, the construct of durability capabilities may provide a better understanding of new venture survival and performance during a major economic recession. Thus, before examining the relationship between durability capabilities and performance outcomes, the durability capabilities construct is examined in more detail in the following section, and specific research gaps are then presented.

### **Durability Capabilities**

Grounded in the strategic change capabilities-based perspective (Teece *et al.*, 1997), “capabilities for durability” involve a comprehensive set of strategic actions involving the structure and bundle of a firm’s resource base that may develop into temporal competitive advantages during disruptive and unexpected environmental challenges (Sutcliffe & Vogus, 2003; Williams *et al.*, 2017). Thus, a firm’s capabilities for durability are likely to influence positive adjustment and development during environmental challenges (Eisenhardt & Martin, 2000; Gruber, Heinemann, Brettel, & Hungeling, 2010).

Williams *et al.* (2017, p. 742) defined durability capabilities “as the resources actors possess before adversity that shapes their capacity for positive adjustment.” They insightfully identify the four resources underpinning durability capabilities of a new venture: financial capital, entrepreneurial capital, human resources, and external social relations (*e.g.*, Lengnick-Hall & Beck, 2005; Sutcliffe & Vogus, 2003). (1) Financial slack helps a firm to appropriately accumulate excess financial and material resources in anticipation of the need to withstand adversity (*e.g.*, Bradley *et al.*, 2011; Virany, Tushman, & Romanelli, 1992). For example, financial slack facilitates adjustment in the face of strains imposed by adversity (Bourgeois,

1981; Bromiley, 1991; Iyer & Miller, 2008; Singh, 1986). (2) Entrepreneurial capital represents the skills, knowledge and aspirations of the strategic decision maker that shape decisions in the face of economic adversity (Becker, 1993; Castanias & Helfat, 2001; Lengnick-Hall *et al.*, 2011). (3) Human resources refer to the policies in place to try to insure employee commitment and motivation (Batt, 2002). Examples include employee stock options, health care, maternity leave, bonus systems, and the like. (Lai *et al.*, 2016). (4) External social relations refer to the extent to which entrepreneurs utilize external social connections to access needed resources to withstand a recession (Adler & Kwon, 2002). Entrepreneurs' external network ties help acquire essential resources and provide them with critical information for decision making (Geletkanycz & Hambrick, 1997) in the face of adversity (*e.g.*, Shepherd & Williams, 2014).

The above mechanisms highlight the notion that the mere possession of a resource does not necessarily confer an advantage; resources need to be used or they may be detrimental to performance under adversity (Wildavsky, 1988). Consequently, the central assumptions of the construct of durability capabilities are a) recombination of various resources; b) deployment of resources into specialized bundles that facilitate specific functions; and c) temporary performance advantages (Sutcliffe & Vogus, 2003; Williams *et al.*, 2017). In other words, configurations of a firm's resources result in durability capabilities, which allow firms to remain in-sync with changes in their external environment.

Based on the above discussion, durability capabilities appear to be a carefully defined construct with a specific theoretical base and mechanisms purported to generate temporal advantages during adversity. Therefore, this work employs organizational resilience as a framework to

establish the origins and to provide theoretical coherence to the construct of durability capabilities. Though compelling, essential areas and critical relationships in the framework remain in need of investigation. Therefore, research gaps in the durability capabilities literature are described in more detail in the following section.

### **Research Gaps in Durability Capabilities**

After a review of the extant OR literature (with a more in-depth discussion in the next chapter), it is clear that at least two main omissions are present; specifically, concerning durability capabilities.

*To the first concern involving configurations of resources that result in durability capabilities.*

As noted, durability capabilities are purposely built on a firm's resources and then deployed in bundles to produce temporal advantages during environmental changes (Williams *et al.*, 2017).

What is less clear is the precise manner in which various resources are combined to create durability capabilities. Indeed, a recent review (Linnenluecke, 2015) indicates that a closer examination of the creation of durability capabilities is needed given that extant OR literature offers limited insights regarding the configuration of resources and their implications on firm performance. Therefore, understanding configurations of resources is important to strategic entrepreneurship research because they are a likely source of competitive advantage for a firm. Additionally, looking at static resources and in isolation, may mislead problem recognition and interpretations—which can have serious implications for firm performance during different economic times (Nason & Wiklund, 2018). Thus, given that configurations can indicate complementary and integrative mechanisms within a firm (Black & Boal, 1994), specific

configurations of resources might have important normative implications for firms (Blair & Payne, 2000). Consequently, configurations of resources are valuable for new ventures for generating durability capabilities during an economic shock.

*To the second, and related, concern involving performance implications of durability capabilities.* Although theoretical contributions of durability capabilities have long been recognized in the OR literature (Lengnick-Hall & Beck, 2005; Lengnick-Hall & Wolff, 1999; Sutcliffe & Vogus, 2003; Van Der Vegt *et al.*, 2015; Williams *et al.*, 2017), recent reviews on OR have noted that there is scant empirical evidence that can be leveraged to support the relationships between durability capabilities and performance outcomes during economic adversity (Annarelli & Nonino, 2016; Bhamra, Dani, & Burnard, 2011; Linnenluecke, 2015; Van Der Vegt *et al.*, 2015). Thus, clear associations between (configurations) durability capabilities and performance outcomes are warranted.

In summary, two primary areas of focus are examined in this study: (1) durability capabilities which reflect configurations of resources; and (2) associations between diverse configurations of durability capabilities with performance outcomes during an economic recession. A graphical representation of these relationships is provided in Figure 2. In subsequent lines, specific research questions are offered.

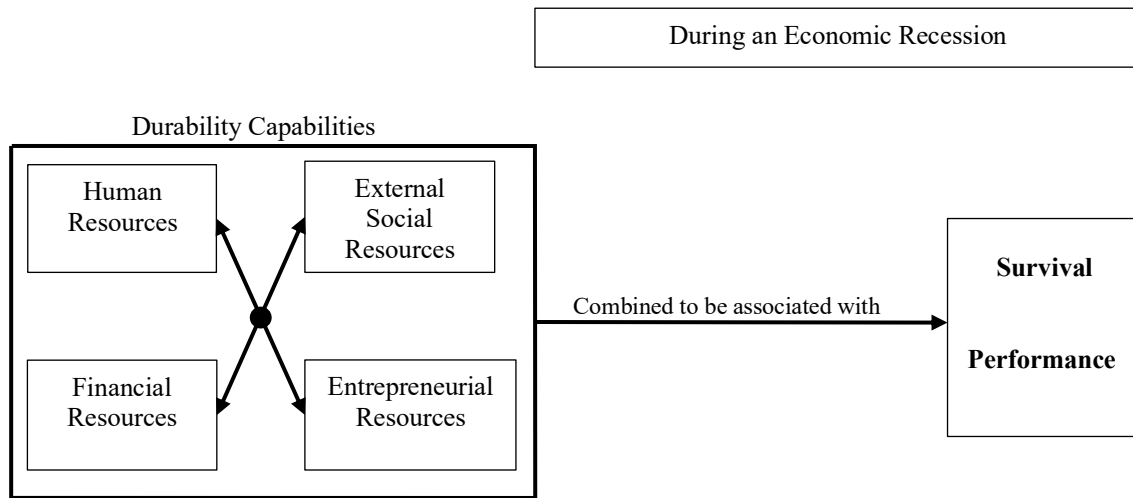


Figure 2. Construct-level graphical research model.

### Statement of Purpose

In light of the ongoing theoretical debate over whether firm or environment are most important for the continuation of a new venture, this dissertation addresses the calls from Josefy *et al.* (2017) and Williams *et al.* (2017). This dissertation focuses on configurations of durability capabilities (based on a firm's resource base) and explores their performance implications on new ventures during the global economic recession (2008 – 2010). Therefore, the purpose of this study is to marry the durability capabilities construct with the configuration approach. With that logic, this study contributes to answering the question of how new ventures can survive and thrive during an economic recession. The following section discusses the research questions that will be investigated.



## **Problem Statement**

The issue of *how* some new ventures can survive and even thrive during an economic recession is the broad problem that is to be addressed in this dissertation. The problem is not new, for it has been the focus of much research (Pearce & Michael, 1997, 2006). However, following Williams *et al.*'s (2017) and others (Williams & Shepherd, 2016) arguments for researching the role of OR on survival and firm performance during a major environmental shock, this study places specific focus on durability capabilities (*ad hoc* organizing effort of the OR framework). Also, this study draws on Meyer *et al.* (1993) and others (*e.g.*, Meyer, Gaba, & Colwell, 2005; Miles & Snow, 1978; Miller, 1987, 1996) to investigate configurational patterns of durability capabilities across the landscape of new ventures. While a preexisting framework concerning durability capabilities is utilized in the present study (Williams *et al.*, 2017), the multiple configurations of durability capabilities and their performance implications have not been examined in any given study—at the time of developing this dissertation.

Thus, the broad research question and the configuration approach to specific durability capabilities in this particular study are new and should, at a minimum, encourage others to break from traditional methodologies to look into new issues and develop new ideas concerning this critical topic of firm, environment, and performance.

## **Research Questions**

The following broad research question will be investigated in this dissertation:

*Who made it through the great economic recession of 2008 – 2010?*

A series of specific research questions regarding configurations of durability capabilities and their relationship to performance during an economic shock are given below. These research questions are closely tied to the previous argument.

- (1) Are there identifiable configurations of new ventures based upon type and level of durability capabilities?
- (2) What is the ontological nature of these configurations of durability capabilities?
- (3) Are these configurations of durability capabilities differentially related to new venture survival and performance during an economic recession?

Related to the first research question, assuming that configurations of durability capabilities appear through empirical induction, the second research question seeks to determine the ontological nature of these configurations of durability capabilities. In other words, the second research question seeks to inform about the way that durability capabilities are organized in a non-linear and non-overlapping set of clusters; and that these categories are fundamentally and significantly different from one another. This research question looks at different clusters of new ventures based on configurations of durability capabilities. Each configuration then isolates different common features, both regarding the type of resources and the level (i.e., their varying degrees such as high or low below the mean). These common features will serve as a yardstick for measuring the adequacy of different proposed ontological categories of durability capabilities. In that way, resources belonging to the same ontological category are then grouped into few, more general clusters of new ventures. Based on this notion, the present study offers two positions. On the one hand, this study explores a taxonomy of new ventures based on durability capabilities. On the other hand, this study serves as a basis for examining the relative

association between a taxonomy and its implications to firm outcomes in accounting for boundary conditions.

Relatedly, and again assuming that a meaningful classification or taxonomy thereof does exist, the third question seeks to determine the associations between configurations of durability capabilities and new venture survival and financial performance during an economic recession. If performance differences exist during the shock period effect, it might be argued that equifinality exists in relationship to new venture survival and performance for any given cluster (*e.g.*, Gresov & Drazin, 1997; Doty, Glick & Huber, 1993). Such performance differences will serve as evidence supporting the proposition that durability capabilities are an actual and factual theoretical approach to understand new venture survival and performance in the face of an economic shock. Indeed, proponents of the durability capabilities approach have argued that a study of configurations of resources is critical in understanding how new ventures survive and even thrive in the face of hardship (Sutcliffe & Vogus, 2003; Williams *et al.*, 2017).

In an effort to examine these questions, it is noted that the recent economic recession (2008 – 2010) is used as an environmental context, one which has been shown to disrupt negatively firm performance and can ultimately lead to the failure of new ventures (*e.g.*, Bradley *et al.*, 2011; Davidsson & Gordon, 2015; Lai *et al.*, 2016; Latham, 2009; Pal *et al.*, 2014; Pearce & Michael, 2006; Powell & Baker, 2014; Smallbone *et al.*, 2012).

## Contributions of the Study

This study makes several contributions to the fields of entrepreneurship and strategic management.

### **To the field of entrepreneurship:**

First, this study informs new venture survival theory (Sine & David, 2003; Singh & Lumsden, 1990; Venkataraman & Van de Ven, 1998) by introducing durability capabilities and by offering a taxonomy of durability capabilities for studying new venture survival and performance in the context of a major economic shock. Durability capabilities offer theoretical underpinnings for the need of understanding how to survive and thrive a “tough” economic shock (Bradley et al., 2011). Durability capabilities suggest that it is a configuration of a firm’s resource base that allow to sustain and even achieve performance advantages when in the face of disruptive environmental shocks. Specifically, research looking at the role of configurations and durability capabilities on new venture survival and performance is absent in current new venture survival literature (*see, Josefy et al., 2017*).

Second, this study informs theories of strategy (*e.g.*, Hitt, Ireland, Camp, & Sexton, 2001) and competitive advantage (*e.g.*, Alvarez & Busenitz, 2001) in the extant entrepreneurship literature by stressing the theory construction of configurations of durability capabilities—as value-extending strategic actions—that develop temporal competitive advantages (Penrose, 1959) under a major economic shock. In that way, this study seeks a more comprehensive and more accurate depiction of “organizational reality” by positing normative implications of empirical findings (Dess, Newport, & Rasheed, 1993) to support that durability capabilities play a vital

role in a new venture performance. This effort enhances the validity of configurations in strategic entrepreneurship research by demonstrating how taxonomies of durability capabilities can be used to remain competitive at different economic conditions.

Third, this study adds to entrepreneurship research concerned with configurational approaches (e.g., DeTienne, McKelvie, & Chandler, 2015; Khelil, 2016; Korunka, Frank, Lueger, & Mugler, 2003; Wiklund & Shepherd, 2005) by suggesting that multiple and interrelated predictors, together, determine new ventures performance outcomes. Moreover, relatedly, this study argues that the configuration approach could advance entrepreneurship research in general by explicitly taking into account interdependencies between multiples contextual domains while coupling with strategic actions.

**To the field of strategic management:**

First, this study attends recent calls (Linnenluecke, 2015; Van Der Vegt *et al.*, 2015) to investigate the resilience-performance link empirically. Although theory surrounding resilience has proliferated in recent years (*for recent reviews see*, Annarelli & Nonino, 2015; Bhamra *et al.*, 2011; Linnenluecke, 2015), Van Der Vegt *et al.* (2015) indicate that the theoretical contributions of resilience are far ahead of related empirical studies. Such lack of empiricism has slowed development of OR in strategic research (Sutcliffe & Vogus, 2003), given the limited competitive and strategic advantages it might offer (Lampel, Bhalla, & Jha, 2014; Sheffi & Rice, 2005). Thus, by testing the role of durability capabilities on firm performance is likely to inform strategic management researchers concern with the resilience-performance link.

Second, this study adds to recent contentions that there are limited insights regarding the configurations of durability capabilities that may influence performance during adversity (Linnenluecke, 2015). The OR literature has thus far proven resistant to observation and measurement (Van Der Vegt *et al.*, 2015). As a consequence, there is scant empirical evidence that can be leveraged to support or refute the various conceptualizations of organizational resilience: its antecedents or its associated outcomes (Kantur & Iseri-Say, 2012). Indeed, Boin and van Eeten (2013, *p.* 430) state “[i]n fact, we do not really know what causes resilience or how it is achieved.” To advance research in OR, the present study provides an understanding of the underlying mechanisms that facilitate the creation of durability capabilities in new ventures during an environmental shock. Such an approach could be leveraged in larger, more mature firms.

**To practitioners:**

This study also makes several practical implications for entrepreneurs and practitioners. The popular press has shown interest in resilient organizations that survive and thrive an economic *recession* (Gulati, Nohria, & Wohlgezogen, 2010; Seville, 2016). The interest relies on the ability of firms to continue operations despite the challenges thrown up by a major economic shock, whose effects have been proven to be detrimental for new ventures. The results of this study offer a toolkit for surviving and thriving an economic shock. Table 1 summarizes chapter one of this dissertation.

This study expects to identify types of new ventures based on durability capabilities, confirming the belief that not all new ventures are the same when it comes to internal firm attributes (Miller,

1993). Understanding the type and level of durability capabilities will help entrepreneurs and leaders to accentuate the positive outcomes associated with particularistic durability capabilities while working to strategically mitigate the associated negative implications to achieve the desired firm outcomes during a recession.

### **Research Limitations**

Notwithstanding the contributions this study will make, the limitations of the investigation exist and should be considered. First, the generalizability of the results should be considered.

Although numerous studies have examined resilience-related phenomena in different contexts (e.g., Bradley *et al.*, 2011; De Carolis *et al.*, 2009; Lai *et al.*, 2016; Latham, 2009; Pal *et al.*, 2014; Smallbone *et al.*, 2012), the results of this study should be interpreted in the context in which they were examined (*i.e.*, in the United States economy). Future researchers are encouraged to replicate and extend the current study to determine whether similar results replicate in other economies and industries where durability capabilities may play a different role.

Table 1. Summary of Chapter 1.

Statement of Purpose	Problem Statement	Research Questions	Rationale	Contributions
1. The purpose of this study is to marry the durability capabilities construct through the configuration approach.	How did new ventures survive and thrive during the past great economic recession (2008 – 2010)?	<p>1. Are there identifiable configurations of new ventures based upon type and level of durability capabilities?</p> <p>2. What is the ontological nature of these configurations of durability capabilities?</p> <p>3. Are these configurations of durability capabilities differentially related to new venture survival and performance during an economic recession?</p>	<p>To derive configurations of durability capabilities through empirical induction.</p> <p>To support configurations of durability capabilities as a factual approach to understand new venture survival and performance.</p> <p>To determine the role of an economic shock on the relationship between configurations of durability capabilities and survival and performance.</p>	<p><u>Strategic entrepreneurship:</u></p> <ul style="list-style-type: none"> <li>- To answer recent calls in new venture survival theory.</li> <li>- To inform new venture strategy and competitive advantage theories.</li> <li>- To add to research concerned with the configuration approach.</li> <li>- To advance entrepreneurship research by considering interdependencies between multiples contextual domains while coupling with strategic actions.</li> </ul> <p><u>Strategic Management:</u></p> <ul style="list-style-type: none"> <li>- To attend recent calls to investigate the resilience-performance link empirically.</li> <li>- To add insights regarding the “optimal” configurations of durability capabilities.</li> </ul> <p><u>Practical knowledge:</u></p> <ul style="list-style-type: none"> <li>- To provide a toolkit for surviving and thriving an economic shock.</li> </ul>



Also related to the issue of generalizability, is the type of firms surveyed. Although all efforts were made to obtain a representative cross-sample of firms during an economic shock, based on data availability, this study draws from the Kauffman Firm Surveys (KFS). This annual survey follows a panel of 4,928 privately held firms that were established in 2004. The survey results are available for the baseline start-up year (2004) and eight follow-up years (2005–2012). The KFS represents the largest and the most comprehensive database on U.S. new ventures that happen to experience the most recent economic recession, suggesting that without going back in time, this sample of new ventures represent an ideal sample for this study. Thus, the type of firms surveyed should be considered when attempting to generalize the findings of this study beyond the context surveyed. Larger and mature firms may have varying manifestations of durability capabilities phenomena; thus, broad generalizations of findings are cautioned.

Other limitations in this study have to do with time and longitudinal analysis. This study suggests that durability capabilities drive survival and performance under adversity, and the measurement of durability capabilities in this sample cohort of firms temporally precedes survival and performance. However, temporal precedence is only one way to establish causality, and some might argue that survival is what enables a firm to enact useful durability capabilities. This line of argument assumes that survival leads firms to acquire resources that they can use to create and develop useful durability capabilities. Also, this study notes that this question of causality as it relates to survival is a complicated issue to address empirically because non-survival means new ventures leave a sample, meaning that one cannot examine data over multiple periods to test the direction of causality. Besides, this study analyses the effects of durability capabilities at different firm developmental stages (startup), assuming that all new ventures were in the same

stage at approximately the same time; which is an imprecision common to research on life cycle effects in entrepreneurship (Phelps, Adams, & Bessant, 2007). The difficulty of longitudinal analysis and causal direction both for survival and performance for durability capabilities warrants future research and innovative research designs that can tease out these complexities.

Another limitation is that the present research considers a limited scope of resources that create durability capabilities and does not consider issues such as the multilevel process of durability capabilities as a whole. Future research could investigate a multilevel framework outlining the antecedents and consequences of the individual, workgroup, and organizational endowments that may create durability capabilities. For example, adopting a multilevel capability perspective would reveal a range of insights that have been overlooked in this study. In particular, the processes that contribute to the emergence of durability capabilities can emerge at the individual and collective levels, which may differ at the individual, group, and organizational levels. Also, the antecedents and consequences of durability capabilities are likely to differ at the three levels of analysis.

Last, while the scope of this research is specific to examining durability capabilities related phenomena, it is likely that other constructs influence the proposed model. Therefore, the current model is likely underspecified. Much research has been conducted on external influences on the durability capabilities construct. For example, Fosfuri and Tribo (2008) propose that activation triggers (i.e., actions that propel a firm to engage) act as an antecedent to a firm's capacity. Additionally, regimes of appropriability and power relationships are yet other constructs that have been proposed to influence the capabilities of the firm (Cohen & Levinthal,

1990; Todorova & Durisin, 2007). Thus, future researchers are encouraged to extend the conceptual model used in this study to determine the influence of the construct mentioned above and others to develop a more comprehensive model.

### **Presentation Format**

This dissertation is presented in five chapters. Following this first chapter, which introduces the study and research questions, the second chapter begins with a review of the OR literature to provide a knowledge framework to draw the link between variables of interest. Accordingly, the construct of durability capabilities is introduced with the purpose of establishing a theoretical basis for examining its various dimensions. The chapter follows with a selective review of configurational approaches with the purpose to suggest that taxonomies are the appropriate conduits to extend current theory on the way various durability capabilities interrelate. The chapter concludes with setting the ground for supporting the development of an empirically derived taxonomy of durability capabilities.

In Chapter III, the research design and methodology used in the study are discussed. The operationalization of the variables is presented followed by a discussion of the sample of firms used for the study, which are selected from the economic context in the United States. Then, the measures used in the study are detailed. The data about the sample for the main study is presented.

In Chapter IV consists of the results from the study. The development of a taxonomy of durability capabilities is presented. This section highlights the resulting clusters of new ventures

based on configurations of durability capabilities. More specifically, the taxonomy considers the varying types and degrees of durability capabilities that may contribute to performance outcomes during an economic shock. The fourth section links configurations of durability capabilities to performance outcomes during an economic shock. More specifically, this section ties each of the configurations of durability capabilities (clusters) to expected performance outcomes during an economic shock.

Chapter V. The final chapter contains a discussion of the findings. Specifically, implications for researchers are offered, and implications for entrepreneurs are provided to translate the practical benefits garnered from this investigation. Future research recommendations, limitations, and a conclusion of overall findings are also presented.

## CHAPTER II

### LITERATURE REVIEW

#### **Overview**

This chapter begins with a review of the theoretical framework used in this study —*i.e.*, organizational resilience (OR). Next, an introduction to organizational capabilities is offered in order to situate the durability capabilities construct, and a discussion of its types is then presented. Finally, this chapter provides the theoretical foundation to support an empirically derived taxonomy of durability capabilities.

#### **Scope of the Study**

In this section, this study organizes and explains the OR literature by demarcating “waves” of development. Based upon the identified relevant studies, this study groups the literature into four separate waves of development (*e.g.*, Wave 1 = 1980 – circa 1989; Wave 2 = 1990 – circa 1999; Wave 3 = 2000 – circa 2009; and Wave 4 = 2010 up to 2018). This study employed the following approach to identify the relevant literature. First, to ensure that the body of research to be included in our review was sufficiently broad, deep, and rigorous, this study followed established procedures of conducting systematic reviews (*e.g.*, Grégoire, Corbett, & McMullen, 2011; Shepherd, Williams, & Patzelt, 2015). Given the study’s broad interest in environmental adversity, it was surveyed relevant articles published not only in top tier management, entrepreneurship, and public policy journals, but also in crisis and risk management journals.

Moreover, this study snowballed (tracked the references and citations) of one seminal article (Sutcliffe & Vogus, 2003). In the end, this study had one inclusion criteria that narrowed the field of studies. The article had to: 1) deal with resilience in the context of organizations/firms/or new ventures. Table 2 provides a selective summary of the key OR literature reviewed in this chapter.

Table 2: Summary of Key Work in Organizational Resilience Literature

Wave	Author (Year)	Contributions
1	Holling (1973)	Uses ecological theory and systems theory to propose that ecological systems be defined according to properties of stability and resilience; prompted shift in focus away from seeking equilibrium system states and toward persistence of relationships found in the system.
	Staw, Sandelands, and Dutton (1981)	Examines the threat rigidity response of firms facing adverse circumstances; found that organizations centralize control and constrain information processing when their vital interests are threatened.
	Meyer (1982)	Investigates how organizational adaptation to exogenous shock contributes to resiliency and retention; proposes that organizational response to threat stems from the interplay between organizational characteristics and the nature of threat.
2	Sitkin (1992)	Juxtaposes the benefits of failure with the liabilities of success and proposes that failure encourages experimentation, increases variation in organizational responses, and is essential to learning.
	Weick (1993)	Proposes four organizational characteristics (i.e., improvisation and bricolage, virtual role systems, respectful interaction, attitude of wisdom) that are critical to preventing organizational collapse amid crisis situations.
	Weick, Sutcliffe, and Obstfeld (1997)	Presents an emergent framework that arises out of a focus on failure rather than success and reliability rather than efficiency; the focus encourages collective mindfulness and makes it possible for the organization to remain reliable while adapting to circumstances.

Table 2 (continued): Summary of Key Work in Organizational Resilience Literature

Wave	Author (Year)	Major Findings/Contributions
	Horn and Orr (1998)	Resilience is the fundamental quality to respond productively to significant change that disrupts the expected pattern of event without introducing an extended period of regressive behavior.
3	Rudolph and Reppenning (2002)	Distinguishes between organizational crises borne of novel events for which the focal organization has no appropriate response and those brought about by an overwhelming quantity of mundane events; demonstrates that non-novel events can overwhelm an otherwise resilient organizational system.
	Staber and Sydow (2002)	Introduces the concept of adaptive capacity which refers to a firm's ability to continuously develop and apply new knowledge in ways that are sustainable and difficult to imitate by competitors.
	Kendra and Wachtendorf (2003)	Provides empirical support for the importance of experience, preparation, training, and flexibility for resilience amid crisis; suggests that both the crisis and its context are instrumental in crisis resolution.
	Sutcliffe and Vogus (2003)	Introduces the developmental resilience perspective wherein organizational resilience is developed via repeatedly addressing challenges over time; define resilience as enabling positive adjustment.
	Hamel and Valikangas (2003)	Resilience refers to the capacity to continuous reconstruction.
	Lengnick-Hall and Beck (2005)	Proposes that organizations cope with environmental instability by creating new opportunities and develop new capabilities; introduces concepts of robust transformation and resilience capacity.

Table 2 (continued): Summary of Key Work in Organizational Resilience Literature

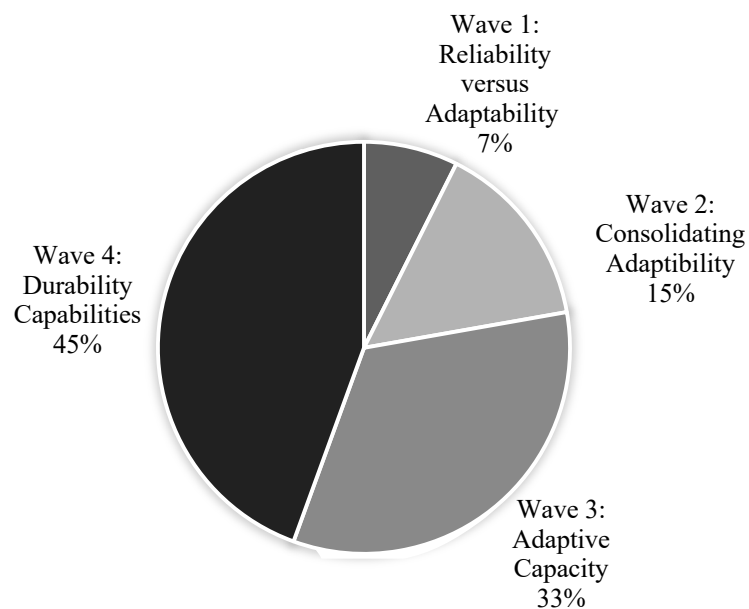
Wave	Author (Year)	Major Findings/Contributions
	Gittell, Cameron, Lim, and Rivas (2006)	One of the earliest studies to leverage archival firm-level data; results suggest that relational reserves, financial reserves, and business model viability are important for post-crisis recovery.
	Vogus and Sutcliffe (2007)	Attempts to develop a theory of organizational resilience. Additionally, explores the extent to which resilience depends on past learning, provides a basis for future learning, but is distinct from the process of learning per se as resilience represents a broader store of capabilities.
4	Lengnick-Hall, Beck, and Lengnick-Hall (2011)	An organization's capacity for resilience is developed through strategically managing human resources to create competencies among core employees.
	Carmeli and Markman (2011)	Analyzes the Republic of Rome's establishment period to develop a strategy-tactic framework incorporating the overarching strategies of capture and governance.
	Ouedraogo and Boyer (2012)	Finds that financial, management, and strategic governance are important elements for resilience.
	Linnenluecke, Griffiths, and Winn (2012)	This paper proposes a comprehensive conceptual framework of organizational adaptation and resilience to extreme weather events for addressing the effects of ecological discontinuities in organizational research and strategic decision-making.
	Kantur and Iseri-Say (2012)	This study proposes an integrative framework for organizational resilience and introduces a new outcome concept of organizational evolvability, emphasizing the heightened sensitivity and increased wisdom of the post-event organization.
	Boin and van Eeten (2013)	Introduces concepts of precursor resilience and recovery resilience.
	Limnios, Mazzarol, Ghadouani, and Schilizzi (2014)	Presents a framework of organizational resilience that explicitly distinguishes between organizational characteristics and environmental characteristics; allows for the dual manifestation of persistence.



Table 2 (continued): Summary of Key Work in Organizational Resilience Literature

Wave	Author (Year)	Major Findings/Contributions
	Ortiz-de-Mandojana and Bansal (2015)	Examines the relationship between sustainable business practices and organizational resilience; organizations employing sustainable practices experience less volatility and stronger recovery.
	Van Der Vegt, Essens, Wahlström, and George (2015)	To study the factors that determine resilience, it may be necessary to measure the relevant characteristics and capabilities of organizations. It is then possible to determine which characteristics and capabilities of (parts of) the system contribute to the ability of the system to achieve its goals.
	Linnenluecke (2015)	This study shows that resilience has been conceptualized differently across studies, meaning that the different research streams have developed their own definitions, theories and understandings of resilience. In addition, prior work has few insights into the empirics.
	Williams and Shepherd (2016)	This study finds that understanding the role of emergent organizations in responding to suffering and building resilience is an important component of the grand challenge of how to effectively respond to disasters.
	Williams, Gruber, Sutcliffe, Shepherd, and Zhao (2017)	This study develops an integrative framework that is focused around key themes of both crisis and resilience, including durability capabilities, organizing and adjusting, responding to major disturbances, and a feedback loop from these experiences.
	Kahn, Barton, Fisher, Heaphy, Reid, and Rouse (2017)	This study develops a theoretical model that maps how the differentiated emergence of strain in focal parts of an organization triggers the movements of adjoining parts to provide or withhold resources necessary for focal parts to adapt effectively.
	Barton and Kahn (2018)	This study applies a relational lens to better understand how adversity, and the anxiety it triggers in people, affects processes of organizational resilience. This conceptual frame enables to begin uncovering the relational micro-dynamics underlying the absorption of strain.

Figure 3 displays the percentage of articles in OR literature concerning each of the Waves. For example, of the 27 articles reviewed in this study, 45 percent are located in Wave four, which serves as an indicator that in recent years researchers have become more interested in the topic; suggests an increasing interest among management and entrepreneurship researchers and supports the relevance and necessity of using the OR framework to explain the link between the firm and the external environment.



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*Figure 3.* Organizational Resilience Articles by Four Waves (1982 – 2018).

Figure 4 contains visual results of the citation base analysis—by following the advice of Busenitz *et al.* (2003) and Rutherford, Pollack, Mazzei, and Sanchez-Ruiz (2017). The results show that there has been an increasing use—and now dominance—of seminal articles within the OR literature. This study reports descriptive statistics about the frequency of citations that organizational resilience articles received from 1982 through 2018. The number of citations

received provides a rough measure of how important an article is in the entrepreneurship and management literature.

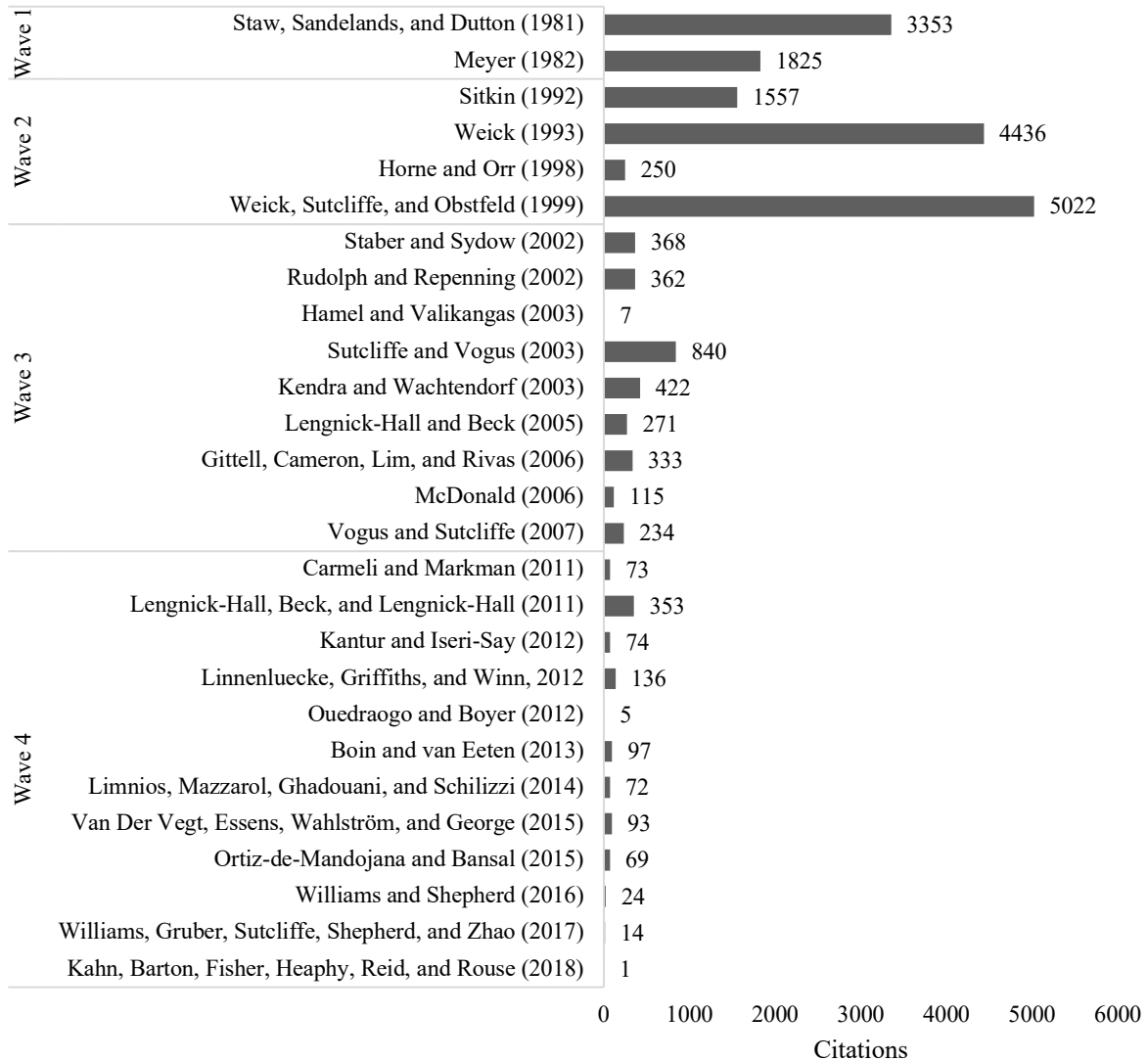


Figure 4. Citation Analysis of Organizational Resilience Scholars by Four Waves (1982 – 2018).

In sum, this chapter offers a review of the OR literature to establish a theoretical foundation for the present dissertation. The next section offers a discussion on durability capabilities with the primary objective of highlighting its dimensions. An investigation into the interrelated internal

dimensions of durability capabilities is conducted by using the configuration approach. The following discussion begins with an overview of the OR framework.

## **Organizational Resilience Literature**

### **Background and Context: A Brief History of the Organizational Resilience Literature**

At its origins, resilience stemmed from *resilire* and *resilio*, which in Latin mean ‘bounce’ or ‘jump back’ (Alexander, 2013; Klein, Nicholls, & Thomalla, 2003). In the mid-1500s the term passed into Middle French, where it came to mean ‘to retract’ or ‘to cancel,’ and then it moved into English as the verb *resile*, meaning to ‘return to a former position’ (Alexander, 2013, *p.* 2708). Over time, resilience has been studied in a number of disciplines including psychology (especially how children overcome adversity) (Bonanno, 2004; Masten, 2013), engineering (describing the strength and ductility of steel beams) (Hollnagel, Woods, Leveson, 2006; Rankine, 1867), ecology (Holling, 1973) (referring to the capacity of an ecosystem to respond to a perturbation or disturbance by resisting damage and recovering quickly), and more recently in the organization sciences (Sutcliffe & Vogus, 2003).

The term resilience was first popularized by Holling (1973) in his seminal work entitled “Resilience and Stability of Ecological Systems.” This work developed the concept of ecological resilience as well as other forms of resilience; suggesting that “models [*of resilience*] are more powerfully used as a starting point to organize” (*p.* 6). As a result, the origins of the *ad hoc* organizing efforts of resilience in management and organization theory literature can be traced back to two seminal papers —*i.e.*, Staw *et al.*, (1981) and Meyer (1982)— that highlighted the key resilience concepts of reliability and adaptability respectively. Both papers draw upon

variation-selection-retention mechanisms posited by evolutionary theory (*see* Campbell, 1969, 1974, outside the scope of this review), but developed very different propositions regarding how organizations respond to external threats.

For example, Staw *et al.* (1981) introduced theory on how negatively framed situations lead to risk avoidance and maladaptive outcomes in the form of “threat-rigidity effects” due to an overall tendency for individuals, groups, and organizations to emphasize responses when facing adversity (rather than flexible and adaptable learning). In contrast, Meyer (1982) extended this line of inquiry in an empirical study of hospital responses to an unexpected doctors’ strike (environmental jolt), suggesting that an external threat automatically places an organization at risk. Findings from Meyer’s study suggested that organizations can display adaptability in the form of two different types of responses: (1) they can absorb the impact of the jolt by undergoing change and single-loop learning (labelled “resiliency”), or (2) they can adopt new practices or configurations and double-loop learning (labeled “retention”). Meyer (1982) further concluded that resiliency is influenced by an organization’s strategy and its slack resources, while an organization’s ideologies shape retention and organizational structures.

Over the years, in management literature, the concept of resilience applied to organizations has taken on a deeper meaning; the simple concept of resistance to shocks and disasters (Holling, 1973) expanded with the notions of recovery ability, recovery times, and costs of recovery. Therefore, the notions of organizational resilience have also varied among researchers and among various point in time (waves).

### **First Wave (1980 – circa 1989): Reliability versus Adaptability**

During the first wave, the concept of OR<sup>6</sup> largely focused on organizational responses to events originated inside the organization, such as operational disruptions leading to industrial accidents and the reliability of high-risk technologies (*e.g.*, Perrow, 1984; Weick, 1993; Wildavsky, 1988). It was only after 9/11 that resilience research reemphasized the importance of *external* threats and thus began to revisit Staw *et al.*'s (1981) and Meyer's (1982) contributions. Thus, given the recurrent, unexpected, and disruptive events in the external environment that threaten organizational survival and functioning the myopia view of resilience research (as reliability) shifted into considering environmental externalities as a matter of consequence for understanding organizational resilience as an adaptation to the environment (Meyer, 1982). The papers by Staw *et al.* (1981) and Meyer (1982) therefore initially had little influence on the resilience literature, even though Meyer (1982) was the first to expressly use “resiliency” as a concept within the business and management literature.

### **Second Wave (circa 1990 – circa 1999): Consolidating Adaptability**

During the second wave, Sitkin (1992) built upon the notion of learning as a key to organizational adaptation. By juxtaposing the trade-offs between failure and success, Sitkin (1992) posited that failure encourages experimentation and increases variation in organizational responses; while success pauses organizations into complacency, leading toward risk-aversion, restricting efforts to seek out new information, and encouraging homogeneity. In short, when organizations find their way that proves the success, organizations are more likely to continue

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<sup>6</sup> In the present study, organizational resilience is defined as “the process by which a firm builds and uses its capability endowments to interact with the environment in a way that positively adjusts and maintains functioning prior to, during, and following adversity” (Williams *et al.*, 2017, *p.* 742).

leveraging that approach, with a focus on learning, to attain long-term benefits —*i.e.*, reliability. Instead, learning from failure is a more effective approach to fostering resilience. That is, gaining experience in challenging conditions to result in small failures and better equip organizations to survive (Sitkin, 1992). These small failures increase the variation in an organization’s potential response repertoire and consequently reduce the likelihood to choose a threat-rigidity response (Staw *et al.*, 1981).

Weick (1993), in the study of the relationship between resilience and sensemaking, introduced four organizational characteristics believed to be critical for preventing organizational collapse amid a crisis. In an attempt to explain organizational disintegration and how organizations might become more resilient, Weick (1993) proposed that improvisation and bricolage, virtual role systems, maintaining respectful interaction, and having an attitude of wisdom are key to preserving organizational functions in the face of a crisis. Improvisation and bricolage refer to the need for organizations to have the creativity and expertise to problem-solve with resources at hand. It follows that slack resources and experience facilitate an organization to engage in problem-solving behavior amid challenges. Weick (1993) suggests that building virtual role systems enable each part of the organization to understand the behavior of all other parts, without the need for communicating directly with each other. Alternatively, when virtual role systems fail, face-to-face communication may become necessary. Finally, organizations maintain a keen awareness of the limits of their knowledge by maintaining an attitude of wisdom —*i.e.*, “... wisdom, which avoids extremes, improves adaptability” (Weick, 1993, *p.* 641).

Weick *et al.* (1999) extended prior research by considering how the processes of high-reliability organizations (HROs) remain effective in challenging situations. The main premise is that HRO processes offer a cognitive framework (*i.e.*, collective mindfulness) that enables both adaptive learning and reliability. This framework is a departure from both Staw *et al.* (1981) and Sitkin (1992) which viewed reliability and efficiency as being inextricably linked. Additionally, HROs are characterized by a “reluctance to simplify interpretations, sensitivity to operations, commitment to resilience and underspecified structuring” (Weick *et al.*, 1999, *p.* 81). Thus, by focusing on the maintenance of critical processes, organizations can remain reliable while also adapting to circumstances.

### **Third Wave (circa 2000 – circa 2009): Adaptive Capacity**

During the third wave, a central theme in the OR research landscape attempted to synthesize the core logic of the reliability and adaptability concepts (*e.g.*, Lengnick & Wolff, 1999). In part, this may be due to the attacks of September 11, 2001, recognizing that the external environment presents enduring challenges that would have a long-term impact on the organizational performance (Linnenluecke, 2015). The shift in perspective is illustrated by the introduction of four key concepts that each appreciably augmented the OR concept. Specifically, adaptive capacity (Staber & Sydow, 2002), developmental resilience (Sutcliffe & Vogus, 2003), robust transformation and resilience capacity (Lengnick-Hall & Beck, 2005).

Adaptive capacity (Staber & Sydow, 2002) refers to a firm’s ability to “continuously develop and apply new knowledge and do so in ways that are sustainable and difficult to imitate by competitors” (*p.* 408). Adaptive capacity differs from the “adaptionist” (adaptive fit) approach



that places a focus on reacting to contingencies rather than preemptively preparing for (Staber & Sydow, 2002). The concept of adaptive capacity challenged much of established management and organization research which tended to have reliability and efficiency at its core. The focus of organizational adaptation research was also fundamentally reactionary with the core assumption that circumstances inevitably change; thus, organizations efficiently and effectively reconfigure their activities to achieve a desirable fit with their environment (*e.g.*, Lawrence & Lorsch, 1986; Pfeffer & Salancik, 1978). Another key difference between the adaptive capacity and “adaptionist” notions is their treatment of slack resources. The “adaptionist” sees slack resources as redundancies and constitute a form of inefficiency; while the adaptive capacity considers slack resources as valuable for supporting organizations’ exploration efforts, as well as coping with ambiguity and uncertainty<sup>7</sup> (Staber & Sydow, 2002). This implies that maintaining critical slack resources contributes to adaptive capacity and provides organizations more opportunity to exhibit resilience in the face of challenging circumstances.

It is until Sutcliffe and Vogus’s (2003) seminal paper that OR research combined insights from the two research streams and defined organizational resilience as the “maintenance of positive adjustment under challenging conditions” (Sutcliffe & Vogus, 2003, *p.* 95). This definition includes more comprehensively the two major assumptions of organizational resilience: adjustments to (1) ongoing strains due to organizational interruptions (Perrow, 1984; Staw *et al.*,

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<sup>7</sup> This dissertation follows the Knightian uncertainty perspective. As Knight saw it, an ever-changing environment brings new opportunities for new ventures to make profits, but also means that there is an imperfect knowledge of future events (Alvarez, Barney, McBride, & Wuebker, 2017; Bylund & McCaffrey, 2017; Navis & Ozbek, 2017; Nikolaev, Boudreaux, & Palich, 2018). Therefore, according to Knight, risk applies to situations where the outcome of a given situation is unknown, but we can accurately measure the odds. Uncertainty, on the other hand, applies to situations where we cannot know all the information, we need in order to set accurate odds in the first place. In other words, a known risk is “easily converted into an effective certainty,” while “true uncertainty is not susceptible to measurement.” (Knight, 1921, *p.* 46).

1981) and (2) severe disruptions due to exogenous events (Meyer, 1982). Also, this developmental view on resilience parallels the rationale presented by Sitkin (1992) but departs from the “learning from failure” view and the outcomes of resilience (Sutcliffe & Vogus, 2003). First, rather than attributing active learning to failure, the developmental perspective argues that learning occurs as a result of the organization repeatedly addressing challenges over time. That is, organizations build resilience through frequently addressing situations that result in both success and failure. Second, resilience outcomes are more than just surviving challenging events; instead, resilience enables positive adjustment. Similar to Sutcliffe and Vogus (2003), Hamel and Valikangas (2003) attempted to synthesize the reliability and adaptability concepts by suggesting that innovation is another enabling condition for resilience, as it allows organizations to remain robust while continuously anticipating and adjusting to turbulent times.

Lengnick-Hall and Beck (2005) criticized the prevailing views (not the learning and outcomes) on the treatment of organizations’ external environments (adaptive fit). Lengnick-Hall and Beck (2005) revealed four limitations. First, environmental change does not necessarily imply a shift from one state of equilibrium to another. If it is indeed the case that change in the environment is from equilibrium to disequilibrium rather than one state of equilibrium to another state of equilibrium, organizational responses should recognize the instability inherent in the circumstances present in the new, dynamic environment. Second, organizations may not be able to anticipate the particulars of unstable environments and the uncertainty associated with them. Third, environments in constant flux require organizations to continually reassess expectations

and adjust approaches to reflect immediate and emerging situations. Finally, when linked with a crisis, environments may require particularly novel responses from organizations.

In order to cope with environmental instability, organizations respond such that they can exploit environmental change to create new opportunities and develop new *capabilities*. Termed robust transformation, this type of response refers to “a deliberately transient, episodic response to a new, yet fluid, environmental condition” (Lengnick-Hall & Beck, 2005, p. 742). Robust transformation is an alternative answer to the adaptive fit; suggesting that organizations can choose which one to employ. The response an organization chooses, however, is determined by its level of resilience capacity. Resilience capacity refers to “a unique blend of human, behavioral, and contextual properties that increase a firm’s ability to understand its current situation and to develop customized responses that reflect that understanding” (Lengnick-Hall & Beck, 2005; p. 750).

Further, Gittell *et al.* (2006) drew upon Lengnick-Hall and Beck’s (2005) work and suggested that organizations need a viable business model that allows stockpiling resources (slack). In that way, such resources can be used and deployed (via capabilities) to provide a strong commitment to employees during challenging times and sustain relationships that act as enabling conditions for organizations to quickly return to equilibrium prior performance. For example, these researchers investigated airlines’ responses to 9/11 and found that the post-9/11 layoff (intended to improve economic performance) inhibited long-term organizational recovery. Similar to Gittell *et al.*, (2006), Luthans and Youssef (2007) examined how organizations can leverage

employee characteristics to enhance organizational resilience as well as how organizations can foster resilience in their employees.

Vogus and Sutcliffe (2007), noticing the shortcomings of existing literature, attempted to develop a theory of OR; their attempts focused on how organizations and their constituent parts remain effective despite impediments to adaptation. They also explored the extent to which resilience depends on past learning and provides a basis for future learning, yet it is distinct from the process of learning per se as “resilience represents a broader store of capabilities” (p. 3418).

#### **Fourth Wave (circa 2010 – present): Durability Capabilities**

Some progress has been made since the influential works of Staw *et al.* (1981), Meyer (1982), and Sutcliffe and Vogus (2003). Recent evidence suggests that during the last three decades of organizational resilience research, scholars have reached consensus that resilience is not only about organizing for reliability or adaptability but is instead a function of both (*e.g.*, Annarelli & Nonino, 2015; Boin & van Eeten, 2013; Kantur & Iseri-Say, 2012; Klibi, Martel, & Guitouni, 2010; Ponomarov & Holcomb, 2009; Sheffi & Rice, 2005). Accordingly, the ability of an organization and its members to maintain critical functions during a threatening event (Coutu, 2002; Meyer, 1982; Staw *et al.*, 1981) and rebound successfully (Lengnick-Hall, Beck, & Lengnick-Hall, 2011; Luthans, 2002) is critical for organizational survival (Kantur & Iseri-Say, 2012), which is the primary concern of organizations and a prerequisite for future performance (Josefy *et al.*, 2017).

Now in its fourth wave, OR research continues to advance in important ways. More recent research has shifted focus (whether resilience is an outcome or a process) and been accompanied by calls to consider organizational resilience as an important element of organizational strategy (Annarelli & Nonino, 2015; Lampel *et al.*, 2014; Kahn *et al.*, 2017). These efforts attempt to position OR as a key antecedent to the outcome variable of principal concern ('Holy Grail') for strategic management scholars. As a result, many studies have attempted to conceptualize organizational resilience as a behavior, as a capability, as a strategy, and as an outcome of firm performance. These efforts have been also accompanied by calls for increased empiricism as the notable dearth of such studies is believed to be limiting scholarly progress (Annarelli & Nonino, 2015; Van Der Vegt *et al.*, 2015). Not surprisingly, prior empirical studies primarily leverage qualitative approaches that employ methods such as ethnography, in-depth interviews, and case analysis. Table 3 shows the evolution of empirical organizational resilience research by concepts and methodologies.

Table 3: Summary of the Evolution of Empirical Organizational Resilience Research by Concepts and Methodologies.

Author	Year	Concepts				Methodologies			
		Behavioral	Capabilities	Strategy	Performance	Theory Building	Case Study	Survey	Model
Hind <i>et al.</i>	1996	✓		✓				✓	
Mallak	1998	✓				✓			
Horn and Orr	1998		✓				✓	✓	
Paton <i>et al.</i>	2000		✓				✓		
Sutcliffe and Vogus	2003		✓	✓		✓	✓		✓
Fiksel	2003		✓				✓		
Starr <i>et al.</i>	2003				✓		✓		
Hamel and Valikangas	2003			✓	✓		✓		
Rioli and Savicki	2003		✓						✓
Dalziell and McManus	2004			✓			✓		
Fiksel	2006		✓				✓		
Hollnagel <i>et al.</i>	2006			✓		✓	✓		
Luthans <i>et al.</i>	2006		✓				✓		

Table 3 (continued): Summary of the Evolution of Empirical Organizational Resilience Research by Concepts and Methodologies.

Author	Year	Concepts				Methodologies				
		Behavioral	Capabilities	Strategy	Performance	Theory Building	Case Study	Survey	Model	Archival
McDonald	2006	✓				✓				
Seville <i>et al.</i>	2006	✓		✓			✓			
Vogus and Sutcliffe	2007		✓			✓				
McManus <i>et al.</i>	2007	✓	✓			✓	✓			
Smith and Fischbacher	2009	✓				✓				
Gibson and Tarrant	2010	✓							✓	
Lengnick-Hall <i>et al.</i>	2010	✓	✓			✓				
Ortiz-de-Mandojana and Bansal (2015)	2015			✓						✓
Williams and Shepherd	2016		✓	✓			✓			

Finally, most recent research has sought to consolidate and integrate disparate research efforts in a way to respond to the disjointed development of the research domain (*e.g.*, Kahn *et al.*, 2018; Van Der Vegt *et al.*, 2015; Williams *et al.*, 2017; Williams & Shepherd, 2016). Now, there seems to be a more general scholarly consensus that portrays resilience as process anchored in the quintessential building block of durability capabilities (Lengnick-Hall & Beck, 2005; Sutcliffe & Vogus, 2003; Vogus & Sutcliffe, 2007; Williams *et al.*, 2017) —defined as “the resources organizations possess that shape their capacity for positive adjustment prior to, during, and following adversity” (*p.* 742). The guiding premise is that the combination of resources translates into the firm’s specialized capabilities (for durability) in such a way that facilitates dynamic adaptation to major environmental shocks. Taken together—whether first, second, third, or fourth waves— studies within OR literature have widely agreed that a combination of resources and capabilities (and other enabling conditions) create the ability to adjust and maintain a positive functioning prior to, during, and following organizational and environmental challenges (Linnenluecke, 2015).

After tracing the evolution of the OR literature, this study proceeds to introduce the notion of organizational capabilities (Amit & Schoemaker, 1993; Dosi, Nelson, & Winter, 2000). That is because the capabilities-based view provides a coherent theoretical foundation to the durability capabilities construct. The main point is to establish durability capabilities as a distinctive form of strategic change (dynamic) capabilities (Teece *et al.*, 1997) as durability capabilities add additional value over and above dynamic capabilities. While this may be the least contentious of the purpose of this dissertation, it is nonetheless important to clarify.



## Organizational Capabilities

Organizational capabilities are defined as “the capacity to perform a particular activity in a reliable and at least minimally satisfactory manner” (Helfat & Winter, 2011, p. 1244; *see also*, Amit & Schoemaker, 1993; Dosi *et al.*, 2000; Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, & Winter, 2007). From this definition, three main features are highlighted that describe a firm’s capabilities. First, there must be an objective for the activity (Amit & Schoemaker, 1993). Second, the activity must be repeatable and reliable; otherwise, no real capacity to perform an activity exists. Third, to perform the activity in a minimally satisfactory manner means that the outcome of the activity is recognized as such and functions at least minimally as intended (Helfat *et al.*, 2007; Helfat & Winter, 2011). That means that the mere possession of a particular capability does not imply the capacity to generate performance outcomes from it (Collis, 1994; Winter, 2000). Capabilities can be divided into three distinct — but interrelated — categories: operational capabilities (or zero-order), dynamic capabilities (or first-order), and metaphysical capabilities (or second-order) (Collis, 1994; Winter, 2003). Even though a discussion on zero-, first-, and second-order capabilities is beyond the scope of the current study, an understanding of the three-tiered hierarchical classification of capabilities is beneficial for situating durability capabilities in an integrative conceptual framework. Thus, researchers would be able to expand the nomological net of the durability capabilities construct further. A graphical representation of organizational capabilities is presented based on Winter’s (2003) conceptualization and adapted from Hoopes and Madsen (2008) graphical representation of capabilities (*see*, Figure 5).

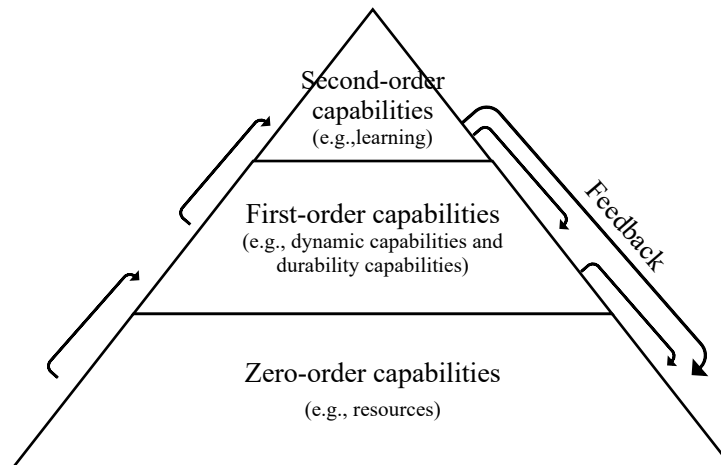


Figure 5. Hierarchy of Organizational Capabilities.

### **Operational Capabilities (Zero-order)**

Operational capabilities are those ordinary capabilities that a firm uses to earn a living in the present (Helfat *et al.*, 2007). Operational capabilities (or zero-order capabilities) are collections of internal processes or routines used to configure resources in a unique manner (Winter, 2000, 2003). For example, one type of zero-order capability is the firm's capability to engage in some form of innovation (Winter, 2003). By configuring the appropriate talent, equipment, culture, and human resources needed, the firm engages in new product development activities; in that way remaining competitive in the market. Firms, however, compete in challenging environments, and capabilities may need alteration to remain relevant (*e.g.*, Zahra, Sapienza, & Davidsson, 2006).

### **Dynamic Capabilities (First-order)**

Dynamic capabilities or first-order capabilities allow firms to integrate and extract value from zero-order capabilities in a dynamic fashion in order to adapt to their external environments (Bartmess & Cerny, 1993; Teece *et al.*, 1997; Winter, 2003; Zahra & George, 2002). Dynamic capabilities “purposefully create, extend, and modify resource base” (Helfat *et al.*, 2007, p. 4).

For example, a firm can develop capabilities that are focused on expanding existing products and services to new markets; another example is capabilities that are focused on recombining resource base to understand, respond to, and absorb environmental variations. Helfat and Martin (2015) indicate that a common misinterpretation of the dynamic capabilities perspective is that dynamic capabilities are primarily associated with highly dynamic markets. However, Eisenhardt and Martin (2002) argued that all markets are dynamic, thus a question of interest is the extent of dynamism in a particular market that is considered an operational capability, a dynamic capability (Helfat & Winter, 2011) and even a durability capability (Williams *et al.*, 2017).

### **Metaphysical Capabilities (Second-order)**

Metaphysical capabilities or second-order capabilities allow the firm to take-in new knowledge, which guides the actions and determines to what extent the firm engages in dynamic behaviors and capability(ies) development (Prahalad & Bettis, 1986). This learning encodes new information, adjusts mental models, and encodes new knowledge into internal routines (Madsen, 2009). Second-order capabilities consist of higher-order learning capabilities that influence first-order capabilities (Cernas Ortiz & D’Souza, 2010), in such a way that dynamic capabilities can be facilitated by learning from experience (feedback loop) (*e.g.*, Weick & Sutcliffe, 2015).

Second-order capabilities include higher-order firm-level schemas (or dominant logic) such as

the top management team that guides the actions of the firm (Prahalad & Bettis, 1986). Thus, sensemaking and learning is likely to be a way to build capability endowments (Weick *et al.*, 2005; Whiteman & Cooper, 2011).

In summary, organizational capabilities are said to have important firm performance implications. As shown above, capabilities are multifaceted in nature and scope. This study considers the strategic nature of organizational capabilities. This is important because strategic change capabilities enable firms to reorganize their resource base in order to remain in sync with their external environment. Thus, a more in-depth discussion on dynamic capabilities is presented in the following lines to make the case that durability capabilities are a distinct form of dynamic capabilities.

### **Dynamic Capabilities**

The purpose of this section is not to review and synthesize the dynamic capabilities literature (see Table 4 for an overview of previous review studies); rather the intention is to draw clear differences between the two constructs —*i.e.*, dynamic capabilities and durability capabilities. That is to better understand the value-added and distinguishing characteristics of durability capabilities. This section begins with a discussion of four seminal review studies on the topic of dynamic capabilities that clearly show the need for accounting for external factors such as major environmental shocks, which the durability capabilities do.

Table 4: Overview of Previous Reviews on Dynamic Capabilities

Authors	Summary	Methodology
Newbert (2007)	Few empirical studies on dynamic capabilities. No consistent findings concerning the link between dynamic capabilities and performance.	Review of 55 empirical articles on the RBV.
Wang and Ahmed (2007)	Dynamic capabilities influence performance via firm strategies and capability development in an environment where market dynamism is a required antecedent.	Qualitative review.
Arend and Bromiley (2009)	Criticize the ability of dynamic capabilities to explain organizational change cohesively with logical consistency, conceptual clarity, and empirical rigor. It is unclear what additional value is created via the dynamic capabilities when compared to existing theories such as the resource and knowledge-based views and evolutionary economics. There is lack of strong empirical support for the positive effects of dynamic capabilities on performance.	Qualitative review
Ambrosini and Bowman (2009)	Stress the mediating and moderating effect of the firm's resource base in the dynamic capabilities—performance relationship.	Qualitative review

Table 4 (continued): Overview of Previous Reviews on Dynamic Capabilities

Authors	Summary	Methodology
Barreto (2010)	Concludes that conceptualizations of dynamic capabilities differ in terms of nature, specific role, relevant context, heterogeneity assumptions, and purpose of dynamic capabilities. Two central ongoing debates are identified: Confusion about role of environmental turbulence; and confusion about whether different kinds of firms may benefit more from the deployment of dynamic capabilities (e.g. firm's structure, age, size, and objectives).	Qualitative review of 38 studies published in eight leading management journals.
Di Stefano <i>et al.</i> (2010)	Identify two main “invisible colleges” of scholarship — “Foundations and Applications.”	Co-citation analysis of the 40 most influential dynamic capabilities articles in the field of management (as determined by their citations).
Giudici and Reinmoeller (2012)	Conclude that dynamic capabilities construct deserves more focused research.	Cross-citation analysis of 104 articles in which dynamic capabilities featured prominently.
Vogel and Güttel (2012)	Dynamic capabilities-based view still lacks consensual concepts that allow comparisons of empirical studies and advance the theoretical understanding of dynamic capabilities.	Bibliographic coupling analysis of 1,152 articles.

Table 4 (continued): Overview of Previous Reviews on Dynamic Capabilities

Authors	Summary	Methodology
Peteraf, Di Stefano, and Verona (2013)	Find that Teece et al.'s (1997) and Eisenhardt and Martin's (2000) contributions represent contradictory conceptualizations of the dynamic capabilities construct. Development of a contingency-based framework to unify the dynamic capabilities-based view. Conclude that dynamic capabilities are characterized as simple rules and processes employed by organizations in high-velocity markets and as best practices in moderately dynamic markets.	Historiograph analysis of the 61 most influential articles (based on citations).
Helfat and Martin (2015)	Investigation of dynamic managerial capabilities construct. Find that managers vary in their influence on organizational change and overall organizational performance due to variances in managerial cognition, social capital, and human capital.	Qualitative analysis of 34 core and 70 related articles on dynamic managerial capabilities.
Pezeshkan, Fainshmidt, Nair, Lance Frazier, and Markowski (2015)	Find overall positive and significant dynamic capabilities—performance relationship. Identify the importance of including context into dynamic capabilities investigation.	Analysis of 89 studies that investigated the dynamic capabilities—performance relationship

Table 4 (continued): Overview of Previous Reviews on Dynamic Capabilities

Authors	Summary	Methodology
Wilden, Devinney, and Dowling (2016)	There are four main issues in the dynamic capabilities view: micro foundations, multilevel nature of dynamic capabilities; definition; and methodological demands.	Review on articles published between 1997 and 2015 in 12 leading management journals using machine-based text analysis and surveyed authors of these articles directly.
Schilke, Hu, and Helfat (2018)	Develop a meta-framework that specifies antecedents, dimensions, mechanisms, moderators, and outcomes of dynamic capabilities identified in the literature to date.	Review on empirical articles published between 2008 and 2016 in the top 100 management journals.

Firm-specific dynamic capabilities support resource reconfiguration, which allows the firm to adapt and even improve performance during environmental dynamism (Teece *et al.*, 1997). The firm consists of mobile resources configured into capabilities through dynamic processes (Amit & Shoemaker, 1993; Capron & Mitchell, 2009; Eisenhardt & Martin, 2000; Helfat & Peteraf, 2003, 2009; Thornhill & Amit, 2003; Winter, 2003). For example, a firm cannot survive and succeed in dynamic environments without cash, prior knowledge, managerial skills, established routines, human resources, network relationships, and related resources; however, it is the configuration of such resources and capabilities that underlie its ability to attain long-term firm survival and success.

Wang and Ahmed (2007) were concerned with coming up with a definition of the dynamic capabilities construct. Their definition refers to “a firm’s behavioral orientation to constantly



integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage” (p. 35); highlighting that dynamic capabilities may be more than just another type of organizational process. For them, dynamic capabilities operate on three dimensions, namely: (a) adaptive capability —the firm’s capacity to identify (sense) and seize opportunities; (b) absorptive capability —the firm’s skill to identify, assimilate, and apply new information; and (c) innovative capability —the firm’s capacity to create new products and/or markets. Underlying these dimensions are processes relating to integration, reconfiguration, renewal, and recreation of a firm’s resource base. From their perspective, capabilities influence firm performance via firm strategies and capability development in an environment where market dynamism is a required antecedent.

Di Stefano, Peteraf, and Verona (2010), following Wang and Ahmed (2007), develop a contingency-based framework that suggest that capabilities can support firms to sustain performance and achieve sustainable competitive advantages regardless of the degree of environmental turbulence and the nature of specific capabilities in certain conditional cases. For them, capabilities are simple rules and processes employed by firms in high-velocity markets and as best practices in moderately dynamic markets. Yet, although Di Stefano *et al.* (2010) and Wang and Ahmed (2007) suggests that capabilities may influence performance under environmental dynamism (a measure of instability in an industry) and munificence (relative growth opportunity within an industry) (D’Aveni, 1994; Bourgeois & Eisenhardt, 1988; Dess & Beard, 1984); the link between capabilities and performance under major environmental shocks remains unspecified (Meyer, 1982).

Indeed, Barreto (2010) argued that the various conceptualizations of capabilities often differ in terms of their nature, specific role, relevant context, heterogeneity assumptions, and purpose, implying that there was no consistent definition of what a capability was or was not. Based on his synthesis of the literature he suggests that “a dynamic capability is the firm’s potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base” (Barreto, 2010, *p.* 271). This definition stresses the multidimensional nature of the construct based on solving problems, sensing, making decisions, and altering the firm’s resource base. In terms of performance outcomes of capabilities, Barreto identified three ways that scholars have, and might, hypothesize such a relationship. First, capabilities may have a direct effect on performance outcomes (*e.g.*, Teece *et al.*, 1997; Zollo & Winter, 2002). Second, capabilities may not necessarily lead to superior performance outcomes, but rather the performance implications of capabilities are dependent on the resulting resource base configurations and managerial decision-making (Eisenhardt & Martin, 2000; Helfat *et al.*, 2007). Third, capabilities operate indirectly, via a mediation of the effect of dynamic capabilities on firm performance through the firm’s resource base (*e.g.*, Zahra *et al.*, 2006; Zott, 2003). Finally, Barreto identifies two ongoing central debates concerning the boundary and contingency conditions relating to capabilities that imply a lack of coherence around what a capability is and when it is valuable —*i.e.*, whether capabilities have value only in turbulent environments and if their value accrues only to certain firms in specific contexts. Such debate remains in the strategy and management literature (*see*, Wilden *et al.*, 2016).

Wilden *et al.* (2016) conduct a comprehensive examination of the dynamic capabilities view by combining text-based analysis with surveys of, and interviews with, researchers in the field. With this approach, they identify missing research themes within the dynamic capabilities literature; much of the early scholarly discussion was concerned with the link between dynamic capabilities and performance and competitive advantage, particularly in turbulent environments. More recent empirical research seems to imply that what matters is the ability of latent dynamic capabilities to be realized in the most appropriate circumstance, which can be contingent on environmental turbulence (Wilden & Gudergan, 2015; Wilden, Gudergan, Nielsen, & Lings, 2013). Thus, an emerging trend that Wilden *et al.* (2016) found is that researchers are paying more attention to the active role of dynamic capabilities instead of defining them as mainly being responsive to the dynamic environment (Pitelis & Teece, 2010). Consequently, firms differ in that some have to respond to market dynamics (i.e. they are market driven) while others seek to change actively (or create new) markets (*i.e.*, market driving) (Day, 2011); and even others seek to actively adapt to environmental shock (Sutcliffe & Vogus, 2003). Walden *et al.* (2016) concluded that it is the configuration of a firm's resource base with other organizational and external factors that affect the strategic posture of the firm and, hence, its subsequent performance. Indeed, Helfat and Martin (2015) suggest that dynamic capabilities vary in their influence on organizational change and overall organizational performance due to variances in managerial cognition, social capital, and human capital. But also vary in their influences on firm performance outcomes due to variations in their external economic environments, characterized by unexpected and disruptive shocks that are detrimental to firms (Williams *et al.*, 2017).

Despite more than three decades of research on dynamic capabilities, important conceptual issues remain. A critical, unresolved issue that strategic research has yet to address is the distinction between dynamic and durability capabilities. As noted, capabilities only qualify as dynamic if they imply a reliable patterned behavior (Winter, 2003). Examples of dynamic capabilities include those for conducting acquisitions, alliances, and new product development (Eisenhardt & Martin, 2000; Helfat et al., 2007). These capabilities have very specific purposes and support very specific activities. Although researchers use the term dynamic capabilities to connote a generic, expansive capacity to undertake change, some researchers “worry that this risks making the concept so broad as to have little meaning” (Helfat & Winter, 2011, *p.* 1245); suggesting that the dynamic capabilities literature needs further refinement in terms of understanding what capabilities firms should use amid major environmental shocks.

The following section is built to address that it is the durability capabilities construct that is said to be a type (or subtype) of strategic change capabilities that is only triggered in the face of disruptive changes in a firm’s external environment. In specific, Table 5 shows the characteristics and differences between the two constructs—dynamic capabilities and durability capabilities. Next, it is argued that it is the configuration of resources that result in durability capabilities; in that way, affecting the strategic posture of the firm during economic adversity.

Table 5. Comparison Between Dynamic Capabilities and Durability Capabilities.

	Characteristics																	
	Nature	Sources				Specific Role			Dimensions			Purpose				Relevant Context		
	Radical Change Adaptation	Financial	Human	Social	Behavioral	Configuration	Creation	Transformation	Absorptive Capacity	Adaptability Capacity	Innovative Capacity	Survival	Performance	Sustained CA	Temporal CA	Dynamism	Munificence	Shocks
Dynamic Capabilities	✓ *	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	✓	✓	*	✓	✓	*
Durability Capabilities	* ✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	✓	*	*	✓

Notes: CA = Competitive Advantage

\* Refers to the dimensions that differ between dynamic and durability capabilities

## Durability Capabilities

Although dynamic capabilities and durability capabilities seem to differ in nature, purpose, and intended outcomes, it is still challenging to draw a bright line between these two types of capabilities. In an ever-changing business environment, dynamic and durability capabilities assume prime importance. That is because both capabilities can be used for adaptation to the environment. Similarly, both capabilities serve dynamic and operational purposes (configuration of resources), so the line between dynamic and durability capabilities is unavoidably blurry. However, one distinguishing element is that durability capabilities support strategic adaptation during challenging environments. That is, durability capabilities are only triggered in the face of environmental adversity. With this in mind, this dissertation offers the following suggestions for research on durability capabilities during an economic recession—especially in the new venture context.

*Durability capabilities can be used for adaptation during challenging environments.* The time period over which one assesses the effectiveness of organizational capabilities depends upon the extent of environmental shifts. Environmental shifts often take time, and firms need time to build dynamic capabilities (Teece *et al.*, 1997). Levinthal (1998) provides an instructive example, in which incremental changes in fits and starts over take many years, ultimately resulting in a completely new set of dynamic capabilities. Examining only a snapshot of time, however, would not reveal the process of the eventual development of dynamic capabilities (*e.g.*, skills, knowledge, processes, routines, etc.). This issue arises with respect to the development of dynamic capabilities during a major economic recession as well. For example, an economic recession often occurs without ample warning and have unpredictable effects, which makes it

difficult for firms to seek development of new routines and processes (Latham & Braun, 2008; Pearce & Michael, 2006). But the limitation of a firm to develop a new dynamic capability over too short a period of time, may imply to researchers to observe no change in this capacity and thus incorrectly concluding that a firm lacks dynamic capabilities.

As these arguments illustrate, environments are always changing to at least some extent. Thus, identifying a precise threshold level that separates a durability capability from a dynamic one is likely to be fruitless, or to produce answers that vary erratically across cases. Instead, it may be more useful to assess the nature of those capabilities—whether or not one observes capabilities that promote adaptation to a major economic recession. For example, although numerous factors are responsible for why firms act the way they do in the face of these harsh conditions, basic resources are noted to be of significant importance to firms' capacity to endure and adapt to an economic recession (Williams *et al.*, 2017). In other words, the emphasis in the locus of dynamic capabilities to external changes tend to direct attention on strategic use, where firms draw on what is 'familiar' to them to aggressively push change into the environment (Winter, 2007). In the view of dynamic capabilities, firms should promote a seemingly radical change during a recession, however, if otherwise, it is not dynamic. In contrast, durability capabilities underpin adaptation that is economically important, suggesting that strategic change is difficult to accomplish in a short period of time, and yet arguably far from radical. Durability capabilities enable firms to fine-tune their operations—such that may even facilitate development during and after adversity (Sutcliffe & Vogus, 2003).

*Durability capabilities can be used for operational purposes.* A further complication arises because dynamic and durability capabilities can be used for operational purposes, either because they have different variants (some more operationally oriented and some more dynamic), or because one capability simultaneously serves multiple purposes (Helfat & Winter, 2011)—such as alliance capabilities (Wang & Rajagopalan, 2015). This again makes it difficult to draw a sharp line between distinct types of capabilities.

Helfat and Campo-Rembado (2010) offer a middle ground to understanding different types of capabilities. They suggest that capabilities can serve multiple purposes and at different contexts. Thus, the distinction lays on the nature, the intended use, and the boundary conditions of the capability. For example, some capabilities can serve an operational purpose such that facilitate production or services (*i.e.*, first order capabilities). Other types of capabilities can make change possible (*e.g.*, design, production, and learning) such as through the alignment between the firm and the environment (*i.e.*, dynamic). Yet durable capabilities facilitate adaptation in the face of *adversity* such that maintain operations and provide temporal competitive advantages. A durability capability—as a type or subtype of strategic change capabilities—is only triggered in the face of a major environmental event (Sutcliffe & Vogus, 2003; Williams & Shepherd, 2016; Williams *et al.*, 2017). In this way, durability capabilities may contribute to building firm resiliency in the face of an economic recession (Newey & Zahra, 2009).

The snapshot of the discussion presented above suggests that various aspects of the strategic change capabilities construct do not adequately apply in purpose and intended context. More specifically, dynamic capabilities focus on radical change and sustained competitive advantage



reflected in stored routines, procedures, and organizational memory (Kor & Mesko, 2013). In contrast, durability capabilities seek adaptation and temporary solutions based on a firm's generic resource base (Sutcliffe & Vogus, 2003). Put differently, durability capabilities help to economize on a short period by channeling entrepreneurs' attention and efforts to the implementation of temporary solutions that will enable their new ventures to resolve the ambiguities they encounter in their external economic environment. Thus, the importance of fostering firm resiliency through durability capabilities comes into sharper focus for the purpose of this dissertation.

### **Durability Capabilities and Resources**

Durability capabilities research is complex, and many avenues of investigation remain open (*cf.* Williams *et al.*, 2017). Here, this study focuses on the combinations of a firm's resource base that will result in durability capabilities, as well as the performance outcomes to which such capabilities are said to lead. In subsequent lines, this study proceeds to describe the various Penrosean resources (including financial, human, behavioral, and relational) that facilitate the creation of durable capabilities—such that facilitate adaptation rather than sustainable competitive advantage (Williams *et al.*, 2017).

According to Penrose (1959), firm growth and survival are associated with two resource uses that are free of the inimitability criterion. First, excess resources that can be put to productive use, creating the incentives and the means for expansion. Second, resources can be redeployed for new and more productive applications. Some resources offer few applications (*i.e.*, a narrow range but rare, valuable, and specialized potential, Barney, 1991) while others can be more easily

redeployed into generic and alternative uses (*i.e.*, versatile, Penrose, 1959). Penrose refers to versatile (or generic) resources to a firm's combinative possibilities that can facilitate adaptation and expansion, into a more productive opportunity set. Penrose (1955, *p.* 539) writes: "it becomes clear that the flexibility and versatility of its own resources are the important factors governing the possibilities of its expansion. So long as there are profitable production opportunities open anywhere in the economy, a firm can take advantage of them if its resources are versatile."

Further, since versatile resources have lower transaction costs in their structuring, bundling, and leveraging (Sirmon, Hitt, & Ireland, 2007), they enable firms to change more rapidly. The ability to quickly combine and recombine resources allows firms to adapt in rapidly changing environments (Kraatz & Zajac, 2001) and to swiftly pursue emergent opportunities (Sapienza, Autio, George, & Zahra, 2006). In contrast, resources that are not versatile (Barney, 1991) can only be used for specific initiatives and lock firms into set strategic directions (*cf.* Ghemawat, 1991). Barnean resources lose value over time because they are not easily reconfigured or put to new uses (Mauri & Michaels, 1998). For instance, reliance on existing knowledge over new combinations can create path dependencies, lead to an overemphasis on strategic search, and prevent the exploration of new growth opportunities (Katila & Ahuja, 2002; March, 1991)—especially during a recession in where firms need to act more quickly.

Therefore, this dissertation provides information regarding the versatility of different resources that combined create durability capabilities (Sutcliffe & Vogus, 2003). While there are different versatile resources, this dissertation considers generic resources as they can be readily utilized

across new ventures. Researchers suggests that these versatile, generic resources can be redeployed easily between uses within a firm (Nason & Wiklund, 2018). These generic resources include financial slack, entrepreneurial capital, human resources, and external social capital with a broader range of uses. These versatile resources make more strategic actions and opportunities available to the firm. Firm specific assets such as brands (Anand & Delios, 2002), reputation (Deepphouse, 2002), patent (Bogner & Bansal, 2007) and R&D (Bromiley, 1991) and experiential learning (Baum, Li, & Usher, 2000) limit exploitable opportunities and constraint strategic adaptation (Nason & Wiklund, 2018). Thus, although non-versatile resources generate a range of productive purposes such as allowing firms to diversify (Teece, 1982), internationalize (Kumar, 2009), and develop new lines of business (Anand & Singh, 1997), clearly these are useful contexts that go beyond the current study. Additionally, although researchers acknowledge the presence of individual-level resources (Luthar, Cicchetti, & Becker, 2000), prominent theories of stress (Bonanno, 2004; Hobfoll, 1989) propose that acquiring firm-level resources is likely to influence more positive adjustment to exogeneous challenges—*i.e.*, over and above trait-based attributes (Williams *et al.*, 2017). Thus, this dissertation in line with Williams *et al.* (2017) and others (Bradley *et al.*, 2011; Lai *et al.*, 2016) suggests that it is the configuration of versatile (generic) resources that are more important to enable adaptability and positive functioning in the face of a major environmental shock. Hence, the decision to include versatile resources in this study is driven by an understanding of the nature of how these organizational attributes may facilitate the creation of durability capabilities in the face of exogeneous economic pressures.

## **Financial Resources**

Empirical research indicates that the level of excess liquid assets or financial slack that is available to a new venture will be associated with lower rates of failures during an economic shock (Bradley *et al.*, 2011; Lai *et al.*, 2016; Pal *et al.*, 2014). Indeed, financial slack reduces the risk of firm failures because it buffers the firm against performance shortfalls when the environment shifts (Bourgeois, 1981; Iyer & Miller, 2008). To new ventures, financial slack thus represents the means to withstand economic jolts, signals stability and wealth security, and provides the resource efforts to pursue opportunities (*e.g.*, Bromiley, 1991; Carmeli & Markman, 2011; Iyer & Miller, 2008; Kraatz & Zajac, 2001; Virany *et al.*, 1992). According to this view, financial slack provides maneuvering room that reinforces clinging to the status quo (Hitt, Hoskisson, & Ireland, 1994; Kraatz & Zajac, 2001) and should then play a decisive role for choosing a particular type of firm action in the face of an economic recession (Arrfelt, Wiseman, & Hult, 2013). For example, Gittell *et al.* (2006) investigated the resilience of the airline industry after the September 11<sup>th</sup> terrorist attack in the United States and found that airlines with strong financial buffers adjusted to the strains imposed by the adversity and performed better than their less well-off counterparts. Similarly, Bardley *et al.* (2011) found in a sample of Sweden new ventures that financial slack reduces hazard rates of a major economic shock on new venture survival. Further, Chakrabarti (2015) found that financial slack facilitated the transition from retrenchment to growth during an economic shock.

### **Entrepreneurial Capital**

Entrepreneurial capital is defined” as a multiplicative function of entrepreneurial competence and entrepreneurial commitment” (Erikson, 2002). Entrepreneurial capital helps entrepreneurs to apply and manage what they know in the face of adversity (Ulrich, 1998). Entrepreneurial capital

represents generic knowledge, commitment, and aspirations that can easily redeploy with a broader range of uses (Becker, 1993; Castanias & Helfat, 2001). Entrepreneurial capital plays a key role in shaping entrepreneurs' strategic actions for their new ventures, so they can maintain or resume functioning during adversity (Lengnick-Hall et al., 2011). Entrepreneurial capital becomes partly idiosyncratic given that it reflects goals and perceptions concerning resource deployment, acquisition, and combinations (Kor & Leblebici, 2005). Entrepreneurial capital shapes the key assumptions and heuristics that entrepreneurs use to make sense of potential disruptions in their external environment (Lengnick-Hall & Beck, 2005; Korr & Mesko, 2013; Weick, 1995). For example, Williams and Shepherd (2016) found that entrepreneurial capital facilitated action in the aftermath of a major environmental shock, suggesting that various forms of entrepreneurial capabilities influence resiliency. Thus, the possession of entrepreneurial capital helps entrepreneurs interpret and navigate their environments and is crucial in directing attention (Weick & Sutcliffe, 2006, 2015).

## **Human Resources**

Human resources involve action alternatives and firm behavior and process that provide incentives and motivation to employees to meet organizational goals. Human resource strategies (HRS), in part, include incentives, stock options, bonuses, and compensation schemes (Jiang, Lepak, Han, Hong, Kim, & Winkler, 2012; Lepak, Liao, Chung, & Harden, 2006). Laursen and Foss (2003) argue that appropriate HRS have an important relationship with firm performance because they are designed to direct effort (Batt, 2002; Becker & Gerhart, 1996) and align employees' goals with those of the organization (*e.g.*, Appelbaum, Bailey, Berg, & Kalleberg, 2000; Gardner, Wright, & Moynihan, 2011)—especially in the face of adversity. For example,

Lai *et al.* (2016) found that HRS are particularly critical to new ventures during economic hardship because they facilitate employee engagement and commitment, provide incentives to retain their workforce and reduce layoffs, and avoid extra recruitment costs. Lai *et al.* (2016) suggests that entrepreneurs react to environmental uncertainty by taking actions that emphasize short-term terms and conditions of employment that can be adjusted at low cost in the case of changed circumstances. Because HRS are important to manage the boundary between the firm (*e.g.*, profitability) and its customers (Batt, 2002), efforts directed to retain and protect the firm's workforce in turn increases a firm's capacity to achieve desirable outcomes (Mishina, Pollock, & Porac, 2004).

### **Social Capital**

Social capital—or the internal and external connections that enable access to and exchange of resources (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998)—are instrumental to entrepreneurs' dominant logic for a firm. Social capital refers to the extent to which entrepreneurs utilize social connections or network ties to access needed resources (De Carolis & Saporito, 2006). Indeed, there is a common practice to refer to social capital in terms of the nature of the relationships through which resources are expected to be derived (Gedajlovic, Honig, Moore, Payne, & Wright, 2013). Interactions with internal and external network members impact how entrepreneurs perceive and interpret information about the external environment and evaluate what could be achievable by their new ventures (Barney & Hansen, 1994; Wernerfelt, 1984). In the presence of the overwhelming amount of information entrepreneurs often receive from the environment (Walsh, 1995), conversations and resources committed from inside (family and friends) and outside investor ties (financiers in the form of angels, venture capitalists, and

government) help entrepreneurs coordinate efforts efficiently and coherently (Dyer & Singh, 1998; Gittell, 2008; Hillman & Dalziel, 2003; Mintzberg, 2009). Thus, by providing knowledge, resources and interpretive lenses, entrepreneurs' investor ties play an important role in shaping immediate actions (Coleman, 1988; Nahapiet & Ghoshal, 1998); ultimately, enabling positive functioning amidst adversity (Pal *et al.*, 2014). For example, Shepherd and Williams (2014) found that social relationships among disaster-impacted community members were critical in response to adversity; when the disaster hit, those who had network relationships were better financially positioned to disaster victims, which enabled a more immediate and effective response to the widespread suffering.

In sum, all these findings highlight the notion that resources need to be interpreted, used, and then transformed, or else they may be detrimental to functioning (Hobfoll, 1989). Yet as Linnenluecke (2015) pointed out, there is a need for using a configuration approach given that there are limited insights regarding the configurations of resources that may translate in durability capabilities and they may even perform and operate differently across the population of new ventures (Adner & Helfat, 2003). In an effort to further build theory around durability capabilities in new ventures (Williams *et al.*, 2017), this study focuses on the integration of the configuration approach (*e.g.*, Meyer *et al.*, 1993; Miller, 1996) as a theoretical alternative to study configurations of resources that may result in durability capabilities during an economic shock.

### **Configuration Approach**

Configuration approaches are well suited to investigate durability capabilities, as they complement process-based and linear estimation models (Meyer, Gaba, & Colwell, 2005). For example, while process models on durability capabilities (Williams *et al.*, 2017) are best at explaining how the phenomena unfold over a sequence of steps, they are less suited to investigating interaction effects of the multiple system elements. Additionally, linear estimation models (*e.g.*, Bradley *et al.*, 2011) are well suited to explain outcomes of predictor variables, however, are restricted in explaining changes within system elements (their varying levels) and their interrelationships (their multiple types). Put differently, process and linear estimation theoretical models do not align with a reality of what often occurs in firms during adversity: a major shock affects not only one-single part of the firm but by the firm-as-a-whole (Horne & Orr, 1998). Thus, when the shock occurs, the firm responds as-a-whole, rallying elements all at once to face a threat (James & Wooten, 2010; McFarlane & Norris, 2006; Williams *et al.*, 2017).

Configurations can be conceptually or empirically driven. Previous research differentiates between typologies (conceptual frameworks that are hard to test) and taxonomies (empirically driven but lack underlying theory) (Cardinal *et al.*, 2010; Doty *et al.*, 1993). In line with Meyer *et al.* (1993) and others (Cardinal *et al.*, 2010; Hambrick, 1983; Miller, 1996), this study uses the term configuration as a concept that is empirically derived in a taxonomy. Accordingly, this study leverages on taxonomy to better understand the combinations of a firm's elements (types and levels of resources) and how the resulting configurations of durability capabilities lead to performance outcomes during adversity. Therefore, this dissertation posits that the empirically driven *taxonomy* has the potential to advance durability capabilities research significantly.



The durability capabilities construct revolves around how new ventures integrate different resources and ultimately achieve organizational fit. A taxonomy is a specific form of configuration based on causal variables that generate an outcome of interest (Cardinal *et al.*, 2010). Thus, the nature of a taxonomy connects the idea of mutual causality of system elements to their context, making them appropriate to middle-range, context-sensitive (rather than universal) theories—which is appropriate for durability capabilities thinking (*e.g.*, Linnenluecke, 2015). The use of a taxonomy of durability capabilities may also add nuance to the recent calls about whether firms’ strategic actions in combination are important factors for the continuation of a new venture when their external environment shifts (*e.g.*, Josefy *et al.*, 2017). In addition, the use of a taxonomy may help to understand whether a firm’s resource base is an appropriate versatile criterion to explain durability capabilities in the face of adversity. Resource versatility posits that generic resources are associated with versatility as they offer a relatively broad range of potential services. A taxonomy thus allows for assessing the complex interconnectedness of multiple resource elements (Meyer *et al.*, 1993).

Given the discussion of configurations presented above, note that both endogenous and exogenous forces are being constantly applied to firms and thus are said to be consistently similar along common dimensions (DiMaggio & Powell, 1983). Drawing from the strategic group literature (*e.g.*, Cool & Schendel, 1987), firm-level characteristics and environmental factors affect the creation of groups of firms and thus tend to center around key themes. As with many of the studies, the first step in a taxonomy is to establish configurations of firms to study—this is mainly dependent on the variables used. In the following section, this study discusses

more squarely the underlying logic used to develop an empirically derived taxonomy of new ventures based on durability capabilities.

### **Toward an Empirical Configuration of Durability Capabilities**

Entrepreneurship research has a long history of using configurational approaches. Table 6 shows the overall use of configuration approaches in strategic entrepreneurship literature. Similarly, Table 7 shows the overall associations that exist between configurations (around a central theme) and firm performance outcomes. Much of the background information presented here is used to illustrate, inform, and offer a more detailed explanation of the relevance of a taxonomy of new ventures based on durability capabilities, which to date remains absent in the literature.

Accordingly, several variables may affect an entrepreneur's decision to adopt a specific configurational action during a specific point in time. This study examines configurations of durability capabilities that are based on (1) type and (2) level of resources owned during a global economic recession. After an entrepreneur has decided to approach a recession both with type and level of resources, her or his next decision relates to the specific, 'tactical' configurations she or he should employ as a 'strategy.' In traditional strategic management literature 'strategies' are more long term and involve VRIO resources (Barney, 1991; Hillman & Hitt, 1999). 'Tactics,' however, generally refer to short-term activities designed to fine-tune strategy, and they involve more general and versatile resources (Penrose, 1959).

Table 6: Studies in Entrepreneurship Research Using the Configuration Approach

Authors	Variables				Sample	N
	Person	Structure	Strategy	Environment		
Gartner <i>et al.</i> (1989)	✓	✓	✓	✓	Startups	106
Khan and Manopichetwattana (1989)	✓	✓	✓	✓	SMEs	50
Woo <i>et al.</i> (1991)	✓	✓			Entrepreneurs	510
Carter <i>et al.</i> (1994)		✓	✓	✓	New Ventures	2,653
Julien and Raymond (1994)		✓	✓	✓	SMEs	79
Ostgaard and Birley (1994)	✓	✓	✓		New Ventures	143
Borch <i>et al.</i> (1999)	✓	✓	✓	✓	SME	660
Mitra and Pingali (1999)	✓	✓	✓		SMEs	40
Paige and Littrell (2002)	✓		✓		SMEs	50
Heirman and Clarysse (2004)	✓	✓	✓	✓	Entrepreneurs	510
Khelil (2016)	✓		✓		Entrepreneurs	44

Table 7: Studies in Entrepreneurship Research Linking Configurations and Firm Performance

Authors	Variables				Sample	N	Time Frame	Firm Performance
	Person	Structure	Strategy	Environment				
Filley and Aldag (1978)	✓	✓	✓		SMEs	85	Cross-sectional	Growth
Lafuente and Salas (1989)	✓	✓	✓		Entrepreneurs	360	Cross-sectional	Profitability/Growth
Birley and Westhead (1990)	✓	✓			SMEs	222	Cross-sectional	Size
Conant et al. (1990)		✓	✓		SMEs	150	Cross-sectional	Profitability
Covin et al. (1990)		✓	✓	✓	SMEs	57	Cross-sectional	Subjective Performance
Hanks et al. (1993)		✓			SMEs	126	Cross-sectional	Profitability
Merz et al. (1994)		✓	✓		SMEs	216	Cross-sectional	Sales Growth
Stearns et al. (1995)		✓	✓	✓	New Ventures	2,653	Longitudinal	Survival
Westhead and Birley (1995)	✓	✓			SMEs	95	Longitudinal	Survival
Dess et al. (1997)		✓	✓	✓	SMEs	32	Cross-sectional	Relative Performance
Bantel (1998)			✓	✓	New Ventures	162	Cross-sectional	Subjective Performance
Covin et al. (1999)		✓	✓	✓	New Ventures	103	Cross-sectional	Sales Growth
Ferreira (2000)		✓			SMEs	65	Cross-sectional	Profitability
Miller and Besser (2000)	✓		✓	✓	SMEs	844	Cross-sectional	Subjective Performance
McMahon (2001)		✓			SMEs	871	Cross-sectional	Profitability
Miller et al. (2001)	✓		✓	✓	SMEs	384	Cross-sectional	Subjective Performance
Beneito (2002)		✓	✓	✓	SMEs	1,488	Cross-sectional	Innovation
Kessler and Hienerth (2002)	✓	✓	✓	✓	New Ventures	918	Cross-sectional	Subjective Performance
Meijaard et al. (2002)		✓	✓	✓	SMEs	1,411	Cross-sectional	Sales Growth/Profitability
Barth (2003)		✓	✓	✓	SME	171	Cross-sectional	Sales Growth
Korunka et al. (2003)	✓	✓	✓	✓	Nascent	287	Cross-sectional	Multiple Indicators
Mugler and Kessler (2004)	✓	✓	✓	✓	New Ventures	1,405	Cross-sectional	Subjective Performance
Unger and Frese (2005)	✓	✓	✓	✓	SMEs	102	Cross-sectional	Growth/Size
Wiklund and Shepherd (2005)		✓	✓	✓	SMEs	413	Cross-sectional	Multiple Indicators
Frank et al. (2006)		✓	✓	✓	SME	85	Cross-sectional	Relative Performance

Unfortunately, prior research shows that there are many different configurations of resources with little empirical examination of tactics, as noted in Tables 6 and 7. Moreover, many researchers limit their examination of surviving and thriving during a recession by pursuing resource strategies in isolation from one another rather than simultaneously (Bradley *et al.*, 2011; Lai *et al.*, 2016); and thus fail to provide a list of resource tactics. The theoretical underpinnings that differentiate resource strategies from tactics (Barney, 1991; Penrose, 1959) have not been explored during a recession (Nason & Wiklund, 2018). Therefore, this study argues that resource tactics in the face of a recession involve a complex set of configurations that may result in multiple, distinct durability capabilities (as strategies) for new ventures. After an entrepreneur decides to take action in the face of hardship, the next question is ‘How?’

The goal in this dissertation is to highlight the importance of durability capabilities to a new venture’s survival and performance outcomes and to describe the potential new ventures have to shape strategic formulation, thereby shaping their strategic implementation that will result in better or worse firm performance. Given that prior literature has devoted little attention to configurations of durability capabilities, no general model of strategy formulation for surviving and thriving in the face of hardship has been proposed in the entrepreneurship domain, and no specific variables that may affect these configurational choices have been identified in the OR literature. Thus, our first goal is to contribute to the field by developing and presenting a configurational model and identifying such variables. Based on the extensive literature review conducted up to date, this study has found no prior research containing dialogue of the material

on the present discussion, yet new ventures have distinct resources that point to their distinctiveness. Thus, this dissertation adds value by drawing on a set of resource tactics (both unique and versatile) that are likely to affect the choice of distinct strategic configurational clusters of firms. Therefore, although the resource tactics related to durability capabilities have theoretical foundations (Barney, 1991; Penrose, 1959), they also serve as the basis for the empirical examination of a taxonomy of durability capabilities (Williams *et al.*, 2017). To this end, no taxonomy of durability capabilities exists in both, strategic entrepreneurship and management literature. Also, this dissertation goes beyond the empirically driven taxonomy by developing observed associations regarding variables that cluster around specific configurations of durability capabilities and are likely to affect survival and performance during a major economic recession.

In short, how resources effectively combine a bundle that may result in durability capabilities is a complex issue. Following Aguilera *et al.* (2008, *p.* 484), it is perhaps not surprising that “combinations [*of capabilities*] remain to be systematically theorized” (*emphasis added*). This dissertation now turns to such a theory-building effort by exploring the three main questions (highlighted in the present study) through a taxonomic analysis of how the specified configurations of resources operate to generate durability capabilities among new ventures. As noted, there are few studies that are specifically devoted to differentiating between various configurations across the landscape of new ventures. Because the paucity of theory and empirical work dedicated on this area, strategic entrepreneurship researchers are largely left-skewed in

assumptions about the groups of new ventures that exist based on durability capabilities; thus, little is known about whether—how and why—they differ from one another. Our study is exploratory in nature in regard to our core objectives.

Based upon the literature reviewed and the framework developed in the previous sections, a general model of configurations of new ventures based on durability capabilities and their subsequent association with survival and firm performance is given in Figure 6. Following the taxonomic approach, the empirical explorative analysis is conducted in three stages (see Sanchez-Ruiz, Daspit, Holt, & Rutherford, 2019). The first step begins by using a two-step cluster analysis technique using both hierarchical clustering and *k*-means cluster analysis. These analyses allow for the identification of empirically derived clusters of new ventures based on durability capabilities. In the second step, while cluster analysis provides established techniques for identifying groups with similar characteristics along the specified cluster variables, it is not necessarily meant to test hypotheses regarding the associations between clusters and outcomes. Therefore, this study examines the significance of the clusters using a series of separate analysis of variance (ANOVA) tests. Last, this study applies a multivariate analysis of variance (MANOVA). This allows revealing differences between the types and levels of variables associated with each cluster of durability capabilities.

Configurations of Durability Capabilities

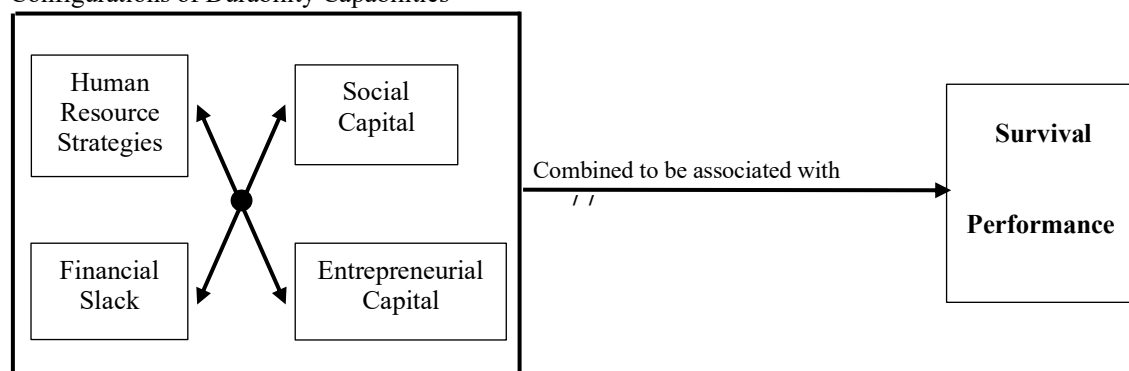


Figure 6. Configuration—Performance Model

### Summary

In summary, this chapter began with an overview of relevant theoretical frameworks used to examine configurations of new ventures based on durability capabilities. The justification was offered for the selection of OR as an appropriate theoretical framework for analyzing phenomena in the context of a major environmental shock. The evolution and nature of organizational capabilities were then discussed to provide an overview of the theoretical development of the study of durability capabilities. Given that research on capabilities is expansive, and numerous definitions have been used in the literature, a review of relevant definitions was presented. Then, common characteristics that exist between dynamic capabilities and durability capabilities were discussed. Durability capabilities were identified as a first-order (dynamic capability), and the scope of this investigation was limited to the examination of durability capabilities. Dynamic and durability capabilities differ in scope and context. Thus, indicating the appropriateness of using the construct of durability capabilities in the present dissertation. Next, various categories of resource tactics were reviewed using a typology of durability capabilities presented by Williams *et al.* (2017). Then, a synthesized review of the configuration approach was offered that includes the most frequent studies in strategic entrepreneurship research that deal with configurations.



To address the three main research questions of the present dissertation: (1) Are there identifiable configurations of new ventures based upon type and level of durability capabilities? (2) What is the ontological nature of these configurations of durability capabilities? (3) Are these configurations of durability capabilities differentially related to new venture survival and performance during an economic recession? A rationale was offered for arguing the need of a theory-building effort by exploring these research question through a taxonomic analysis of new ventures based on durability capabilities (that centered and build on a firm's resource base). Next, the influence of the resulting taxonomy on new ventures performance outcomes was proposed. In the next chapter, the empirically derived taxonomy is used to examine the specific clusters of new ventures and their performance implications during a global economic recession.

## CHAPTER III

### METHOD

#### **Overview**

This investigation focuses on understanding how configurations of durability capabilities shape new ventures' survival performance outcomes during an economic recession. In an attempt to address that broad research question, this study attempts to develop an empirically based taxonomy of new ventures based upon durability capabilities and to explore their subsequent implications on new venture survival and performance. Thus, three basic research questions are addressed:

- (1) Are there identifiable configurations of new ventures based upon type and level of durability capabilities?
- (2) What is the ontological nature of these configurations of durability capabilities?
- (3) Are these configurations of durability capabilities differentially related to new venture survival and performance during an economic recession?

In generating a general taxonomy of new ventures, broad combinations of durability capabilities may be possible. Here, several researchers have used contingency-based reasoning (e.g., McKelvey, 1982; Mohr, 1982; Drazin & Van de Ven, 1985) to argue that new ventures during a recession can maximize strategic-resource 'fit' and hence achieve survival and performance (Bradley et al., 2011; Lai et al., 2016). A firm's resource base would presumably consist of

multiple bundles of resources influencing performance advantages (Barney, 1991; Penrose, 1959). However, not all new ventures may be in a position to configure their resource base. Indeed, resource constraints may encourage new ventures to pursue a number of reasonable configurations of resources and capabilities during challenging conditions (Baker & Nelson, 2005; Teece et al., 1997). Hence, a new venture has varying levels of resources and capabilities. These heterogeneous effects of durability capabilities in survival and firm performance have never been explored in a global recession context.

In this chapter, the sample and context used for the study is first described. Following the description of the sample and context, the constructs and measures are then described and discussed. Specifically, each construct and dimension are operationalized. Then, the research design is reviewed, which includes the method used in this dissertation study. The data for the study is drawn from the Kauffman Firm Survey (KFS). The KFS is analyzed to explore the creation of a taxonomy. Finally, the analytical procedure for this study is outlined.

### **Sample and Data**

The sample used in this study is taken from the KFS. The KFS was conducted during 2004–2012 from the core population of national businesses registered as newly formed businesses in the Dun and Bradstreet (D&B) database. The specific sample of new ventures used in the KFS, consisting of 4,928 firms, was identified through two systematic inclusion criteria. First, the analysis includes firms that were started as independent business. In other words, the analysis excluded businesses that were started as a branch or a subsidiary owned by an existing business, that were inherited, or that were created as a not-for-profit organization. Additionally, to be inclusive of

new and independent firms, the KFS included businesses that have a valid business legal status (sole proprietorship, limited liability company, subchapter S corporation, C-corporation, general partnership, or limited partnership) and at least have one of the following activities: (1) employer identification number and (2) report business income. Second, the KFS primary sampled new ventures in the high-technology and medium-technology industries; comprising 80% of the entire sample. Table 8 provides a useful specification of high- and medium-tech industries in the U.S. A two- and three-digit SIC is utilized to isolate those industries with high and moderate levels of industrial and technology development (Bell, Moore, & Filatotchev, 2012; Moore, Bell, & Rasheed, 2012).

The present study focused on new ventures operating in 22-high and medium-tech industries—representing 3,869 firm observations— “to provide reasonably similar context for firms but also to be broad enough for results to be generalizable” (Slater & Olsen, 2001, *p.*, 1058). This is important because prior empirical studies using the taxonomic approach (*e.g.*, Ketchen & Shook, 1997; Payne, 2006) have provided actionable recommendations to researchers, indicating to focus on firms operating in similar industries. By doing so, the firms assessed are more likely to exhibit the importance that they attach to their strategic actions in a more similar fashion and, thus, should be more reliable informants (Slater & Olsen, 2001). This procedure allowed to control for potential agglomerations of firms based on industry (Ketchen *et al.*, 1993). In that way, the resulting clusters of new ventures are likely to closely resemble configurations based on the variables of interest. Additionally, high- and medium-tech orientated firms are likely to have a more theoretical fit with a resource base that is more compatible with growth (Nason & Wiklund, 2018; Nuscheler, Engelen, & Zahra, 2019; Deeds, DeCarolis, & Coombs, 2000).



Table 8. High- and Medium-Tech SIC Codes

	<b>2 Digit SICs</b>	<b>Industry</b>
High Tech (two-digit SIC)	28	Chemicals and allied products
	35	Industrial machinery and equipment
	36	Electrical and electronic equipment
	38	Instruments and related products
Medium Tech (three-digit SIC)	131	Crude Petroleum and natural gas operations
	211	Cigarettes
	229	Miscellaneous textile goods
	261	Pulp mills
	267	Miscellaneous converted paper products
	291	Petroleum refining
	299	Miscellaneous petroleum and coal products
	335	Nonferrous rolling and drawing
	348	Ordnance and accessories, not elsewhere classified
	371	Motor vehicles and equipment
	372	Aircraft and parts
	376	Guided missiles, space vehicles, parts
	379	Miscellaneous transportation equipment
	737	Computer and data processing services
	871	Engineering and architectural services
	873	Research and testing services
	874	Management and public relations
899	Services, not elsewhere classified	

As noted, this study draws its sample from the KFS. This annual survey results are available for the baseline start-up year (2004) and eight follow-up years (2005–2012). The KFS represents the largest and the most comprehensive database on U.S. start-up firms. Although the KFS focuses solely on one cohort panel of entrepreneurial firms, by starting from a firm’s startup stage, this study minimizes left censoring issues such as survivor bias. Further, the KFS is an ideal dataset that strengthens this study’s design because it captures the effects of the recent global economic recession on new ventures, that otherwise would be impossible to measure without going back in

time. Similarly, the richness and detailed information of the KFS data allows this study to identify and test relationships of the measures and the outcomes of interest.

### **The Economic Recession Context**

The context of this study is therefore the great economic recession. The recent global economic recession began toward the end of 2007 and continued through mid-2009. The recession in worldwide markets affected U.S.'s high- and medium-tech sectors (Chen & Miller, 2010). According to data from the World Bank, the U.S. GDP growth rate, which was approximately three percent during 2005-2007, declined to zero percent in 2008 and turned negative in 2009, see Figure 7. Furthermore, during the year 2008 alone approximately \$17.6 trillion in market capitalization was lost in the U.S. (-43 percent) (Bamiatzi *et al.*, 2016). In particular, the U.S. economy suffered dramatic reversals in capital flows and synchronized recessions during the global crisis of 2008, resulting in widespread disruption in firm-level performance and elevated rates of firm failure (Chakrabarti, 2015), see Figure 8. Therefore, it becomes clear that the past economic recession had a severe impact across the global economy, slowing down global GDP, and costing over \$24 trillion in market capitalization across developed countries (Bamiatzi *et al.*, 2016; Chen & Miller, 2010). For the purpose of the empirical analysis, this study follows management research that considers the cut-off of the past global recession as between 2008 and 2010 (Bradley *et al.*, 2011; Bamiatzi *et al.*, 2016; Chakrabarti, 2015).

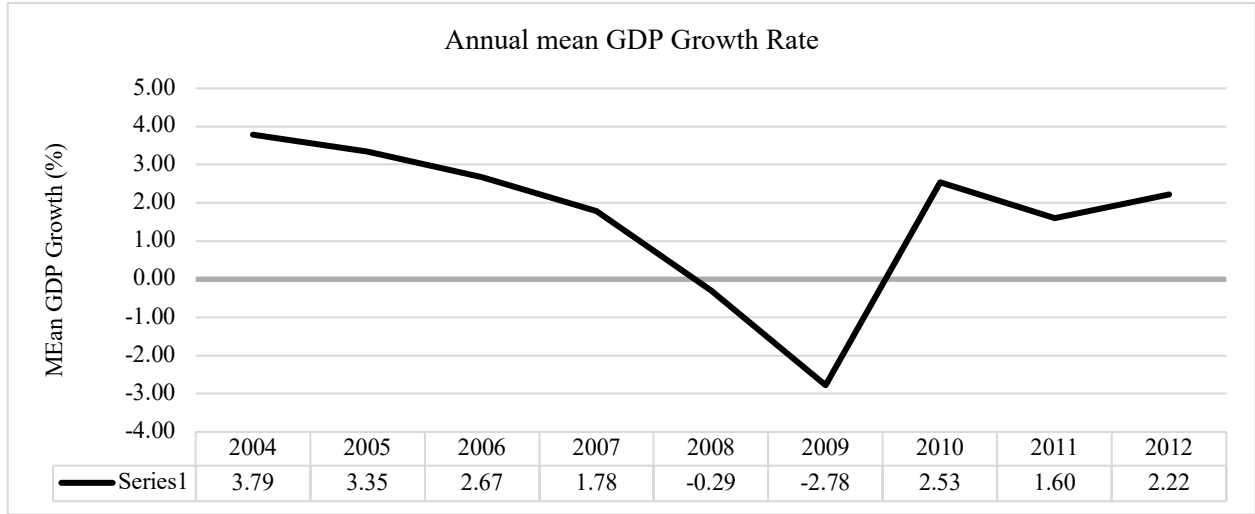


Figure 7. Decline in U.S. GDP During the Past Economic Recession.

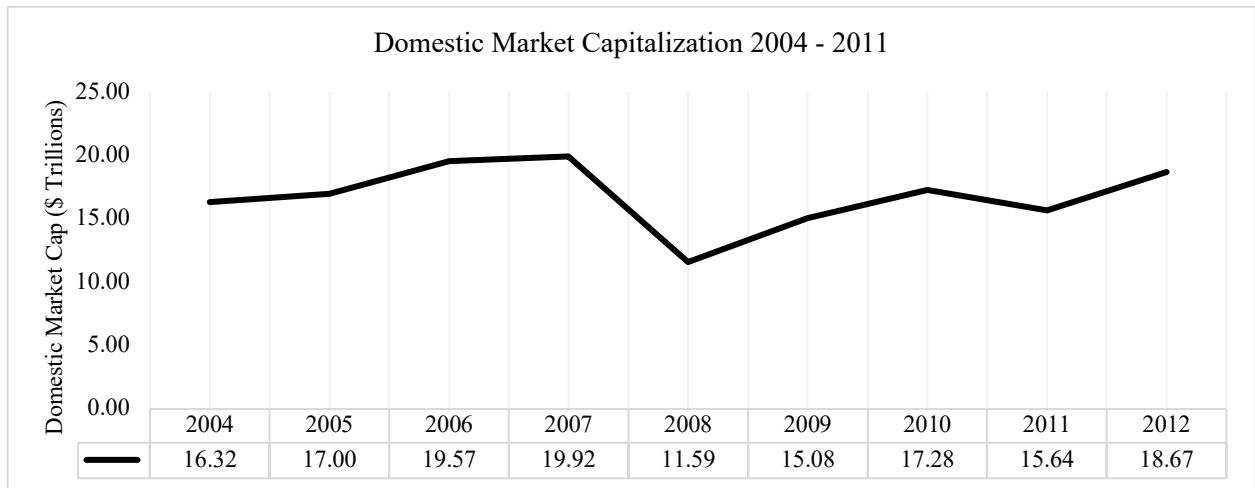


Figure 8. Decline in U.S. Market Capitalization During the Past Economic Recession.



Consistent with research focusing on the effects of the past global economic recession on new ventures (e.g., Bradley *et al.*, 2011; Davidsson & Gordon, 2015; Lai *et al.*, 2016; Latham, 2009; Pal *et al.*, 2014; Powell & Baker, 2014; Smallbone *et al.*, 2012), this study explores the configurations of durability capabilities and their implications for new ventures operating in high- and medium-tech industries in the U.S. economy. This study examines configurations of durability capabilities one-year before the global economic recession (KFS, 2007). With this in mind, this study captures the stability of the firm's resource base and its growth during the first critical years of the firm's operations. Accordingly, this study captures the outcome variables at the end of the next year (i.e., KFS, 2008). That is to avoid unwanted biases in the data. Further, and following the advice of Cole and Sokolyk (2017) using the KFS, it is likely that a firm performance measurement becomes stronger three or four years after startup. That is because new ventures must typically reach a modicum of legitimacy (Rutherford, Tocher, Pollack, & Coombes, 2016), whereby firms are able to attract stable resources and thus entrepreneurs are likely to make informed decisions about the appropriateness of resource levels. Taken all together, this study ensures that a new venture qualifies as part of the inclusion and exclusion criteria of being new and independent, participating in high- and medium tech sectors, and context-specific.

### **Constructs and Measures**

To measure the clustering variables, this study employs previously validated measures, most of which are drawn from the context of an economic recession. In addition, this study conducted a pilot of 15 highly informative field-based interviews with entrepreneurs who were running a business during the great economic recession and survived. The archival measures for the

clustering variables were revised based on the feedback provided in the pilot stage and the insights were used to reduce researcher's biases in measurement selection but, more importantly, ensured that measures were substantive and operationally appropriate to the context of this study. In this way, the pilot provided information, strength, and support the broad focus on proxies reflecting generic resources, as they were theoretically derived. The pilot also provided information on one outcome variable that has rarely been used in the context of an economic recession, namely entrepreneurial exit strategies (*e.g.*, merger and acquisition and sale of a business). In addition, entrepreneurs who survived the recession reflected that specific resources such as technology (patent and R&D), prior work and entrepreneurial experience, and routines and established activities (dynamic capabilities) had little to do with surviving a recession. Therefore, this study's theoretical considerations were supplemented by the suggestions of expert entrepreneurs who did survive the past great recession. This extra effort gets this study closer to reflect the reality of managing during economic adversity. Additionally, though the use of proxies for durability capabilities possess the issues of all archival measures (*e.g.*, Aguinis & Edwards, 2014), this study follows Ketchen, Ireland, and Baker's (2012) two 'actionable suggestions' for improving the use proxies: (1) this study uses measures that have been extensively used in the past; and (2) this study provides sound logic for and empirical validation of the proxies. In addition, the measures employed here have an essential advantage over other measures used in the literature as they are available as eight continuous years for a single cohort, which allows to assign each observation the value pertaining to the year of firm birth. In the subsequent lines, the proxies used in the study are described and discussed; and in the next section, explanations about data preparation are discussed (*e.g.*, normality, transformations, and outliers).

## Outcome Variables

**Survival.** The new venture survival construct is measured using a previously validated measure (see for a review on survival, Josefy *et al.*, 2017). New venture survival is coded “1” if a new venture survives during the time period studied and “0” otherwise. Failures include completed bankruptcies, completed liquidations, closures based on company request, and merger or acquisition of organizations at risk of bankruptcy (Bradley *et al.*, 2011; Carroll & Hannan, 1989).

$$\text{Firm Survival} = \begin{cases} 0 & \text{if a new venture failed or closed during a recession} \\ 1 & \text{if a new venture continued operations during a recession} \end{cases}$$

**Sales Revenue.** The sales revenue construct is measured using a previously validated measure by Cole and Sokolyk (2017) as the natural logarithm of one plus the level of revenue of firm (from sales of product or service). This study adds one to the level of sales revenue before taking the natural logarithm to avoid creating a missing value for a firm with zero level of sales revenue.

$$\text{Sales Revenue} = \log (\text{Sales Revenue} + 1)$$

**Profitability.** Profitability is measured using the ratio of return on assets (ROA) by following Rutherford, Coombes, and Mazzei (2012). ROA is obtained by dividing a firm’s net income by its total assets. A natural logarithm transformation of one plus the level of ROA is used to normalize this variable.

$$\text{Profitability} = \frac{\text{Net Income}}{\text{Total Assets}} = \text{ROA} = \log (\text{ROA} + 1) * 100$$

**Growth.** The sales growth performance measure is fashioned as indicated by Rutherford et al. (2012). Growth performance is calculated by using the difference in year-to-year revenue. A natural logarithm of one plus the level of sales growth of firm is used to normalize this variable.

$$\text{Year-over-year Growth} = \frac{\text{Total Revenue } (t) - \text{Total Revenue } (t-1)}{\text{Total Revenue } (t-1)}$$

**Entrepreneurial Exit Strategies.** Entrepreneurial exit is defined as the strategies “by which the founders of privately held firms leave the firm they helped to create; thereby removing themselves, in varying degree, from the primary ownership and decision-making structure of the firm” (DeTienne, 2010, p. 203). Entrepreneurial exit incorporates strategies including merger and acquisition and sale to a third party (DeTienne & Cardon, 2012; Wennberg & DeTienne, 2014; Wennberg, Wiklund, DeTienne, & Cardon, 2010). These two measures of entrepreneurial exit are used in the analysis in the following manner: Merger and acquisition is coded “1” if a new venture is identified to take this route during the time period studied and “0” otherwise. Sale of a business is coded “1” if a new venture is identified to take this route during the time period studied and “0” otherwise.

$$\text{Merger \& Acquisition} = \begin{matrix} 0 & \text{if a new venture does not take this route during a recession} \\ 1 & \text{if a new venture takes this route during a recession} \end{matrix}$$

$$\text{Sale of a Business} = \begin{matrix} 0 & \text{if a new venture does not take this route during a recession} \\ 1 & \text{if a new venture takes this route during a recession} \end{matrix}$$

### Clustering Variables

**Financial Resources.** Firm financial resources represent multi-dimensional measures. Prior strategic entrepreneurship research (Bradley *et al.*, 2011; Lai *et al.*, 2016; Pal *et al.*, 2014; Powell & Baker, 2014; Smallbone *et al.*, 2012; Williams *et al.*, 2017) argues that the levels of financial slack that are available to a new venture are associated with lower rates of failures during an

economic recession. That is because the presence of excess financial resources leads entrepreneurs and managers with discretion to make decisions in the face of recessions (Harford, 1999). Following Bourgeois (1981) and Iyer and Miller (2008), financial slack is a multifaceted construct and consist of several proxies. Absorbed (recoverable) slack resources are less accessible resources that have already been absorbed as costs into operations (e.g., excess overhead costs), but can be recovered in the time of adversity (Bourgeois & Singh, 1983; Tabesh, Vera, & Keller, 2019). This is measured as the ratio of administrative expenses to sales. Unabsorbed slack resources are readily-available uncommitted resources, such as cash flows or liquidities, that can be easily recovered or assimilated into technical activities of the firm (Bourgeois & Singh, 1983; Tan & Peng, 2003). This is measured as the ratio of current assets to current liabilities. Finally, potential slack refers to the ability of firms to secure potential future resources (e.g., debt financing) in the external environment (Bourgeois, 1981). This is measured as the ratio of debt to equity (as an inverse indicator) (Iyer & Miller, 2008, *p.* 813).

$$\text{Absorbed Slack} = \frac{\text{Selling, General, and Administrative Expenses}}{\text{Net Sales}}$$

$$\text{Unabsorbed Slack} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Potential Slack (as an inverse indicator)} = \frac{\text{Debt}}{\text{Equity}}$$

**Entrepreneurial Capital.** Following Erikson (2002), entrepreneurial capital represents generic knowledge, commitment, and motivations of an entrepreneur that allows for taking action.

Entrepreneurial capital is measured using one indicator of human capital, general, by following previous validated measures (Becker, 1993; Unger, Rauch, Frese, & Rosenbusch, 2011) in the

context of an economic recession (Cole & Sokolyk, 2017). To model general human capital, the level of prior education of the primary owner or entrepreneur is calculated. Additionally, this study measures sweat equity as a proxy to entrepreneurial capital given that it represents the traditional approach for studying entrepreneurs' commitment to the firm (Smilor, 1997). Thus, this study measures the extent to which the primary owner commits time to her/his venture (Rutherford *et al.*, 2012). Last, motivations are central to understanding why entrepreneurs take action in the face of uncertainty (McMullen & Shepherd, 2006). Entrepreneurs direct attention based on motivational levels (Erikson, 2002; Khelil, 2015). Thus, the choices (act/forego) during economic adversity may be based on motivations, which may prompt entrepreneurs to respond in different ways. Thus, this study argues that a frame of reference for entrepreneurs is based on their motivational levels grounded on social comparison (median performance of competitors in industry) and historical performance (prior firm performance) (*adapted from* Carree & Verheul, 2012; Cooper & Artz, 1995; *and adopted from* Gomez-Mejia, Patel, & Zellweger, 2018)—both having ROA as a benchmark.

General Human Capital (education level) = 1 if some high school or less;  
 2 if technical, trade or vocational degree;  
 3 if bachelor's degree or less;  
 4 if master's degree or less;  
 5 if doctorate.

Sweat Equity = Average weekly hours worked by primary owner.

Motivation Level (historical) =  $ROA(t-1) - ROA(t)$ ; then coded as "0" if below level of historical aspiration and "1" if above level of historical aspiration.

Motivation Level (social comparison) =  $ROA(t) - \text{Median } ROA(t-1) \text{ Competitors } t-1$ ; then coded as "0" if below level of social

aspiration and “1” if above level of social aspiration.

**Human Resources.** Human resource strategies affect firm behavior and employee engagement in the presence of risks and hazards (Nahrgang, Morgeson, & Hofmann, 2011). HRS are directed to retain and protect the firm’s workforce (Boin, Hart, Stern, & Sundelius, 2005). This is important because a firm’s HRS have been proven to be advantageous when there is a need to respond quickly to market conditions and environmental uncertainty. For example, on the one hand, HRS offer job stability and compensation packages that attract recruitment, acting as incentives to protect employees’ interests and statutory rights during challenging times (Lai *et al.*, 2016). On the other hand, HRS facilitate new ventures to retain their workforce, in where layoffs are considerably higher than in large firms and consequently damage the stability of a firm during a recession (*e.g.*, Wright & McMahan, 2011). Thus, HRS represent multiple measures. As a result, prior studies have used many different proxies for HRS (*e.g.*, Bourgeois & Singh, 1983; Mahoney, 1995; Medsker, Williams, & Holahan, 1994). This study focuses on two validated measures of HRS that are said to be critical to firms’ responses to economic adversity. First, HRS is assessed with a measure proposed by Lai *et al.* (2016)—an index of eight HR policies on a binary scale. An overall score is created after calculating KR20 ( $\alpha = 0.76$ ). Second, and related to the above, this study examines the extent to which the firm experiences differences in year-to-year turnover (Lai *et al.*, 2016).

Human Resource Strategies (HRS) =  $\begin{cases} 0 & \text{if a new venture does not offer HRS to employees} \\ 1 & \text{if a new venture does offer HRS to employees} \end{cases}$

$$\text{Annual Turnover} = \frac{\text{Total \# of Employees } (t) - \text{Total \# of Employees } (t-1)}{\text{Mean \# of Employees } (t)} * 100$$

**Social Capital.** Firm social capital represents the internal and external connections that enable access to and exchange of resources (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998). When direct bootstrapping is not available, entrepreneurs build relationships and potential partners because they need third-party endorsements, who offer time, experience, and capital to the firm. Relying on network positions is a “second-best” approach to resolving risk and uncertainty (Podolny, 1994). Entrepreneurs rely on internal (family and friends) and external (financiers) sources of information, experience, and capital. That is because network collaborations foster the formation of a “defense” based on partners capabilities (Gulati & Gargiulo, 1999). At a more diffuse level (Friedkin, 1983), all the benefits (information, experience, and capital) gained from potential partners indicate some modicum of willingness to bear the risk and uncertainty—in the hope of improving performance during economic adversity. By following pre-existing and validated measures of social connections that commit capital and assistance to the venture (*e.g.*, Coleman, Cotei, & Farhat, 2010; Rutherford *et al.*, 2012; Robb & Robinson, 2014; Shepherd & Williams, 2014).

$$\text{Inside Investor Ties} = \frac{\text{Total Amount Invested (spouse, parents, and friends) + Total Amount Loaned (spouse, parents, friends, and employees)}}{\text{Total Firm Financial Capital (Debt + Equity)}}$$

$$\text{External Investor Ties} = \frac{\text{Total Amount Invested (angels, venture capitalists, government) + Total Amount Loaned (financial institution, other businesses)}}{\text{Total Firm Financial Capital (Debt + Equity)}}$$

Thus, after describing each measure that is relevant to this study and that will aid to the creation of an empirically driven taxonomy, Table 9 provides a summary of constructs and measures. In the next section, the analytical procedure will be discussed.



Table 9. Constructs, Proxies, Conceptualizations, and Measures

<b>Construct/Proxies</b>	<b>Conceptualization</b>	<b>Measures</b>
Firm Survival	Continuity of operations (Josefy <i>et al.</i> , 2017).	“0” if not “1” if yes
Sales Revenue	A firm’s net profit and loss (Cole & Sokolyk, 2017)	$\log(\text{Sales Revenue} + 1)$
Profitability	A firm’s net income generated from total assets (Cole & Sokolyk, 2017)	$\log(\text{ROA} + 1) * 100$
Growth	The expansion of the size of a business or firm over time (Rutherford <i>et al.</i> , 2012).	$[\text{Total Revenue}(t) - \text{Total Revenue}(t - 1)] / \text{Total Revenue}(t - 1)$
Entrepreneurial Exit	Strategies including merger and acquisition and sale to a third party (DeTienne & Cardon, 2012; Wennberg & DeTienne, 2013)	“0” if not merged or acquired “1” if merged or acquired  “0” if not sold or acquired “1” if sold or acquired
Financial resources	Absorbed Slack: Expenses from selling, general, and administrative to net sales (Bourgeois, 1981).	Selling, general, and administrative expenses / net sales
	Unabsorbed Slack: Current assets to current liabilities.	Current assets / current liabilities
	Potential Slack: debt to equity as an inverse indicator.	(inverse indicator) debt / equity
Entrepreneurial Capital	General human capital: Prior education of the primary owner or entrepreneur.	Education level: “1” if some high school or less; “2” if technical, trade or vocational degree; “3” if bachelor’s degree or less; “4” if master’s degree or less; “5” if doctorate.
	Sweat Equity: Commitment of the entrepreneur towards her/his business.	Average weekly hours worked by primary owner

	Motivation Level (historical ROA): Prior firm performance.	“0” if below level “1” if above level
	Motivation Level (social comparison): Median performance of competitors in industry.	“0” if below level “1” if above level
Human Resource Strategies	Human Resource Strategies: Actions directed to retain and protect the firm’s workforce.	“0” if not “1” if yes
	Employee Turnover:	$[\text{Total of employees } (t) - \text{Total \# of employees } (t - 1) / \text{Mean \# of employee}] * 100$
Social Capital	Internal Investor Ties: The amount of capital committed to the firm (spouse, parents, and friends).	$[\text{Total Amount Invested (spouse, parents, and friends)} + \text{Total Amount Loaned (spouse, parents, friends, and employees)} / \text{Total Firm Financial Capital (Debt + Equity)}]$
	External Investor Ties: The amount of capital committed to the firm (angels, VCs, banks, government).	$[\text{Total Amount Invested (angels, VCs, government)} + \text{Total Amount Loaned (financial institution, other businesses)} / \text{Total Firm Financial Capital (Debt + Equity)}]$

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### **Data Preparation**

Prior to the main statistical analyses, a series of modifications was performed to improve these data’s analyzability and predictability. Two statistical issues were addressed in the creation and use of the above measures and are discussed in this section. These two issues involve the normality of the data and address the presence and influence of outliers. These issues are related and involve a series of methodological treatments used to increase their utility and reliability.

## **Data Normality and Outlier Influence**

Statistical and visual tests (*e.g.*, Shapiro-Wilks' test, histograms, and stem-and-leaf plots) assessed that superimposing a normal distribution on the data values is of benefit to the KFS data used in this study. To obtain these normal probability plots, a Tukey's transformation was utilized. The Tukey's proportion estimation formula  $(r - (1/3)) / (n + (1/3))$  was used where  $n$  is the number of observations and  $r$  is the rank, ranging from 1 to  $n$ . Accordingly, log transformations were used to make variables less skewed and cases with the same values for a variable were centered to their mean of zero and a standard deviation of one.

In addition, cluster analysis in general tends to be sensitive to outliers (Ketchen *et al.*, 1996; Milligan & Hirtle, 2003; Punj & Stewart, 1983), this study eliminated 277 cases as outliers. Outliers or extreme observations beyond three standard deviations were considered to be highly influential and 277 cases were eliminated from the analyses. Last, missing values for some cases reduced the sample size for the clustering procedure. The final sample of new ventures that met the above criteria is 2,500.

## **Analytical Procedure**

This study uses a step-wise multiple approach to develop a taxonomy of new ventures based upon durability capabilities and testing its associations with firm outcomes during a recession. The first two-steps concern the selection of appropriate clustering methods (*i.e.*, the rules or procedures followed to sort observations) that are critical to the effective use of a taxonomy of durability capabilities (Punj & Stewart, 1983). There are two basic types of clustering algorithms: hierarchical and nonhierarchical (Ketchen & Shook, 1996). The third-step concerns

testing assumptions regarding mean differences between the clustering variables and the resulting clusters. This study uses multivariate analysis of variance (MANOVA) and analysis of variance (ANOVA). Step 4 consists of exploratory analysis to assesses the match of each configuration type to firm-level outcomes of interest. This study uses two well established techniques, (1) Least Significant Differences (LSD) and Chi-Square Tests, to detect significant differences (at  $p < 0.05$ ) between configurations of durability capabilities with their respective continuous and binary outcome variables.

### **Step 1: Hierarchical**

This study uses agglomerative hierarchical cluster analysis—*i.e.*, a step-wise clustering algorithm that builds a tree-like structure by adding elements (firms) into clusters. According to Kaufman and Rousseeuw (1990) and others (*e.g.*, Schaffer & Green, 1996), agglomerative hierarchical clustering methods begin with each observation's being considered as a separate group ( $N$  groups each of size 1). The closest two groups are combined ( $N - 1$  groups, one of size 2 and the rest of size 1), and this process continues until all observations belong to the same group. This process creates a hierarchy of clusters which serve as the basis for the specification of the number of clusters available in the sample. The five most popular agglomerative algorithms are single linkage, complete linkage, average linkage, centroid method, and Ward's method (Hair et al., 1992). The differences among them lie in the mathematical procedures used to calculate the distance between clusters (Ketchen & Shook, 1996). This study uses Ward's agglomerative method, which first treats each unit as its own cluster and computes the  $n \times (n - 1)/2$  distance across clusters.

Unfortunately, all hierarchical algorithms suffer from several problems. First, researchers often do not know the underlying structure of a sample in advance, making it difficult to select the ‘correct’ algorithm. Second, because of their hierarchical nature, these algorithms make only one pass through a sample, thus poor cluster assignments cannot be modified and eventually each observation starts as its own individual cluster. Finally, solutions are often unstable when cases are dropped (Jardine & Sibson, 1971). Because of these problems, after specifying the number of clusters that can be interpretable in a meaningful way, this study uses a  $k$ -means method (clustering procedure) that allows for case reassignment in each of the clusters identified.

## Step 2: $K$ -means

Nonhierarchical algorithms, also referred to as  $k$ -means or iterative methods, uses a squared Euclidean distance to place firms closest to the cluster center (centroid) with characteristics most similar to the grouping theme. The  $k$ -means clustering algorithm is as follows:

(1) Initialize cluster centroids  $\mu_1, \mu_2, \mu_3, \dots, \mu_k \in \mathbb{R}^n$

(2) Repeat until convergence: {

For every  $i$ , set

$$c^{(n)} := \arg \min_j \|x^{(i)} - \mu_j\|^2$$

(4) For each  $j$ , set

$$\mu_j := \frac{\sum_{i=1}^m 1\{c^{(i)}=j\}x^{(i)}}{\sum_{i=1}^m 1\{c^{(i)}=j\}}$$

Put differently,  $k$ -means partitions a dataset into a pre-specified number of clusters (Hair *et al.*, 1998). After initial cluster centroids are selected, each observation is assigned to the group with

the nearest centroid. As each new observation is allocated, the cluster centroids are recomputed. Multiple passes are made through a data set to allow observations to change cluster membership based on their distance from the recomputed centroids (Ketchen & Shook, 1996). To arrive at an optimal solution, passes through a data set continue until no observations change clusters (Anderberg, 1973).

Nonhierarchical methods have two potential advantages over hierarchical methods (Ketchen & Shook, 1996). First, by allowing observations to switch cluster membership, nonhierarchical methods are less impacted by outlier elements. Although outliers can initially distort clusters, this is often corrected in subsequent passes as the observations switch cluster membership (Aldenderfer & Blashfield, 1984; Hair *et al.*, 1992). Second, by making the multiple passes through the data, the final solution optimizes within-cluster homogeneity and between-cluster heterogeneity. Obtaining this improvement, however, requires that the number of clusters be specified a priori (Milligan, 1980). This is problematic because *k*-means cluster analyses are often exploratory, thus the specification of initial cluster centers and the number of clusters need to be specified.

A solution is to use a two-stage procedure where a hierarchical algorithm is used to define the number of clusters and cluster centroids; these results then serve as the starting point for subsequent nonhierarchical clustering (Hair *et al.*, 1998). In other words, this study uses a combination of hierarchical and *k*-means to strength their benefits and suppress their drawbacks.

### Step 3: MANOVA and ANOVA

A variety of statistical techniques are used to assess the statistical validity of the empirical taxonomy: MANOVA and ANOVA tests are conducted to detect differences in group means.

First, this study uses a MANOVA to find differences between clusters while controlling the Type I error rate. Thus, a MANOVA is used to determine whether the means between the groups differ when having multiple continuous response variables, in this case clustering variables. If the response variables are correlated, the MANOVA test can detect multivariate response patterns and smaller differences than are possible with separate ANOVA tests. This study considers four MANOVA tests and apply them to sample: Wilk’s test, Layley-Hotelling test, Pillai’s test, and Roy’s maximum root test. Table 10 shows each test and summarizes its properties.

Table 10. MANOVA Tests

	<b>Wilks</b>	<b>Roys</b>	<b>Pillai</b>	<b>Hotelling</b>
Test Stat	$\Lambda = \frac{ E }{ E + H }$	$\min(p, q)$	$V^{(s)} = tr((E + H)^{-1} H)$	$U^{(s)} = tr(E^{-1} H)$
Test Stat Eigen Values	$\Lambda = \prod_{i=1}^S \frac{\lambda_i}{1 + \lambda_i}$	$\theta = \frac{\lambda_i}{1 + \lambda_i}$	$\sum_1^S \frac{\lambda_i}{1 + \lambda_i}$	$\sum_1^S \lambda_i$
Robust	Yes	NO	Yes	Yes
Power	Reverse	High if correlated	Reverse	Reverse
Measure of Association	$\eta_{\Lambda}^2 = 1 - A$	$\eta_{\theta}^2 = \theta$	$A_p = \frac{V^{(s)}}{S}$	$A_H = \frac{U^{(s)/s}}{1 + U^{(s)/s}}$

Second, a set of independent ANOVAs and the Scheffe Multiple Comparison Tests are used to assess whether the means of the clustering variables are significantly different across the clusters identified. For example,

$$H_0: \mu_1 = \mu_2 = \mu_3 = \dots = \mu_J$$

$H_A$ : The means are not all equal.

Thus, the basic idea is to determine whether all of the variation in the sample is attributable to random error (chance) or whether some of the variation is attributable to chance and some is attributable to differences in the means of the clustering groups. Additionally, this study uses the conservative Scheffe method to test for differences across the clusters because identifying distinct characteristics of the clusters is important for the clear description of the strategic value of durability capabilities. The following formula is used to find a set of Scheffe formula values.

$$\sqrt{(k - 1) fvalue MSE \left( \frac{1}{n_j} + \frac{1}{n_j} \right)} \quad (1)$$

Furthermore, this study adjusts for multiple comparisons to control for Type I errors (also known as a “false positive” in that results in the rejection of a true null hypothesis). Adjustments can either be made to  $\alpha$  (Bonferroni procedure) or the math may be inverted and instead applied to adjust p-values (the so-called q-values) (Scheffe procedure). The preference here is to  $\alpha$ .<sup>8</sup> Thus, this study applies the Bonferroni formula to post hoc multiple comparisons following rejection of a one-way ANOVA. It basically multiplies each of the significance levels from the Least Significant Difference (LSD) test

$$LSD_{i-j} = \frac{\check{\mu}_i - \check{\mu}_j}{S_{\check{\mu}_i - \check{\mu}_j}} \quad (2)$$

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<sup>8</sup> The Scheffe test takes a somewhat different approach. The Scheffe test computes an  $F$  statistic with d.f. =  $J-1$ ,  $N-J$ . In other words: Scheffe =  $LSD^2/(J - 1)$ .



by the number of tests performed:  $J \times (J - 1)/2$ . If this value is greater than 1, then a significance level of 1 is used. So, for example, the LSD test reports that the difference between groups 1 and 2 is significant at the 0.001 level. Then, the Bonferroni adjustment multiplies this by the number of pairwise comparisons when there are  $n$  groups and reports a significance level of  $n \times 0.001 = X$ .<sup>9</sup> Note that if this value is  $> 0.05$ , the difference between groups is not significant.

#### **Step 4: Least Significance Difference Tests and LOGIT**

A set of significant t-tests are used to perform a pairwise comparisons between all group means. While not as conservative as the Scheffe method, LSD test balances the risks of committing Type I and Type II errors when using taxonomic analysis (Slater & Olson, 2001)—in that those use an accepted  $p$ -value (0.05) but does not make identifying significant differences overly difficult to detect by using the widest interval statements. The second step consists of logit regressions on survival and entrepreneurial exit. In this study covariates such as industry and recession are included.

$$P (Y_i = 1 | X_i) = \frac{\exp (\hat{X}_i \beta)}{1 + \exp (\hat{X}_i \beta)} \quad \text{for logit regression}$$

The next section discusses the results of the cluster analysis, ANOVA, MANOVA, LSD and LOGIT.

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<sup>9</sup> Bonferroni adjustment actually overcompensates for the fact that multiple comparisons are being made. This somewhat similar with Scheffe. So, for group 1 versus group 2, the Scheffe value is:  $F = (SSE1 - SSE2 / m) / SSE2 / n-k$ , where SSE = residual sum of squares,  $m$  = number of restrictions and  $k$  = number of independent variables.

## CHAPTER IV

### RESULTS

#### **Overview**

In this chapter, an empirical examination of configurations of durability capabilities is conducted and the results are presented. However, prior to assessing an empirically driven taxonomy, the hierarchical clustering approach is assessed, and a *k*-means analysis is conducted. As part of the first research question: Are there identifiable configurations of new ventures based upon type and level of durability capabilities? Following the *k*-means analysis, the validity and reliability of the taxonomy is assessed. A set of individual ANOVAs are then examined, and the manner in which the clustering dimensions are related is determined through a MANOVA. Then, as part of the second research question—what is the ontological nature of these configurations of durability capabilities?—this study identified and labeled each configuration. Last, the firm-level outcomes are assessed as part of separated set of models, in which associations between a taxonomy and firm-level outcomes are examined in line with the third research question: Are these configurations of durability capabilities differentially related to new venture performance outcomes during an economic recession? The chapter concludes with an examination of supplemental analyses from which findings are validated and implications are discussed in the following chapter.

This section is presented in four parts. First, the descriptive statistics for the sample are discussed. Second, this is followed by a presentation of a taxonomic analysis in a two-step procedure (*e.g.*, Gruber *et al.*, 2010): Hierarchical clustering and *k*-means. Third, to interpret cluster solutions, this study uses ANOVA and MANOVA to assess whether the means of the clustering variables were significantly different across the resulting configurations of durability capabilities. Further, this study develops descriptions of the identified configurations to synthesize the quantitative findings. Similarly, to assess the external validity of the identified configurations of durability capabilities this study conducted a set of semi-structured questions to assess entrepreneurs' perceptions of the accuracy of the configuration descriptions, as Ketchen and Shook (1996, *p.* 447) noted: "Only when cluster analysis is augmented with additional techniques—especially ones that are less sensitive to researchers' biases—can confidence in the results obtained be strong." Fourth, the results of the associations between configurations of durability capabilities and firm-level outcomes during an economic recession are tested (using LSD and LOGIT) and summarized.

### **Part I: Sample Descriptive Statistics**

Building configurations of resources that result in durability capabilities required four steps. This first entailed adjusting all data for variations in the resource characteristics of new ventures. For all measures, variable scores were centered to their respective means (*e.g.*, sweat equity). The adjusted data were then used in the taxonomic analyses. The descriptive statistics for the clustering variables are presented in Table 11.

The descriptive variables are associated with the clustering variables: financial slack, entrepreneurial capital, HRS, social capital, and technology resources. Three proxies for measuring “financial slack” were used: Absorbed ( $M = -0.04$ ,  $SD = 0.17$ ), unabsorbed ( $M = -0.02$ ,  $SD = 0.01$ ), and potential ( $M = -0.01$ ,  $SD = 0.01$ ) (Bourgeois, 1981; Iyer & Miller, 2008). Six proxies for measuring “entrepreneurial capital” were used: General human capital ( $M = -2.93e-07$ ,  $SD = 1$ ), commitment or sweat equity ( $M = -0.00$ ,  $SD = 0.98$ ), motivation level in the form of historical ( $M = 0.01$ ,  $SD = 0.03$ ) and social comparison ( $M = -0.02$ ,  $SD = 0.05$ ) (Carree & Verheul, 2012; Cooper & Artz, 1995; Erikson, 2002; Gomez-Mejia *et al.*, 2018; Khelil, 2016). Two proxies were used to measure HRS: An index of eight HR policies on a binary scale ( $M = -0.00$ ,  $SD = 0.98$ ) and differences in year-to-year turnover ( $M = -0.00$ ,  $SD = 0.99$ ) (Lai *et al.*, 2016). Three proxies were used to measure social capital: inside ties ( $M = -0.02$ ,  $SD = 0.83$ ), outside ties ( $M = -1.20e-07$ ,  $SD = 0.99$ ) (*e.g.*, Coleman *et al.*, 2010; Rutherford *et al.*, 2012; Robb & Robinson, 2014). All correlations above  $|0.02|$  are significant at  $p < 0.05$  or lower for two-tailed test. All correlations above  $|0.03|$  are significant at  $p < 0.01$  or lower for two-tailed test (*see* Table 11).

## **Part II: Develop A Taxonomy**

The second part of the analysis focuses on answering the first main research question—whether there are identifiable configurations of durability capabilities based upon type and level of resources. To answer that research question, this study creates a taxonomy of durability capabilities based on configurations of resources, by using cluster analysis. To identify resource configurations in new ventures, this study follows the two-step procedure outlined by Gruber *et al.* (2010). Steps 1 and 2 relate to developing an initial taxonomy.

### **Step 1: Hierarchical Clustering**

First, this study determined the appropriate number of clusters using the hierarchical clustering algorithm developed by Ward (1963), complemented by the cubic clustering criterion proposed by Sarle (1983). Ward's method of hierarchical agglomeration was used because of its reputed ability to create meaningful clusters. Two factors guided the selection of the final cluster solution. First, Lehmann (1979) has suggested that, for a given sample of companies ( $N$ ), the number of reliable clusters must be in the  $N/30$  to  $N/50$  region; this is within the two- to four-cluster range in the present sample. Second, Hambrick (1983, 1984) has suggested examining variations in clustering coefficients as radical changes in these coefficients would indicate unstable coefficient from the results. This analysis provided strong support for a four-cluster solution. In addition, because Ward's (1963) algorithm, as well as cluster analysis in general (Punj & Stewart, 1983), tends to be sensitive to scaling—which Milligan and Hirtle (2003) identified as the second major source of problems in running Ward's (1963) algorithm—was not relevant in this case.

Table 11. Correlations of Clustering Variables ( $N = 2,500$ )

	1	2	3	4	5	6	7	8	9	10	11	<i>M</i>	<i>SD</i>
1. Absorbed Slack	1.00											-0.04	0.17
2. Unabsorbed Slack	-0.02	1.00										-0.02	0.01
3. Potential Slack	0.08**	0.07**	1.00									-0.01	0.01
4. Generic Human Capital	0.06**	0.01	-0.02	1.00								-0.00	1.00
5. Sweat Equity	0.12**	0.00	0.03**	-0.07**	1.00							-0.00	0.98
6. Motivation Level (Historical)	-0.01	-0.00	-0.01	0.01	-0.02	1.00						0.01	0.03
7. Motivation Level (Social Comparison)	-0.12**	-0.06**	-0.04*	0.00	-0.19**	0.48**	1.00					-0.02	0.05
8. Human Resource Strategies	0.43**	-0.01	0.04*	0.13**	0.22**	-0.02	-0.19**	1.00				-0.00	0.98
9. Employee Turnover	0.07*	0.00	0.01	0.01	0.00	0.00	-0.02*	0.10**	1.00			-0.00	0.99
10. Inside Ties	-0.02	0.01	-0.05*	-0.01	0.04**	-0.03	-0.01	-0.09	0.01	1.00		-0.02	0.83
11. Outside Ties	0.06*	0.09**	0.11**	0.03**	0.01	-0.04	-0.04	0.06**	0.05*	-0.04**	1.00	-0.00	0.99

\*  $p < 0.05$ , \*\*  $p < 0.01$

## **Step 2: K-Means**

Second, this study assigned the cases in the sample to the appropriate cluster using the *k*-means clustering method. *K*-means cluster analysis “implicitly minimizes the variance within each cluster” (Punj & Stewart, 1983, *p.* 139). As Punj and Stewart (1983, *p.* 143) note, “the *k*-means procedure appears to be more robust than any of the hierarchical methods with respect to the presence of outliers, error perturbations of the distance measures, and the choice of a distance metric. It appears to be least affected by the presence of irrelevant attributes or dimensions in the data.” This is important in this study given the number of clustering variables (*e.g.*, Slater & Olson, 2001). Figure 9 shows cluster mean solutions.

Further, this study assessed the stability of this cluster assignment using McIntyre and Blashfield’s (1980) cross-validation procedure. Using the cross-validation procedure, the study randomly split the 2,500 usable cases into two halves and applied the *k*-means clustering method to each half (*cf.* Homburg, Jensen, & Krohmer, 2008). This study assigned each case in the second half to the cluster with the nearest cluster centroid from the first half (based on the lowest squared Euclidean distance). Comparing the two cluster assignments for each observation in the second half—applying the *k*-means clustering method based on the nearest cluster centroid—this study found that 98.1 percent coincided; indicating a high level of stability.

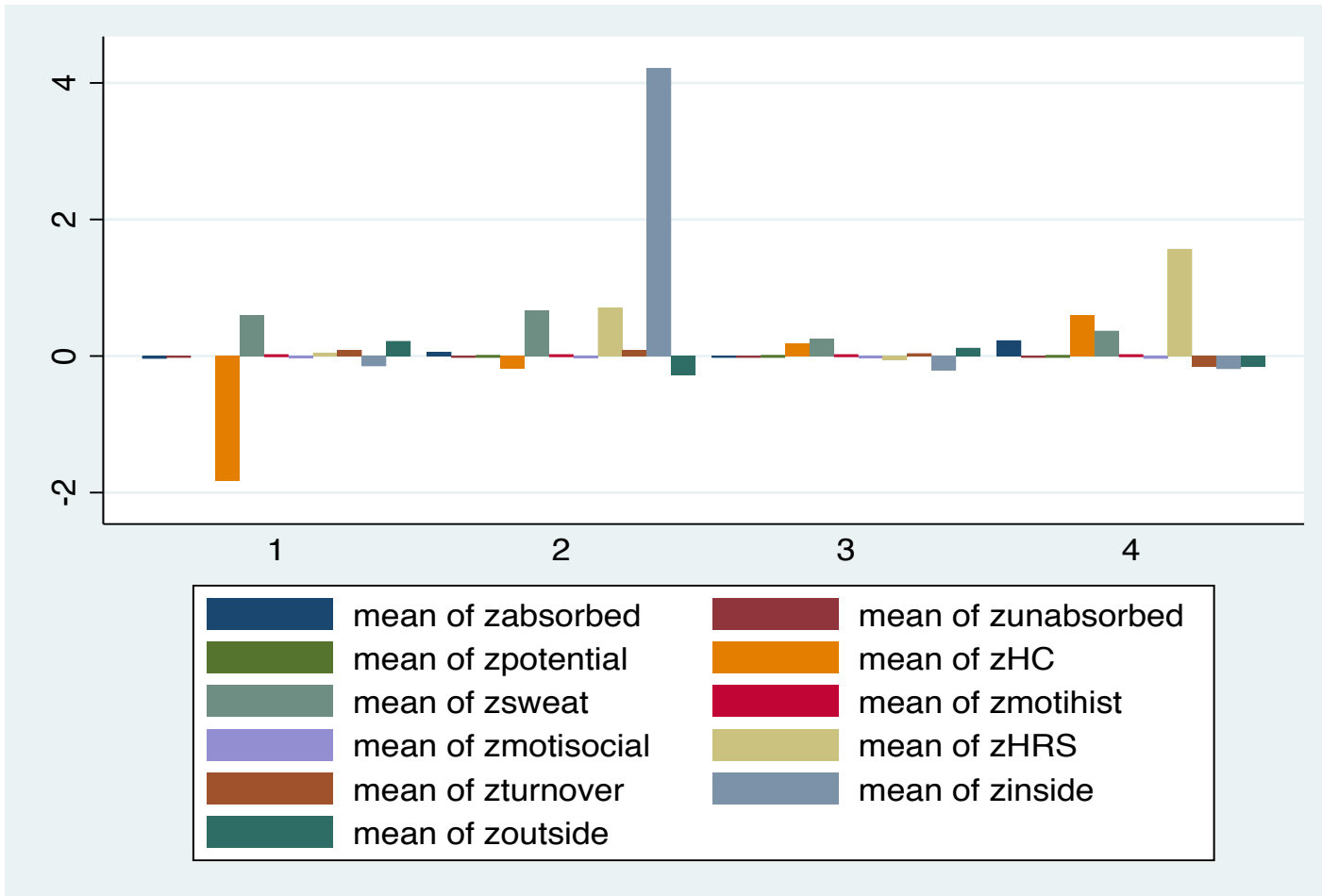


Figure 9. Cluster Solutions of Durability Capabilities

Notes: Cluster 1 ( $N = 602$ ; 24%); Cluster 2 ( $N = 588$ ; 23.52%); Cluster 3 ( $N = 629$ ; 25.16%); Cluster 4 ( $N = 681$ ; 27.24%).

Industry membership for each cluster: Cluster 1 ( $N = 294$  high-tech;  $N = 308$  medium-tech); Cluster 2 ( $N = 425$  high-tech;  $N = 163$  medium-tech); Cluster 3 ( $N = 386$  high-tech;  $N = 243$  medium-tech); Cluster 4 ( $N = 579$  high-tech;  $N = 102$  medium-tech).



### Part III: Interpretation of Cluster Solution

The third part of the analysis focuses on answering the second central research question—whether there are significant differences across the configurations of durability capabilities. A set of analyses are used to interpreting the resulting configurations of durability capabilities by using MANOVA and ANOVA tests. For the interpretation of each of the clusters, this study follows the three-step procedure outlined by Slater and Olson (2001). Table 12 shows correlations between clusters, and proportions of each cluster are shown below.

Table 12. Cluster Correlations and Descriptive Statistics ( $N = 2,500$ )

	Cluster 1 (24%)	Cluster 2 (23.52%)	Cluster 3 (25.16%)	Cluster 4 (27.24%)	<i>M</i>	S.D.
Cluster 1	1.00				0.13	0.33
Cluster 2	-0.18*	1.00			0.18	0.39
Cluster 3	-0.14*	-0.18*	1.00		0.12	0.33
Cluster 4	-0.18*	-0.23*	-0.18*	1.00	0.18	0.39

\*  $p < 0.05$ , \*\*  $p < 0.01$

#### Step 3: MANOVA and ANOVA

To understand these clusters, multivariate analysis (MANOVA), analysis of variance (ANOVA), and Scheffe tests of differences in group means were conducted. MANOVA showed that the four clusters were significantly different (Wilks' lambda = 0.00,  $F = 77.60$ ,  $p < 0.000$ ; Pillai's trace = 2.07,  $F = 45.74$ ,  $p < 0.000$ ; Hotelling's trace = 20.57,  $F = 138.84$ ,  $p < 0.000$ ; and Roy's largest root = 17.54,  $F = 360.55$ ,  $p < 0.000$ ), suggesting that the four configurations of durability capabilities varied significantly depending upon type and level of a firm's resource base. Variations in dimensions of the configurations of durability capabilities among the four clusters

were gleaned from ANOVA, as summarized in Table 13. Scheffe tests also highlighted the differences existed among the clustering variables of the four clusters.

#### **Step 4: Interpretation of the Identified Configurations**

To highlight the empirically distinct characteristics of the configurations of durability capabilities this study identified, labels were assigned to each configuration. Even though these labels may oversimplify the actual solutions, the resulting taxonomy makes the configurations more easily accessible and facilitates discussion of the findings.

*Configuration 1: 'Simple-Minded.'* The empirical findings show a group of new ventures that typically contain levels of financial, entrepreneurial, behavioral, and relational resources that are well below the average of other new ventures. Among the dimensions of versatile resources in this cluster, the generic human capital is the lowest. This finding suggests that these new firms exhibit less general knowledge and education level compared to others—making them configure *simple-minded durability capabilities*. In contrast, firms with this type of versatile resources possess above-average commitment to their firms, which yields more similarity in effort, time spent, and higher levels of loyalty to the business compared to other new ventures. These differences make environmental understanding more difficult. Further, the capital obtained from inside ties is below average; yet, the level of capital obtained from outside ties is above average in this cluster. This results in an increasing need to continuously search for outside resources—in the believe that it may help the business. However, the fact of focusing on activities other than the day-to-day operations, may imply a disconnection with what it is important. In all, new

ventures in Cluster 1 have the lowest overall configuration of durability capabilities, and as a result, potential benefits from durability capabilities are likely to be negligible.

*Configuration 2: 'Support-System.'* Cluster 2 contains above-average values of financial, entrepreneurial, behavioral, and relational resources, which demonstrates a salient level of durability capabilities in new ventures. Although the levels of all durability capabilities are above average, not all types manifest at the same level. Specifically, the social capital that these firms obtain from inside ties, is most prominent among all resources in the cluster, which suggests that these firms are characterized by exceptional support from spouse, family, and friends—such that minimize uncertainty and facilitate sharing information, time, communication, and capital (*e.g.*, Tsai & Ghoshal, 1998). Given the salience of the economic benefits emanating from firms' internal social capital, new ventures in Cluster 2 are noted to have a strong 'support-system durability capabilities.' Surprisingly, the level of capital coming from outside ties is not as pronounced. In specific, although the level of internal social capital is above average, these firms exhibit below the mean external social capital. While interesting, this does, perhaps, suggest that the advantage associated with this cluster primarily lies in the reduction of the cost of capital rather than high penalties in the equity structure as it is the always the case with external network ties. Additionally, entrepreneurs leading these firms exhibit high levels of commitment and are preoccupied with incentivizing and protecting its workforce. These entrepreneurs seem to have strong HRS, are proud of their employees, and share a unique behavioral bond with their firms. In all, new ventures in Cluster 2 exhibit the highest levels of resources coming from internal ties overall.

Table 13. ANOVA Statistics and Cluster Means

Firm-level Indicators	Clustering Variables	Configurations of Durability Capabilities				Scheffe & Bonferroni Results	F
		(1)	(2)	(3)	(4)		
<i>Financial Slack</i>	Absorbed Slack	-0.04	0.06	-0.02	0.23	4 > 1, 3	15.68***
	Unabsorbed Slack	-0.02	-0.02	-0.02	-0.02	-	0.54
	Potential Slack	-0.00	-0.01	-0.01	-0.01	-	0.63
<i>Entrepreneurial Capital</i>	General Human Capital	-1.83	-0.18	0.18	0.60	4 > 1, 2, 3; 2 > 1	109.24***
	Sweat Equity	0.60	0.67	0.25	0.37	-	2.03
	Motivational Level (Historical)	0.01	0.01	0.01	0.01	-	1.33
	Motivational Level (Social Comp)	-0.03	-0.03	-0.03	-0.04	-	0.83
<i>HRS</i>	HRS index	0.05	0.71	-0.06	1.57	4 > 1, 2, 3; 2 > 1, 3	116.22***
	Employee Turnover	0.09	0.09	0.04	-0.16		1.69
<i>Social Capital</i>	Internal Investor Ties	-0.15	4.22	-0.21	-0.19	4 > 2; 2 > 1, 3	1307.71***
	External Investor Ties	0.22	-0.28	0.12	-0.16	1 > 2, 4; 3 > 2, 4	654.91***

*Configuration 3: 'Stuck-in-the-Middle.'* A third cluster of firms contains levels of financial, entrepreneurial, behavioral, and relational resources that are 'stuck-in-the-middle;' exhibiting both marginally above- and below-average durability capabilities that is term New ventures in this cluster are identified by levels of durability capabilities being slightly above (and below) average compared to other clusters. Among these durability capabilities, the capital coming from internal network ties is the lowest. Entrepreneurs involved in this type of firm may have bootstrapped with owned resources and may tend to have varied levels of commitment and entrepreneurial capital. Indeed, these new ventures are defined by a low level of commitment rather than the strongest level of commitment as exhibited by firms with in Cluster 2. This particular dimension, unlike in the other clusters, is more salient which highlights that in this cluster, firm experienced low levels of commitment. This may reflect little effort to navigate a recession, having low incentives to perform, and may indicate that entrepreneurs are not motivated to respond (create tactics and strategies for surviving and thriving) in the face of a recession. Similarly, these firms exhibit little effort into HRS.

*Configuration 4: 'All-Stars.'* A final cluster of new ventures comprise of *balanced* levels of financial, entrepreneurial, behavioral, and relational resources. This cluster of new ventures exhibit moderated, above-average levels of durability capabilities. This cluster is termed 'balanced durability capabilities.' New ventures in this cluster provide the strongest level of absorbed slack, generic human capital, employee support, and relatively low employee turnover. Their limited dependence on internal and external ties as source of capital, indicate that network ties provide limited value. Similarly, these firms seem to seriously take into account the cost of doing business. However, the greater the level of sunk costs, relatively less easy is to put efforts

toward more productive ends. Entrepreneurs involved in this type of firms possess somewhat dissimilar goals and motivations and may tend to have lower levels of commitment as compared to Clusters 1 and 3. Because of their high focus on HRS and human capital, as well as their apparent spread with employee turnover and commitment, unlike in the other clusters, this cluster is more balanced across all dimensions of durability capabilities.

### **Step 5: Validation of the Identified Configurations**

To assess the external validity of the configurations of durability capabilities identified quantitatively, this study assessed entrepreneurs' perceptions of the accuracy of the taxonomy of durability capabilities. Thus, if the configurations identified are considered by the respondents to be as accurate descriptions of combinations of resources that are needed to survive and thrive during a recession, this study can determine that the taxonomy of durability capabilities are a valid and factual approach (Ketchen & Shook, 1996).

To accomplish this, the present study adopted Slater and Olsen (2001) methodology. This study develops an instrument that included configurations type descriptions. Then, this study developed scales (Table 14) to assess the accuracy of the configurations of durability capabilities each respondent indicated as being most representative of their businesses during the past great economic recession. This questionnaire was emailed to 20 entrepreneurs who were in business during the past economic shock (2008 – 2010). A week after the initial emailing, 15 responses were received, constituting 75% response rate.

Reliability scores (Cronbach's  $\alpha$ ) and average scores for each scale were computed (*see* Table 15). The average score indicated agreement that the paragraph descriptions were generally accurate. Then, a comparison between average scores from each of these scales was conducted. The results reject the null hypothesis of no significant difference between the accuracy of the scales at the  $p < 0.05$  level. Thus, the accuracy of each description of configurations of durability capabilities is significantly different from one another.

Table 14. Paragraph Descriptions of Configurations and Scale for Assessing Accuracy.

Description					
Cluster 1: Simple-Minded	Typically, during the past great recession, your business contained levels of financial, entrepreneurial, and behavioral resources that are well below an optimal threshold. While, your business relied heavily on external funding (e.g., angel and venture capitalists).				
Cluster 2: Support-System	Typically, during the past great recession, your business contained high levels of financial, entrepreneurial, behavioral, and relational resources.				
Cluster 3: Stuck-in-the-Middle	Typically, during the past great recession, your firm contains levels of financial, entrepreneurial, behavioral, and relational resources that are marginally above-average.				
Cluster 4: All-stars	Typically, during the past great recession, your firm contains moderated levels of financial, entrepreneurial, behavioral, and relational resources.				
Scale for Accuracy					
Strongly Agree 1	Agree 2	Agree Somewhat 3	Disagree Somewhat 4	Disagree 5	Strongly Disagree 6
<p>_____ This accurately describes the type and level of resources your business had during the past great economic recession.</p> <p>_R_ This leaves out one or more key elements of the type and level of resources your business had during the past great economic recession.</p> <p>_R_ This mischaracterizes a key element of the of the type and level of resources your business had during the past great economic recession.</p> <p>_____ This encompasses the primary features of the type and level of resources your business had during the past great economic recession.</p> <p>_R_ This is an inadequate characterization of the type and level of resources your business had during the past great economic recession.</p>					

*Note:* R = reverse coded

For simplicity, paragraph descriptions here are mere representations of observed patterns of configurations. A more thorough clarification of financial, entrepreneurial, behavioral, and relational resources was given in the cover letter that was sent to each participant.



Table 15. Descriptive Statistics for External Validity of Configurations

Configurations	Cronbach's $\alpha$	Mean	S.D.
<i>Cluster 1: Simple-Minded</i>	0.62	3.62	0.53
<i>Cluster 2: Support-System</i>	0.52	3.37	0.45
<i>Cluster 3: Stuck-in-the-Middle</i>	0.55	4.08	0.48
<i>Cluster 4: All-stars</i>	0.56	4.14	0.60

#### **Part IV:**

#### **Exploring Performance Implications of Configurations of Durability Capabilities During an Economic Recession**

The third central research question in this study is whether configurations of durability capabilities have implications to performance during the great economic recession (2008 – 2010). The study now offers propositions addressing the match between each of the four empirically derived configurations of durability capabilities and firm-level outcomes during the recession.

Simple-minded new ventures are the least proactive firms during the period of an economic recession. They heavily rely on the sweat equity of their owners, which enables them to monitor the business on a daily basis. They constitute their capital structure based on external network ties, stimulating the infusion of capital but also diffusing ownership, which may result in low motivations and aspirations to perform. Similarly, they have extremely low generic knowledge, which may blind strategic actions and responses in the face of a recession. Thus:

*Proposition 1: New ventures will achieve lower survival and financial performance during an economic recession when they utilize simple-minded durability capabilities.*

As entrepreneurs are concerned with putting a great deal of effort towards the firm, as well as protecting its structure (e.g., workforce), these firms pursue a relatively broad market orientation with a heavily dependence on internal network ties. Support-system new ventures are able to leverage on internal network ties, have low employee turnover, have a relatively strong HR system, and have strong commitment toward operations; which may created awareness of the environmental needs. Support-system firms may utilize an intensive distribution of strategy, relatively little change, and may induce growth behavior during economic adversity. Thus:

*Proposition 2: New ventures will achieve superior survival and financial performance during an economic recession when they utilize support-system durability capabilities.*

Stuck-in-the-middle new ventures are focused on maintaining status quo during an economic recession. These firms allocate proportionally fewer resources to maintain proactive responses amidst a recession such that they reflect low commitment to the operations of the firm, low motivations to perform, and low efforts to protect their workforce. Additionally, stuck-in-the-middle firms do utilize external networks (as opposed to internal ties) to potentially navigate the recession. This may enable them to even achieve some level of performance. Thus:

*Proposition 3: New ventures will achieve lower survival and financial performance outcomes during an economic recession when they utilize stuck-in-the-middle durability capabilities.*

New ventures create value during a recession by maintaining above average levels of versatile resources such as absorbed slack, entrepreneurial capital, commitment, and HRS; while reducing employee turnover and dependence on internal and external sources of capital. Such low cost of capital tactics may enable them to ‘play the spread’ and create temporal value for the firm and even superior performance. Thus:

*Proposition 4: New ventures will achieve superior survival and financial performance outcomes during an economic recession when they utilize all-stars durability capabilities.*

To assess the benefit of configurations of durability capabilities, this study conducted a series of LSD tests and LOGIT models when modeling which configuration types are associated with a firm-level outcome during economic adversity. Before turning to the results of the analyses, one must caution the reader that this study is only attempting to show correlations and probabilities among variables but not causation. After making such clarification statement, this study now turns to testing the above propositions.

### **Results: Validation of the Identified Configurations**

The correlations and results of this analysis, as shown in Tables 16 and 17, indicate strong support for Propositions 1 – 4. Proposition 1 —new ventures are less likely to survive and achieve lower financial performance when they utilize configurations of simple-minded durability capabilities— is supported in that a combination of generic knowledge (levels below the mean) with a strong dependence on commitment and external ties (levels above the mean) resource tactics produces less chances of surviving and thriving an economic recession.

Proposition 2 —new ventures are more likely to survive and will achieve higher performance when they utilize efficiency-centered configurations of durability capabilities— is supported in that new ventures exhibit significantly greater sales revenue, ROA, and growth. This reflects that levels (above the mean) of commitment, HRS, and internal ties drive their tactics for surviving and thriving during an economic recession. Put differently, for some new ventures, leveraging on their internal ties (in contrast of their external ties) may shape performance outcomes during a recession.

Proposition 3 —new ventures are likely to achieve lower survival and performance when they utilize stuck-in-the-middle configurations of durability capabilities— is partially supported in that new ventures have low probabilities to survive and also exhibit lower levels of growth. Surprisingly, though, new ventures seem to benefit from stuck-in-the-middle durability capabilities in that achieve high levels of sales revenue and ROA during the recession.

Proposition 4 —new ventures will achieve greater survival and performance when they utilize all-stars configurations of durability capabilities— is supported. All-stars durability capabilities produce high chances to survive and thrive a recession. This indicates that levels (above the mean) of absorbed slack, generic knowledge, commitment, and HRS drive the tactics of some new ventures in the face of a recession. Surprisingly, low dependence on internal and external ties seem to enable these firms to navigate the recession. Overall, this study finds strong support for the proposed durability capabilities framework to study how new ventures survive and thrive during economic adversity.

## **Robustness Tests**

This study examined the robustness of the results for several subsamples. First, the sample was divided up in terms of industry (tech and nontech). These analyses produced only minimal differences in the means for the various configurations of durability capabilities (see Table 18). Second, because it is possible that configurations of durability capabilities may be associated with outcomes at different economic conditions, a set of analysis with data from a later period ( $t + 2$ ) were reran. Specifically, differences in means and probabilities were conducted for the year of 2011. The results from this analysis suggests that the empirically driven taxonomy is robust concerning the benefits that durability capabilities provide to new ventures during a recession (see Table 19). Though, future research should focus on the specific characteristics of a firm's resource base when studying causal relationships.

Table 16. Correlations of Performance Outcomes, Clusters, and Recession

	1	2	3	4	5	6	7	8	9	10	11	12	<i>M</i>	<i>SD</i>
1. Survival	1.00												0.98	0.10
2. Exit Strategy (M&A)	-0.53**	1.00											0.00	0.05
3. Exit Strategy (Sale)	-0.80**	-0.00	1.00										0.00	0.08
4. Sales Revenue	-0.00	0.00	0.01**	1.00									0.87	4.90
5. ROA	0.00	0.01	-0.00	0.16**	1.00								0.24	0.77
6. Firm Growth	0.00	-0.00	0.00	0.68**	0.12**	1.00							-0.12	0.48
7. Cluster 1	-0.01*	0.00	0.01*	0.07**	-0.03**	-0.03**	1.00						0.00	0.07
8. Cluster 2	0.01*	0.00	0.01*	0.06**	-0.03**	-0.02**	0.00	1.00					0.01	0.15
9. Cluster 3	0.00	-0.00	-0.00	0.03**	-0.03**	-0.00	-0.00	-0.00	1.00				0.00	0.04
10. Cluster 4	0.03*	-0.03	-0.02	0.11**	0.04	0.04	-0.00	-0.00	-0.00	1.00			0.02	0.15
11. Recession	0.06*	-0.00	-0.00	0.13**	0.03**	0.08**	-0.00**	-0.02	-0.00	-0.03	1.00		0.31	0.46
12. Industry (binary)	0.05*	-0.02	-0.04*	0.14*	0.00	-0.00	0.13*	0.00	-0.02	-0.00	0.00	1.00	0.13	0.33

Notes:

(M&A) = Merger and acquisitions

(Sale) = Sale of a business

ROA = Return on assets as natural logarithm

Cluster 1 = Static and Impoverished Durability Capabilities

Cluster 2 = Efficiency-Centered Durability Capabilities

Cluster 3 = Disturbed Durability Capabilities

Cluster 4 = Balanced Durability Capabilities

Industry = 0 = medium-tech and 1 = high-tech

\* $p < 0.05$ , \*\* $p < 0.01$

Table 17. Performance Implications of Configurations During A Recession

	Cluster Membership	Propositions	Survival	Revenue		ROA		Growth	
			Odds Ratio	<i>M/S.D.</i>	( $\eta^2$ )	<i>M/S.D.</i>	( $\eta^2$ )	<i>M/S.D.</i>	( $\eta^2$ )
<i>Cluster 1: Static and Impoverished</i>	<i>N = 294 high-tech; N = 308 medium-tech</i>	Supported	0.001 (0.00)	-3.71/0.55	0.46	-0.13/0.02	0.28	-3.27/0.86	0.35
<i>Cluster 2: Efficiency-Centered</i>	<i>N = 425 high-tech; N = 163 medium-tech</i>	Supported	2.98 (0.51)	11.66/3.76	0.16	0.15/0.03 2 > 1, 3	0.25	0.19/0.01 2 > 1, 3	0.15
<i>Cluster 3: Disturbed</i>	<i>N = 386 high-tech; N = 243 medium-tech</i>	Partially Supported	0.01 (0.00)	11.34/3.39	0.42	0.01/0.02	0.19	-0.01/0.02	0.06
<i>Cluster 4: Balanced</i>	<i>N = 579 high-tech; N = 102 medium-tech</i>	Supported	3.98 (0.73)	13.14/3.36 4 > 3	0.49	0.13/0.04 4 > 1, 3	0.23	0.18/0.01 4 > 1, 3	0.17

*Note:* Results on entrepreneurial exit strategies are missing due to statistical calculations: not sufficient observations to perform it during the economic recession.

Probabilities and differences in mean between configurations during a recession are significant at  $p < 0.05$ , using LOGIT and LSD.

Interpretations:

(1) Survival is reflected in probabilities. For example, cluster 4 has the highest probability of survival (3.98) over failure during a recession; while cluster 1 is against the odds of surviving a recession (0.001).

(2) Performance outcomes are reflected in Mean Value/S.D. For example, cluster 1 has the lowest mean value with respect to sales revenue; while cluster 2 has the highest value. This implies that new ventures in cluster 1 experience negative performance outcomes during a recession. In contrast, cluster 2 experience overall positive performance outcomes in the face of a recession.

(3)  $\eta^2$  = Effect size. This study uses Cohen's  $d$  measure of effect size ( $\eta^2$ ). This can be used when comparing the difference between the two groups' means divided by the average of their standard deviations. For example, the difference in average ROA is about 0.5 standard deviations for cluster 1.

Table 18. Robustness Tests: Tech versus non-Tech

Configurations (Non-tech)	Configurations (Tech)				Scheffe & Bonferroni Tests	<i>F</i>
	(1)	(2)	(3)	(4)		
(1)	0.00	-	-	-	-	0.35
(2)	-	0.01	-	-	-	0.58
(3)	-	-	-0.00	-	-	0.27
(4)	-	-	-	0.01	-	0.63

Table 19. Robustness Tests: Performance Implications of Configurations During A Recovery Time

Recovery Time	Survival	Revenue	ROA	Growth
	Odds Ratio	M/S.D.	M/S.D.	M/S.D.
Cluster 1: Impoverished	0.001 (0.31)	0.40/0.39	0.01/0.57	0.03/0.14
Cluster 2: Efficiency-Centered	0.51 (-0.66)	0.19/0.87	-0.01/0.60	0.05/0.14
Cluster 3: Disturbed	0.82 (-0.19)	0.82/0.81	0.10/0.39	0.01/0.09
Cluster 4: Balanced	1.00 (0.07)	0.61/0.88	-0.11/0.43	-0.02/0.15



## CHAPTER V

### DISCUSSION

#### **Overview**

The primary objectives of this investigation are to (1) identify configurations of new ventures based upon type and level of durability capabilities; (2) understand the ontological nature of these configurations of durability capabilities; and (3) understand the performance implications of these configurations of durability capabilities during an economic recession. To address these research questions, a detailed literature review was conducted, and an empirically derived taxonomy of new ventures was proposed to examine the nature of the configurations of durability capabilities. The taxonomy was operationalized, and data were analyzed. In this chapter, the results are discussed in detail, and their implications for theory and practice are outlined. Following, the limitations of this study are discussed, and recommendations for future research are provided.

#### **Results**

Studies have indicated that new ventures face substantial threats in their external economic environment. Economic recessions are disruptive and unpredictable shocks that give rise to declines in new venture survival and performance (Bradley *et al.*, 2011). After ten years of the past great recession, many empirical questions remain unanswered.

For example, how new ventures made it through the great recession. To address this broad question, this study draws upon the organizational resilience framework to explore how, through the configuration approach, combinations of durability capabilities are related to firm survival and performance during the past great recession. Because durability capabilities are based upon types and levels of versatile resources, this study recognizes the heterogeneity among new ventures. Accordingly, this study expected that a taxonomy of new ventures based upon durability capabilities empirically emerged.

### **Research Question 1**

The first research question focuses on identifying versatile resources and attempt to discover how these resources work together to create durability capabilities. Recently, researchers have suggested that durability capabilities —based on a firm’s resource base— facilitate new ventures to adapt, remain functioning, and even outperform others in the face of environmental adversity (Sutcliffe & Vogus, 2003; Williams *et al.*, 2017; Williams & Shepherd, 2016). Thus, because new ventures possess varying types and levels of resources, this study argued that complex interrelationships exist among the versatile resources that create durability capabilities. Using a two-step cluster analysis procedure, a taxonomy of new ventures based upon durability capabilities was empirically derived, and it was determined that new ventures can be clustered in four main groups.

Interestingly, recent studies have offered a valuable conceptualization of durability capabilities, and various dimensions have been offered. For example, Lengnick-Hall and Beck (2005) and others (*e.g.*, Williams *et al.*, 2017) propose that a firm's durability capabilities result from combinations of multiple resources. Though insightful, the interrelationships among the resources the researchers propose warrants empirical examination. This study is among the first to empirically examine the manner in which various resources are interrelated, and the findings suggest the configurations of resources that develop durability capabilities.

The findings of this study suggest that four configurations of durability capabilities exist — namely, simple-minded, support-system, stuck-in-the-middle, and all-stars. The emergence of these configurations of durability capabilities suggests the manner in which new ventures are clustered. Rather than conceiving new ventures as a homogenous population, the findings of the study are more closely aligned with the theoretical roots of configurational approaches and closely resembles theoretical models of organizational architecture (Fjeldstad, Snow, Miles, & Lettl, 2012). Strategic entrepreneurship researchers are no longer required to rely solely on theoretical proposals about configurations of resources and capabilities and are now able to conceptualize the internal dimensions of new ventures, using specific empirical evidence from this investigation. Given that many conceptualizations of durability capabilities are theoretical in nature, this investigation provides valuable insight to shape the future directions of durability capabilities research.

## **Research Question 2**

The second research question seeks to answer the ontological nature of the resulting configurations of durability capabilities. In other words, the second research question seeks to inform about the way that durability capabilities are organized in a non-linear and non-overlapping set of clusters; and that these categories are fundamentally and significantly different from one another. The prior research question establishes that four configurations of durability capabilities exist; yet, whether they statistically differ from one another (*i.e.*, not correlated with each other thus can coexist coherently and independently) remains to be answered. In pursuit of this question, a set of statistical tests —based on contributions of Ketchen and Shook (1996) and Slater and Olsen (2001) — were performed and confirmed that the four clusters of durability capabilities are statistically different from one another. Given that the different clusters of durability capabilities are shown overall to exist statistically independent from another, it was necessary to examine variations that exist among the clustering variables of each of the four clusters. This finding empirically supports the notion that specific versatile resources —such as absorbed slack, unabsorbed slack, general human capital, HRS, internal investor ties, and external investor ties— are significantly different among the four clusters; while specific clustering resources —unabsorbed slack, potential slack, motivational level (in the form of past performance and social comparison), and employee turnover—are not. Thus, it is fair to suggest that across the population of new ventures, these firms are heterogeneous in type and level of durability capabilities.

These findings support the empirically driven taxonomy of new ventures based upon durability capabilities. The resulting taxonomy indicated four clusters of new ventures that differ from one another based upon levels of durability capabilities: simple-minded, support-system, stuck-in-the-middle, and all-stars. Cluster 1 —*Simple-Minded Configurations of Durability Capabilities*— shows a group of new ventures that typically contains levels of financial, entrepreneurial, behavioral, and relational resources that are well below the average of other new ventures. Interestingly, new ventures in this cluster exhibit the high level (above the mean) of economic benefits emanating from external ties. However, these firms that rely heavily on external ties seem to offer little on their probability of surviving and are associated with the lowest level of performance during a recession.

Cluster 2 —*Support-System Configurations of Durability Capabilities*— shows firms that typically contain above-average values of financial, entrepreneurial, behavioral, and relational resources. Particularly, these firms have a salient level of internal investor ties as compared to other clusters. Seems that firms in this cluster benefit from supporting their workforce but also from being supported by their internal ties (family and friends).

Cluster 3 —*Stuck-in-the-Middle Configurations of Durability Capabilities*— shows firms that typically contain levels of financial, entrepreneurial, behavioral, and relational resources that are marginally above-average. A particular feature of this cluster is that these firms exhibit high dependence on external ties, which may affect their performance outcomes during a recession.

Cluster 4 —*All-Stars Configurations of Durability Capabilities*— shows new ventures that typically contain above-average levels of financial, entrepreneurial, behavioral, and relational resources. Three interesting features emerged from this cluster. First, these firms possess the highest level of general human capital when compared to the other clusters. Second, these firms exhibit greater focus upon protecting their employee base by offering above-average HRS. Third, these firms seem to have weak dependence on internal and external ties, which may create strategic flexibility for managing during a recession.

Overall, this is among the first studies to theoretically propose and empirically examine configurations of durability capabilities. The presence of varying types and levels of resources that create durability capabilities is found to be instrumental to new ventures. This study finds support of the arguments indicating the presence of variations among new ventures based on the way they configure their resource base. In addition to examining differences in means between clusters of new ventures based on durability capabilities, this study assessed the external validity of the taxonomy of new ventures. As researchers have suggested to supplement quantitative taxonomies with reality checks (Ketche & Shook, 1996; Slater & Olsen, 2001), this study adopted Eisenhardt, Graebner, and Sonenshein's (2016) and Graebner and Eisenhardt's (2004) 'triangulation in action' method and conducted a 15 pilot, semi-structure interviews (through emails and phone calls) with key entrepreneurs who managed to survive and thrive the great recession. It should be noted that this is not intended to be a separate inductive study, rather this

serves to simply validate findings using qualitative data sources in a joint display approach.

Table 18 summarizes the view of entrepreneurs who indicated that the management of their firms during the great recession was consistent with the evidence of this study.

Table 20. Description of Cases

Entrepreneur (founder)	Industry	Outcome	Primary Action
1	Real State	Sold (2012)	“We had the ‘advantage’ in this period that we were still small enough that I could personally lend additional funds and/or buy more equity to help keep us a going concern.”
2	Information technology	Sold (2011)	“We still couldn’t tell we were actually being impacted until we were 3 months in to our own down cycle and it took three months to adjust out of it. Some of this was because we were growing 50%-100% compounded annually, but we continue to note the lag in knowing something is highly probable in coming.”
3	Business assistance	Operating	“Spiritual capital is very, very important. It is often called grit in human psychology. Having a willing and understanding spouse to support the effort, especially by not being disruptive or a distraction during difficult work periods is an unalloyed blessing.”
4	Construction	Operating	“We negotiated larger, longer-term (multi-year) projects at lower margins and more favorable payment terms to carry remaining people resources through the down period.”
5	Technology services	Merged	“In order to maintain resilience, one must give up some upside. We were less resilient in the Great Recession in terms of our financial capacity, but very resilient in terms of revenue momentum.”
6	Venture capital findings	Retired (2016)	“Experience was helpful. Having experienced several downturns involving layoffs in prior firms as a line employee, junior executive and later as a senior executive provided useful context. Having a finance and economics educational background and being a long-term investor in equity markets was also very helpful.”
7	Technology	Operating	“Our human resources practices as a business are highly advanced and sophisticated, leading to extremely high employee engagement, which is a fabulous resource to tap into in good times and bad.”
8	Health care	Operating	“Novel business models supported by reliable government and commercial reimbursement.”
9	Green technology	Acquired (recently)	“As we’ve built in greater sustainability over time, it has meant slowing down to modest double-digit annual growth rates in exchange for more “dry powder”. This is a polarity



			we continue to manage. It is not straightforward or easy. This is the essence of the complexity of business.”
10	Technology advertisement	Operating	“I went thru two or three pivots and had to be re-capitalized.”
11	Technology	Sold (2015)	“A strong base though didn’t generate enough revenue, it allowed to continue operations.”
12	Technology	Operating	“We also established early on a strong, transparent relationship with our bank. At the time of the Great Recession, we were in the first years of our relationship and we approached them (with the recession in our forecast) and shared with them the possibility that we could break our covenants over the course of 2009.”
13	Technology	Operating	“We are in the technology business and don’t see much advantage to “control” of technology under any market conditions. External ties were important.”
14	Technology	Operating	“Emotionally it was difficult as we had to conduct a small reduction in force (about 9%). It was a roller coaster of letting people go and managing cash to meet payroll commitments.”
15	Technology	Operating	“We had no financial slack in our business as we were growing as fast as we could – all resources were committed to growing the business.”

From these 15 cases, one can conclude that these entrepreneurs acted proactively, took steps to promote adaptation, and generated leadership to maintain functioning during the period of the great recession. Though, multiple informants are central to mitigate subject biases (Golden, 1992; Miller, Cardinal, & Glick, 1997) and lead to a richer, more elaborated model (Schwenk, 1985), this pilot provided guidance in identifying the most influential resources and capabilities during the process of surviving and thriving a recession. Future research is warned to follow-up extensive interviews with primary owners, partners, investors, and stakeholders. Through this

process of external validation, raised interesting avenues for future research on the phenomenon. For example, future development in the field of beliefs, values, and spirituality of the top leader could provide new insights in strategic decision making during an economic recession.

### **Research Question 3**

The third research question seeks to answer how configurations of durability capabilities are correlated and associated with performance outcomes during the great recession. Researchers have established that durability capabilities shape the way new ventures survive and perform during adversity (Sutcliffe & Vogus, 2003; Williams *et al.*, 2017). This study provides empirical substantiation by exploring the performance implications of configurations of durability capabilities on new venture performance outcomes.

The empirical examination of the third research question showed support to the proposed associations between configurations of durability capabilities and firm-level outcomes. A set of propositions confirm that significant mean differences exist between configuration of durability capabilities with respect to firm-level outcomes. For example, overall cluster 1 has less probability to survive a recession and exhibited the lowest performance means as compared to the other clusters. Similarly, clusters 2 and 4 offer a more appropriate strategic framework for new ventures to survive and thrive during a recession —both clusters have high probabilities to survive and also to outperform their counterparts. Finally, cluster 3 seems to be “stuck-in-the-

middle,” such that this type of configurations can reduce the ability of a new venture to survive and grow amidst a recession.

Moreover, this study conducted a set of robustness tests and found that the associations between configurations and performance are largely confined to challenging economic times. That is, our robustness analyses confirmed that configurations are more salient during recessionary times as compared to expansionary times. To this end, this is among the first studies to empirically examine configurations of durability capabilities and theoretically propose associations with firm-level outcomes during the great economic recession. The supportive findings received from this investigation give rise to abundant potential in the strategic entrepreneurship literature—specifically with respect to durability capabilities. The multiple contributions of this investigation to research and practice are discussed in detail, and following, the practical implications for entrepreneurs and top managers are offered.

### **Research Implications**

This study offers a number of implications for strategic entrepreneurship researchers. Overall, understanding how new firms survive and thrive in the face of an economic recession is important for theory development and testing in the strategic entrepreneurship research domain. Specifically, researchers have relied on conceptualizations of durability capabilities that are strictly theoretical. While the contribution of theory to the development of durability capabilities is instrumental, it is also important for theory testing to occur. Thus, in this investigation, prior

conceptualizations of durability capabilities were examined, and the findings have the potential to expand knowledge on new venture performance research.

This study began by noting that durability capabilities are fundamental for firms to adapt, survive, and even thrive in the face of economic hardship. Durability capabilities reflect combinations of firm resources. Yet, despite extensive research, there is no explicit evidence indicating how firms combine their resource base to produce durability capabilities, and how firms can benefit from different configurations. This study took a configurational view as a framework for providing knowledge regarding configurations of durability capabilities. This study combines various versatile resources that, *together*, create instrumental durability capabilities for firm survival and performance during exogenous economic shocks.

This study found that new ventures clustered in four major groups based on configurations of durability capabilities. First, in cluster 1, firms possess below average versatile resources which result in simple-minded configurations of durability capabilities. These firms show hurdles in continuing operations and fostering development in the face of a major economic recession challenges. These firms have salient levels (below-average) of general knowledge and (above-average) external ties. Apparently, having levels of prior education that are below-average and extracting economic benefits from external ties (angels and VCs) that are above the mean do not provide the means for surviving and thriving a recession. Put differently, simple-minded configurations of durability capabilities are not conducive of performance outcomes in the face

of challenging economic shocks.

Second, in cluster 2, firms exhibit greater interest in prioritizing certain resources, resulting in more strategic responses in the face of a recession. More specifically, firms in cluster 2 possess levels of HRS and internal ties that are above-average. This seems to suggest that new ventures emphasizing support-system configurations of durability capabilities have higher probability to survive and even outperform their peers during the recession. In other words, support-system durability capabilities facilitate continuation of operations while also foster performance and growth.

Third, in cluster 3, firms possess levels of resources that are marginally below the mean—such that these firms are stuck-in-the-middle. As a result, these firm potentially struggle to maintain positive functioning and development. Surprisingly, these firms seem to be positively associated with sales revenue and ROA. These seemingly controversial results may be explained by the fact that these firms are profit-oriented, with little consideration for growth, at least in a recessionary economic environment. In other words, growth is not seen as a milestone for these firms, potentially unattractive to financiers. The downside is that these firms prepare less for the eventual slowdown in the economy, increase high capital burn rates which may impact growth rates.

Fourth, in cluster 4, firms prioritize above-average absorbed slack, prior education, commitment,

and HRS. These firms seem to configure resources in a more balance fashion, resulting in all-stars durability capabilities. Firms exhibiting all-stars durability capabilities increase their odds of surviving and even outperforming their counterparts during an economic recession. It is noteworthy to mention that all-stars exhibit below mean levels of internal and external ties. In other words, these firms do not leverage economic benefits from their network ties. Perhaps, these firms balance strategic actions that are based on resources owned than resources to be obtain. Low dependence on internal and external ties may drive strategic actions—such that firms prioritize and leverage on their capacity to generate excess financial resources, prior knowledge, and workforce.

Taken all together—whether simple-minded, support system, stuck-in-the-middle, and all-stars—durability capabilities provide a fertile ground for future research. In subsequent lines, this study outlines implications for strategic entrepreneurship research.

### **Implications for Strategic Entrepreneurship Research**

Strategic entrepreneurship researchers have contributed to a steady accumulation of knowledge in terms of why some new ventures survive and even thrive when the external economic environment shifts. Two views have dominated our understanding of this phenomenon. On the one hand, a view on excess resources has contributed to efficiency-based strategies, providing buffers that enable adaptation and growth in resource-poor environments (*e.g.*, Bradley *et al.*, 2011; Lai *et al.*, 2016; Pal *et al.*, 2014). On the other hand, a view on resource-constraint firms

indicates that new ventures cope with situational factors by creating something from nothing (resourcefulness) (Bradley, Shepherd, & Wiklund, 2010; Powell & Baker, 2011). The resourcefulness construct refers to acquired behaviors and skills by which a firm regulates internal responses that interfere with the smooth execution of a desired firm behavior during stressful environmental events (Bradley, McMullen, Atmadja, Simiyu, & Artz, 2011). Both, the excess and the scarcity views on resources, have illustrated the scenario of how firms survive and thrive in the face of an economic recession.

Although interest in surviving and thriving a recession has increased, a key theoretical contribution of this work is reframing the phenomenon. Resource slack and scarcity models are limited to provide a useful explanation for how firms combine varying types and levels of resources that enable adaptation to the environment. From the durability capabilities-based perspective, survival and performance are a function of combinations of resources rather than resources in isolation. Resources are interdependent, needing each other to achieve the collective goal of firm success when the economic environment shifts (Williams *et al.*, 2017). This study observed that resources combined in multiple ways, and each model combination points to multiple but varying performance outcomes. The more intriguing question is whether there exists an optimal configuration of durability capabilities that may lead to higher probabilities of survival and superior financial performance during challenging environments. Consistent with the findings in this study, the evidence indicates that new ventures with support system and all-stars configurations of durability capabilities are associated with higher performance outcomes

during the great economic recession (2008 – 2010).

Accordingly, traditional strategic entrepreneurship research has long theorized that “more” and “few” resources are desired strategic actions for new ventures to survive and thrive a recession (e.g., Bradley *et al.*, 2011; Powell & Baker, 2012). This study provided an alternative but useful explanation. Specifically, this study assumed heterogeneity among the landscape of new ventures, possessing varying types and levels of resources. And that the combination of such resource diversity resulted in four configurations of durability capabilities. The theoretical framework suggested that differences in means of durability capabilities (based on resources) exist across the population new ventures. While a firm resource base is important, this framework showed that the resulting configurations of new ventures are associated with performance outcomes, identifying significant mean performance differences among the clusters of firms. The results showed four instrumental configurations with durability capabilities. ‘Support System’ and ‘All-Stars’ configurations of durability capabilities displayed stronger associations (above the mean) with survival and performance outcomes during a recession. One may assume that these two configurations are a more instructive alternative for new ventures on how to combine resources—such that they are more likely to survive and thrive. In contrast, ‘Simple-Minded’ and ‘Stuck-in-the-Middle’ configurations of durability capabilities exhibited below and slightly below the mean levels of resources, respectively. This finding is instructive in nature, in that new ventures are more likely to fail during a recession if the preferred tactic reflects a simple-minded or stuck-in-the-middle resource combination.



Further, though examining possible changes in beta coefficients of performance outcomes based on one-unit change in configurations of durability capabilities are beyond the scope in this study, the framework developed here provides conceivable evidence that an optimal level of durability capabilities may exist—*i.e.*, not too much but not too little. Therefore, this study indicates that an optimal level of resources is warranted to fully understand the complexity of factors that may lead to divergent performance paths. Future research could benefit from causal and linear estimation models, potentially investigating curvilinear effects of durability capabilities and resources on performance during a recession. In each case, there should be a threshold (U- and inverted U-relationships) with firm-level outcomes.

With respect to theories of strategy (*e.g.*, Hitt *et al.*, 2001) and competitive advantage (*e.g.*, Alvarez & Busenitz, 2001), this study explores the theory construction of configurations of durability capabilities. The framework developed here should be seen as a value-extending view on strategic advantages (Penrose, 1959) for new firms when the environment shifts. Rather than a universal framework of competitive advantage across multifaceted environments (Barney, 1991), this study presents an appropriate framework with clear boundary conditions that may be most applicable—especially when a startup resource base is not yet well-developed. In that way, this study seeks a more comprehensive and more accurate depiction of “organizational reality” (Dess *et al.*, 1993) by showing support that the configurational framework of durability capabilities plays a pivotal role in new venture performance, capable of creating a temporal

competitive advantage. Additionally, this effort enhances the validity and applicability of configurational approaches in strategic entrepreneurship research by demonstrating how taxonomies can be used in the context of challenging economic conditions.

Overall, the main contribution of the framework presented here lies in reframing the strategic actions new ventures use in the face of challenging exogenous conditions; suggesting that it is the combinations of actions that facilitate functioning and development when the environment shifts. Together, the framework suggested a multidimensional view of durability capabilities, emphasizing the configuration of versatile resources. These ideas stand in stark contrast to both the traditional static view on resources and the competitive advantage perspective, in which new venture survival and performance sway. If the theoretical ideas presented here overcome more sophisticated statistical tests, they stand to provide a more robust, accurate account and description of the phenomenon. Future research could perhaps leverage on fuzzy-set analyses, survival models, fixed- and random-effect models, model robustness, and Monte Carlo simulations.

### **Strategic Management Research**

With an indirect application to the broad strategic management research, this study extends the organizational resilience perspective. This study attends recent calls (Linnenluecke, 2015; Van Der Vegt *et al.*, 2015) to investigate the durability capabilities-performance link empirically. Although theory surrounding resilience has proliferated in recent years, Van Der Vegt *et al.*

(2015) indicate that the theoretical contributions of OR are far ahead of related empirical studies. Such lack of empiricism has slowed development of durability capabilities in strategic management research (Sutcliffe & Vogus, 2003). Thus, by exploring and testing the implications of durability capabilities on firm performance is likely to inform strategic management researchers concern with OR and competitive advantages (Lampel *et al.*, 2014; Sheffi & Rice, 2005).

The findings of this study offer implications to the strategic change capabilities literature. Although the findings of this study relate to new ventures, configurations of durability capabilities may extend to the capabilities and resources of public firms. Configurations of capabilities (more broadly) are central to public firms (Teece *et al.*, 1997). The reason is that firms have considerable slack to engage in routines, processes, and learning. Capabilities play an important role, likely to create and destroy value by encouraging stretching or constraining resource portfolio. Recently, Wilden *et al.* (2016) suggested that there are several ways in which firms combine and recombine resources to create capabilities; yet, the process of combination has not been explored. This study suggests that firms combine resources in varying levels, and that such heterogeneity creates valuable combinations, as well as less valuable. Because capabilities are said to have a double-edged sword effect (Le Breton-Miller & Miller, 2015; Leonard-Barton, 1992), strategic management researchers can gain more value from understanding configurations of capabilities—potentially finding an optimal configuration that amplifies their benefits while suppressing their drawbacks.

## **Implications for Entrepreneurs, Managers, and Practitioners**

This study also makes several practical implications for entrepreneurs. Briner, Engwall, Juillerat, Mintzberg, Morgeson, and Pratt (2012) discussed the importance to bridge the gap between theory and practice. In an attempt to minimize the current divide, therefore, practical implications for entrepreneurs and top managers are discussed.

The popular press has shown interest in resilient firms that survive and thrive the great economic *recession* (Gulati *et al.*, 2010; Seville, 2016). The results of this study offer a toolkit for surviving and thriving an economic shock. Indeed, this study identified the characteristics of new ventures that strategically mitigate the associated negative implications of an economic recession, and thus achieve desired firm outcomes. The findings show the balance of durability capabilities as a means to support firm behaviors during harsh economic conditions. Durability capabilities may be a key baseline requirement for new ventures to initiate, sustain, and manage effective firm behavior during challenging times. Indeed, the study found that HRS and network ties are more important resources than financial and entrepreneurial capital. As such, HRS and network relationships are likely important for continued strategy, growth, and performance of new ventures during a recession. In addition, the findings underscore the importance of creating versatile and generic resources rather than unique and difficult to imitate resources. This study offers unique insight to entrepreneurs by suggesting the levels of generic resources that are more likely to create resiliency in their firms during a recession.

### **Limitations and Directions for Future Research**

Several limitations of the study must be acknowledged: 1) secondary data use, 2) nonlinear method, 3) the measurement of clustering variables, and 4) the use of durability capabilities construct.

First, even though it has been increasingly applied in entrepreneurship research, the KFS is susceptible to measurement error. That is because the researcher had no control over the manner in which the data was collected nor the weights that were assigned to measures (*e.g.*, Cole & Sokolyk, 2017). In this study, a set of robust findings are included to supplement such deficiencies. Future research may use different samples to validate the findings of this study. Additionally, the collection and merging of data from other sources may help to overcome deficiencies inherent to the KFS. For example, CENSUS data, GDP data, market indicators, are some ideas that researchers can use to further expand the findings of this study.

Second, because the nature of the present study, a cluster analysis does not allow for cause and effect arguments in the same manner that other sophisticated methods do. Put differently, although configurations of durability capabilities were found, no strong statement regarding the effect of such configurations on firm-level outcomes can be made. Future research could perhaps explore the influence such configurations on survival and performance outcomes across different economic conditions. This could include the development of arguments regarding conditions

under which high and low levels of durability capabilities may lead to greater performance. Alternatively, it may be that firms with high durability capabilities undertake strategies that benefit the firms compared to actions by low level durability capabilities firms. Additionally, future research could delve more deeply into the relationships among the durability capability dimensions. Given the observed salience of the relational and behavioral dimensions, future research using traditional variance, causal methods may require reconsidering interactions among different levels of these and other dimensions of durability capabilities.

Third, while this study identified distinct configurations using sound methods (hierarchical and *k*-means) and finding within-cluster differences (MANOVA and ANOVA), and between-cluster differences with respect to outcomes (LOGIT and ANOVA), this approach does call for some individual judgement when identifying the number and nature of clusters. Our use of a replicative design, however, ameliorates these concerns, increasing the validity of the findings.

Fourth, a major limitation is the use of proxies for measuring durability capabilities. This is consistent with many studies, which leveraging upon archival sources face problems when capturing more effectively the substance of the measures. Future research may contribute by using more direct measures to assess observable attributes of new ventures.

In conclusion, our study demonstrates that durability capabilities, when considered together, have implications for new ventures during an economic recession. Durability capabilities are

based on financial, entrepreneurial, behavioral, and relational building blocks. However, the effects of configurations of durability capabilities on firm-level outcomes are yet to be discovered. New ventures, a fundamental organizational form for innovation and economic development, could benefit from configuring their resource based to withstand turbulent economic environments.

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## VITA

Paul Sanchez Ruiz

Candidate for the Degree of

Doctor of Philosophy

Thesis: CONFIGURATIONS OF DURABILITY CAPABILITIES AND THEIR PERFORMANCE IMPLICATIONS DURING AN ECONOMIC SHOCK: AN EXPLORATORY STUDY ON NEW VENTURES

Major Field: Business Administration

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Business Administration at Oklahoma State University, Stillwater, Oklahoma in May, 2019.

Completed the requirements for the Master of Science in Entrepreneurship at Oklahoma State University, Stillwater, Oklahoma in 2019.

Completed the requirements for the Master of Business Administration at Tec Milenio del Sistema Tecnológico de Monterrey, Puebla, México in 2012.

Completed the requirements for the Bachelor of Science in Law at Escuela Libre de Derecho de Puebla, Puebla, México in 2007.

Experience: Paul's research focuses on the psycho-socio-behavioral determinants of firm survival and performance, strategy formulation and implementation, and entrepreneurial finance. Paul has extensive practical experience as an entrepreneur, co-founder, and manager of numerous startups

Professional Memberships: Management Decision, Baltic Management Review, International Journal of Entrepreneurial Behavior & Research, Academy of Management's Annual Conference, Family Enterprise Research Conference, Southern Management Association's Annual Conference, US Association of Small Business & Entrepreneurship Annual Conference, International Council Small Business' Annual Conference, International Family Enterprise Research Academy's Annual Conference.